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**PRELIMINARY ENVIRONMENTAL
SURVEY REPORT**

ENVIRONMENTAL
PROTECTION
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**TMI PROPERTY
LIVERMORE, CALIFORNIA**

TMI-101H

prepared for:

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by

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Wahler Associates

Geotechnical and Water Resources Engineering

February 15, 1989
Project TMI-101H

TMI Analysts, Inc.
2667 Camino Del Rio South, Suite 306
San Diego, California 92108-3707

Attention: Mr. David W. Hutchinson
Subject: Preliminary Environmental Survey
Patterson Pass Road and N. Greenville Road Site
Livermore, California

Dear David:

Wahler Associates (WA) was retained by TMI Analysts, Inc. to conduct a preliminary environmental survey of a 300-acre site located northeast of the intersection of Patterson Pass Road and North Greenville Road in Livermore, California. WA is pleased to present the results of the Preliminary Environmental Survey of the TMI site at this time.

If you have any questions regarding the information presented in this report, please do not hesitate to call.

Very truly yours,

WAHLER ASSOCIATES

Peter Lyon
Environmental Engineer

Fred A. Seirafi
Principal Engineer
Environmental Services

PL/FAS:5

cc: James R. Martin
Mel Cecil
Craig Crockwell

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PRELIMINARY ENVIRONMENTAL SURVEY
PATTERSON PASS ROAD AND NORTH GREENVILLE ROAD SITE
LIVERMORE, CALIFORNIA

CHAPTER I
INTRODUCTION AND OVERVIEW

TMI Analysts, Inc. (TMI) is conducting a study of an approximately 300-acre property located northeast of the intersection of Patterson Pass Road and North Greenville Road in Livermore, California. Wahler Associates (WA) was retained by TMI to conduct a preliminary environmental survey of this property, generally referred to as the site. The results of WA's survey are presented in this report.

A. SCOPE OF SERVICES

The scope of services presented by WA and agreed to by TMI for the preliminary environmental survey consisted of: a review of pertinent information, including aerial photographs, available within the specified time frame; a site visit and walk-through/drive-through to obtain information for filling-out of WA's Property Transaction Environmental Assessment Questionnaire (Property Transaction Questionnaire); identifying on-site and off-site potential sources of contamination that could influence the property; selected shallow soil sampling and chemical testing; installation of 3 monitoring wells and chemical testing of groundwater samples; and, reporting the results of the preliminary survey in written form.

Additionally, WA was requested by TMI to perform an accelerated program designed to obtain as much information as possible for verbal presentation by February 2, 1989, as well as obtaining further information for the written Preliminary Environmental Survey Report. Therefore, WA also: advanced one boring to a depth of 25 feet near the underground fuel tanks between the hangars at the glider airport at the site; sampled and analyzed soil from the boring at 20 feet and 25 feet for total petroleum hydrocarbons and for aromatic hydrocarbons; sampled and analyzed shallow soil in the vicinity of the existing oil well and the former (now abandoned) oil well



for total oil and grease; sampled and analyzed shallow soil along the glider landing strip at the site for chlorinated herbicides. The additional information obtained has been incorporated in this report.

B. SITE LOCATION

The site is located northeast of the intersection of Patterson Pass Road and North Greenville Road in Livermore, California. Figure 1 shows the Site Location Map.

C. SITE DESCRIPTION

The approximately 300-acre site is gently sloped toward the west in its southern two-thirds, with elevations along the eastern boundary being about 60 feet higher than along the western boundary. The northern third of the site has more relief and features two small hills which respectively rise about 100 and 160 feet above the southern portion of the site.

The southern two-thirds of the site is predominantly used for agriculture and currently has about 80 acres of plowed fields. The other areas of the site, including the northern third of the site, are predominantly used for grazing land. With the exception of the realigned portion of Patterson Pass Road, the site does not appear to have any paved areas.

Despite the generally undeveloped nature of the site, several significant features are present in addition to the many open acres of agriculturally-used land. The main features of note include: two farmhouses and associated structures at the eastern and western boundaries of the southern two-thirds of the site; an existing oil well and oil derrick at the southeastern portion of the site; a landing strip, two hangars and associated structures for a glider airport running west-to-east across the southern third of the site; an east-west unpaved quarry road near the middle of the site; a clean gravel quarry near the northeastern portion of the site; and several small lakes or ponds which may be associated with the quarry in the northeastern portion of the site.

The site is bordered to the south by Patterson Pass Road (old alignment), to the west by North Greenville Road, and to the northwest by a section of the Western Pacific Railroad. The eastern and northern borders are Section boundaries.

D. GEOLOGY

The TMI site is located on the lower, western foothills of the Diablo Range and a portion of the adjacent Livermore Valley. Tertiary marine sandstones comprise the low rounded hills on the northeastern portion of the property. Pleistocene alluvial deposits occur on the gently sloping valley floor at the base of the hills and presumably overlie the older marine sandstones.

The active Greenville Fault trends northwesterly across the property. Three traces of the fault have been identified: one at the base of the hills; a second trending through a narrow, linear valley some 900 feet to the northeast of the first trace; and the third trending along an aligned series of lateral valleys and saddles about 1,200 feet northeast of the second trace. The Greenville Fault has been identified as the source of the magnitude 5.5 and 5.2 1980 Livermore earthquakes.

E. HYDROGEOLOGY

According to a 1983 groundwater evaluation report by Alexander Buller Associates, Inc. for a planned (but never built) Greenville Industrial Park, little is known of the occurrence and movement of groundwater beneath the site. However, it does seem that a groundwater sub-basin boundary divides the Altamont Sub-basin to the east from the Livermore Valley groundwater to the west. The western boundary of the Altamont Sub-basin is reported to be the Greenville Fault, which runs diagonally southeast to northwest through the northern third of the site. The effect of the Greenville Fault on the movement of groundwater at the site is not definitively known.

The three monitoring wells which WA installed on the site portray a slight north of west direction of groundwater flow beneath the southern half of the property, with a gradient of approximately 0.024 ft/ft. The first-

encountered water at monitoring wells MW-1 and MW-2 along the western boundary of the site was at about 40 feet and the static water level is approximately the same for MW-1 and MW-2. The first-encountered water at monitoring well MW-3 was about 33 feet and the static water level rose to about 23 feet.



CHAPTER II
FIELD INVESTIGATION PROCEDURES

WA implemented a field investigation program consisting of: the installation of three monitoring wells; a survey of relative monitoring well elevations and locations; well development, sampling and laboratory analysis of groundwater from the three monitoring wells; the advancement of a 25-foot deep soil boring near the underground tanks at the glider airport, as well as laboratory analysis of two samples retained from this soil boring; the sampling of shallow soils from suspect areas of the site; and the laboratory analysis of selected samples based on possible contamination introduced at various areas of the site. The specifics of the field program are described below. DH-8

A. WELL DRILLING AND INSTALLATION

Well drilling activities took place on January 27, 30 and 31, 1989. Figure 2 shows locations of monitoring wells and exploratory borings. Drilling was performed by a subcontractor (Westec Drilling of San Jose, California) using a CME-55 drill rig with an 8-inch diameter hollow-stem auger. Soil samples were taken at 5-foot intervals or more frequently if the subsurface conditions dictated, using a 2.4-inch I.D. Cal-Mod sampler. A 140-pound hammer falling 36 inches was used to drive the sampler and blow counts were recorded. Both soil cuttings and soil samples were examined for material types and recorded in the boring logs. Drilling and sampling tools and casings were steam-cleaned prior to drilling each hole.

The depth and screened interval of each upper-aquifer monitoring well was determined in the field on the basis of information gathered during drilling. Two-inch diameter Schedule 40 PVC casing was installed through the augers to the bottom of the hole. The slotted section of casing was placed in the saturated zone of the aquifer. No. 3 sand was used as the sand pack around the slotted portions of the groundwater monitoring wells. A bentonite seal was placed on top of the sand pack. A neat grout seal, at least 5 feet in length, was placed to the surface. Above-ground steel locking devices were installed at each of the monitoring wells.



Lithologic logs of the three monitoring wells and of soil boring DH-8, including detailed geologic information, Unified Soil Classification System (USCS) labeling, and well construction details, are presented in Appendix A.

B. WELL DEVELOPMENT

After installation of each well, sufficient time was allowed for the seal to set. Subsequently, each well was developed using an air-lift method. This process continued until the groundwater was free from fine sand and sediments.

C. WELL SURVEY

A reference elevation for each monitoring well was surveyed on February 10, 1989 by a State-certified surveyor (Altamont Land Surveyors) to within the nearest 0.01-foot, based on the assumed datum. WA also measured depths to water in each of the wells on this date. The relative elevations and depth to groundwater from top-of-casing of the three upper aquifer monitoring wells installed by WA, in feet, are as follows:

| <u>Well Number</u> | <u>Top of Casing</u> | <u>Groundwater Elevation</u> | <u>Depth to Groundwater</u> |
|--------------------|----------------------|------------------------------|-----------------------------|
| MW-1 | 619.23 | 575.84 | 43.39 |
| MW-2 | 610.42 | 569.71 | 40.71 |
| MW-3 | 663.49 | 639.83 | 23.66 |

D. GROUNDWATER SAMPLING AND LABORATORY PROCEDURES

Groundwater samples were obtained from each of the three upper aquifer monitoring wells. The wells were purged of at least three casing volumes of groundwater prior to sampling. Groundwater from each well was sampled with a clean Teflon bailer which had been pre-washed and then decontaminated with a steam-cleaner. After a sample of water was drawn from one of the wells, it was carefully poured into an appropriate container and stored in an ice-filled cooler.

The groundwater testing program was designed to determine whether volatile or semi-volatile organic contaminants existed beneath, or had migrated beneath, the site. Therefore, the groundwater samples were analyzed by Sequoia Laboratories in accordance with EPA Methods 8240 and 8270, as described in Methods for Organic Chemical Analyses of Municipal and Industrial Waste Water (U.S. EPA, EPA 600/4-82-057, July 1982, Cincinnati, Ohio). Field sampling parameters including pH, conductivity, and temperature are enclosed in Appendix B. Complete laboratory data on chemical testing, along with chain-of-custody documentation, is included in Appendix B. The summaries of groundwater chemical testing are provided in Table 1.

E. SUBSURFACE SOIL SAMPLING

Subsurface soil samples were taken during the drilling of boring DH-8. The 6-inch ring samples were obtained using a 2.4-inch I.D. Cal-Mod sampler and the samples were immediately sealed, put in an ice chest and readied for shipping to Superior Analytical Laboratory for chemical analysis. Two soil samples from DH-8, one at 20 feet and one at 25 feet, were analyzed for total petroleum hydrocarbons and for aromatic hydrocarbon content. Complete laboratory data on chemical testing, along with chain-of-custody documentation, is included in Appendix B. Figure 2 shows the locations of the monitoring wells and borings completed at the site. Table 2 summarizes the subsurface soil chemical analysis results from boring DH-8, near the underground tanks at the site.

F. SHALLOW SOIL SAMPLING

WA also performed shallow soil sampling to determine if organochlorine pesticides or chlorinated herbicides existed in the soil at the site. The site was divided into a rough grid and a total of 22 samples were taken at a depth of 9 inches. Also, 8 samples at a depth of 18 inches were taken. Further, six shallow soil samples were taken to be analyzed for total oil and grease from the vicinity of the existing and abandoned oil wells at the site. Figure 3 shows near-surface soil sampling locations.

The selected samples were composited and analyzed by EPA Method 8080, a test for organochlorine pesticides and PCBs, and by EPA Method 8150, a test for chlorinated herbicides. Some samples were also tested by a gravimetric method for total oil and grease content. The shallow soil chemical analysis results are summarized in Table 3.



CHAPTER III

ENVIRONMENTAL SURVEY OF POTENTIAL OFF-SITE SOURCES

WA conducted a regulatory agency case review and literature search, a review of aerial photographs, a site reconnaissance, and filled-out WA's Property Transaction Questionnaire, in order to examine potential off-site sources of contamination which may influence the site. The findings of WA's potential off-site source survey are discussed below. The Property Transaction Questionnaire is included in Appendix C.

A. LAWRENCE LIVERMORE NATIONAL LABORATORY (LLNL)

Southwest of the TMI site is the Lawrence Livermore National Laboratory (LLNL). LLNL, operated by the University of California for the U.S. Department of Energy (DOE), was established in 1952 to conduct nuclear weapons and magnetic fusion energy research. The developed part of the main LLNL site is about one square mile in area. The LLNL also operates Site 300, a high explosives testing facility, in the hills about 15 miles to the east of the main LLNL site. Figure 1 shows the location of the main LLNL site relative to the TMI site.

Through WA's background information search, three primary sources of potential contamination which could impact the TMI site, have been identified. These sources are airborne emissions, radioactive waste, contamination, and volatile organic compound contamination in the groundwater at the LLNL site. A survey of these three potential sources is included below.

1. Air Quality in the Vicinity of the LLNL

The LLNL and the Bay Area Air Quality Management District (BAAQMD) conduct air sampling programs in the vicinity of the LLNL. Levels of various airborne radionuclides and beryllium measured at the LLNL site, and at off-site locations near the LLNL site, were below regulatory limits in 1986 and 1987 (Holland et al., 1987 and 1988). Further air monitoring data collected by the LLNL may be available if a request in writing is made to the Environmental Protection Department of the LLNL.

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The BAAQMD has monitored existing ambient concentrations of criteria air pollutants at a station on Old First Street in Livermore, located four miles west from the LLNL in Livermore. Criteria air pollutants include: carbon monoxide, nitrogen dioxide, sulphur dioxide, ozone and particulate matter. This station is located generally upwind of the LLNL in Livermore, since the predominant wind direction is from the southwest through west in that area (Holland et al., 1987 and 1988). According to information supplied to WA by the BAAQMD, state and federal ambient air quality standards for criteria air pollutants were achieved at the Livermore Station in 1983 through 1987, with the exception of ozone. Ozone standards were exceeded at the Livermore Station and in many other locations in the San Francisco Bay Area.

In 1987, the LLNL was issued 163 air permits to operate equipment at the Livermore site and at a LLNL testing center referred to as Site 300, which is located fifteen miles southeast of Livermore. The Livermore site airborne emission sources, which include an incinerator associated with LLNL's existing hazardous waste management facilities, are permitted by the BAAQMD. Discussions with BAAQMD staff indicate that ambient air quality standards probably have not been exceeded in the vicinity of the LLNL site due to LLNL activities in this area, including operation of the existing incinerator. More detailed information about these air pollution sources is available in the BAAQMD permits. However, examining these permits required a request in writing to the BAAQMD and time constraints did not allow a more in-depth review at this time.

A new Decontamination and Waste Treatment Facility (DWTF) within the LLNL site has been proposed to replace the existing hazardous waste management facilities. The proposed facility includes a new incinerator. Constructing and operating this facility will require a variety of federal, state and local permits. As part of the process of obtaining these permits, the Department of Energy (DOE) has prepared a Draft Environmental Impact Statement (DOE, 1988). This document examines potential adverse environmental effects of both maintaining the existing hazardous waste management facility and replacing it with the new DWTF. The authors conclude that the maximum ambient concentrations of air pollutants produced anywhere in the vicinity of the LLNL site would, in either case, be within

federal, state and local standards. These conclusions are still under review by the permitting regulatory agencies. A public hearing concerning the proposed DWTF was held in 1988, and the DOE has tentatively scheduled to reopen this hearing in April of this year.

Based on the information collected so far and discussed above, WA believes that the existing equipment and facilities and the proposed DWTF at the LLNL in Livermore probably do not pose a significant threat to the air quality at the proposed TMI site. In any case, TMI may wish to follow the status of the permitting process for the DWTF, which may include attending any future public hearings concerning these matters.

2. LLNL Radioactive Waste Contamination

WA conducted a review of regulatory agency records relating to potential radioactive waste contamination at the LLNL site. WA's review of the LLNL site records at the Regional Water Quality Control Board (RWQCB) led to a 1985 report titled "Investigation of Past and Present Use, Storage and Disposal of Hazardous Materials at the Lawrence Livermore National Labs." This report explained that in the 1960s, experiments were conducted to study the biological cycling of radionuclides in cows, sheep, mice and rabbits. The report asserts that contaminated biological waste was shipped to a toxic waste facility, that a few of the non-contaminated animals were buried in the northeast corner of the site, and that such non-contaminated animals were never buried deeper than 20 feet.

In addition, the report indicates that in 1974, an experimental garden plot was constructed in the northeast corner of the site to study uptake of plutonium into agricultural plants. Low level plutonium-contaminated sludge was used as fertilizer in the garden plot. After the conclusion of the experiment, the soil was left in-place apparently because it was not considered hazardous. At present, LLNL maintains monitoring wells at the northeast corner of the site (diagonally adjacent to the southwest corner of the TMI site), but the groundwater in these wells does not appear to have been analyzed for radioactive content.

Though the information presented above has left open the possibility of radioactive waste contamination adjacent to the southwest corner of the TMI site, two factors should be borne in mind. Firstly, the historical boundary of the Livermore Lab at its northeast corner was approximately 600 feet south of the present boundary, which is the Patterson Pass Road. The additional strip of land was reportedly acquired later, consequently creating a buffer zone between the LLNL site and other properties. Secondly, the groundwater gradient beneath the Livermore Lab site is generally in a westerly direction or away from the TMI property. In particular, the groundwater gradient is relatively steep at the eastern and northeastern end of the Livermore Lab property. Thus, the possibility of radioactive waste contaminated groundwater entering the TMI site from beneath the Livermore Lab site is quite remote.

In this case, without shallow surface and subsurface sampling and laboratory analysis, the remote possibility of some radioactive waste contamination dispersing from LLNL onto the TMI site cannot be completely ruled out. Therefore, despite the remote possibility mentioned above, it is recommended that further investigation of potential radioactive waste contamination and migration be performed, to the satisfaction of all parties involved.

3. LLNL Volatile Organic Contamination (VOC) of Groundwater

LLNL is a Superfund Site and has several groundwater contamination plumes being investigated and/or remediated. All of the plumes are moving to the west or northwest and appear to originate near the western or southwestern sections of the LLNL site. These VOC plumes would be expected to continue moving toward the west or northwest and would not be expected to impact the TMI site as long as current conditions persist. WA's field investigation data support this conclusion because WA has established that the groundwater flow direction in the upper aquifer beneath the southern section of the TMI site is slightly north of west. Therefore, it is unlikely that VOCs would migrate from the LLNL site toward the TMI site.

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B. LEAKING UNDERGROUND FUEL TANK SITES

The Regional Water Quality Control Board (RWQCB) keeps records of leaking underground fuel tanks (LUFTs) for the Bay Area counties. The RWQCB files indicate that no LUFTs occur up-gradient of the site and that the closest LUFT site in Livermore is more than one mile down-gradient of the site. Checking with the California Department of Water Resources LUFT records, as well as checking with Alameda County Flood Control and Water Conservation District (ACFCWCD) has revealed that no evidence exists of up-gradient LUFTs relative to the site.

C. TOXIC GROUNDWATER CONTAMINATION SITES

The RWQCB also maintains records of other toxic groundwater contamination sites. Review of the RWQCB's North Bay Toxics records has indicated no documentation of up-gradient off-site toxic groundwater contamination sites. A number of down-gradient sites were indicated, most notably the LLNL site, but the rest were more than one mile away from the TMI site. Checking with the ACFCWCD showed they were unaware of any up-gradient potential source of toxic contamination of the groundwater which could impact the TMI site. Accordingly, the most proximate site would appear to be the down-gradient LLNL site, to the southwest of the TMI site.

D. SURROUNDING BUSINESSES

WA conducted a site vicinity reconnaissance of businesses surrounding the TMI site. All of the businesses adjacent to the site are located to the west along North Greenville Road. As one moves from north to south along North Greenville Road adjacent to the site, the following businesses are encountered: Bishop Industries (light industry), Allied Metal Fabrication (manufacturing yard/light industry), Sierra Products (distributor), Gene Caldeira Inc. (grading and paving), Livermore Truck and Trailer (industry), and finally, Amador/Lincoln Business Center (new warehousing being constructed).

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E. PATTERSON PASS WATER TREATMENT PLANT

The Patterson Pass Water Treatment Plant is located about 1/4-mile to the east of the site along Patterson Pass Road. The activities at the treatment plant would not be expected to be an off-site source of potential contamination for the TMI site.

F. ALTAMONT PASS LANDFILL

The nearest landfill to the site appears to be the Altamont Pass Landfill, located about 4 miles northeast of the site in the Altamont Pass area to the north of Interstate 580.

G. WESTERN PACIFIC RAILROAD SPILLS

A Western Pacific Railroad (W.P.R.R.) line runs along the northwestern portion of the site for a distance of about 2,000 feet. WA came across no documented evidence of hazardous waste spills from the railroad in its discussions with regulatory agency officials regarding the site. Additionally, no visual evidence of discolored soil or suspect materials were noted during WA's reconnaissance along the W.P.R.R. line at the border of the site.

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CHAPTER IV
ENVIRONMENTAL SURVEY OF POTENTIAL ON-SITE SOURCES

WA conducted a literature search, site reconnaissance, aerial photograph examination, regulatory agency review, and completed WA's Property Transaction Questionnaire to identify the potential on-site source of contamination at the site. The results of this survey of on-site sources are detailed below.

A. AGRICULTURE

Any storage or mixing area for pesticides/herbicides.

From the site reconnaissance and aerial photograph review activities it is apparent that the southern third of the property has been plowed for planting as far back as 1966. Additionally, the areas in the northern two-thirds of the site have been used for cattlegrazing since at least that date. Generally, the main hazardous waste contamination problems that may be associated with these farming activities are confined to either pesticide or herbicide accumulation in the shallow soils at the site. In order to address this potential on-site contamination problem, WA designed and implemented a shallow soil sampling and testing program intended to roughly cover the site while focusing on the most suspect areas of the site. The results of this sampling program are described in the Field Investigation Results chapter.

B. HUMMINGBIRD HAVEN GLIDER AIRPORT

Through WA's site reconnaissance and survey it was determined that two areas of environmental concern existed due to activities at the glider airport. The first area of concern was the apparent application of herbicides to the landing strip itself as a means of defoliation. The second, and more serious, environmental concern is the existence of not one, but three, underground fuel tanks between the hangars at the glider airport. At the request of TMI, WA has implemented a limited program to address these two issues in this Preliminary Environmental Survey Report. The results of the field sampling at the glider airport are described in the Field Investigation Results chapter.

*where is
air strip
on site plan*

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C. OIL WELLS

WA's preliminary environmental survey has established that two oil wells have operated on the site. Both of the oil wells (one is now abandoned) were drilled near the southern boundary of the site about 100 feet north of Patterson Pass Road. The existing well is operated by Hershey Oil Company and has been producing sporadically since 1967. The abandoned well was operated from about 1981 to 1983 by TXO. Other oil wells, some of which are also operated by Hershey Oil, are situated to the east and southeast of the southeastern portion of the site.

Discussions between WA and California Division of Oil and Gas (CDOG) personnel indicated that there were no reported spills or leaks related to any of the oil well production or storage activities at the site. Also, permits for necessary "workovers" of the oil wells had been properly obtained at all times. Finally, the abandonment conducted by TXO had also been permitted and carried-out in an approved manner. The CDOG had no records of any problems at the site.

Currently, the infrastructure associated with the Hershey Oil well is limited to a fenced-off derrick and some 3-inch diameter piping running parallel to Patterson Pass Road and then crossing Patterson Pass Road to link the Hershey Oil wells to an above-ground storage site south of the road and about 100 feet off-site. Based on information obtained by WA through historical aerial photograph examination, an above-ground storage site was located immediately southeast of Hershey's on-site oil well for a period of time around 1984. This storage site was subsequently abandoned, probably because of the limited production from the on-site well.

Two pieces of information made WA aware of the previous on-site storage area as a potential on-site contamination source. First, the CDOG relayed the Hershey Oil contention that no storage of oil was ever undertaken at the site. Second, a map supplied by TMI showed the suspect area designated as "Existing Underground Tank Field." Due to this contradictory information, it was decided that shallow soil samples should be taken and analyzed in the



vicinity of the abandoned oil wells, the existing oil well, and the apparent former above-ground storage area at the site. The results of these analyses are discussed in Chapter V.

D. QUARRY

A lease for mining of clean gravel fill materials from a quarry in the northern portion of the site allows continued mining of materials by Jilchrist Development Company under certain conditions for a maximum period of three years after purchase of the site. During WA's site visits and field work between January 18, 1989 and February 14, 1989, the mining of the quarry was never under way. From the information available to WA, it is not likely that this mining would constitute a potential contamination hazard, unless methods other than a typical mechanical process are employed.

E. FARMHOUSE RELATED INFRASTRUCTURE

It appears that two above-ground propane tanks, two domestic wells, three septic systems and associated private utilities supplying power to the facilities exist at the site. It is not clear that these facilities would pose any significant potential contamination sources, and this potential was not evaluated by WA.

was domestic wells tested?

CHAPTER V
FIELD INVESTIGATION RESULTS

WA conducted a field investigation program designed to examine potential sources of contamination at the site. WA installed three upper aquifer monitoring wells, advanced one 25-foot deep soil boring in the vicinity of the underground tanks at the on-site glider airstrip, and conducted a shallow soil sampling and analysis program designed to address potential pesticide, herbicide and oil contamination at the site.

A. SHALLOW SOIL SAMPLING

1. Agriculture

WA implemented a shallow soil sampling program designed to roughly cover the site, but also to focus on more likely areas of pesticide or herbicide application at the site. Since both chlorinated pesticide and herbicides tend to be relatively immobile in soil, the sampling depths were limited to either 9 inches or 18 inches. The site was divided roughly into a grid and sample locations were chosen to be representative of each region within the grid. Twenty 9-inch samples were taken and composited into 7 samples for analysis, and 8 18-inch samples were taken and composited into 4 samples for analysis. Sample numbers SS-1 through SS-28 were used. It was expected that this shallow soil sampling program would help establish if elevated levels of pesticides or herbicides existed at the site and help establish a rough vertical profile if any such contamination existed in the shallow soil at the site.

WA followed the sampling procedures indicated in Chapter II of this report and tested the selected shallow soil samples for EPA Method 8080 and 8150 compounds. EPA Method 8080 detects and quantifies the presence of organochlorine pesticides and PCBs; EPA Method 8150 detects and quantifies the presence of chlorinated herbicides. The shallow soil sample locations are shown on Figure 3. The results of the chemical analyses for 8080 and 8150 compounds are summarized in Table 2. Complete analytical results are included in Appendix B.

As can be seen in Table 2, the shallow soil chemical analysis results for the agriculturally-used portions of the site are all non-detected (ND). This indicates that none of the compounds analyzed for in the two test methods were detected above the stated detection levels for any of the composite samples from plowed-land or grazing-land areas of the site. If pesticides or herbicides had been widely used at the site, it is unlikely that they would have accumulated in unacceptable concentrations over the site without having been detected in the shallow soil sampling and analysis program.

2. Landing Strip

The issue of potentially unacceptable chlorinated herbicide accumulation in the shallow soil along the landing strip at the glider airport was addressed using the same shallow soil sampling and analysis methods as has been described for the plowed and cattle-grazing portions of the site. Two nine-inch samples (SS-29 and SS-30) were taken from opposite ends of the landing strip, were composited together and analyzed for EPA Method 8150 chlorinated herbicides. According to the laboratory analytical results, no 8150 compounds were detected. Therefore, unacceptable accumulations of herbicides beneath the landing strip are unlikely. Table 2 shows the chemical analysis summary. Appendix B contains complete analytical results.

3. Oil Derrick Vicinity

The potential for oil contamination of soil in the vicinity of the existing and former oil wells, as well as the apparent former above-ground oil storage area, was addressed through a series of shallow soil samples taken and analyzed for total oil and grease. Shallow samples SS-31 and SS-32 were taken from the former above-ground storage area, samples SS-33 and SS-34 were taken from the immediate vicinity of the existing Hershey Oil well, and samples SS-35 and SS-36 were taken from the approximate vicinity of the former TXO oil well. Composite samples were analyzed for each of the three areas of concern and the single area with higher than 100 ppm total oil and grease content was the former above-ground storage area to the southeast of



ToG by aboveground tanks

the existing oil well at the site, with a 400 ppm_w result. This level of oil in the shallow soil at the site may warrant further investigation. For the summary of shallow soil chemical results, see Table 2. Complete chemical analysis results are included in Appendix B.

B. EXPLORATION BORING - LEAKING UNDERGROUND TANKS

Through site reconnaissance and research, it was discovered that there are three underground fuel tanks at the hangar area of the landing strip on the site. The first two tanks are steel and the third is fiberglass. All of the tanks seem to be in the 1,000-gallon size range.

According to information obtained by WA, the first tank was installed around 1956 and was replaced by another tank at some unspecified date after the first tank was found to be leaking. The second tank also leaked and was replaced by a fiberglass tank in 1978. All three underground tanks remain in place. There is no record of the fuel from the first two abandoned tanks having been evacuated.

In order to examine the possibility of fuel leaks from these underground tanks, WA advanced one boring to a depth of 25 feet in what was estimated to be the down-gradient direction from the fuel tanks at the time. The boring, ~~DH-8~~, was advanced about 5 feet southwest of the approximate location of the oldest underground tank. The determined direction of upper-aquifer groundwater flow in the southern portion of the site may actually transport any hydrocarbon fuel contamination in the soil or groundwater toward the west or slightly north of west direction from the underground tanks. Further borings and monitoring wells will need to be completed in the immediate vicinity of the three underground tanks before a more definitive characterization of soil and/or groundwater hydrocarbon contamination is possible.

Nevertheless, WA retained samples from boring DH-8 and sent the samples from the 20-foot (L-5) and 25-foot (L-6) intervals to an analytical laboratory for total petroleum hydrocarbon and aromatic hydrocarbon constituent analyses. These two samples were selected based on field observations and

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based on portable Organic Vapor Analyzer (OVA) results of double-bagged samples retained for head-space analysis. The OVA results indicated that the 25-foot sample (L-6) could contain significant hydrocarbon contamination. The 20-foot sample (L-5) was selected for analysis as the second highest OVA sample and as an additional measure of vertical extent data for boring DH-8.

The laboratory analysis by modified EPA Method 8015 for total petroleum hydrocarbons indicates gasoline range constituents of L-5 at 11 parts per million (ppm), and of L-6 at 1,700 ppm. The laboratory analysis for benzene, toluene, ethylbenzene and xylenes by EPA Methods 5030 and 8020 also revealed a large disparity between concentrations from L-5 and L6. The L-5 concentrations were non-detected for benzene and toluene, 19 parts per billion (ppb) for ethylbenzene, and 99 ppb for xylenes. The L-6 concentrations were non-detected (at a detection limit of 150 ppb) for benzene, 9,300 ppb for toluene, 18,000 ppb for ethylbenzene, and 84,000 ppb for xylenes. The chemical analysis results for DH-8 are summarized in Table 3. The complete chemical analysis results are included in Appendix B.

The concentration difference between L-5 and L-6 for the analyses conducted may be partly due to the higher apparent permeability of the sandy material in L-6 relative to L-5. Additionally, the age of the leaking tanks (assuming the leak has not been continuous) may cause the higher concentrations of petroleum hydrocarbons at 25 feet than at 20 feet. Unfortunately, without more data, conclusions cannot be reached about the degree and depth of contamination at points other than those analyzed to date.

The low concentrations of benzene and toluene with respect to ethylbenzene and xylenes in both the samples analyzed may be explained in part by the age of the leaks and/or the nature of the fuel constituents themselves. The relative age of gasoline fuel leaks can sometimes be inferred from the ratio of benzene and toluene to ethylbenzene and xylenes because the more mobile benzene and toluene constituents tend to be concentrated at the leading edge of a gasoline contamination plume. Therefore, an older gasoline fuel leak

would tend to have a lower benzene and toluene to ethylbenzene and xylenes ratio near the source of the leak. This may partly explain the results for aromatic hydrocarbons detected in DH-8.

However, as mentioned above, another factor that may be causing the low ratio of benzene and toluene to ethylbenzene and xylenes is the nature of the fuel itself. The aviation fuel used for the small airplanes that operate at the glider airstrip is generally a very high octane gasoline. The very high octane rating of the fuel may cause the low ratio of benzene and toluene to ethylbenzene and xylenes because the fuel mix is designed to exclude some of the lower chain hydrocarbons, such as benzene. In any case, without more data, the nature of the hydrocarbon contamination cannot be definitively characterized.

The laboratory analytical results from L-5 and L-6 for aromatic hydrocarbons can be compared to California Department of Health Services (DOHS) drinking water action levels. The DOHS action level for benzene is 0.7 ppb, the action level for toluene is 100 ppb, the action level for ethylbenzene is 680 ppb, and the action level for xylenes is 620 ppb. Also, the DOHS and RWQCB typically use 1,000 ppm as an imperative clean-up level for total petroleum hydrocarbons, although case-by-case levels are established down to 0 ppm. Therefore, it appears very likely that some remediation of the fuel hydrocarbon contamination associated with the underground tanks at the site will be required.

With only one data point and no analytical laboratory results as yet available, it is impossible to assess the lateral or vertical extent of contamination. Nevertheless, some very preliminary estimates of the cost of remediation can be attempted if several assumptions are made. If one can assume that the depth of contamination does not exceed 25 feet, is limited to soil contamination, and is laterally limited to the area of the underground tank backfill, then typical costs for the soil remediation may be in the \$80,000-\$100,000 range. If one encounters limited groundwater contamination as well as soil contamination, then the typical cost for remediation could be in the \$200,000-\$250,000 range.



It must be emphasized that these potential remediation figures are estimates based on limited available information. Without further investigation and definition of the extent of any soil or groundwater fuel-hydrocarbon contamination, more precise estimates cannot be made at this time.

C. GROUNDWATER SAMPLING AND ANALYSIS

WA drilled and installed three monitoring wells on the site. The three monitoring wells allowed upper-aquifer groundwater to be sampled and analyzed in order to establish baseline conditions beneath the site and to determine if volatile or semi-volatile organic contaminants had been introduced, or had migrated, beneath the site. The three wells were each sampled and analyzed by EPA Method 8240, a test for volatile organic compounds (VOCs), and by EPA Method 8270, a test for semi-volatile organic compounds. The locations of three wells are indicated on Figure 2.

In each case, the groundwater sample results from the three monitoring wells were non-detected for volatile and semi-volatile organic compounds analyzed. The most significant results were those from MW-1, which is nearest the LLNL site, indicating that VOCs do not appear to exist or to be migrating beneath the site. The summarized groundwater analysis results are presented in Table 1; the complete groundwater analytical results are presented in Appendix B.

However, as described in Chapter II, the possible introduction of some radioactive wastes onto the northeastern portion of the LLNL site was discovered during WA's background information search of off-site potential sources. Based on WA's research, a remote potential exists for limited radioactive waste contamination in the soil or groundwater at the northeastern portion of the LLNL site near the site border. Therefore, additional sampling and analysis of soil and groundwater for the presence of radioactive waste products is prudent. The chances of any radioactive wastes migrating against the established upper-aquifer groundwater gradient onto the site are unlikely, but for a higher comfort level, a program of sampling and analysis may prove to be beneficial.

0292449

D. GROUNDWATER GRADIENT AND DIRECTION

Based on the information gathered from the well survey and WA's measurement of water levels in MW-1, MW-2 and MW-3, the approximate direction of upper-aquifer groundwater flow in the southern portion of the site is slightly north of west. The gradient is about 0.024 ft/ft., or a vertical drop of about 127 feet in water elevation, per mile covered horizontally. The upper-aquifer groundwater contour map is shown on Figure 4.

0292450



CHAPTER VI
CONCLUSIONS AND RECOMMENDATIONS

The focus of this study was to help TMI obtain preliminary information regarding major sources of contamination associated with the site. The size of the property, as well as the time constraint, dictated a general rather than specific approach in conducting the study. Specific delineation of each component could be accomplished upon undertaking a more comprehensive study.

Based on the data collected during this preliminary study, the following conclusions and recommendations are made.

A. OFF-SITE POTENTIAL SOURCES

1. Lawrence Livermore National Laboratory

a. Airborne Emissions from LLNL - LLNL currently treats hazardous wastes generated during their operations with on-site incineration at their existing Decontamination and Waste Treatment Facility (DWTF). LLNL plans to close the existing DWTF and open an improved DWTF with more stringent standards, somewhere on-site. The preferred site for the new DWTF is in the northeast corner of the LLNL site, nearest the TMI site. Based on the information obtained by WA, it appears that both the existing and planned DWTFs should not pose a significant threat to air quality at the TMI site. Nevertheless, WA recommends that TMI continues to follow the status of the on-going permitting process for the planned DWTF.

b. LLNL Radioactive Waste Contamination - Through WA's research it was determined that a slight potential exists for some radioactive wastes having been introduced into the soil in the northeastern portion of the LLNL site. Although the historical northern boundary of the LLNL site was some 600 feet south of its present location, and despite the fact that the established

upper-aquifer groundwater gradient is toward the west away from the TMI site, WA recommends some soil and groundwater sampling and analysis for radioactivity at the TMI site.

c. LLNL VOCs in Groundwater - LLNL is a Superfund Site and has several groundwater contamination plumes of volatile organic compounds moving off-site to the west and northwest from the southern and western portions of the LLNL site. These VOC plumes would not be expected to impact the TMI site, as long as current groundwater conditions persist. In any case, WA recommends periodic sampling and analysis of TMI site monitoring wells for VOCs.

2. Leaking Underground Fuel Tank (LUFT) Sites

WA's review of applicable regulatory agency records indicates that there is no documented evidence of up-gradient LUFTs which may impact the TMI site. The documented LUFTs are all down-gradient and relatively distant.

3. Toxic Groundwater Contamination

WA's review of applicable regulatory agency records indicates that there are no documented off-site toxic groundwater contamination sites up-gradient of the TMI site. A number of down-gradient sites were identified but with the exception of the LLNL site, the other toxic groundwater contamination sites are relatively distant from the TMI site.

4. Surrounding Businesses

WA's review of surrounding businesses identified a variety of businesses located along North Greenville Road on the western or down-gradient side of the site. It would be unlikely for these businesses to adversely affect the site, based on the information generated by WA during its site reconnaissance.

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5. Water Treatment Plant

The Patterson Pass Water Treatment Plant is located about 1/4-mile east of the TMI site. It would be unlikely for the typical activities conducted at the water treatment plant to pose a concern regarding migration of contamination onto the site.

6. Altamont Pass Landfill

The most proximate landfill to the TMI site would appear to be the Altamont Pass Landfill, located about 4 miles northeast of the site. This distance should severely limit the possibility of the Altamont Pass Landfill as a potential source of contamination for the TMI site.

7. Western Pacific Railroad (W.P.R.R.) Spills

During its review of records from the RWQCB and ACFCWCD Zone 7, WA did not come across any evidence of hazardous materials spills along the section of the railroad that makes the northwest border of the TMI site. Further, WA did not observe any unusual debris or discolored soils along this section of the W.P.R.R. line.

B. ON-SITE POTENTIAL SOURCES

1. Agriculture

WA implemented a shallow soil sampling and analysis program to check for organochlorine pesticides and chlorinated herbicides which may have accumulated at the site. In all cases, the composite samples were non-detected for the 8080 and 8150 method compounds analyzed. The results of this aspect of WA's field investigation program are summarized in Table 2.



2. Hummingbird Haven Glider Airport

Through the site reconnaissance and survey, WA determined that two potential sources of contamination exist associated with the glider airport. The first concern was with the potential application of herbicides to the landing strip itself. The other concern was with potentially leaking underground fuel tanks at the airstrip.

The results of WA's sampling and analysis program show that herbicides should not be a concern since none were detected in a shallow soil sample that was analyzed by EPA Method 8150. However, the results of the deeper soil sample and analysis near the underground fuel tanks indicates significant hydrocarbon contamination at a depth of 25 feet.

The analysis of information obtained from boring DH-8 is presented in detail in Chapter 5, Section B, and the chemical data are summarized in Table 3. From the information obtained, it can be concluded that a hydrocarbon contamination problem exists associated with the underground tanks at the glider airport. It is highly likely that regulatory agency requirements for the investigation, characterization, and eventual clean-up of this contamination will be implemented.

3. Cost Estimate - LUFT Remediation

At the request of TMI, WA has attempted to estimate the potential costs for remediation of limited soil and/or limited groundwater contamination. Based on a number of assumptions outlined in Chapter 5, Section B, on the data from a single soil boring, and based upon WA's experience with similar leaking tank situations, WA has estimated that the typical costs for soil remediation could be in the \$80,000-\$100,000 range and the typical costs for soil and groundwater remediation could be in the \$200,000-\$250,000 range.

It must be emphasized that these potential remediation figures are estimates based on the available information and these estimates do not include the cost of necessary characterization of the hydrocarbon contamination prior to

remediation. Without further investigation and definition of the extent of any soil or groundwater fuel-hydrocarbon contamination, more accurate estimates cannot be made.

4. Oil Wells

Through WA's site survey and reconnaissance, it was established that there was one existing oil well, operated by Hershey Oil since 1967, on the southeast portion of the TMI site. Further, TXO had operated an oil well from about 1981-1983 on the site, but has now abandoned it. According to CDOG personnel, there are no records of significant spills on the site associated with these oil wells or their appurtenant structures. Also, CDOG records indicate that all applicable permits had been properly obtained for construction and abandonment activities at the site.

However, a discrepancy between aerial photograph data, statements made by Hershey Oil personnel, and a site map provided to WA by TMI led WA to investigate the immediate vicinity of the oil derricks as well as an apparent above-ground storage facility southeast of the existing Hershey Oil well. The total oil and grease levels detected in shallow soil samples at these locations were not unusual with the exception of 400 ppm detected near the old above-ground storage area. Some localized oil spills are to be expected in the vicinity of oil wells. Additional borings and sampling may help obtain a descriptive vertical profile of any oil contamination at this area.

5. Quarry

Although no chemical analysis data was obtained from the quarry debris itself, the clean gravel quarry in the northern portion of the TMI site is not expected to be a source of contaminants due to the solely mechanical processes typically associated with this kind of mining.

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6. Farmhouse Infrastructure

WA has determined that two domestic wells, two above-ground propane tanks, and three septic systems appear to be located on the site. WA does not anticipate contamination being a concern with these facilities, but these were not specifically investigated by WA.



CHAPTER VII
ACKNOWLEDGEMENTS AND LIMITATIONS

A. ACKNOWLEDGEMENTS

The Preliminary Environmental Survey for the TMI site was prepared under the supervision of Nick Homayounfar, Ph.D, P.E., Department Head of WA's Environmental Services. The work was directed by Fred A. Seirafi, Principal Engineer, Environmental Services. Peter C. Lyon acted as Project Manager. The work was performed by Niccola J. Barratt, Jon Konnan, Lynford Edwards, and John Sarmiento, Staff Environmental Engineers and Geologists, and by Mike Chen, Mike Sylvestri, and Holly Davis, Environmental Technicians. Report production and support services were provided by Stew Evans and Maria Tarczy.

B. LIMITATIONS

The data, information, interpretations, and recommendations contained in this technical report are presented solely as preliminary bases and guides to the existing environmental conditions of the proposed TMI site in Livermore, California. The conclusions and professional opinions presented herein were developed by Wahler Associates in accordance with generally accepted engineering principles and practices. As with all geotechnical and environmental reports, the opinions expressed here are subject to revisions in light of new information which may be developed in the future, and no warranties are expressed or implied.

This report has not been prepared for use by parties other than TMI Analysts, Inc. It may not contain sufficient information for the purposes of other parties or other uses. However, Wahler Associates is aware that TMI Analysts, Inc. may wish to share the information presented in this report with its parent company or other TMI affiliates. If any changes are made in the project as described in this report, the conclusions and recommendations contained herein should not be considered valid, unless the changes are reviewed by Wahler Associates, and the conclusions and recommendations are modified or approved in writing.

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Soil deposits may vary in type, strength and many other important properties between points of observation and exploration. Additionally, changes can occur in ground water and soil moisture conditions due to seasonal variations, or for other reasons. Furthermore, the distribution of chemical concentrations in the soil and ground water can vary spatially and over time. The chemical analysis results, valid as of the present time only, are based on data collected at the sampling locations only. Therefore, it must be recognized that WA does not and cannot have complete knowledge of the subsurface conditions underlying the subject site. The opinions presented are based upon the findings at the points of exploration and upon interpretative data, including interpolation and extrapolation of information obtained at points of observation.

TABLE 1

GROUNDWATER CHEMICAL ANALYSIS

| <u>Monitoring Well</u> | <u>Method 8240</u> | <u>Method 8270</u> |
|------------------------|--------------------|--------------------|
| MW-1 | ND - all compounds | ND - all compounds |
| MW-2 | ND - all compounds | ND - all compounds |
| MW-3 | ND - all compounds | ND - all compounds |

ND = non-detected



TABLE 2
SHALLOW SOIL SAMPLES

Agricultural

| <u>Sample I.D.</u> | <u>Method</u> | <u>Result</u> |
|---------------------|---------------|--------------------|
| SS-1, SS-3, SS-4 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |
| SS-5, SS-7, SS-8 | 8080 | ND - all compounds |
| | 8150 | |
| SS-10, SS-11, SS-12 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |
| SS-9, SS-14, SS-16 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |
| SS-2, SS-6 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |
| SS-13, SS-15 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |
| SS-27 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |
| SS-26, SS-28 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |
| SS-21, SS-23, SS-25 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |
| SS-19, SS-22, SS-24 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |
| SS-17, SS-18, SS-20 | 8080 | ND - all compounds |
| | 8150 | ND - all compounds |

Landing Strip Herbicides

| | | |
|--------------|------|--------------------|
| SS-29, SS-30 | 8150 | ND - all compounds |
|--------------|------|--------------------|

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TABLE 2
SHALLOW SOIL SAMPLES
(Continued)

Oil Well Vicinity

| <u>Sample I.D.</u> | <u>Method</u> | <u>Result</u> |
|--------------------|-------------------------------|---------------|
| SS-31, SS-32 | Oil & Grease (Gravimetric) | 400 ppm |
| SS-33, SS-34 | Oil & Grease (Gravimetric) | 70 ppm |
| SS-35, SS-36 | Oil & Grease (Gravimetric) | 22 ppm |

ND = non-detected



TABLE 3
SUBSURFACE SOIL CHEMICAL ANALYSIS

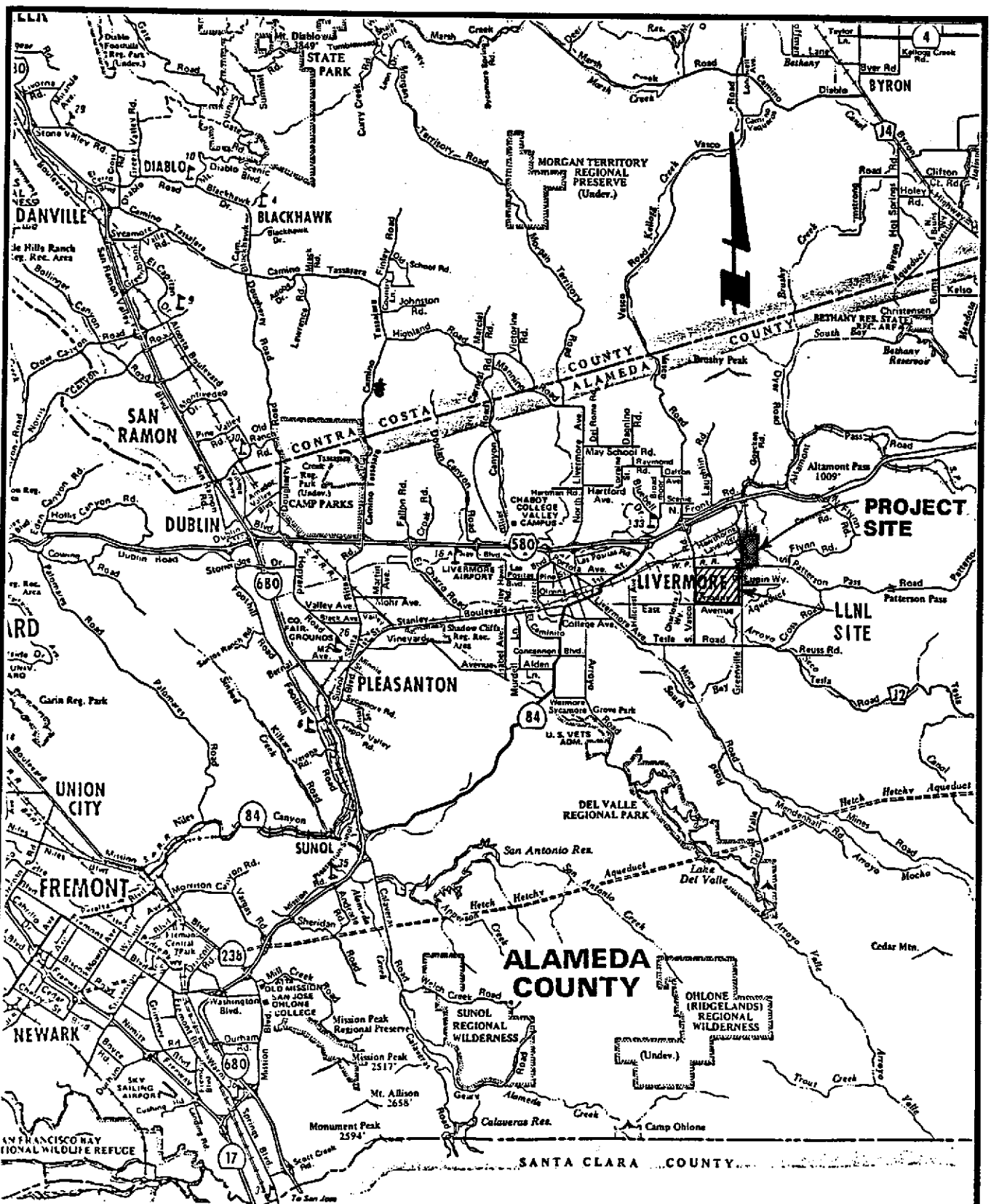
Sample I.D. TPH As Gasoline

DH-8 *
L-5 (20 ft) 1,700 ppm*
L-6 (25 ft) 11 ppm

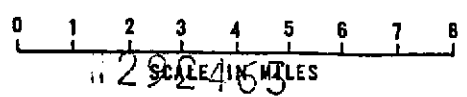
| | <u>Benzene</u> | <u>Toluene</u> | <u>Ethylbenzene</u> | <u>Xylenes</u> |
|----------------------------|----------------|----------------|---------------------|----------------|
| DH-8 L-5 | ND '3 ppb | ND '3 ppb | 19 ppb | 99 ppb |
| DH-8 L-6 ^{25'} | ND '150 ppb | 9,300 ppb | 18,000 ppb | 84,000 ppb |

| <u>For Comparison</u> | <u>Benzene</u> | <u>Toluene</u> | <u>Ethylbenzene</u> | <u>Xylenes</u> |
|---|----------------|----------------|---------------------|----------------|
| DOHS Drinking Water Action Levels | 0.7 ppb | 100 ppb | 680 ppb | 620 ppb |

ND - non-detected



REFERENCE: "LIVERMORE AND PLEASANTON AREA MAP," COPYRIGHT BY COMPASS MAPS, INC., MODESTO, CALIFORNIA, 1982.

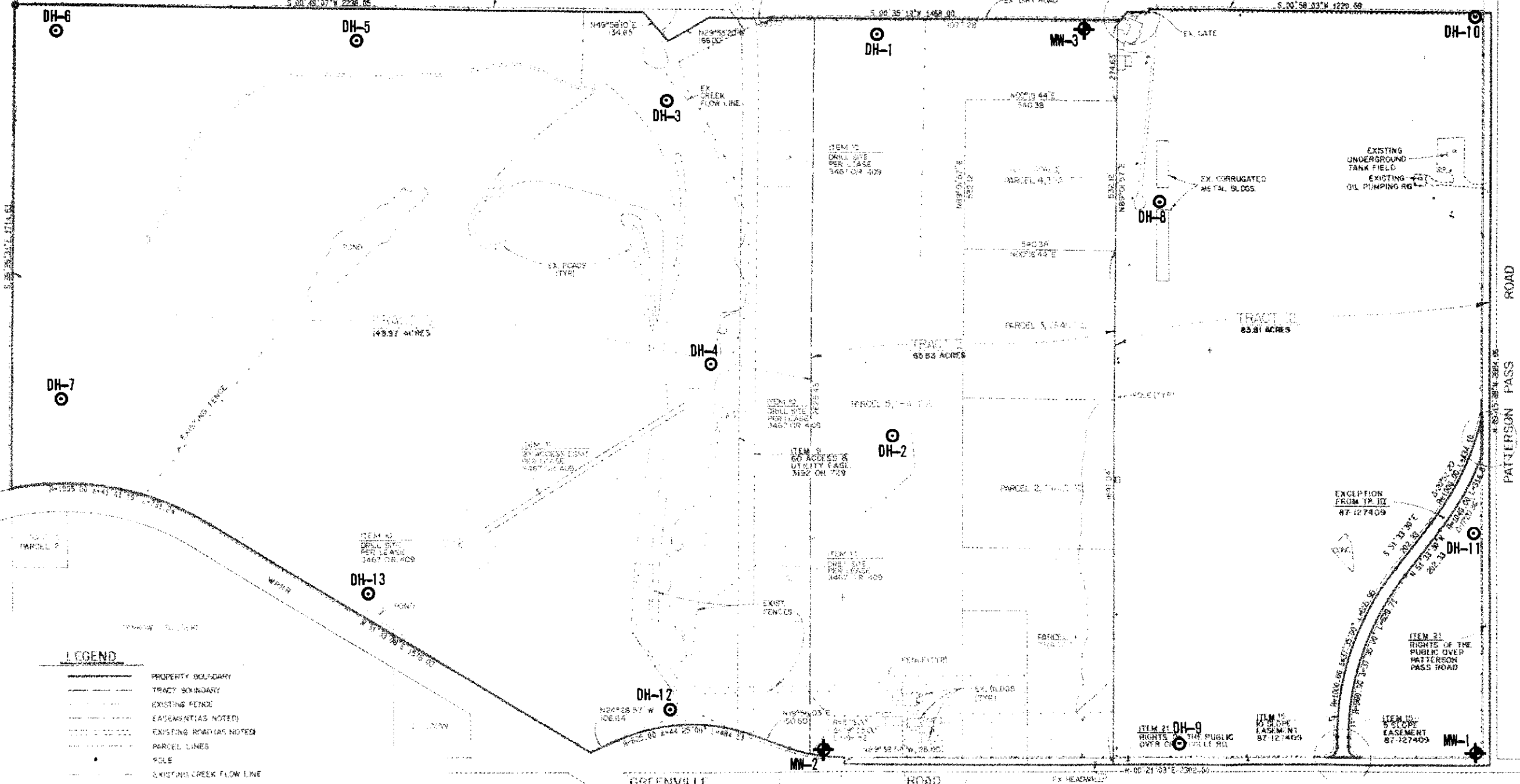


| | | | | | |
|--|--|--------------|---------------------|---------------|------------|
| | TMI SITE LIVERMORE, CALIFORNIA | | LOCATION MAP | | |
| | PALO ALTO | ● CALIFORNIA | PROJECT NO. | DATE | FIGURE NO. |
| | | | TMI-101H | FEBRUARY 1989 | 1 |

FIND SURVEY CAP U.S. 3048 W FENCE INTER
 U.P. 1231 & N74 SECTION CORNER SEC. 2 CORNER SEC. 6, T.5S, R.3E, MDM
 PER NON-FILED SURVEY BY RAY PETERS.

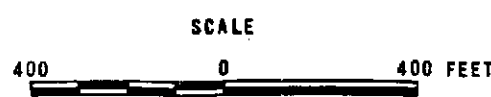
WESTERN LINE OF POL. 12, REEL 145 OR 720

SOUTHERN LINE OF THE SW 1/4 OF THE NE 1/4 SEC. 6, T.5S, R.3E
 WESTERN LINE OF POL. 2, 2596 OR 491



- LEGEND**
- PROPERTY BOUNDARY
 - - - TRACT BOUNDARY
 - EXISTING FENCE
 - - - - EASEMENT (AS NOTED)
 - - - - EXISTING ROAD (AS NOTED)
 - - - - PARCEL LINES
 - POLE
 - - - - EXISTING CREEK FLOW LINE

- EXPLANATION**
- DH-13 DRILL HOLE LOCATION
 - MW-3 MONITORING WELL LOCATION



292464

| | | | | |
|--|--|--------------------------------|----------------------------------|------------------------|
| | TMI SITE LIVERMORE, CALIFORNIA | | SITE AND EXPLORATION PLAN | |
| | PALO ALTO • CALIFORNIA | PROJECT NO. TMI-101H | DATE FEBRUARY 1989 | FIGURE NO. 2 |

END SURVEY CAP L.S. 1045 IN FENCE INTER
 L.P. XXIII IN N 1/4 SECTION CORNER SEC. 6, T.3S, R.3E, NDM
 PER NDM-FILED SURVEY BY RAY PETERS

S. 00°49'57"N 2738.05

WESTERN LINE OF POL. 42, REEL 145 OR 720

DIFFERENTIAL

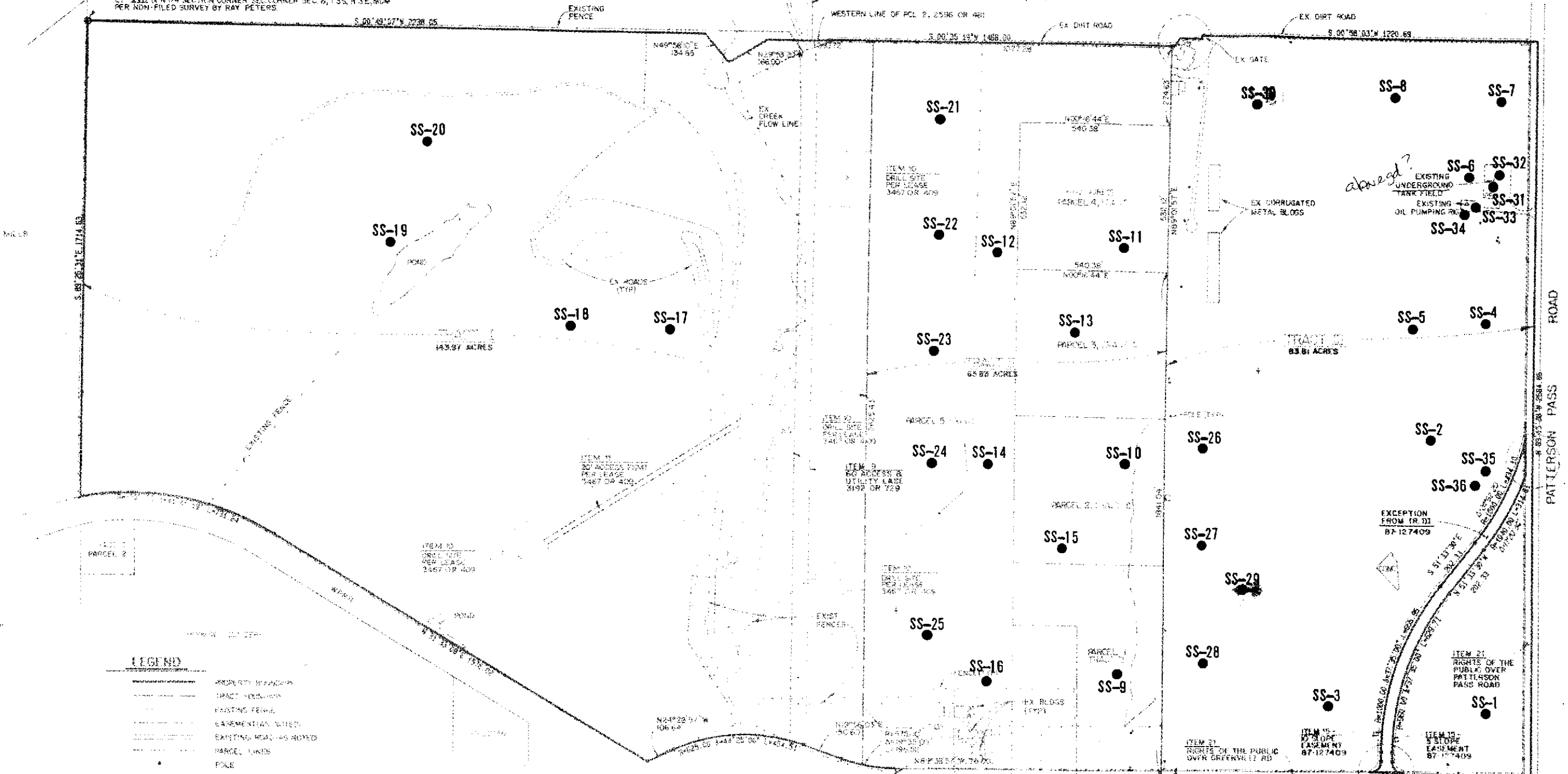
NORTHERN LINE OF THE SW 1/4 OF THE NE 1/4 SEC. 6, T.3S, R.3E

WESTERN LINE OF POL. 2, 25195 OR 481

EX. DIRT ROAD

EX. DIRT ROAD

S. 00°38'53"W 1220.69



LEGEND

- PROPERTY BOUNDARY
- TRACT BOUNDARY
- EXISTING FENCE
- EASEMENTS (AS NOTED)
- EXISTING ROAD (AS NOTED)
- PARCEL LINES
- POLE
- EXISTING CREEK FLOW LINE



292465

| | | | | |
|--|--|---------------|--------------------------------------|--|
| | TMI SITE LIVERMORE, CALIFORNIA | | SHALLOW SOIL SAMPLE LOCATIONS | |
| | PROJECT NO. | DATE | FIGURE NO. | |
| | TMI-101H | FEBRUARY 1989 | 3 | |

| BORING LOCATION: See Site Plan | | | APPROVED BY: | | | GROUND EL: '617 ft. | |
|---------------------------------------|--|--------------------|-------------------------------------|-----------------------|------|-----------------------|---------------|
| DEPTH TO GROUND WATER LEVEL: 47.5 ft. | | | DRILL CONTRACTOR: West Tec Drilling | | | TOTAL DEPTH: 56.0 ft. | |
| DRILL RIG: CME - 55 | | BORING DIA.: 8 in. | | DATE DRILLED: 1/27/89 | | LOGGED BY: J.S. | |
| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS |
| CL | 0.0 - 3.5' SANDY CLAY, dark yellowish brown, damp, v. stiff. | 0 | | | | AD | OVA = 1.6 ppm |
| | | | | 8 | | | |
| | | R-1 | 11 | 1.4 | DR | | |
| L-1 | 14 | 1.5 | | | | | |
| SC | 3.5 - 10.0' CLAYEY SAND, yellowish brown, damp, dense. @ 7.0' grades moist. | 4 | | | | AD | OVA = 1.6 ppm |
| | | | | 9 | | | |
| | | R-2 | 22 | 1.2 | DR | | |
| L-2 | 40 | 1.5 | | | | | |
| SP | 10.0 - 15.5' SAND, yellowish brown, damp, med. dense to dense, fine grained, ~5% fines. @ 11.0 - 13.0' 5-10% fine rounded gravel up to 1/3" @ 13.0' Gravel size increases up to 3/4" | 10 | | | | AD | OVA = 1.6 ppm |
| | | | | 5 | | | |
| | | R-3 | 13 | 1.5 | DR | | |
| L-3 | 17 | 1.5 | | | | | |
| CL | 15.5 - 23.0' SANDY CLAY, yellowish brown, damp to moist, hard, whitish thin calcareous veinlets and small nodules ~1/8" | 16 | | | | DR | OVA = 1.6 ppm |
| | | | | 10 | | | |
| | | R-4 | 20 | 1.5 | DR | | |
| L-4 | 30 | 1.5 | | | | | |
| | | 18 | | | | AD | |
| | | 20 | | | | | |



T.M.I. PROPERTY
LIVERMORE, CALIFORNIA

| EXPLORATION BORING LOG | | BORING NO. MW - 1 |
|------------------------|--------|----------------------|
| PROJECT NO. | SHEET: | |
| TMI-101H | 1 OF 3 | |

292467

| | | | | | |
|---------------------------------------|--|-------------------------------------|--|-----------------------|--|
| BORING LOCATION: See Site Plan | | APPROVED BY: | | GROUND EL: 1617 ft. | |
| DEPTH TO GROUND WATER LEVEL: 47.5 ft. | | DRILL CONTRACTOR: West Tec Drilling | | TOTAL DEPTH: 56.0 ft. | |
| DRILL RIG: CME - 55 | | BORING DIA.: 8 in. | | DATE DRILLED: 1/27/89 | |
| | | | | LOGGED BY: J.S. | |

| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS | | |
|------------|---|-------|------------|--------|------|--------|--------------------------------------|----|----|
| CL | 15.5 - 23.0' SANDY CLAY (cont.) | 20 | | 16 | | | OVA = 1.6 ppm | | |
| | | | R-5 | 32 | 1.5 | DR | | | |
| | | | L-5 | 45 | 1.5 | | | | |
| SC | 23.0 - 42.0 CLAYEY SAND, yellowish brown, moist, medium dense, fine grained sand, trace fine rounded gravel < 1/4". | 22 | | | | AD | @ 23.0' Slightly less hard drilling. | | |
| | | | 24 | | | | | | |
| | | | | | | | | | |
| | | | 26 | | 11 | | | | |
| | | | | R-6 | 15 | 1.4 | | DR | |
| | | | L-6 | 21 | 1.5 | | | | |
| | | | 28 | | | | | | AD |
| | | | | | | | | | |
| | | | 30 | | | 14 | | | |
| | | | | R-7 | 32 | 1.3 | | DR | |
| | | | | L-7 | 50 | 1.5 | | | |
| | | | 32 | | | | | | AD |
| | | | | | | | | | |
| 34 | @ 34.0' Grades less clayey, siltier. | | | | | | | | |
| | | | | | | | | | |
| 36 | | | 12 | | | | | | |
| | R-8 | 19 | 1.2 | DR | | | | | |
| | L-8 | 25 | 1.5 | | | | | | |
| 38 | | | | | AD | | | | |
| | | | | | | | | | |
| 40 | | | | | | 292463 | | | |

| | | | | | |
|--|--|------------------------|--|----------------------|------------------|
|  Wahler Associates | T.M.I. PROPERTY LIVERMORE, CALIFORNIA | EXPLORATION BORING LOG | | BORING NO. MW - 1 | |
| | | PROJECT NO. | | | SHEET: 2 OF 3 |
| | | TMI-101H | | | |

| BORING LOCATION: See Site Plan | | | APPROVED BY: | | | GROUND EL: 617 ft. | | | |
|---------------------------------------|--|--------------------|-------------------------------------|-----------------------|------|-----------------------|---|--|--|
| DEPTH TO GROUND WATER LEVEL: 47.5 ft. | | | DRILL CONTRACTOR: West Tec Drilling | | | TOTAL DEPTH: 56.0 ft. | | | |
| DRILL RIG: CME - 55 | | BORING DIA.: 8 in. | | DATE DRILLED: 1/27/89 | | LOGGED BY: J.S. | | | |
| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS | | |
| CL | 23.0 - 42.0' CLAYEY SAND (cont.) | 40 | | | | | OVA = 1.6 ppm @ 42.0' Slightly easier drilling. | | |
| | | | R-9 | 27 | 1.2 | DR | | | |
| | | | L-9 | 50/5" | 1.4 | | | | |
| SM | 42.0 - 48.0' SILTY SAND, yellowish brown, wet, v. dense, < 5% clay. | 42 | | | | AD | @ 43.2' water table encountered during drilling. | | |
| | | | | | | | | | |
| | 48.0 - 56.0' CLAYEY SAND, yellowish brown, wet, dense. | 44 | | | | | OVA = 2.0 ppm @ 47.5' water table measured 1.5' after drilling. | | |
| | | | R-10 | 27 | 1.4 | DR | | | |
| | | | L-10 | 37 | 1.5 | | | | |
| SC | 48.0 - 56.0' CLAYEY SAND, yellowish brown, wet, dense. | 48 | | | | AD | OVA = 1.6 ppm <u>WELL CONSTRUCTION</u> - Solid 12" pvc 0.0-44.0' - .02" perforated pvc 44.0-54.0' - Neat cement grout 0.0-40.0' - Bentonite pellets 40.0-41.5' - Monterey Sand 12/20 41.5-56.0' | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | <small>DATA ON THIS LOG ARE AN APPROXIMATION OF THE GEOLOGIC AND SUBSURFACE CONDITIONS BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT, DISCONTINUOUS, AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.</small> <small>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. ANY WATER LEVELS SHOWN ARE SUBJECT TO VARIATION.</small> <small>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONTRACTORS.</small> <small>THE STRATIFICATION LINES OR DEPTH INTERVALS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES, AND THE TRANSITIONS MAY BE GRADUAL.</small> <small>SOIL CLASSIFICATIONS SHOWN ON LOGS ARE FIELD CLASSIFICATIONS BASED ON THE UNIFIED SOILS CLASSIFICATION SYSTEM.</small> | 50 | | | | | OVA = 1.6 ppm | | |
| | | | R-11 | 21 | 1.3 | DR | | | |
| | | 52 | | | | AD | | | |
| | | | | | | | | | |
| | | 54 | | | | | | | |
| | | | | | | | | | |
| | Boring terminated at 56.0'. Groundwater encountered at 43.2' during drilling. Groundwater measured at 47.5' 1.5 hours after drilling. | 56 | | | | | | | |
| | | | R-12 | 50/5" | 0.7 | DR | | | |
| | | 58 | | | | | | | |
| | | 60 | | | | | | | |



T.M.I. PROPERTY
LIVERMORE, CALIFORNIA

| | | |
|------------------------|--------|----------------------|
| EXPLORATION BORING LOG | | BORING NO. MW - 1 |
| PROJECT NO. | SHEET: | |
| TMI-101H | 3 OF 3 | |

292469

BORING LOCATION: See Site Plan APPROVED BY: GROUND EL: 612 ft.
 DEPTH TO GROUND WATER LEVEL: 38.5 ft. DRILL CONTRACTOR: West Tec Drilling TOTAL DEPTH: 51.5 ft.
 DRILL RIG: CME - 55 BORING DIA.: 8 in. DATE DRILLED: 1/30/89 LOGGED BY: J.S.

| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS |
|------------|---|-------|------------|--------|------|------|------------------------|
| CL | 0.0 - 3.5' SILTY CLAY, yellowish brown, damp, trace of fine gravel < 1/4". | 0 | | | | AD | OVA = 2.8ppm |
| | | 2 | | 7 | | | |
| | | | R-1 | 13 | 1.5 | DR | |
| | | | L-1 | 21 | 1.5 | | |
| SM | 3.5 - 14.5' SILTY SAND, yellowish brown, damp to slightly moist, < 5% clay. | 4 | | | | AD | OVA = 2.0 ppm |
| | | 6 | | 10 | | | |
| | | | R-2 | 12 | 1.4 | DR | |
| | | | L-2 | 18 | 1.5 | | |
| SC | @7.5 - 8.5' Clayey sand lense. | 8 | | | | AD | @ 7.5' softer drilling |
| SM | | | | | | | @ 8.5' harder drilling |
| SC | | | | | | | |
| SM | @10.0 - 10.5' Clay sand lense. | 10 | | | | | OVA = 1.8 ppm |
| | | | | 10 | | | |
| | | | R-3 | 26 | 1.3 | DR | |
| | | | L-3 | 33 | 1.5 | | |
| SC | 14.5 - 16.0' CLAY SAND, yellowish brown, moist. | 16 | | | | | OVA = 1.4 ppm |
| | | | | 2 | | | |
| | | | R-4 | 1 | 0.8 | DR | |
| | | | L-4 | 10 | 1.5 | | |
| CL | 16.0 - 28.0' SANDY CLAY, yellowish brown, damp, hard, whitish calcareous veinlets, abundant silt. | 18 | | | | AD | R292470 |
| | | 20 | | | | | |
| | | | | | | | |

| | | | | |
|---|--|------------------------|--------|----------------------|
|  | T.M.I. PROPERTY LIVERMORE, CALIFORNIA | EXPLORATION BORING LOG | | BORING NO. MW - 2 |
| | | PROJECT NO. | SHEET: | |
| | | TMI-101H | 1 OF 3 | |

BORING LOCATION: See Site Plan APPROVED BY: GROUND EL: 612 ft.
 DEPTH TO GROUND WATER LEVEL: 38.5 ft. DRILL CONTRACTOR: West Tec Drilling TOTAL DEPTH: 51.5 ft.
 DRILL RIG: CME - 55 BORING DIA.: 8 in. DATE DRILLED: 1/30/89 LOGGED BY: J.S.

| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS | |
|------------|---|-------|------------|--------|------|------|--|----|
| CL | 16.0 - 28.0' SANDY CLAY (cont.) @ 24.0' Grades less veinlets. | 20 | | | | | OVA = 1.4 ppm | |
| | | | | 10 | | | | |
| | | | R-5 | 28 | 1.4 | DR | | |
| | | | L-5 | 32 | 1.5 | | | |
| | | 22 | | | | | | AD |
| | | 24 | | | | | | |
| SC | 28.0 - 33.0' CLAYEY SAND, yellowish brown, moist, med. dense, v. silty. | 26 | | | | | OVA = 2.0 ppm | |
| | | | | 10 | | | | |
| | | | R-6 | 14 | 1.5 | DR | | |
| | | | L-6 | 22 | 1.5 | | | |
| | | 28 | | | | | | AD |
| | | 30 | | | | | | |
| SW | 33.0 - 46.0' SAND, yellowish brown, moist, v. dense, fine-med. grained sand. @ ~39.0' Grades medium- coarse grained sand with ~5% fine gravel <1/3" and wet. | 32 | | | | | OVA = 2.0 ppm | |
| | | | | 8 | | | | |
| | | | R-7 | 12 | 1.3 | DR | | |
| | | | L-7 | 16 | 1.5 | | | |
| | | 34 | | | | | | AD |
| | | 36 | | | | | | |
| SW | 33.0 - 46.0' SAND, yellowish brown, moist, v. dense, fine-med. grained sand. @ ~39.0' Grades medium- coarse grained sand with ~5% fine gravel <1/3" and wet. | 36 | | | | | OVA = 1.4 ppm | |
| | | | | 18 | | | | |
| | | | R-8 | 30 | 1.2 | DR | | |
| | | | L-8 | 29 | 1.5 | | | |
| | | | | | | | @ 38.5' Water table encountered during drilling. | |
| 38 | | | | | AD | | | |
| | | 40 | | | | | | |



T.M.I. PROPERTY
LIVERMORE, CALIFORNIA

EXPLORATION BORING LOG
 PROJECT NO. TMI-101H SHEET: 2 OF 3
 BORING NO. MW - 2

292471

BORING LOCATION: See Site Plan APPROVED BY: GROUND EL: 612 ft.
 DEPTH TO GROUND WATER LEVEL: 38.5 ft. DRILL CONTRACTOR: West Tec Drilling TOTAL DEPTH: 51.5 ft.
 DRILL RIG: CME - 55 BORING DIA.: 8 in. DATE DRILLED: 1/30/89 LOGGED BY: J.S.

| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS | |
|------------|--|----------------|------------|--------|---------------|------------|---|---------------|
| SW | 33.0 - 46.0' SAND (cont.) @ 41.5 - 42.0' Clayey fine sand lense | 40 | R-9 | 18 | 1.1 1.5 | DR | OVA = 2.0 ppm | |
| | | | R-10 | 20 | | | | |
| | | | L-9 | 32 | | | | |
| CL | 46.0 - 51.5' SANDY CLAY, yellowish brown, wet, whitish calc. seams < 1/4". | 42 | | | | AD | | |
| | | | 44 | | | | | AD |
| | | | | | | | | |
| | | | 46 | SP-1 | 8 10 21 | 1.5 1.5 | DR | OVA = 1.0 ppm |
| | | | 48 | | | | | AD |
| 50 | SP-2 | 13 17 17 | 1.5 1.5 | DR | OVA = 1.0 ppm | | | |
| | Boring terminated at 51.5'. Groundwater encountered at 38.5' during drilling. | 52 | | | | | <u>WELL CONSTRUCTION</u> - Monterey Sand 12/20 backfill 33.0 - 51.5' - Bentonite pellets 31.5 - 33.0' - Neat cement/ Bentonite grout 0.0 - 31.5' - 2" well screen(.02") 35.0 - 50.0' - 2" solid well pipe 0.0 - 35.0' | |
| | <p>DATA ON THIS LOG ARE AN APPROXIMATION OF THE GEOLOGIC AND SUBSURFACE CONDITIONS BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT, DISCONTINUOUS, AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.</p> <p>THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. ANY WATER LEVELS SHOWN ARE SUBJECT TO VARIATION.</p> <p>THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONTRACTORS.</p> <p>THE STRATIFICATION LINES OR DEPTH INTERVALS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES, AND THE TRANSITIONS MAY BE GRADUAL.</p> <p>SOIL CLASSIFICATIONS SHOWN ON LOGS ARE FIELD CLASSIFICATIONS BASED ON THE UNIFIED SOILS CLASSIFICATION SYSTEM.</p> | 54 | | | | | | |
| | | 56 | | | | | | |
| | | 58 | | | | | | |
| | | 60 | | | | | | |



T.M.I. PROPERTY
LIVERMORE, CALIFORNIA

EXPLORATION BORING LOG BORING NO.
 PROJECT NO. SHEET: 3 OF 3
 TMI-101H MW - 2

BORING LOCATION: See Site Plan APPROVED BY: GROUND EL: ~665 ft.
 DEPTH TO GROUND WATER LEVEL: 33.2 ft. DRILL CONTRACTOR: West Tek Drilling TOTAL DEPTH: 49.0 ft.
 DRILL RIG: CME - 55 BORING DIA.: 8 in. DATE DRILLED: 1/31/89 LOGGED BY: J.S.

| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS |
|------------|--|--|------------|--------|------|------|---------------------|
| CL | 0.0 - 2.5' SANDY CLAY, dark, yellowish brown, slightly damp, hard. | 0 | | | | AD | Slightly soapy feel |
| SC | | 2.5 - 9.5' CLAYEY SAND, yellowish brown, slightly damp, dense, traces of fine rounded gravel < 1/4". | | | | | |
| | | | R-1 | 14 | 1.2 | DR | |
| | | | L-1 | 24 | 1.5 | | |
| | | | | 30 | | | |
| SM | @ 5.0 - 6.0' Silty sand lense. | 4 | | | | AD | |
| | | | R-2 | 11 | 1.0 | DR | |
| | | | L-2 | 18 | 1.5 | | |
| | | | | 27 | | | |
| SC | | 6 | | | | | |
| | | | | | | AD | |
| CL | 9.5 - 41.5' SILTY CLAY, olive, damp, hard, ~10% fine sand. | 8 | | | | | |
| | | | R-3 | 15 | 1.5 | DR | |
| | | | L-3 | 30 | 1.5 | | |
| | | | | 50/5" | | | |
| SC | @ 11.5 ~6" Sandy clay. | 10 | | | | | |
| CL | | 12 | | | | AD | |
| | | | | | | | |
| | | | R-4 | 12 | 1.3 | DR | |
| | | | L-4 | 20 | 1.4 | | |
| | | | | 40/4" | | | |
| | @ 16.0' Calcareous zone with nodules < 3/4". | 16 | | | | | |
| | | | | | | AD | |
| | | 18 | | | | | |
| | | 20 | | | | | |

292473



T.M.I. PROPERTY
LIVERMORE, CALIFORNIA

EXPLORATION BORING LOG
PROJECT NO. TMI-101H
SHEET: 1 OF 3

BORING NO. MW - 3


BORING LOCATION: See Site Plan APPROVED BY: GROUND EL: ~665 ft.
 DEPTH TO GROUND WATER LEVEL: 33.2 ft. DRILL CONTRACTOR: West Tek Drilling TOTAL DEPTH: 49.0 ft.
 DRILL RIG: CME - 55 BORING DIA.: 8 in. DATE DRILLED: 1/31/89 LOGGED BY: J.S.

| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS | | |
|------------|--|-------|------------|--------|------|------|---------|----|---|
| CL | 9.5 - 41.5' SILTY CLAY (cont.) @ 24.0' Abundant dark reddish brown inclusions, slightly yellowish brown and reddish brown mottling. | 20 | | | | | | | |
| | | | R-5 | 12 | 1.5 | DR | | | |
| | | | | 20 | 1.5 | | | | |
| | | | L-5 | 26 | 1.5 | | | | |
| | | | | 22 | | | | AD | |
| | | | | 24 | | | | AD | |
| | | | | 26 | | | | | |
| | | | | | R-6 | 10 | 1.5 | DR | |
| | | | | | L-6 | 34 | 1.5 | | |
| | | | | 28 | | | | AD | |
| | | | | 30 | | | | | |
| | | | | | R-7 | 8 | 1.4 | DR | |
| | | | | | L-7 | 16 | 1.5 | | |
| | | | | 32 | | | | AD | end drilling 1/30/89 start drilling 1/31/89 |
| | | | | 34 | | | | AD | @ 33.2' Groundwater encountered during drilling |
| | | | | 36 | | | | | 1.0 TSF pocket penet. |
| | | | R-8 | 8 | 1.5 | DR | | | |
| | | | L-8 | 11 | 1.5 | | | | |
| | | 38 | | | | AD | | | |
| | | 40 | | | | | 292474 | | |



T.M.I. PROPERTY
LIVERMORE, CALIFORNIA

EXPLORATION BORING LOG
 PROJECT NO. TMI-101H SHEET: 2 OF 3 BORING NO. MW - 3

| BORING LOCATION: See Site Plan | | | | APPROVED BY: | | GROUND EL: ~665 ft. | | |
|---|---|--|-------------------------------------|------------------------|------------|-----------------------|---|--|
| DEPTH TO GROUND WATER LEVEL: 33.2 ft. | | | DRILL CONTRACTOR: West Tek Drilling | | | TOTAL DEPTH: 49.0 ft. | | |
| DRILL RIG: CME - 55 | | BORING DIA.: 8 in. | | DATE DRILLED: 1/31/89 | | LOGGED BY: J.S. | | |
| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS | |
| CL | 9.5 - 41.5' SILTY CLAY (cont.) | 40 | | 6 | 1.0 1.5 | DR | 2.3 TSF pocket pen. Boring backfilled with Bentonite pellets to 41.5'. <u>WELL CONSTRUCTION</u> - Monterey Sand 12/20 backfill 28.0 - 41.5' - Bentonite pellets 26.5 - 28.0' - Neat cement/ Bentonite grout 0.0 - 26.5' - 2" well screen (pvc) 30.0 - 40.0' (.02") - 2" solid well casing (pvc) 0.0 - 30.0' R290475 | |
| | | | R-9 | 9 | | | | |
| | | | B-9 | 10 | | | | |
| CH | 41.5 - 49.0 CLAY, olive gray, v. moist, very stiff, minor reddish-brown mottling. | 42 | | | | AD | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | 44 | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | 46 | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | 48 | | | 11 | 1.5 1.5 | DR | | |
| | | | R-10 | 18 | | | | |
| | | | B-10 | 36 | | | | |
| | Boring terminated at 49.0'. Groundwater encountered at 33.2' during drilling. <small>DATA ON THIS LOG ARE AN APPROXIMATION OF THE GEOLOGIC AND SUBSURFACE CONDITIONS BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT, DISCONTINUOUS, AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL-DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES. THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. ANY WATER LEVELS SHOWN ARE SUBJECT TO VARIATION. THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONTRACTORS. THE STRATIFICATION LINES OR DEPTH INTERVALS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES, AND THE TRANSITIONS MAY BE GRADUAL. SOIL CLASSIFICATIONS SHOWN ON LOGS ARE FIELD CLASSIFICATIONS BASED ON THE UNIFIED SOILS CLASSIFICATION SYSTEM.</small> | 50 | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | 52 | | | | | | |
| | | 54 | | | | | | |
| | | 56 | | | | | | |
| | | 58 | | | | | | |
| | | 60 | | | | | | |
|  | | T.M.I. PROPERTY LIVERMORE, CALIFORNIA | | EXPLORATION BORING LOG | | BORING NO. MW - 3 | | |
| | | | | PROJECT NO. | SHEET: | | | |
| | | | | TMI-101H | 3 OF 3 | | | |

| | | | | | |
|------------------------------------|--|-------------------------------------|--|-----------------------|--|
| BORING LOCATION: See Site Plan | | APPROVED BY: | | GROUND EL: ~650 ft. | |
| DEPTH TO GROUND WATER LEVEL: n. e. | | DRILL CONTRACTOR: West Tek Drilling | | TOTAL DEPTH: 26.0 ft. | |
| DRILL RIG: CME - 55 | | BORING DIA.: 8 in. | | DATE DRILLED: 2/1/89 | |
| | | | | LOGGED BY: J. K. | |

| SOIL CLASS | DESCRIPTION | DEPTH | SAMPLE NO. | PR REQ | REC. | MODE | REMARKS |
|------------|--|-------|------------|--------|------|------|--|
| | continued: | 20 | R-5 | 7 | 1.0 | DR | @19.5'-21.0' gasoline fuel odor. OVA = 55 ppm |
| SW | 20.'-22.5' SAND; light olive-green, slightly moist, fine to coarse grained sand. | | L-5 | 19 | 1.5 | | |
| | | 22 | | | | AD | |
| SM | 22.5'-24.5' SILTY SAND; light olive-brown, slightly moist, 20% fines. | | | | | | |
| | | 24 | | | | DR | @24.5'-26.0' gasoline fuel odor. OVA = >>1000 ppm |
| SP | 24.5'-26.0' SAND; light olive-brown, slightly moist, medium to coarse grained. | | R-6 | 22 | 1.5 | | |
| | | 26 | L-6 | 23 | 1.5 | | |
| | Boring terminated at 26.0 ft. Groundwater not encountered. | 28 | | | | | Boring grouted with neat cement/bentonite |
| | | 30 | | | | | |
| | | 32 | | | | | |
| | | 34 | | | | | |
| | | 36 | | | | | |
| | | 38 | | | | | |
| | | 40 | | | | | |

DATA ON THIS LOG ARE AN APPROXIMATION OF THE GEOLOGIC AND SURFACE CONDITIONS BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT, DISCONTINUOUS, AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL-DIAMETER HOLES. RETRY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. ANY WATER LEVELS SHOWN ARE SUBJECT TO VARIATION.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONTRACTORS.

THE STRATIFICATION LINES ON DEPTH INTERVALS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES, AND THE TRANSITIONS MAY BE GRADUAL.

SOIL CLASSIFICATIONS SHOWN ON LOGS ARE FIELD CLASSIFICATIONS BASED ON THE UNIFIED SOILS CLASSIFICATION SYSTEM.

292477

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23
266



T.M.I. PROPERTY
LIVERMORE, CALIFORNIA

EXPLORATION BORING LOG

PROJECT NO.

TMI-101H

SHEET:

2 OF 2

BORING NO.

DH - 8

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Date Sample Shipped 1/30/89
 Name of Laboratory Sequoia
 Lab Project Manager Belinda Vega
 Turnaround Time 48 HRS!
 Report to Peter Lyon

Collector Peter Lyon
 Affiliation Wahler Assoc.
 Address 1023 Corporation Way PA 9423
 Phone (415) 968-6250

Checked by Amy Chau

Sample Information

| Your Sample I.D. | Date Collected | Matrix | Container | Analysis Requested |
|------------------|----------------|-------------|--------------|--|
| <u>SS - 1</u> | <u>1/27/89</u> | <u>Soil</u> | <u>Liner</u> | <u>Composite & run</u> <u>8080 & 8150</u> |
| <u>SS - 3</u> | <u>"</u> | <u>"</u> | <u>"</u> | |
| <u>SS - 4</u> | <u>"</u> | <u>"</u> | <u>"</u> | |
| <u>SS - 5</u> | <u>1/27/89</u> | <u>Soil</u> | <u>Liner</u> | <u>Composite & run</u> <u>8080 & 8150</u> |
| <u>SS - 7</u> | <u>"</u> | <u>"</u> | <u>"</u> | |
| <u>SS - 8</u> | <u>"</u> | <u>"</u> | <u>"</u> | |

Comments 48 HRS! FAX initial hardcopy

Wahler Contact Person Peter Lyon / Fred Seivani

Phone (415) 968-6250

Chain of Possession

| | Relinquished by | Date | Time | Received by | Date | Time |
|----|---|----------------|-------------|---|----------------|-------------|
| | (Sign. & affiliation) | | | (Sign. & affiliation) | | |
| 1. | <u>Peter Lyon</u> <u>Wahler Assoc.</u> | <u>1/30/89</u> | | <u>Hillary Johnson</u> <u>Sequoia Analytical</u> | <u>1/30/89</u> | <u>5:30</u> |
| 2. | <u>Heusel Schnapp</u> | <u>1/30/89</u> | <u>5:27</u> | | | |
| 3. | | | | | | |

292478



CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM (Cont'd)

Sample Information

| Your Sample I.D. | Date Collected | Matrix | Container | Analysis Requested |
|------------------|----------------|------------------|---------------|--------------------------------|
| SS-10 | 1/27/89 | Soil | Liner | Composite & run 8080 & 8150 |
| SS-11 | " | " | " | |
| SS-12 | " | " | " | |
| SS-9 | 1/27/89 | Soil | Liner | Composite & run 8080 & 8150 |
| SS-14 | " | " | " | |
| SS-16 | " | " | " | |
| SS-2 | 1/27/89 | Soil | Liner | Composite & run 8080 & 8150 |
| SS-6 | " | " | " | |
| SS-13 | 1/27/89 | Soil | Liner | Composite & run 8080 & 8150 |
| SS-15 | " | " | " | |
| MW-1 | 1/29/89 | H ₂ O | VOAs (2) | 8240 |
| MW-1 | 1/29/89 | H ₂ O | Ambers (2) | 8270 |

Comments 48 HRS! FAX initial hardcopy

Wahler Contact Person Peter Lyon / Fred Seirafi

Phone (415) 968-6250



Wahler Associates

292479



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

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U

Wahler & Assoc.

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite, SS-1,SS-3,SS-4
Analysis Method: EPA 8080
Lab Number: 901-3069

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 10.0 | N.D. |
| gamma-BHC (Lindane)..... | 5.0 | N.D. |
| Chlordane..... | 50.0 | N.D. |
| 4,4'-DDD..... | 10.0 | N.D. |
| 4,4'-DDE..... | 5.0 | N.D. |
| 4,4'-DDT..... | 10.0 | N.D. |
| Dieldrin..... | 5.0 | N.D. |
| Endosulfan I..... | 10.0 | N.D. |
| Endosulfan II..... | 5.0 | N.D. |
| Endosulfan sulfate..... | 50.0 | N.D. |
| Endrin..... | 10.0 | N.D. |
| Endrin aldehyde..... | 15.0 | N.D. |
| Heptachlor..... | 5.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 150.0 | N.D. |
| Toxaphene..... | 175.0 | N.D. |
| PCB-1016..... | 50.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

3292480



SEQUOIA ANALYTICAL

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Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-5, SS-7, SS-8
Analysis Method: EPA 8080
Lab Number: 901-3070

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 30, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 5.0 | N.D. |
| gamma-BHC (Lindane)..... | 10.0 | N.D. |
| Chlordane..... | 5.0 | N.D. |
| 4,4'-DDD..... | 50.0 | N.D. |
| 4,4'-DDE..... | 10.0 | N.D. |
| 4,4'-DDT..... | 5.0 | N.D. |
| Dieldrin..... | 10.0 | N.D. |
| Endosulfan I..... | 5.0 | N.D. |
| Endosulfan II..... | 10.0 | N.D. |
| Endosulfan sulfate..... | 5.0 | N.D. |
| Endrin..... | 50.0 | N.D. |
| Endrin aldehyde..... | 10.0 | N.D. |
| Heptachlor..... | 15.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 5.0 | N.D. |
| Toxaphene..... | 150.0 | N.D. |
| PCB-1016..... | 175.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

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Wahler Associates
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Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-10, SS-11, SS-12
Analysis Method: EPA 8080
Lab Number: 901-3071

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 30, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 10.0 | N.D. |
| gamma-BHC (Lindane)..... | 5.0 | N.D. |
| Chlordane..... | 50.0 | N.D. |
| 4,4'-DDD..... | 10.0 | N.D. |
| 4,4'-DDE..... | 5.0 | N.D. |
| 4,4'-DDT..... | 10.0 | N.D. |
| Dieldrin..... | 5.0 | N.D. |
| Endosulfan I..... | 10.0 | N.D. |
| Endosulfan II..... | 5.0 | N.D. |
| Endosulfan sulfate..... | 50.0 | N.D. |
| Endrin..... | 10.0 | N.D. |
| Endrin aldehyde..... | 15.0 | N.D. |
| Heptachlor..... | 5.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 150.0 | N.D. |
| Toxaphene..... | 175.0 | N.D. |
| PCB-1016..... | 50.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

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Wahler Associates
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Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-9, SS-14, SS-16
Analysis Method: EPA 8080
Lab Number: 901-3072

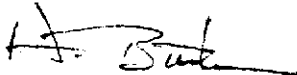
Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 30, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| gamma-BHC..... | 10.0 | N.D. |
| gamma-BHC (Lindane)..... | 5.0 | N.D. |
| Chlordane..... | 50.0 | N.D. |
| 4,4'-DDD..... | 10.0 | N.D. |
| 4,4'-DDE..... | 5.0 | N.D. |
| 4,4'-DDT..... | 10.0 | N.D. |
| Dieldrin..... | 5.0 | N.D. |
| Endosulfan I..... | 10.0 | N.D. |
| Endosulfan II..... | 5.0 | N.D. |
| Endosulfan sulfate..... | 50.0 | N.D. |
| Endrin..... | 10.0 | N.D. |
| Endrin aldehyde..... | 15.0 | N.D. |
| Heptachlor..... | 5.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 150.0 | N.D. |
| Toxaphene..... | 175.0 | N.D. |
| PCB-1016..... | 50.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

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Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-2, SS-6
Analysis Method: EPA 8080
Lab Number: 901-3073

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 10.0 | N.D. |
| gamma-BHC (Lindane)..... | 5.0 | N.D. |
| Chlordane..... | 50.0 | N.D. |
| 4,4'-DDD..... | 10.0 | N.D. |
| 4,4'-DDE..... | 5.0 | N.D. |
| 4,4'-DDT..... | 10.0 | N.D. |
| Dieldrin..... | 5.0 | N.D. |
| Endosulfan I..... | 10.0 | N.D. |
| Endosulfan II..... | 5.0 | N.D. |
| Endosulfan sulfate..... | 50.0 | N.D. |
| Endrin..... | 10.0 | N.D. |
| Endrin aldehyde..... | 15.0 | N.D. |
| Heptachlor..... | 5.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 150.0 | N.D. |
| Toxaphene..... | 175.0 | N.D. |
| PCB-1016..... | 50.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

0292484

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Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-13, SS-15
Analysis Method: EPA 8080
Lab Number: 901-3074

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 10.0 | N.D. |
| gamma-BHC (Lindane)..... | 5.0 | N.D. |
| Chlordane..... | 50.0 | N.D. |
| 4,4'-DDD..... | 10.0 | N.D. |
| 4,4'-DDE..... | 5.0 | N.D. |
| 4,4'-DDT..... | 10.0 | N.D. |
| Dieldrin..... | 5.0 | N.D. |
| Endosulfan I..... | 10.0 | N.D. |
| Endosulfan II..... | 5.0 | N.D. |
| Endosulfan sulfate..... | 50.0 | N.D. |
| Endrin..... | 10.0 | N.D. |
| Endrin aldehyde..... | 15.0 | N.D. |
| Heptachlor..... | 5.0 | N.D. |
| Heptachlor expoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 150.0 | N.D. |
| Toxaphene..... | 175.0 | N.D. |
| PCB-1016..... | 50.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

0292485

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Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-1, SS-3, SS-4
Analysis Method: EPA 8150
Lab Number: 901-3069

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

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0292486



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Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-5, SS-7, SS-8
Analysis Method: EPA 8150
Lab Number: 901-3070

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

0292487



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Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite, SS-10, SS-11, SS-12
Analysis Method: EPA 8150
Lab Number: 901-3071

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

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292488



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Wahler Associates
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Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-9, SS-14, SS-16
Analysis Method: EPA 8150
Lab Number: 901-3072

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

0292489

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Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-2, SS-6
Analysis Method: EPA 8150
Lab Number: 901-3073

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 5.0 | N.D. |
| Dichloroprop..... | 0.25 | N.D. |
| Dinoseb..... | 0.5 | N.D. |
| MCPA..... | 0.2 | N.D. |
| MCPP..... | 200.0 | N.D. |
| | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

0292490

SEQUOIA ANALYTICAL

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Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, Composite SS-13, SS-15
Analysis Method: EPA 8150
Lab Number: 901-3074

Sampled: Jan 27, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 2, 1989
Reported: Feb 2, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

0292491

SEQUOIA ANALYTICAL

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1023 Corporation Way
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Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Water, MW1
Analysis Method: EPA 8240
Lab Number: 901-3075

Sampled: Jan 29, 1989
Received: Jan 30, 1989
Analyzed: Feb 1, 1989
Reported: Feb 2, 1989

VOLATILE ORGANICS by GC/MS (EPA 8240)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|--------------------------------|-------------------------|------------------------|
| Acetone..... | 10.0 | N.D. |
| Benzene..... | 2.0 | N.D. |
| Bromodichloromethane..... | 2.0 | N.D. |
| Bromoform..... | 2.0 | N.D. |
| Bromomethane..... | 2.0 | N.D. |
| 2-Butanone..... | 2.0 | N.D. |
| Carbon disulfide..... | 10.0 | N.D. |
| Carbon tetrachloride..... | 2.0 | N.D. |
| Chlorobenzene..... | 2.0 | N.D. |
| Chlorodibromomethane..... | 2.0 | N.D. |
| Chloroethane..... | 2.0 | N.D. |
| 2-Chloroethyl vinyl ether..... | 10.0 | N.D. |
| Chloroform..... | 2.0 | N.D. |
| Chloromethane..... | 2.0 | N.D. |
| 1,1-Dichloroethane..... | 2.0 | N.D. |
| 1,2-Dichloroethane..... | 2.0 | N.D. |
| 1,1-Dichloroethene..... | 2.0 | N.D. |
| Total 1,2-Dichloroethene..... | 2.0 | N.D. |
| 1,2-Dichloropropane..... | 2.0 | N.D. |
| cis 1,3-Dichloropropene..... | 2.0 | N.D. |
| trans 1,3-Dichloropropene..... | 2.0 | N.D. |
| Ethylbenzene..... | 2.0 | N.D. |
| 2-Hexanone..... | 2.0 | N.D. |
| Methylene chloride..... | 10.0 | N.D. |
| 4-Methyl-2-pentanone..... | 2.0 | N.D. |
| Styrene..... | 10.0 | N.D. |
| 1,1,2,2-Tetrachloroethane..... | 2.0 | N.D. |
| Tetrachloroethene..... | 2.0 | N.D. |
| Toluene..... | 2.0 | N.D. |
| 1,1,1-Trichloroethane..... | 2.0 | N.D. |
| 1,1,2-Trichloroethane..... | 2.0 | N.D. |
| Trichloroethene..... | 2.0 | N.D. |
| Trichlorofluoromethane..... | 2.0 | N.D. |
| Vinyl acetate..... | 2.0 | N.D. |
| Vinyl chloride..... | 2.0 | N.D. |
| Total Xylenes..... | 2.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

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Client Project ID: TMI-101H
Sample Descript: Water, MW-1
Analysis Method: EPA 8270
Lab Number: 901-3075

Sampled: Jan 29, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 1, 1989
Reported: Feb 2, 1989

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|----------------------------------|-------------------------|------------------------|
| Acenaphthene..... | 2.0 | N.D. |
| Acenaphthylene..... | 2.0 | N.D. |
| Aniline..... | 2.0 | N.D. |
| Anthracene..... | 2.0 | N.D. |
| Benzidine..... | 50.0 | N.D. |
| Benzoic Acid..... | 10.0 | N.D. |
| Benzo(a)anthracene..... | 2.0 | N.D. |
| Benzo(b)fluoranthene..... | 2.0 | N.D. |
| Benzo(k)fluoranthene..... | 2.0 | N.D. |
| Benzo(g,h,i)perylene..... | 2.0 | N.D. |
| Benzo(a)pyrene..... | 2.0 | N.D. |
| Benzyl alcohol..... | 2.0 | N.D. |
| Bis(2-chloroethoxy)methane..... | 2.0 | N.D. |
| Bis(2-chloroethyl)ether..... | 2.0 | N.D. |
| Bis(2-chloroisopropyl)ether..... | 2.0 | N.D. |
| Bis(2-ethylhexyl)phthalate..... | 10.0 | N.D. |
| 4-Bromophenyl ether..... | 2.0 | N.D. |
| Butyl benzyl phthalate..... | 2.0 | N.D. |
| 4-Chloroaniline..... | 2.0 | N.D. |
| 2-Chloronaphthalene..... | 2.0 | N.D. |
| 4-Chloro-3-methylphenol..... | 2.0 | N.D. |
| 2-Chlorophenol..... | 2.0 | N.D. |
| 4-Chlorophenyl phenyl ether..... | 2.0 | N.D. |
| Chrysene..... | 2.0 | N.D. |
| Dibenz(a,h)anthracene..... | 2.0 | N.D. |
| Dibenzofuran..... | 2.0 | N.D. |
| Di-N-butyl phthalate..... | 10.0 | N.D. |
| 1,3-Dichlorobenzene..... | 2.0 | N.D. |
| 1,4-Dichlorobenzene..... | 2.0 | N.D. |
| 1,2-Dichlorobenzene..... | 2.0 | N.D. |
| 3,3-Dichlorobenzidine..... | 10.0 | N.D. |
| 2,4-Dichlorophenol..... | 2.0 | N.D. |
| Diethyl phthalate..... | 2.0 | N.D. |
| 2,4-Dimethylphenol..... | 2.0 | N.D. |
| Dimethyl phthalate..... | 2.0 | N.D. |
| 4,6-Dinitro-2-methylphenol..... | 10.0 | N.D. |
| 2,4-Dinitrophenol..... | 10.0 | N.D. |

3292493



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Water, MW-1
Analysis Method: EPA 8270
Lab Number: 901-3075

Sampled: Jan 29, 1989
Received: Jan 30, 1989
Extracted: Jan 31, 1989
Analyzed: Feb 1, 1989
Reported: Feb 2, 1989

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|---------------------------------|-------------------------|------------------------|
| 2,4-Dinitrotoluene..... | 2.0 | N.D. |
| 2,6-Dinitrotoluene..... | 2.0 | N.D. |
| Di-N-octyl phthalate..... | 2.0 | N.D. |
| Fluoranthene..... | 2.0 | N.D. |
| Fluorene..... | 2.0 | N.D. |
| Hexachlorobenzene..... | 2.0 | N.D. |
| Hexachlorobutadiene..... | 2.0 | N.D. |
| Hexachlorocyclopentadiene..... | 2.0 | N.D. |
| Hexachloroethane..... | 2.0 | N.D. |
| Indeno(1,2,3-cd)pyrene..... | 2.0 | N.D. |
| Isophorone..... | 2.0 | N.D. |
| 2-Methylnaphthalene..... | 2.0 | N.D. |
| 2-Methylphenol..... | 2.0 | N.D. |
| 4-Methylphenol..... | 2.0 | N.D. |
| Naphthalene..... | 2.0 | N.D. |
| 2-Nitroaniline..... | 2.0 | N.D. |
| 3-Nitroaniline..... | 2.0 | N.D. |
| 4-Nitroaniline..... | 2.0 | N.D. |
| Nitrobenzene..... | 2.0 | N.D. |
| 2-Nitrophenol..... | 2.0 | N.D. |
| 4-Nitrophenol..... | 2.0 | N.D. |
| N-Nitrosodiphenylamine..... | 10.0 | N.D. |
| N-Nitroso-di-N-propylamine..... | 2.0 | N.D. |
| Pentachlorophenol..... | 2.0 | N.D. |
| Phenathrene..... | 10.0 | N.D. |
| Phenol..... | 2.0 | N.D. |
| Pyrene..... | 2.0 | N.D. |
| 1,2,4-Trichlorobenzene..... | 2.0 | N.D. |
| 2,4,5-Trichlorophenol..... | 2.0 | N.D. |
| 2,4,6-Trichlorophenol..... | 2.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

292494

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Date Sample Shipped 2/7/89
 Name of Laboratory Superior
 Lab Project Manager Les Pattridge
 Turnaround Time 2 Days!
 Report to Peter Lyon

Collector Nick Bavin
 Affiliation Wahler Associates
 Address 1023 Corporation Way PA
 Phone (415) 768-6250

Checked by Amy Chau.

Sample Information

| <u>Your Sample I.D.</u> | <u>Date Collected</u> | <u>Matrix</u> | <u>Container</u> | <u>Analysis Requested</u> |
|-------------------------|-----------------------|---------------|------------------|--|
| <u>DH-8 L-5</u> | <u>2/1/89</u> | <u>Soil</u> | <u>Liner</u> | TPH as kerosene & BTEX for each sample |
| <u>DH-8 L-6</u> | <u>2/1/89</u> | <u>Soil</u> | <u>Liner</u> | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Comments 2 Day Turnaround - FAX initial hardcopy
& Sample is probably Aviation Fuel

Wahler Contact Person Peter Lyon Phone (415) 768-6250

Chain of Possession

| | <u>Relinquished by</u> | | | <u>Received by</u> | | |
|----|---|---------------|-------------|---|---------------|----------------|
| | <u>(Sign. & affiliation)</u> | <u>Date</u> | <u>Time</u> | <u>(Sign. & affiliation)</u> | <u>Date</u> | <u>Time</u> |
| 1. | <u>Peter Lyon</u> <u>Wahler Associates</u> | <u>2/7/89</u> | <u>2:55</u> | <u>Nick Bavin</u> <u>Wahler Associates</u> | <u>2/7/89</u> | <u>3:30 PM</u> |
| 2. | | | | | | |
| 3. | | | | | | |



2292495

SUPERIOR ANALYTICAL LABORATORY, INC.

1385 FAIRFAX ST., STE D • SAN FRANCISCO, CA 94124 • PHONE (415) 647-2081

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 50614
CLIENT: Wahler Associates
CLIENT ID: TMI-101H

DATE RECEIVED: 2/7/89
DATE REPORTED: 2/9/89
JOB NO.: TMI-101H

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 8015

| Sample Identification | Concentration (mg/kg) | |
|-----------------------|-----------------------|--------------|
| | Gasoline Range | Diesel Range |
| 1 DH-8 L-5 2/1/89 | 11 | ND <10 |
| 2 DH-8 L-6 2/1/89 | 1700 | ND <10 |

No Kerosene or Jet Fuel detected; Detection limit 10 mg/kg.

mg/kg = part per million (ppm)

Minimum Detection Limit for Gasoline and Diesel, 10 mg/kg.

QA/QC Summary:

MS/MSD: Average Gasoline Recovery = 89; Duplicate RPD = 20.
Daily Standards run for Gasoline, Diesel Fuel and Kerosene
at 200 mg/kg: RPD < 15.

Les Partridge, Ph.D.


Laboratory Manager

292496

OUTSTANDING QUALITY AND SERVICE

SUPERIOR ANALYTICAL LABORATORY, INC.

1385 FAIRFAX ST., STE D • SAN FRANCISCO, CA 94124 • PHONE (415) 647-2081

C E R T I F I C A T E O F A N A L Y S I S

LABORATORY NO.: 50614
CLIENT: Wahler Associates
JOB NO.: TMI-101H

DATE SAMPLED: 2/1/89
DATE ANALYZED: 2/9/78
DATE REPORTED: 2/9/89

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

| Sample Identification | Concentration (ug/kg) | | | |
|-----------------------|-----------------------|---------|---------------|---------|
| | Benzene | Toluene | Ethyl Benzene | Xylenes |
| 1 DH-8 L-5 2/1/89 | ND< 3 | ND< 3 | 19 | 99 |
| 2 DH-8 L-6 2/1/89 | ND< 150 | 9300 | 18000 | 84000 |

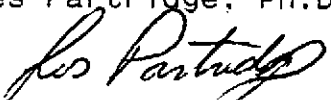
ug/kg = part per billion (ppb)

Minimum Detection Limit in Soil, 3 ug/kg.

QA/QC Summary:

MS/MSD: Average Recovery = 94; Duplicate RPD = 7.
Daily Standards run at 20 ug/L RPD<10.
Average Surrogate Recovery 88%.

Les Partridge, Ph.D.


Laboratory Manager

2292497

OUTSTANDING QUALITY AND SERVICE

Checked by Peter Lyon

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Date Sample Shipped 2/9/89
Name of Laboratory Sequoia
Lab Project Manager Belinda Vega
Turnaround Time 48 HRS!
Report to Peter Lyon

Collector Peter Lyon
Affiliation Wahler Associates
Address 1023 Copovahn Way Palo Alto
Phone (415) 968-6250

Sample Information

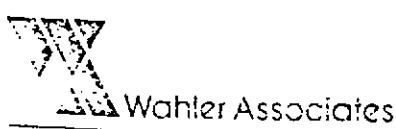
| Your Sample I.D. | Date Collected | Matrix | Container | Analysis Requested |
|--|----------------|-------------|--------------|------------------------|
| <u>SS-27</u> | <u>2/1/89</u> | <u>Soil</u> | <u>Liner</u> | <u>8080 & 8150</u> |
| Composite { <u>SS-26</u> <u>SS-28</u> | <u>2/1/89</u> | <u>Soil</u> | <u>Liner</u> | <u>8080 & 8150</u> |
| | <u>"</u> | <u>"</u> | <u>"</u> | <u>on composite</u> |
| Composite { <u>SS-21</u> <u>SS-23</u> <u>SS-25</u> | <u>2/1/89</u> | <u>Soil</u> | <u>Liner</u> | <u>8080 & 8150</u> |
| | <u>"</u> | <u>"</u> | <u>"</u> | <u>on composite</u> |
| | <u>"</u> | <u>"</u> | <u>"</u> | <u>on composite</u> |

Comments 2/13 - MONDAY AM FAX RESULTS Please
48 HRS!

Wahler Contact Person Peter Lyon Phone (415) 968-6250

Chain of Possession

| 1. | Relinquished by | Date | Time | Received by | Date | Time |
|----|--------------------------|----------------|-------------|---------------------|-----------------------|-------------|
| | (Sign. & affiliation) | | | | (Sign. & affiliation) | |
| | <u>Peter Lyon</u> | <u>2/17/89</u> | <u>9:20</u> | <u>L. Schnapp</u> | <u>2/19/89</u> | <u>9:20</u> |
| | <u>WAHLER ASSOCIATES</u> | <u>1/1</u> | | <u>Wahler Assoc</u> | <u>1/1</u> | |
| | <u>Liese Schnapp</u> | <u>2/19/89</u> | <u>9:50</u> | <u>Wahler Assoc</u> | <u>1/1</u> | |
| | <u>Wahler Assoc.</u> | <u>1/1</u> | | <u>Wahler Assoc</u> | <u>2/19/89</u> | <u>9:50</u> |
| | | <u>1/1</u> | | <u>Sequoia</u> | <u>1/1</u> | |
| | | <u>1/1</u> | | | <u>1/1</u> | |



0292498

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM (Cont'd)

Sample Information

Composite

| Your Sample I.D. | Date Collected | Matrix | Container | Analysis Requested |
|------------------|----------------|--------|-----------|-----------------------------|
| SS - 19 | 2/1/89 | Soil | Linear | 8080 & 8150 on composite |
| SS - 22 | " | " | " | |
| SS - 24 | " | " | " | |

Composite

| | | | | |
|---------|--------|------|--------|-----------------------------|
| SS - 17 | 2/1/89 | Soil | Linear | 8080 & 8150 on composite |
| SS - 18 | " | " | " | |
| SS - 20 | " | " | " | |

| | | | | |
|------|--------|------------------|---------------|------|
| MW-2 | 2/4/89 | H ₂ O | Ambers (2) | 8270 |
|------|--------|------------------|---------------|------|

| | | | | |
|------|--------|------------------|-------------|------|
| MW-2 | 2/4/89 | H ₂ O | VOAs (2) | 8240 |
|------|--------|------------------|-------------|------|

| | | | | |
|------|--------|------------------|---------------|------|
| MW-3 | 2/6/89 | H ₂ O | Ambers (2) | 8270 |
|------|--------|------------------|---------------|------|

| | | | | |
|------|--------|------------------|-------------|------|
| MW-3 | 2/6/89 | H ₂ O | VOAs (2) | 8240 |
|------|--------|------------------|-------------|------|

Comments 48 HRS! - FAX Results on 2/13/ AM

Wahler Contact Person Peter Lyon

Phone (415) 768-6250
2292499



CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Date Sample Shipped 2/9/89
 Name of Laboratory Sequoia
 Lab Project Manager Belinda Vega
 Turnaround Time 48 HRS!
 Report to Peter Lyon

Collector Peter Lyon
 Affiliation Wahler Associates
 Address 1023 Corporation Way Palo Alto
 Phone (415) 968-6250

Checked by Amy Chale

Sample Information

| | Your Sample I.D. | Date Collected | Matrix | Container | Analysis Requested |
|-----------|------------------|----------------|--------|-----------|--|
| Composite | SS-29 | 2/8/89 | Soil | Liner | 8150 and Total Oil & Grease |
| | SS-30 | " | " | " | |
| Composite | SS-31 | " | " | " | 8150 and Total Oil & Grease |
| | SS-32 | " | " | " | |
| Composite | SS-33 | " | " | " | 8150 and Total Oil & Grease |
| | SS-34 | " | " | " | |
| Composite | SS-35 | " | " | " | 8150 and Total Oil & Grease |
| | SS-36 | " | " | " | |

Comments Monday PM FAX results please
48 HRS Turnaround

Wahler Contact Person Peter Lyon Phone (415) 968-6250

Chain of Possession

| | Relinquished by | | | Received by | | |
|----|---|---------------|----------------|---|---------------|----------------|
| | (Sign. & affiliation) | Date | Time | (Sign. & affiliation) | Date | Time |
| 1. | <u>Peter Lyon</u> <u>Wahler Associates</u> | <u>2/9/89</u> | | | <u>1/1</u> | |
| 2. | <u>Liese Schnaps</u> <u>Wahler Assoc</u> | <u>2/9/89</u> | <u>4:10 PM</u> | <u>[Signature]</u> <u>Sequoia Analytical</u> | <u>1/1</u> | |
| 3. | | <u>1/1</u> | | | <u>2/9/89</u> | <u>4:10 PM</u> |
| | | <u>1/1</u> | | | <u>1/1</u> | |



0292500



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

RECEIVED

1989 FEB 14

| | | |
|---|--|---|
| Wahler Associates 1023 Corporation Way Palo Alto, CA 94303 Attention: Peter Lyon | Client Project ID: TMI-101H Sample Descript: Soil, SS-27 Analysis Method: EPA 8080 Lab Number: 902-0823 | Wahler Associates Sampled: Feb 1, 1989 Received: Feb 9, 1989 Extracted: Feb 13, 1989 Analyzed: Feb 13, 1989 Reported: Feb 14, 1989 |
|---|--|---|

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 5.0 | N.D. |
| gamma-BHC (Lindane)..... | 10.0 | N.D. |
| Chlordane..... | 5.0 | N.D. |
| 4,4'-DDD..... | 50.0 | N.D. |
| 4,4'-DDE..... | 10.0 | N.D. |
| 4,4'-DDT..... | 5.0 | N.D. |
| Dieldrin..... | 10.0 | N.D. |
| Endosulfan I..... | 5.0 | N.D. |
| Endosulfan II..... | 10.0 | N.D. |
| Endosulfan sulfate..... | 5.0 | N.D. |
| Endrin..... | 50.0 | N.D. |
| Endrin aldehyde..... | 10.0 | N.D. |
| Heptachlor..... | 15.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 5.0 | N.D. |
| Toxaphene..... | 150.0 | N.D. |
| PCB-1016..... | 175.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

292501



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-26, SS-28 Composite
Analysis Method: EPA 8080
Lab Number: 902-0824

Sampled: Feb 1, 1989
Received: Feb 9, 1989
Extracted: Feb 13, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 10.0 | N.D. |
| gamma-BHC (Lindane)..... | 5.0 | N.D. |
| Chlordane..... | 50.0 | N.D. |
| 4,4'-DDD..... | 10.0 | N.D. |
| 4,4'-DDE..... | 5.0 | N.D. |
| 4,4'-DDT..... | 10.0 | N.D. |
| Dieldrin..... | 5.0 | N.D. |
| Endosulfan I..... | 10.0 | N.D. |
| Endosulfan II..... | 5.0 | N.D. |
| Endosulfan sulfate..... | 50.0 | N.D. |
| Endrin..... | 10.0 | N.D. |
| Endrin aldehyde..... | 15.0 | N.D. |
| Heptachlor..... | 5.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 150.0 | N.D. |
| Toxaphene..... | 175.0 | N.D. |
| PCB-1016..... | 50.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

8292502



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-21, SS-23, SS-25 Composite
Analysis Method: EPA 8080
Lab Number: 902-0825

Sampled: Feb 1, 1989
Received: Feb 9, 1989
Extracted: Feb 13, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 10.0 | N.D. |
| gamma-BHC (Lindane)..... | 5.0 | N.D. |
| Chlordane..... | 50.0 | N.D. |
| 4,4'-DDD..... | 10.0 | N.D. |
| 4,4'-DDE..... | 5.0 | N.D. |
| 4,4'-DDT..... | 10.0 | N.D. |
| Dieldrin..... | 5.0 | N.D. |
| Endosulfan I..... | 10.0 | N.D. |
| Endosulfan II..... | 5.0 | N.D. |
| Endosulfan sulfate..... | 50.0 | N.D. |
| Endrin..... | 10.0 | N.D. |
| Endrin aldehyde..... | 15.0 | N.D. |
| Heptachlor..... | 5.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 150.0 | N.D. |
| Toxaphene..... | 175.0 | N.D. |
| PCB-1016..... | 50.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

0292503



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-19, SS-22, SS-24 Composite
Analysis Method: EPA 8080
Lab Number: 902-0826

Sampled: Feb 1, 1989
Received: Feb 9, 1989
Extracted: Feb 13, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 10.0 | N.D. |
| gamma-BHC (Lindane)..... | 5.0 | N.D. |
| Chlordane..... | 50.0 | N.D. |
| 4,4'-DDD..... | 10.0 | N.D. |
| 4,4'-DDE..... | 5.0 | N.D. |
| 4,4'-DDT..... | 10.0 | N.D. |
| Dieldrin..... | 5.0 | N.D. |
| Endosulfan I..... | 10.0 | N.D. |
| Endosulfan II..... | 5.0 | N.D. |
| Endosulfan sulfate..... | 50.0 | N.D. |
| Endrin..... | 10.0 | N.D. |
| Endrin aldehyde..... | 15.0 | N.D. |
| Heptachlor..... | 5.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 150.0 | N.D. |
| Toxaphene..... | 175.0 | N.D. |
| PCB-1016..... | 50.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

292504



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-17, SS-18, SS-20 Composite
Analysis Method: EPA 8080
Lab Number: 902-0827

Sampled: Feb 1, 1989
Received: Feb 9, 1989
Extracted: Feb 13, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

ORGANOCHLORINE PESTICIDES AND PCB'S (EPA 8080)

| Analyte | Detection Limit ug/kg | Sample Results ug/kg |
|--------------------------|--------------------------|-------------------------|
| Aldrin..... | 5.0 | N.D. |
| alpha-BHC..... | 5.0 | N.D. |
| beta-BHC..... | 5.0 | N.D. |
| sigma-BHC..... | 10.0 | N.D. |
| gamma-BHC (Lindane)..... | 5.0 | N.D. |
| Chlordane..... | 50.0 | N.D. |
| 4,4'-DDD..... | 10.0 | N.D. |
| 4,4'-DDE..... | 5.0 | N.D. |
| 4,4'-DDT..... | 10.0 | N.D. |
| Dieldrin..... | 5.0 | N.D. |
| Endosulfan I..... | 10.0 | N.D. |
| Endosulfan II..... | 5.0 | N.D. |
| Endosulfan sulfate..... | 50.0 | N.D. |
| Endrin..... | 10.0 | N.D. |
| Endrin aldehyde..... | 15.0 | N.D. |
| Heptachlor..... | 5.0 | N.D. |
| Heptachlor epoxide..... | 5.0 | N.D. |
| Methoxychlor..... | 150.0 | N.D. |
| Toxaphene..... | 175.0 | N.D. |
| PCB-1016..... | 50.0 | N.D. |
| PCB-1221..... | 50.0 | N.D. |
| PCB-1232..... | 50.0 | N.D. |
| PCB-1242..... | 50.0 | N.D. |
| PCB-1248..... | 50.0 | N.D. |
| PCB-1254..... | 50.0 | N.D. |
| PCB-1260..... | 50.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

3292505

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director



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680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-27
Analysis Method: EPA 8150
Lab Number: 902-0823

Sampled: Feb 1, 1989
Received: Feb 9, 1989
Extracted: Feb 10, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

292506



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Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-26, SS-28 Composite
Analysis Method: EPA 8150
Lab Number: 902-0824

Sampled: Feb 1, 1989
Received: Feb 9, 1989
Extracted: Feb 10, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

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Laboratory Director

8292507



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(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-21, SS-23, SS-25 Composite
Analysis Method: EPA 8150
Lab Number: 902-0825

Sampled: Feb 1, 1989
Received: Feb 9, 1989
Extracted: Feb 10, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

3292508



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Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-19, SS-22, SS-24 Composite
Analysis Method: EPA 8150
Lab Number: 902-0826

Sampled: Feb 1, 1989
Received: Feb 9, 1989
Extracted: Feb 10, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

2292509



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(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-17, SS-18, SS-20 Composite
Analysis Method: EPA 8150
Lab Number: 902-0827

Sampled: Feb 1, 1989
Received: Feb 9, 1989
Extracted: Feb 10, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

0292510



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| | | |
|---|--|---|
| Wahler Associates 1023 Corporation Way Palo Alto, CA 94303 Attention: Peter Lyon | Client Project ID: TMI-101H Sample Descript: Water, MW-2 Analysis Method: EPA 8240 Lab Number: 902-0829 | Sampled: Feb 4, 1989 Received: Feb 9, 1989 Analyzed: Feb 10, 1989 Reported: Feb 14, 1989 |
|---|--|---|

VOLATILE ORGANICS by GC/MS (EPA 8240)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|--------------------------------|-------------------------|------------------------|
| Acetone..... | 10.0 | N.D. |
| Benzene..... | 2.0 | N.D. |
| Bromodichloromethane..... | 2.0 | N.D. |
| Bromoform..... | 2.0 | N.D. |
| Bromomethane..... | 2.0 | N.D. |
| 2-Butanone..... | 2.0 | N.D. |
| Carbon disulfide..... | 10.0 | N.D. |
| Carbon tetrachloride..... | 2.0 | N.D. |
| Chlorobenzene..... | 2.0 | N.D. |
| Chlorodibromomethane..... | 2.0 | N.D. |
| Chloroethane..... | 2.0 | N.D. |
| 2-Chloroethyl vinyl ether..... | 10.0 | N.D. |
| Chloroform..... | 2.0 | N.D. |
| Chloromethane..... | 2.0 | N.D. |
| 1,1-Dichloroethane..... | 2.0 | N.D. |
| 1,2-Dichloroethane..... | 2.0 | N.D. |
| 1,1-Dichloroethene..... | 2.0 | N.D. |
| Total 1,2-Dichloroethene..... | 2.0 | N.D. |
| 1,2-Dichloropropane..... | 2.0 | N.D. |
| cis 1,3-Dichloropropene..... | 2.0 | N.D. |
| trans 1,3-Dichloropropene..... | 2.0 | N.D. |
| Ethylbenzene..... | 2.0 | N.D. |
| 2-Hexanone..... | 2.0 | N.D. |
| Methylene chloride..... | 10.0 | N.D. |
| 4-Methyl-2-pentanone..... | 2.0 | N.D. |
| Styrene..... | 10.0 | N.D. |
| 1,1,2,2-Tetrachloroethane..... | 2.0 | N.D. |
| Tetrachloroethene..... | 2.0 | N.D. |
| Toluene..... | 2.0 | N.D. |
| 1,1,1-Trichloroethane..... | 2.0 | N.D. |
| 1,1,2-Trichloroethane..... | 2.0 | N.D. |
| Trichloroethene..... | 2.0 | N.D. |
| Trichlorofluoromethane..... | 2.0 | N.D. |
| Vinyl acetate..... | 2.0 | N.D. |
| Vinyl chloride..... | 2.0 | N.D. |
| Total Xylenes..... | 2.0 | N.D. |
| | 2.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

2292511



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Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Water, MW-3
Analysis Method: EPA 8240
Lab Number: 902-0831

Sampled: Feb 4, 1989
Received: Feb 9, 1989
Analyzed: Feb 10, 1989
Reported: Feb 14, 1989

VOLATILE ORGANICS by GC/MS (EPA 8240)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|--------------------------------|-------------------------|------------------------|
| Acetone..... | 10.0 | N.D. |
| Benzene..... | 2.0 | N.D. |
| Bromodichloromethane..... | 2.0 | N.D. |
| Bromoform..... | 2.0 | N.D. |
| Bromomethane..... | 2.0 | N.D. |
| 2-Butanone..... | 2.0 | N.D. |
| Carbon disulfide..... | 10.0 | N.D. |
| Carbon tetrachloride..... | 2.0 | N.D. |
| Chlorobenzene..... | 2.0 | N.D. |
| Chlorodibromomethane..... | 2.0 | N.D. |
| Chloroethane..... | 2.0 | N.D. |
| 2-Chloroethyl vinyl ether..... | 10.0 | N.D. |
| Chloroform..... | 2.0 | N.D. |
| Chloromethane..... | 2.0 | N.D. |
| 1,1-Dichloroethane..... | 2.0 | N.D. |
| 1,2-Dichloroethane..... | 2.0 | N.D. |
| 1,1-Dichloroethene..... | 2.0 | N.D. |
| Total 1,2-Dichloroethene..... | 2.0 | N.D. |
| 1,2-Dichloropropane..... | 2.0 | N.D. |
| cis 1,3-Dichloropropene..... | 2.0 | N.D. |
| trans 1,3-Dichloropropene..... | 2.0 | N.D. |
| Ethylbenzene..... | 2.0 | N.D. |
| 2-Hexanone..... | 2.0 | N.D. |
| Methylene chloride..... | 10.0 | N.D. |
| 4-Methyl-2-pentanone..... | 2.0 | N.D. |
| Styrene..... | 10.0 | N.D. |
| 1,1,2,2-Tetrachloroethane..... | 2.0 | N.D. |
| Tetrachloroethene..... | 2.0 | N.D. |
| Toluene..... | 2.0 | N.D. |
| 1,1,1-Trichloroethane..... | 2.0 | N.D. |
| 1,1,2-Trichloroethane..... | 2.0 | N.D. |
| Trichloroethene..... | 2.0 | N.D. |
| Trichlorofluoromethane..... | 2.0 | N.D. |
| Vinyl acetate..... | 2.0 | N.D. |
| Vinyl chloride..... | 2.0 | N.D. |
| Total Xylenes..... | 2.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

0292512



SEQUOIA ANALYTICAL

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Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Water, MW-2
Analysis Method: EPA 8270
Lab Number: 902-0828

Sampled: Feb 4, 1989
Received: Feb 9, 1989
Extracted: Feb 9, 1989
Analyzed: Feb 10, 1989
Reported: Feb 14, 1989

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|----------------------------------|-------------------------|------------------------|
| Acenaphthene..... | 2.0 | N.D. |
| Acenaphthylene..... | 2.0 | N.D. |
| Aniline..... | 2.0 | N.D. |
| Anthracene..... | 2.0 | N.D. |
| Benzidine..... | 2.0 | N.D. |
| Benzoic Acid..... | 50.0 | N.D. |
| Benzo(a)anthracene..... | 10.0 | N.D. |
| Benzo(b)fluoranthene..... | 2.0 | N.D. |
| Benzo(k)fluoranthene..... | 2.0 | N.D. |
| Benzo(g,h,i)perylene..... | 2.0 | N.D. |
| Benzo(a)pyrene..... | 2.0 | N.D. |
| Benzyl alcohol..... | 2.0 | N.D. |
| Bis(2-chloroethoxy)methane..... | 2.0 | N.D. |
| Bis(2-chloroethyl)ether..... | 2.0 | N.D. |
| Bis(2-chloroisopropyl)ether..... | 2.0 | N.D. |
| Bis(2-ethylhexyl)phthalate..... | 10.0 | N.D. |
| 4-Bromophenyl ether..... | 2.0 | N.D. |
| Butyl benzyl phthalate..... | 2.0 | N.D. |
| 4-Chloroaniline..... | 2.0 | N.D. |
| 2-Chloronaphthalene..... | 2.0 | N.D. |
| 4-Chloro-3-methylphenol..... | 2.0 | N.D. |
| 2-Chlorophenol..... | 2.0 | N.D. |
| 4-Chlorophenyl phenyl ether..... | 2.0 | N.D. |
| Chrysene..... | 2.0 | N.D. |
| Dibenz(a,h)anthracene..... | 2.0 | N.D. |
| Dibenzofuran..... | 2.0 | N.D. |
| Di-N-butyl phthalate..... | 10.0 | N.D. |
| 1,3-Dichlorobenzene..... | 2.0 | N.D. |
| 1,4-Dichlorobenzene..... | 2.0 | N.D. |
| 1,2-Dichlorobenzene..... | 2.0 | N.D. |
| 3,3-Dichlorobenzidine..... | 10.0 | N.D. |
| 2,4-Dichlorophenol..... | 2.0 | N.D. |
| Diethyl phthalate..... | 2.0 | N.D. |
| 2,4-Dimethylphenol..... | 2.0 | N.D. |
| Dimethyl phthalate..... | 2.0 | N.D. |
| 4,6-Dinitro-2-methylphenol..... | 10.0 | N.D. |
| 2,4-Dinitrophenol..... | 10.0 | N.D. |

0292513



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Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Water, MW-2
Analysis Method: EPA 8270
Lab Number: 902-0828

Sampled: Feb 4, 1989
Received: Feb 9, 1989
Extracted: Feb 9, 1989
Analyzed: Feb 10, 1989
Reported: Feb 14, 1989

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|---------------------------------|-------------------------|------------------------|
| 2,4-Dinitrotoluene..... | 2.0 | N.D. |
| 2,6-Dinitrotoluene..... | 2.0 | N.D. |
| Di-N-octyl phthalate..... | 2.0 | N.D. |
| Fluoranthene..... | 2.0 | N.D. |
| Fluorene..... | 2.0 | N.D. |
| Hexachlorobenzene..... | 2.0 | N.D. |
| Hexachlorobutadiene..... | 2.0 | N.D. |
| Hexachlorocyclopentadiene..... | 2.0 | N.D. |
| Hexachloroethane..... | 2.0 | N.D. |
| Indeno(1,2,3-cd)pyrene..... | 2.0 | N.D. |
| Isophorone..... | 2.0 | N.D. |
| 2-Methylnaphthalene..... | 2.0 | N.D. |
| 2-Methylphenol..... | 2.0 | N.D. |
| 4-Methylphenol..... | 2.0 | N.D. |
| Naphthalene..... | 2.0 | N.D. |
| 2-Nitroaniline..... | 2.0 | N.D. |
| 3-Nitroaniline..... | 2.0 | N.D. |
| 4-Nitroaniline..... | 2.0 | N.D. |
| Nitrobenzene..... | 2.0 | N.D. |
| 2-Nitrophenol..... | 2.0 | N.D. |
| 4-Nitrophenol..... | 2.0 | N.D. |
| N-Nitrosodiphenylamine..... | 10.0 | N.D. |
| N-Nitroso-di-N-propylamine..... | 2.0 | N.D. |
| Pentachlorophenol..... | 2.0 | N.D. |
| Phenathrene..... | 10.0 | N.D. |
| Phenol..... | 2.0 | N.D. |
| Pyrene..... | 2.0 | N.D. |
| 1,2,4-Trichlorobenzene..... | 2.0 | N.D. |
| 2,4,5-Trichlorophenol..... | 2.0 | N.D. |
| 2,4,6-Trichlorophenol..... | 2.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

0292514



SEQUOIA ANALYTICAL

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(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Water, MW-3
Analysis Method: EPA 8270
Lab Number: 902-0830

Sampled: Feb 4, 1989
Received: Feb 9, 1989
Extracted: Feb 9, 1989
Analyzed: Feb 10, 1989
Reported: Feb 14, 1989

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|----------------------------------|-------------------------|------------------------|
| Acenaphthene..... | 2.0 | N.D. |
| Acenaphthylene..... | 2.0 | N.D. |
| Aniline..... | 2.0 | N.D. |
| Anthracene..... | 2.0 | N.D. |
| Benzidine..... | 50.0 | N.D. |
| Benzoic Acid..... | 10.0 | N.D. |
| Benzo(a)anthracene..... | 2.0 | N.D. |
| Benzo(b)fluoranthene..... | 2.0 | N.D. |
| Benzo(k)fluoranthene..... | 2.0 | N.D. |
| Benzo(g,h,i)perylene..... | 2.0 | N.D. |
| Benzo(a)pyrene..... | 2.0 | N.D. |
| Benzyl alcohol..... | 2.0 | N.D. |
| Bis(2-chloroethoxy)methane..... | 2.0 | N.D. |
| Bis(2-chloroethyl)ether..... | 2.0 | N.D. |
| Bis(2-chloroisopropyl)ether..... | 2.0 | N.D. |
| Bis(2-ethylhexyl)phthalate..... | 10.0 | N.D. |
| 4-Bromophenyl ether..... | 2.0 | N.D. |
| Butyl benzyl phthalate..... | 2.0 | N.D. |
| 4-Chloroaniline..... | 2.0 | N.D. |
| 2-Chloronaphthalene..... | 2.0 | N.D. |
| 4-Chloro-3-methylphenol..... | 2.0 | N.D. |
| 2-Chlorophenol..... | 2.0 | N.D. |
| 4-Chlorophenyl phenyl ether..... | 2.0 | N.D. |
| Chrysene..... | 2.0 | N.D. |
| Dibenz(a,h)anthracene..... | 2.0 | N.D. |
| Dibenzofuran..... | 2.0 | N.D. |
| Di-N-butyl phthalate..... | 10.0 | N.D. |
| 1,3-Dichlorobenzene..... | 2.0 | N.D. |
| 1,4-Dichlorobenzene..... | 2.0 | N.D. |
| 1,2-Dichlorobenzene..... | 2.0 | N.D. |
| 3,3-Dichlorobenzidine..... | 10.0 | N.D. |
| 2,4-Dichlorophenol..... | 2.0 | N.D. |
| Diethyl phthalate..... | 2.0 | N.D. |
| 2,4-Dimethylphenol..... | 2.0 | N.D. |
| Dimethyl phthalate..... | 2.0 | N.D. |
| 4,6-Dinitro-2-methylphenol..... | 10.0 | N.D. |
| 2,4-Dinitrophenol..... | 10.0 | N.D. |

R292515



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Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Water, MW-3
Analysis Method: EPA 8270
Lab Number: 902-0830

Sampled: Feb 4, 1989
Received: Feb 9, 1989
Extracted: Feb 9, 1989
Analyzed: Feb 10, 1989
Reported: Feb 14, 1989

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

| Analyte | Detection Limit ug/L | Sample Results ug/L |
|---------------------------------|-------------------------|------------------------|
| 2,4-Dinitrotoluene..... | 2.0 | N.D. |
| 2,6-Dinitrotoluene..... | 2.0 | N.D. |
| Di-N-octyl phthalate..... | 2.0 | N.D. |
| Fluoranthene..... | 2.0 | N.D. |
| Fluorene..... | 2.0 | N.D. |
| Hexachlorobenzene..... | 2.0 | N.D. |
| Hexachlorobutadiene..... | 2.0 | N.D. |
| Hexachlorocyclopentadiene..... | 2.0 | N.D. |
| Hexachloroethane..... | 2.0 | N.D. |
| Indeno(1,2,3-cd)pyrene..... | 2.0 | N.D. |
| Isophorone..... | 2.0 | N.D. |
| 2-Methylnaphthalene..... | 2.0 | N.D. |
| 2-Methylphenol..... | 2.0 | N.D. |
| 4-Methylphenol..... | 2.0 | N.D. |
| Naphthalene..... | 2.0 | N.D. |
| 2-Nitroaniline..... | 2.0 | N.D. |
| 3-Nitroaniline..... | 2.0 | N.D. |
| 4-Nitroaniline..... | 2.0 | N.D. |
| Nitrobenzene..... | 2.0 | N.D. |
| 2-Nitrophenol..... | 2.0 | N.D. |
| 4-Nitrophenol..... | 2.0 | N.D. |
| N-Nitrosodiphenylamine..... | 10.0 | N.D. |
| N-Nitroso-di-N-propylamine..... | 2.0 | N.D. |
| Pentachlorophenol..... | 2.0 | N.D. |
| Phenathrene..... | 10.0 | N.D. |
| Phenol..... | 2.0 | N.D. |
| Pyrene..... | 2.0 | N.D. |
| 1,2,4-Trichlorobenzene..... | 2.0 | N.D. |
| 2,4,5-Trichlorophenol..... | 2.0 | N.D. |
| 2,4,6-Trichlorophenol..... | 2.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Arthur G. Burton
Laboratory Director

292516



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Matrix Descript: Soil
Analysis Method: EPA 413.2 (I.R.)
First Sample #: 902-0930

Sampled: Feb 9, 1989
Received: Feb 9, 1989
Extracted: Feb 13, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

TOTAL RECOVERABLE OIL & GREASE

| Sample Number | Sample Description Composite | Oil & Grease mg/kg (ppm) |
|---------------|------------------------------|--------------------------|
| 902-0930 | SS-29, SS-30, | 14 |
| 902-0931 | SS-31, SS-31, | 400 |
| 902-0932 | SS-33, SS-34, | 70 |
| 902-0933 | SS-35, SS-36 | 22 |

Detection Limits:

1.0

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

0292517



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-29, SS-30 Composite
Analysis Method: EPA 8150
Lab Number: 902-0930

Sampled: Feb 9, 1989
Received: Feb 9, 1989
Extracted: Feb 13, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

292518



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Wahler Associates
1023 Corporation Way
Palo Alto, CA 94303
Attention: Peter Lyon

Client Project ID: TMI-101H
Sample Descript: Soil, SS-35, SS-36 Composite
Analysis Method: EPA 8150
Lab Number: 902-0933

Sampled: Feb 9, 1989
Received: Feb 9, 1989
Extracted: Feb 13, 1989
Analyzed: Feb 13, 1989
Reported: Feb 14, 1989

CHLORINATED HERBICIDES (EPA 8150)

| Analyte | Detection Limit mg/kg | Sample Results mg/kg |
|------------------------|--------------------------|-------------------------|
| 2,4-D..... | 1.0 | N.D. |
| 2,4-DB..... | 1.0 | N.D. |
| 2,4,5-T..... | 0.2 | N.D. |
| 2,4,5-TP (Silvex)..... | 0.2 | N.D. |
| Dalapon..... | 5.0 | N.D. |
| Dicamba..... | 0.25 | N.D. |
| Dichloroprop..... | 0.5 | N.D. |
| Dinoseb..... | 0.2 | N.D. |
| MCPA..... | 200.0 | N.D. |
| MCPP..... | 200.0 | N.D. |

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Arthur G. Burton
Laboratory Director

8292519

WAHLER ASSOCIATES
PROPERTY TRANSACTION ENVIRONMENTAL ASSESSMENT
PRELIMINARY CHECKLIST

Equipment for Visit

Camera: Yes

Tape measure: Yes

Plans: —

Business cards: Yes

General Site Information

Site Location: NE of Patterson Pass Road / N. Greenville Road intersection

Owner: Livermore, California

DICK DOTY & SIM COX

Address:

Telephone: (415) 866-6720 (415) 228-7300

Occupants: John Deponte (eastern farmhouse) & ? (western farmhouse)

Telephone: 447-1546 home 447-2896 office

Key Individual In-Charge: David Hutchinson (619) 299-0821
TME

Local Governing Body: County of Alameda

Nature of Business:

Mostly farm related: crops and grazing, one oil well
SITE MAP (SKETCH): and oil derrick, small airstrip for sliders, quarry
for clean gravel fill.

SEE FIG. 2

wells 2 domestic
tanks 3 UFT, 2 AFT
drums none observed
stained areas none observed
private utilities exist on site
sample locations

See FIG.S 2-4

292524₁

crude oil - 0-500 barrels/month 42 gal./barrel
Type and Volume of Products: quarry - clean gravel fill
farm products - unknown quantity

Chemical used in manufacturing the products:
no manufacturing

By-Products of Manufacturing Process:

n/a

Methods of Disposal: —

Emissions: none observed on-site

Solid Wastes: septic tanks near houses and hangars

Liquid Wastes: crude oil pumped underground along PP Road and across PP Road to the oil derrick.

Laboratory Facilities: n/a

Location: —

Type: —

Storage Facilities:

Aboveground Crude Oil Storage

Loading Bays: —

Transfer Areas: —

Location: across PP Road to the south
Content: crude oil
Age: 1967
Labeled? —

Underground Storage Tanks (3)

Location: between hangars on airstrip
Content: aviation fuel - high octane gasoline
Age: 1957, ?, 1978
Labeled? —

Aboveground Storage Tank

Location: behind pump house
Content: unknown
Age:
Labeled?

Aboveground Storage Tank
Location: Behind western farmhouse
Content: propane
Age: ?
Labeled? yes

PCB Transformers: none observed on site Number: — Location: —

Depth to Groundwater, if known: \approx 40 feet beneath southern portion of site

Recent Testing of Soil and Groundwater? see WA report

Soil type: —

Groundwater conditions: —

Surface Impoundments: — Content: — Age: —

Neighborhood Information

Past and present uses of surrounding properties within 1/4 miles: mostly agricultural, warehouse development in progress west of site, LLNL SW of site. See also report Section III, D.
Any suspected contaminated sites nearby? yes

Industrial facilities: Lawrence Livermore National Laboratory Location: SW of site.

Landfill/dumps: not within one mile Location:

Yes.

LLNL treats hazardous wastes
with on-site incineration

Hazardous waste facilities: Location: SW of TMI site

Sewage treatment plants: Yes Location: East of site

Abandoned/operating Gas Stations: no, but
crude oil drilling and storage Location: South part of site
and south and east of the site

Military installations: No Location: —

Superfund or any RWQCB sites: Yes Location: LLNL, SW of site

Has the potential impact of these neighbors on the site been evaluated by an environmental engineer? Yes

What sources of information was used for this research? RWQCB files, aerial photographs,
site reconnaissance, ACWFCD Zone 7 officials, CA Div Oil & Gas officials, DOE officials,
LLNL officials.

Were aerial photographs used in researching past uses of the property and surroundings: Yes

SEE
REFERENCES
section of
report

What time Period? 1988, 1984, 1971, 1966

Site History

Date constructed: Quarry (between '71 & '84)
landing strip, farm buildings (prior to 1966)

Date and nature of major alterations: 2 oil wells 1967 - present
3 UFTS 1957, ?, 1978 1981 - 1983 abandoned

Past tenants: 1. Hershey Oil 1967 - present Operations type: oil well / oil Derrick

2. TXO Oil - 1981 - 1983 Operations type: " " (now abandoned)

3. John Deponte Operations type: Farming

4. Northern CA Soaring Association
S. J. Christ Dev. Co. Glider Airport
Quarry

Recent spill history: None reported or observed

Review of Title Report: —

Review of site disposition with Fire Marshall: —

Personnel:

Title:

Comments:

Review of site disposition with RWQCB: Yes -

Personnel: North Bay Toxics case officer

Title: —

Comments: North Bay Toxics Case listing shows only down-gradient cases — most proximate is LLNL.

Review of site disposition with DOHS: —

Personnel: —

Title: —

Comments: —

Review of site disposition with County Health Department: —

Personnel: —

Title: —

Comments: —

Review of site disposition with other government agencies:

Agency Name: ^{ACWFCO} Zone 7 Personnel: Mr. Jerry Killingstad Title: ?

Comments: no toxic sites upgradient; NE corner of LLNL had VOC's at one point in time: well # 7D-2; all wells north of LLNL have been clean

Agency Name: CA Div. of Oil & Gas Personnel: Mr. Rob Hauser Title: ?

Comments: No reported crude oil spills or leaks, well abandonment by TXO was permitted and approved method, no reported problems with Hershey's well.

Past or present environmental permits: Hershey's oil well permit

Number: 1 Limitations: — Expiration Date: ?

Site Visit Comments:

Discolored soil areas: no, but fields in south are plowed frequently Location: —

Isolated areas of sick or dead vegetation: no Location: —

Discolored surfaces: quarry and adjacent areas

Pavement Condition: no paved surfaces

Loading and delivery areas conditions: none observed

Unusual or noxious odors: none observed

292527

Water wells: at pump house

Monitoring wells: see WA report

Boreholes: see WA report

Sewer lines, connections, and outfalls condition: probably 3 septic systems on site, condition unknown

Water treatment/pretreatment facilities: east of site.

Any accumulated solid wastes on site: ^{none} observed Location: -

Sign-Off

Name of person preparing this checklist: Nicola J. Barvatt
Peter Lyon

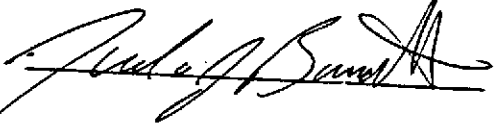
Title: Geologist
Environmental Engineer

Registration/State Certification: -

Firm: Wahler Associates

Liability Insurance: \$ 1,000,000

I have performed this investigation to the best of my abilities and based on the information available herein, I do/do not believe there is a need for additional investigation. *

Signature: 

Peter Lyon

2/13/89

PK:M

* see WA report.