Report of Soil and Ground-Water Investigation
White GMC Truck Corporation Facility
5050 Coliseum Way
Oakland, California

94601

June 25, 1992
2407.06

Prepared for:

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Greensboro, North Carolina 27402-6115

LEVINE·FRICKE

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CERTIFICATION

All hydrogeologic and geologic information, conclusions, and recommendations have been prepared under the supervision of and reviewed by a Levine·Fricke California Registered Geologist.

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California Registered Geologist (5106)

6/25/92
Date

seal?

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REPORT OF SOIL AND GROUND-WATER INVESTIGATION
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5050 COLISEUM WAY
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1.0 INTRODUCTION

This report presents the results of a soil and ground-water investigation performed by Levine•Fricke, Inc. (Levine•Fricke) for Volvo GM Heavy Truck Corporation ("Volvo GM") at the White GMC Truck ("White GMC") facility, 5050 Coliseum Way, Oakland, California ("the Site"; Figure 1). This on-site investigation was conducted in accordance with a Work Plan, dated and submitted on September 3, 1991, to the Alameda County Department of Environmental Health (ACDEH). The Work Plan was prepared in response to the ACDEH's April 10, 1991 letter to Volvo GM, requesting an investigation of soil and ground-water quality at the former location of the underground waste-oil storage tank at the Site (Figure 2). The Work Plan was given verbal approval by Ms. Cynthia Chapman of the ACDEH on September 19, 1991. In addition, the scope of work outlined in the Work Plan was expanded to include investigation of soil and ground-water quality at other parts of the Site to assess potential impacts resulting from operations of previous site owners.

1.1 Objective

Elevated concentrations of oil and grease (O&G) and metals were detected in soil samples collected by Tank Protect Engineering (TPE) of Union City, California, from the sidewalls of the excavation and the excavated soil stockpile during removal of the waste-oil tank on the Site in April 1991. This investigation was conducted by Levine•Fricke to assess the approximate extent of O&G and metals remaining in soil near the former waste-oil tank pit and to assess the approximate extent and concentrations of O&G, other petroleum hydrocarbons, and metals in ground water near the pit. An additional investigation was conducted to further assess the possible effect of the historical use of the Site, before acquisition of the property by White Motor Corporation, on soil and ground-water quality.

1.2 Scope of Work

Levine·Fricke conducted the following tasks to assess the presence of certain chemicals in soil and ground water at the former waste-oil tank location and at certain other locations at the Site.

- Reviewed regulatory records to identify reported releases of hazardous materials at sites located within a 0.5-mile radius of the Site.
- Drilled seven soil borings and collected soil samples from each soil boring for lithologic description and possible chemical analysis.
- Installed seven ground-water monitoring wells (LF-1 through LF-7; Figure 2) in the seven soil borings and developed the new wells.
- Collected ground-water samples from the seven new on-site wells and four existing wells located on adjacent property (MW-1 through MW-4; Figure 2) for chemical analysis.
- Measured depth to ground water in the seven new wells and four existing wells on the adjacent property six times during an 8-hour period to assess ground-water flow direction and the possible effect of tidal fluctuations on ground-water elevation and flow direction.
- Evaluated soil and ground-water quality data.

2.0 BACKGROUND

2.1 Site Description

The Site is located approximately 0.5 mile northeast of San Leandro Bay in a heavy industry area of Oakland in Alameda County, California (Figure 1). The Site occupies approximately 4 acres of land; its elevation is approximately 10 feet above sea level.

The Site is occupied by a large warehouse-type building (Figure 2), which contains office space and large service bays to maintain heavy trucks and other large vehicles. This building is surrounded by a concrete apron, and the remainder of the Site is covered with asphalt.

In the surrounding area are salvage businesses and other industrial and commercial facilities (Figure 2). A PG&E transformer station is located immediately southwest of the Site. The Southern Pacific Railroad tracks parallel the northeast perimeter of the Site. A concrete-lined stormwater canal runs parallel to Coliseum Way southeast of the Site and drains into San Leandro Bay.

2.2 Historical Usage of the Site

Review of RWQCB records, historical aerial photographs (Pacific Aerial Survey 1950, AV-28.-18-17; 1957, AV-253-11-34; 1959, AV-337-7-35; 1990, AV-3845-10-34), and Sanborne insurance maps (1912, 1925, 1950) indicate that the Site and the adjoining property at 750-50th Avenue were occupied by a variety of chemical companies between 1910 and 1964. These tenants included Chemical and Pigment Company, a division of Glidden Company, which operated at the Site between 1926 to 1964. Activities conducted at the Site during this period included production of paint-related materials such as lithopone (zinc sulfide and barium sulfate). Notations on the Sanborne maps indicate that acids, including sulfuric, nitric, and hydrochloric acid, were handled on the Site at least until 1950. According to information provided in an environmental site assessment report prepared by Blymyer Engineers, Inc. (1990), the buildings were demolished in 1964 and the Site was not occupied between 1964 and 1973.

White Motor Corporation purchased the Site in 1973. The building and facilities, including the underground storage tanks (Figure 2) located at the Site, were built in 1974 (Blymyer, 1990). From 1981 to 1988, Volvo-White Truck Corporation operated at the Site. White GMC, a division of Volvo GM, has operated at the Site since 1988. Operations at the Site from 1974 to the present have included maintenance of trucks and other large vehicles.

Based on information supplied by Volvo GM personnel (Bob Ware, 1991), the three underground tanks on the eastern side of the building historically were used to store motor oil. The former waste-oil tank on the northern side of the building received waste oil from the adjacent underground clarifier, which is still in place (Figure 2). The clarifier receives discharge from on-site steam-cleaning facilities.

not on

2.3 Tank Excavations

Based on work performed by TPE, three underground motor-oil tanks located immediately east of the building and one underground 550-gallon-capacity waste-oil tank located immediately north of the building were excavated and removed from the Site by TPE on March 18, 1991 (Figure 2). The following describes activities conducted by TPE as part of that excavation.

2.3.1 Waste-Oil Tank

When the waste-oil tank was removed, TPE field staff observed a 3-inch by 0.5-inch hole on the north end of the underside of the tank. Volvo GM personnel observed that the hole was in the shape of a puncture caused by a backhoe tooth, and concluded that it had resulted from the tank removal. We took no notes re hole According to TPE personnel, ground water was observed approximately 6 feet below ground surface (bgs). This shallow depth to ground water reportedly was anomalously high, according to TPE, because of a ruptured terra-cotta stormwater drain located at approximately 8 feet bgs.

TPE collected two soil samples for chemical analysis from above the soil-water interface from the excavation sidewalls where hydrocarbon-affected soil was observed. Additional soil was excavated to remove soil observed to be affected by hydrocarbons. The excavation was completed to about 9 feet bgs. Hydrocarbons were observed floating on ground water in the tank pit. Over two days, TPE pumped approximately 1,500 gallons of water from the excavation. Two to three days later, floating hydrocarbons were again observed on the ground water in the excavation. TPE used absorbent pads to remove floating hydrocarbons from the ground-water surface. Since then, floating hydrocarbons have not been observed in the excavation. TPE collected ground-water samples from the tank excavation on March 26, 1991 (one week after ground water was removed from the tank pit), and on April 4, 1991.

what happened to water pumped from pit? how was it disposed?

Soil and ground-water samples collected from the excavation by TPE were analyzed by Sequoia Analytical of Concord, California, for total petroleum hydrocarbons as gasoline (TPHg) and diesel (TPHd) using EPA Method 8015, for aromatic hydrocarbons using EPA Method 8020, for O&G using EPA Method 5520 E and F, for semivolatile hydrocarbons using EPA Method 8270, and for the metals cadmium, chromium, lead, zinc, and

nickel using EPA Methods 6010, 6010, 7421, 6010, and 6010, respectively. Ground-water samples were analyzed for polychlorinated biphenyls (PCBs) using EPA Method 8080.

Soil samples collected from the western side (WO1-W) and southeastern side (WO2-S) of the tank excavation contained 470 parts per million (ppm) and 40 ppm TPHd, respectively, 320 ppm and below the detection limit (1 ppm) TPHg, respectively, and 960 ppm and 110 ppm O&G, respectively. TPHd, TPHg, and O&G were reported at 3,300 ppm, 450 ppm, and 870 ppm, respectively, for the soil sample collected from the excavation stockpile (SPWO-1). Benzene, toluene, ethylbenzene, and total xylenes (BTEX) were not detected in the sidewall samples, with the exception of 0.14 ppm ethylbenzene and 0.340 ppm total xylenes in sample WO1-W. The stockpile sample contained 3.60 ppm total xylenes and lower concentrations of toluene and ethylbenzene. (+ 6 ppm 1,2-dichlorobenzene, +.660 ppm 2-methylnaphthalene)

For the two soil samples collected from the excavation sidewalls, the highest reported metals concentrations were 580 ppm cadmium, 29 ppm chromium, ~~1,900 ppm lead~~, 5,300 ppm zinc, (? TTLC ?) and 25 ppm nickel. Higher concentrations of lead (16,000 ppm) and zinc (5,600 ppm) were detected in the one stockpile sample. The three soil samples were also analyzed for semivolatile hydrocarbons; only 6.0 ppm 1,2-dichlorobenzene and 0.660 ppm 2-methylnaphthalene were detected in the stockpile sample. (Semivolatile) (8020)

Ground-water samples collected from the tank excavation contained 3.1 ppm TPHd, 0.65 ppm TPHg, 0.0026 ppm benzene, 0.042 ppm toluene, 0.0076 ppm ethylbenzene, 0.014 ppm total xylenes, and 7.9 ppm O&G.

For the ground-water samples, chromium and nickel were not reported above detection limits, and cadmium, lead, and zinc were reported at concentrations of 0.13 ppm, 0.32 ppm, and 100.0 ppm, respectively. PCBs and polynuclear aromatics (PNAs) were not detected above the laboratory's detection limits in the ground-water samples. STLC not exceeded

2.3.2 Motor-Oil Tanks

TPE personnel did not observe holes in any of the three underground motor-oil tanks during removal. However, during removal of the tanks, TPE personnel observed evidence of overflow (minor soil staining), which possibly occurred during filling of the tanks. Five soil samples were collected on March 18, 1991, from the sidewalls of the excavation at approximately 8.5 feet bgs, just above the soil-water

interface. A ground-water sample was collected from the bottom of the excavation on March 18, 1991, at approximately 9 feet bgs. The soil and ground-water samples were analyzed for TPHd and aromatic hydrocarbons.

TPHd concentrations in the five soil samples ranged from less than the detection limit (1.0 ppm) to 78 ppm. Benzene and ethylbenzene were detected in one soil sample at concentrations of less than 0.001 ppm. Toluene was reported at concentrations ranging from less than the detection limit of 0.0050 ppm to 0.024 ppm and total xylenes were reported at concentrations ranging from less than the detection limit of 0.050 ppm to 0.054 ppm. The ground-water sample contained 1,700 ppb TPHd and 0.36 ppb total xylenes. Benzene, toluene, and ethylbenzene were not reported above the detection limit of 0.30 ppb.

2.4 Previous Investigations - 750-50th Avenue

The following is a brief summary of investigations conducted by Aqua Terra Technologies, Inc. (ATT) of Walnut Creek, California, at the adjoining property located immediately north of the Site at 750-50th Avenue in September 1990 (Figure 2).

ATT installed four shallow monitoring wells and drilled four additional borings at the 750-50th Avenue site (Figure 2). The analytical results indicated that soil samples collected during drilling contained elevated concentrations of metals. Concentrations of zinc up to 14,900 ppm were detected in soil samples collected at 10 feet bgs from borings B2 and MW-2 on the south corner of the property near White GMC. The highest concentration of barium (9,540 ppm) was detected in a soil sample collected at 5 feet bgs from boring B-1, located near well MW-3.

Ground-water samples collected from wells MW-1 through MW-4 did not contain detectable concentrations of organic hydrocarbons based on analysis using EPA Methods 8240 (volatile organic compounds [VOCs]) and 8270 (semivolatile compounds [SVOCs]). Elevated concentrations of metals, including zinc, were detected in these ground-water samples. The highest concentration of zinc (2,720 ppm) was reported for water collected from well MW-2. Water sampling results indicated that the pH for the ground water measured during sampling ranged from 4.81 to 6.91 standard units. The lowest pH was reported for water collected from well MW-2.

Water-level measurements taken by ATT in August 1991 indicated that ground water was mounded in the area of well MW-2 and locally flowed to the northeast, away from San Leandro Bay. ATT attributed the mounding to tidal influences in the canal, which is located 140 feet west across Coliseum Way.

3.0 SOIL AND GROUND-WATER INVESTIGATION

To further assess the possible effect of O&G and metals on soil and ground-water quality near the former location of the waste-oil tank, and to assess the potential impact of previous activities conducted at the Site, Levine·Fricke observed the installation of seven ground-water monitoring wells on October 28, 29, 30, and 31, 1991. The locations of these wells are illustrated in Figure 2. These activities were conducted as outlined in the Work Plan dated September 3, 1991.

As discussed previously, the Scope of Work described in the September 3, 1991 Work Plan was expanded to assess soil and ground-water quality at other parts of the Site so that the potential impact of activities conducted at the Site before acquisition by the White Motor Corporation could be evaluated. To achieve this objective, wells LF-4 through LF-7 were installed at the locations illustrated on Figure 2. These wells were installed, developed, and sampled with the same procedures as those outlined for wells LF-1, LF-2, and LF-3 in the September 3, 1991 Work Plan.

3.1 Soil Boring and Monitoring Well Installation

Seven well borings (LF-1 through LF-7) were drilled, using the hollow-stem auger method, and completed as monitoring wells. Two soil borings (LF-1A and 1B) were attempted at locations within 10 to 20 feet of the waste-oil tank excavation so that monitoring well LF-1 could be completed adjacent to the former tank location. However, refusal was encountered at a depth of 2.5 feet (LF-1B) and 4 feet (LF-1A) bgs in the borings, because of the presence of large slabs of concrete encountered in shallow fill in the area. These two shallow borings were grouted to the ground surface. Similarly, borings SB-1 and SB-2, shown near the tank excavation on Figure 3 of the Work Plan, could not be drilled at locations specified because of subsurface impediments. Monitoring well LF-1 was moved to a location outside the area containing concrete debris fill.

but it's now 50' from w.o. pit

Soil samples were collected during drilling for lithologic description and possible chemical analysis. About 10 grams of soil was removed from the samples and placed in 50-milliliter (ml) centrifuge tubes with about 10 ml of distilled water to measure pH using a calibrated pH meter.

Appendix A describes the procedures for soil sampling and monitoring well installation. Lithologic logs with well construction details are included in Appendix B.

Ground water in natural sediments was generally encountered during drilling at depths ranging from 9.5 to 15 feet bgs. In borings LF-1, LF-2, and LF-3, shallower water was observed in material at the approximate fill/sediment interface at depths ranging from 4 to 7 feet bgs. The monitoring wells constructed of 2-inch-diameter polyvinyl chloride (PVC) casing were installed to depths ranging between 15 and 21.5 feet bgs and were completed to avoid screening across fill material. Table 1 summarizes well construction details.

3.2 Well Development and Ground-Water Sampling

The newly installed wells were developed on November 4 and 5, 1991, by purging approximately 6 well casing volumes of ground water from each well. The wells were developed using a clean Teflon bailer, with the exception of well LF-5, which was developed with a centrifugal pump. During development, observation of the quantity, clarity, pH, temperature and specific conductance were recorded on water-quality sampling sheets. Copies of these sheets are contained in Appendix C. Appendix A describes field procedures for well development and sampling.

Following development, ground-water samples for chemical analysis were collected on November 4 and 5, 1991 from wells LF-1 through LF-7. Ground-water samples were collected on December 5, 1991, from wells MW-1 through MW-4 located on the adjacent property (Figure 2). Before the samples were collected from wells MW-1 through MW-4, the wells were purged with a clean Teflon bailer until the pH, specific conductance, and temperature had stabilized in each well (approximately 3 well casing volumes were purged). Appendix C contains copies of water-quality sampling sheets used to record these measurements. Table 2 summarizes sample preservation methods and sample containers used for this ground-water sampling event.

4.0 RESULT OF HYDROGEOLOGIC INVESTIGATION

4.1 Site Geology

The information on the geology of the Site was obtained from well borings LF-1 through LF-7 logged by Levine·Fricke personnel (Appendix B) and the logs for well borings MW-1 through MW-4 completed by ATT. Shallow sediments encountered at the Site consist of up to 8 feet of fill material overlying silty and sandy clay sediments.

The ground surface surrounding the buildings is underlain by 4 to 6 inches of asphalt. Approximately 2.5 to 7.5 feet of fill was encountered underlying the asphalt. The fill matrix consists of gravelly sandy clay, silty sand, and gravel. Red brick, concrete rubble, wood, white and yellow powdery materials, and other debris were observed in the fill. Additionally, 4 inches to 6.5 feet of metallic slag (waste product from the processing of mineral ores) was observed in borings LF-1, LF-4, and LF-6. The greatest thickness of slag was measured in well boring LF-6. Slag was encountered in well boring LF-6 between approximately 1.5 and 8 feet bgs. In addition, the dusky red, silty sand observed in borings LF-2, LF-3, and LF-5 at depths of 3.5, 5.5, and 2.5 feet bgs, respectively, also may be fill, based on the amount of debris contained in it. Alternatively, this material may consist of native soil mixed with other manufacturing materials emplaced before ~~when~~ the Site was paved in 1973.

The native sediments underlying the fill are heterogeneous and consist of interbedded sand, silt, and clay. Silty and sandy clay and clay commonly were observed from below the fill to depths ranging from about 10 to 13.5 feet bgs. The sediments observed in the borings below approximately 13 feet bgs consisted of interbedded silty clay, clayey and silty sand and sand. Sandy units encountered at varying depths between 10 and 15 feet bgs do not appear to be laterally continuous. The thickness of the units varied from not observed in boring LF-4 to 5 feet in boring LF-5. According to ATT, clayey material was observed in at least the lower 5 feet of borings MW-1 through MW-4. Those four wells were drilled to depths ranging from 27 to 29 feet bgs. This information indicates that a more laterally continuous layer of clayey sediments may underlie the Site below depths of about 22 feet.

4.2 Ground-Water Elevations and Flow

The ground-surface and top-of-casing elevations were surveyed on November 7, 1991, by Stedman and Associates of Walnut Creek, California, a licensed surveyor. Appendix D presents the tabulated survey data. The bench mark used by Stedman and Associates (City of Oakland BM #1094, elevation 7.85 mean sea level datum) is located on top of the concrete wall over the drainage channel across from the Site on 50th Avenue (Figure 2).

Six rounds of depth-to-water measurements were taken in the seven new wells and four existing wells on the adjacent property between 9 am and 5 pm on November 7, 1991, to provide data for evaluating ground-water flow direction and the possible influence of tidal fluctuation on ground-water elevations and flow direction. Depth to water in the drainage channel was also measured from the bench mark during each round. Based on northern California tide and current tables, high tide in San Leandro Bay (+7 feet) was at approximately noon and low tides were at about 6 am (+2.8 feet) and at about 7 pm (-0.6 feet). Ground-water elevation data are presented on Table 3.

Although water levels in the channel appeared to respond to tidal fluctuations, ground-water elevations measured in the wells did not appear to change in a similar manner. Comparison of the six rounds of measurements indicates that ground-water flow is generally toward the south and west in the direction of San Leandro Bay. This pattern did not change significantly over the time when the six measurements were taken. Figure 3 presents ground-water elevations for the measurement round started at about 11 am. The ground-water elevation for well MW-4 was not used for contouring, since the depth to water fluctuated while measurements were taken. After the well cap was removed, the water level in MW-4 fluctuated 4.4 feet over approximately 8 hours. The ground-water levels in well LF-4 fluctuated similarly about 0.69 foot. This amount of fluctuation was not observed in any of the other wells measured. Ground-water elevations in the other nine wells increased 0.25 foot or less over the 8-hour measurement period.

ATT said gw flow to NE "locally" p7

The measured increases and decreases of depth to water in the channel at the point of measurement appeared to coincide with the rise and fall of the tide. The level in the channel increased about 2.38 feet between 9 am and noon (high tide) and dropped 6.57 feet between noon and 4 pm (approaching time

of low tide) when the channel was dry at the measurement point. The channel was also dry during the 4 pm to 5 pm measurement round.

4.3 Results of Soil Chemical Analysis

only LF-1 was analyzed for HCs. Why not the others?

4.3.1 Petroleum-Related Compounds

Soil samples collected from boring LF-1 located about 50 feet northwest of the former waste-oil tank pit (Figure 3) were analyzed for petroleum-related compounds. Table 4 presents analytical results. Appendix E includes laboratory reports with chain-of-custody forms.

Four soil samples collected from boring LF-1 at approximately 2-foot intervals between 2.0 and 11.0 feet bgs were analyzed for O&G and hydrocarbons using EPA Methods 5520 E & F. O&G and hydrocarbons were only detected in the sample collected at 2.5 feet bgs at 2,200 ppm and 1,700 ppm, respectively. O&G and hydrocarbons were not reported above the detection limit of 10 ppm for the other three samples.

a pocket of coarse at 2.5' bgs

Samples collected from boring LF-1 at 5.5 feet bgs and 10.5 feet bgs were also analyzed for extractable hydrocarbons as diesel (EPA Method 3550), purgeable hydrocarbons as gasoline (modified EPA Method 5030/8015), and BTEX (EPA Method 8020). Diesel, gasoline, and BTEX were not reported above laboratory detection limits (Appendix E).

4.3.2 Metals

A total of 24 soil samples collected at depths ranging from 2 to 21 feet bgs from borings LF-1 through LF-7 (Figure 4) were analyzed for arsenic, barium, cadmium, chromium, nickel, lead, and zinc using the EPA Method 6010/7000 series. Those metals were selected for analysis based on analytical results reported for soil samples collected during excavation of the waste-oil tank by TPE; on results reported for soil samples collected during the ATT investigation on the adjacent property; and on past usage of the Site before 1974.

Should look for all 5 cam metals at least once

Figure 4 and Table 5 summarize analytical results for this investigation. Figure 4 also includes data for soil samples collected by ATT. Appendix E includes laboratory reports.

Arsenic was detected in all samples except for the sample collected at 2 feet bgs from boring ~~LF-2~~ LF-4. Arsenic concentrations ranged from 2 to 270 mg/kg.

Barium was detected in all samples analyzed. The highest concentrations, ranging from 60,000 to 92,000 mg/kg, were detected in samples collected at depths of 4 feet bgs and shallower from borings LF-4 and LF-7. Based on the past use of the property, the barium detected may have been in the form of barium sulfate. A white powdery material (possibly a barium compound) was observed during drilling in samples collected at a depth of 3.5 feet from boring LF-4 and at 4 feet bgs from LF-6. Lower concentrations of barium, ranging from 30 to 4,200 mg/kg, were reported for samples collected from the remaining borings. The sample collected at a depth of 3.5 feet bgs from boring LF-4 was described during drilling by Levine·Fricke's field staff as containing material that appeared to be sulfur. Analysis of that sample by ASTM Method D129 indicated sulfur at 1.08 percent.

need to verify TTLC Ba SO4 since its an example

The highest concentrations of cadmium, chromium, and nickel were detected in the sample collected from boring LF-1 at a depth of 7.5 feet bgs. Cadmium results ranged from less than the detection limit (0.2 mg/kg) to 110 mg/kg. Chromium was detected in all samples except those collected at 2.5 feet and 7 feet bgs from boring LF-3. Concentrations of chromium ranged from 8 to 65 mg/kg. Nickel was detected in all samples, except the sample collected from boring LF-3 at a depth of 7 feet bgs, at concentrations ranging from 8 to 130 milligrams per liter (mg/l).

> 100 ppm TTLC

not mg/kg?

Lead was detected at concentrations ranging from 5 to 24,000 mg/kg. The highest concentration reported was for the sample collected at 2.5 feet bgs from boring LF-2, which contained 8,600 mg/kg of lead. The next highest concentration (1,000 mg/kg) was collected at a depth of 3.5 feet bgs from boring LF-5.

24000

> TTLC 1000

incorrect

where was 24,000?

Zinc was detected in all samples except for the sample collected at 7 feet bgs from boring LF-3 (detection limit 200 mg/kg). The highest concentrations (16,000 mg/kg and 31,000 mg/kg) were detected in samples collected at depths of 21 feet bgs (6 feet below first water in natural sediments observed during drilling) and 7.5 feet bgs, respectively, from boring LF-1. Lower concentrations ranging from 20 to 6,900 mg/kg were detected in the rest of the samples analyzed.

> 5000 TTLC

4.3.3 Soil pH

Measurements of pH recorded when soil samples were analyzed for metals are presented on Figure 4, while soil pH values measured during drilling are presented on the boring logs. The pH for soils in the Bay Area typically ranges from 6.5 to 8 standard units (Brady, 1974). Measurements of pH ranged from a low of 3.9 standard units, in soil samples collected from boring LF-1 at depths of 15.5 feet to 20 feet bgs, to a high of 10.6 standard units, in the soil sample collected at a depth of 3.5 feet bgs from boring LF-7. Most samples from borings LF-1, LF-2, and LF-3 had pH levels between 4.3 and 6.5 standard units. Samples from borings LF-4, LF-5, and LF-6 indicated pH measurements between 6.1 and 9.3 standard units.

4.4 Results of Ground-Water Chemical Analysis

Ground-water samples were analyzed to evaluate the possible effect of O&G and petroleum-related compounds, VOCs, and metals on ground-water quality. Table 2 presents the types of analysis conducted on these samples. Appendix F includes laboratory reports with chain-of-custody forms for ground-water analysis.

4.4.1 Petroleum-Related Compounds

Ground-water samples collected from wells LF-1, LF-2, LF-3, and MW-2 were analyzed for petroleum-related compounds outlined in the September 3, 1991 Work Plan; Table 6 presents analytical results. The ground-water sample from well LF-4 was also analyzed for petroleum hydrocarbons because a fuel-type odor was noted at the time of sampling.

No O&G was detected above the detection limit of 0.5 ppm in the sample from LF-1. Results for extractable hydrocarbons as diesel in samples from wells LF-1, LF-2, and LF-3 ranged from below the detection limit of 0.05 mg/l for well MW-2 to 0.3 mg/l for well LF-2. No extractable hydrocarbons as oil were reported above the detection limit of 0.10 mg/l for the sample from well MW-2.

Purgeable hydrocarbons as gasoline were not detected in the samples from wells LF-1, LF-2, LF-3 and MW-2. Purgeable hydrocarbons as gasoline were detected in LF-4 at 0.59 mg/l. Benzene, toluene, and ethylbenzene were reported at below the detection limits of 0.003 mg/l and 0.005 mg/l for analysis by EPA Methods 8020 and 8240, respectively. Concentrations of total xylenes were below the detection limits of 0.001 mg/l and 0.010 mg/l, respectively.

4.4.2 Volatile and Semivolatile Organic Compounds

Purgeable hydrocarbons were not detected above laboratory detection limits in ground-water samples from wells LF-1 through LF-7 (Appendix F). SVOCs and PCBs were not detected above detection limits in samples from wells LF-2 and LF-5 using EPA Method 8270 (Appendix F).

4.4.3 Metals

Samples collected from wells LF-1 through LF-7 and MW-1 through MW-4 were analyzed for CAM-17 metals using the EPA Method 6010/7000 series. Where applicable, San Francisco Basin Plan detection limits were used. Table 7 summarizes the analytical results. Figure 5 presents results for arsenic, barium, cadmium, chromium, nickel, lead, zinc, and copper.

Arsenic was detected in samples from all wells above the detection limit of 0.002 mg/l at concentrations ranging from 0.004 to 3.1 mg/l, except for wells LF-5 and MW-3. The highest concentrations (2.1 and 3.1 mg/l) were reported for samples from wells MW-2 and LF-3, respectively. Barium was detected in samples from all wells sampled. Concentrations ranged from 0.013 mg/l for well MW-2 to 0.13 mg/l for well LF-7.

The highest concentration of cadmium (130 mg/l), copper (1.9 mg/l), nickel (20 mg/l), lead (0.5 mg/l), and zinc (40,000 mg/l) were detected in a sample collected from well LF-1. Lower concentrations of these metals were detected in samples from most of the wells; however, lead was only reported for wells LF-6 and MW-3.

Chromium was not detected above the detection limit of 0.01 mg/l in any of the ground-water samples.

Iron (Fe), manganese (Mn) and magnesium (Mg) were detected at elevated concentrations in the ground-water sample from well LF-1 analyzed for general minerals. These metals are common in natural sediments. The higher concentrations detected in the ground-water samples (2,900 mg/l Fe; 350 mg/l Mn; 860 mg/l Mg) are likely due to leaching of the elements from the sediments under low pH (acidic) conditions.

Other metals in the ground-water samples are presented in Table 7. These data were not discussed because generally the reported concentrations for those metals were below levels of concern. Elevated concentrations of those metals generally were detected in the ground water from well LF-1.

4.4.4 General Minerals, Total Dissolved Solids and pH

General minerals, including sulfate, along with total dissolved solids (TDS), electrical conductivity (EC), and pH were analyzed in ground-water samples from all 11 wells. All samples also were analyzed for sulfide by EPA Method 367.2. Table 8 summarizes the analytical results. Figure 5 presents the results for sulfate, TDS, and pH. Appendix F includes laboratory reports.

Measurements of pH in ground-water samples from wells LF-3, LF-4, LF-5, LF-7, MW-1, and MW-4 ranged between the expected natural range of 6.5 to 8 standard units. Measurements in ground-water samples from the other five wells indicated lower pH (acidic conditions), ranging from 4 to 5.6 standard units. The lowest pH (4) was reported for well LF-1.

Concentrations of TDS above 3,000 mg/l were detected in samples from wells LF-1, LF-2, LF-3, LF-5, LF-6, MW-2, and MW-3. The highest concentration (33,000 mg/l) was reported for well LF-1. The second highest concentration (16,000 mg/l) was reported for well MW-2. The laboratory report indicated that positive interference in TDS for well MW-2 may be due to fine particulates passing through the standard glass fiber filter. Concentrations of TDS below 3,000 mg/l were detected in samples from wells LF-4, LF-7, MW-1, and MW-4, and ranged from 190 mg/l for well MW-1 to 2,600 mg/l for well LF-4.

The highest concentration of sulfate (91,000 mg/l) was detected in the sample collected from well LF-1. A comment on the laboratory report for that sample indicated that a portion of the sulfate might be attributed to sulfide. Ground-water samples from all wells were analyzed for sulfide, which is not part of a general mineral analysis. Sulfide was reported below the detection limit (1 mg/l) for samples from all the wells. For samples from the other 10 wells, lower concentrations of sulfate range from 190 mg/l for well MW-1 to 9,500 mg/l for well MW-2.

EC measurements follow a similar pattern to TDS concentrations. EC measurements ranged from a low of 930 umhos/cm for well MW-1 (620 mg/l TDS) to a high of 49,000 umhos/cm (33,000 mg/l TDS) for well LF-1. The presence of dissolved solids in ground water tends to increase the measured EC.

5.0 DISCUSSION OF RESULTS AND CONCLUSIONS

5.1 Petroleum Hydrocarbons and Other Organic Compounds in Soil and Ground Water

BTEX, VOCs, SVOCs, and PCBs were not detected in samples collected from any other wells. A relatively low concentration of TPH as purgeable hydrocarbons was detected in the sample from well LF-4 and ~~very~~ low concentrations of TPH as extractable hydrocarbons were detected in wells LF-1 through LF-4.

The results indicate that ground-water quality has not been affected by detectable concentrations of O&G approximately 50 feet downgradient from the former waste-oil tank pit based on the analytical results for the sample collected from well LF-1. O&G ~~only~~ were detected in a near-surface soil sample from boring LF-1; however, O&G were not detected in deeper soil or ground water. As discussed in Section 3.1, limitations during drilling due to subsurface obstacles precluded investigation of soil and ground-water quality directly adjacent to the tank pit.

5.2 Metals and pH in Soil and Ground Water

Metals detected in soil and ground water and low pH conditions appear to be the result of activities conducted at the Site prior to the acquisition by White Motor Corporation. The data collected during this investigation for metal concentrations in soil compare well with the previous data collected by TPE during excavation of the waste-oil tank and data reported by ATT for the adjoining property (750-50th Avenue). In general, elevated concentrations of metals appear to be restricted to the upper 10 feet of material beneath the Site, except in the vicinity of well LF-1 where concentrations of zinc up to 16,000 ppm were detected to 20 feet bgs. Concentrations of metals detected in ground water were most elevated in wells LF-1 ~~and MW-2.~~ Concentrations of zinc and other metals in ground water from wells LF-1 and MW-2 appear to correlate with concentrations of metals in soil in that area and with low pH conditions (4 standard units) in soil and ground water. The solubility and subsequent mobility of some metals such as zinc may be enhanced in low pH environments.

Barium was detected at concentrations of 60,000 mg/kg (boring ~~LF-2~~) and greater in near surface soils at the east and south corners of the Site. However, the barium may be in the form of barium sulfate, which is not considered a hazardous waste. Ground-water samples collected from wells in those areas contain relatively low concentrations of barium.

Although lead concentrations up to 24,000 mg/kg were detected in acidic near-surface soil samples (2.5 feet bgs) collected beneath the west-central part of the Site, lead was not reported above the detection limit of 0.005 mg/l in ground-water samples collected from nearby monitoring well LF-2. The neutral pH of soil overlying ground water may have restricted the downward migration of lead from shallower soil into ground water.

The occurrence of elevated concentrations of metals in ground-water samples and relatively lower pH of soil and ground-water associated with wells LF-1 and MW-2 indicates that these wells LF-1 and MW-2 likely are located near former acid source areas at the Site. Wells LF-2 and MW-3 located on the southwestern perimeter of the Site and northwestern corner of the adjacent property, respectively, contain relatively much lower but elevated concentrations of metals in ground water compared to those detected in samples from wells LF-1 and MW-2.

5.3 Conclusions

Based on the results of this investigation, O&G and other petroleum hydrocarbons were not detected in samples from well LF-1 located 50 feet downgradient from the former waste-oil tank pit. An evaluation of ground-water and soil quality in the immediate area of the tank excavation was not possible. Subsurface conditions precluded drilling and sampling in that area.

The metals and other chemicals detected in soil and ground water beneath the Site and adjacent property are consistent with materials reportedly handled on the property before 1973. Although soil and ground-water samples collected from [redacted], contain the highest concentrations of metals and the lowest pH measured at the Site, these conditions are more likely due to pre-1973 activities and not related to the operation of the former waste-oil tank. The distribution of elevated concentrations of metals in near-surface soil at the Site is consistent with the

manufacturing and handling of materials by occupants of the Site prior to White Motor Corporation, as indicated by records for the Site.

6.0 REFERENCES

Blymyer Engineers, Inc. 1990. Environmental site assessment, Charles Campanella, Oakland, California, for 750-50th Avenue, Oakland, California. June 21.

Brady, N.C. 1974. The Nature and Properties of Soils (8th edition). MacMillan Publishing Company, Inc. New York.

Freeze, R.A., and J.A. Cherry. 1979. Groundwater. Prentice-Hall, Inc. Englewood Cliffs, New Jersey.

Ware, Bob. 1991. White GMC, Oakland, California. Personal communication.

TABLE 1
WELL CONSTRUCTION DETAILS
WHITE GMC FACILITY
OAKLAND, CALIFORNIA

Well Number	Date Installed	Installed By	Boring Depth (ft bgs)	Screen Interval (ft bgs)	Sand Pack Interval (ft bgs)	Depth to First Water (in naturally occuring sediments) (ft bgs)
LF-1	10/31/91	LF	21	10-20	8-20	15
LF-2	10/29/91	LF	16	10-15	8-15	13
LF-3	10/30/91	LF	16	9.5-14.5	8.5-15	9.5
LF-4	10/29/91	LF	21	8-18	6-18	12
LF-5	10/29/91	LF	24	11.5-21.5	9.5-21.5	13.5
LF-6	10/28/91	LF	21	11-21	9-21	14
LF-7	10/28/91	LF	25	11-21	9-21.5	14.5
MW-1	09/05/90	ATT	28	8-28	6-28	16
MW-2	09/05/90	ATT	27	7-27	5-27	10.5
MW-3	09/05/90	ATT	27	7-27	5-27	10
MW-4	09/05/90	ATT	29	9-29	7-29	17

NOTES:

LF - Levine-Fricke
ATT - Aqua Terra Technologies
ft bgs - feet below ground surface

TABLE 2
TYPES OF CHEMICAL ANALYSES, SAMPLE CONTAINERS,
AND PRESERVATION METHODS USED FOR GROUND-WATER SAMPLING
NOVEMBER 4 AND 5, 1991
WHITE GMC FACILITY
OAKLAND, CALIFORNIA

Analysis	Title 22 Metals	TPH(gas)	TPH(diesel)	5520 Oil & Grease	8240 VOCs	8270 + PCB	General Minerals Add Sulfide
Type of container Type of preservative	1 liter None Filtered	2 40-ml VOAs HCl Unfiltered	2-liter amber HCl Unfiltered	2-liter amber H2SO4 Unfiltered	2 40-ml VOAs HCl Unfiltered	2-liter amber None Unfiltered	2 500-ml plastic 1 HNO3; 1 none Unfiltered
Well #							
LF-1	X	X	X	X	X		X
LF-2	X	X	X		X	X	X
LF-3	X	X	X		X		X
LF-4	X				X		X
LF-5	X				X	X	X
LF-6	X				X		X
LF-7	X				X		X
MW-1	X						X
MW-2	X	X					X
MW-3	X						X
MW-4	X						X
Bailer blank		X			X		
Trip blank		X			X		

* All samples were stored in a chilled cooler for transport to analytical laboratory.

Key to Abbreviations:

H2SO4 - sulfuric acid
HCl - hydrochloric acid
HNO3 - nitric acid
TPH - total petroleum hydrocarbons
VOA - volatile organic analysis

TABLE 3
GROUND-WATER ELEVATION DATA
WHITE GMC FACILITY
5050 COLISEUM WAY
OAKLAND, CALIFORNIA

Well ID	Date Measured	Time Measured	Top of PVC Casing Elevation (feet msl)	Top of Well Box Elevation (feet msl)	Depth to Water (feet msl)	Ground-Water Elevation (feet msl)
LF-1	07-Nov-91	9-10 a.m.	7.56	7.93	6.79	0.77
		11-12 a.m.	7.56	7.93	6.79	0.77
		12-1 p.m.	7.56	7.93	6.76	0.80
		2-3 p.m.	7.56	7.93	6.76	0.80
		3-4 p.m.	7.56	7.93	6.76	0.80
		4-5 p.m.	7.56	7.93	6.76	0.80
LF-2	07-Nov-91	9-10 a.m.	9.84	10.17	7.43	2.41
		11-12 a.m.	9.84	10.17	7.26	2.58
		12-1 p.m.	9.84	10.17	7.24	2.60
		2-3 p.m.	9.84	10.17	7.22	2.62
		3-4 p.m.	9.84	10.17	7.21	2.63
		4-5 p.m.	9.84	10.17	7.22	2.62
LF-3	07-Nov-91	9-10 a.m.	10.98	11.33	7.58	3.40
		11-12 a.m.	10.98	11.33	7.55	3.43
		12-1 p.m.	10.98	11.33	7.53	3.45
		2-3 p.m.	10.98	11.33	7.51	3.47
		3-4 p.m.	10.98	11.33	7.52	3.46
		4-5 p.m.	10.98	11.33	7.52	3.46
LF-4	07-Nov-91	9-10 a.m.	10.36	10.54	11.89	-1.53
		11-12 a.m.	10.36	10.54	11.63	-1.27
		12-1 p.m.	10.36	10.54	11.51	-1.15
		2-3 p.m.	10.36	10.54	11.37	-1.01
		3-4 p.m.	10.36	10.54	11.29	-0.93
		4-5 p.m.	10.36	10.54	11.20	-0.84
LF-5	07-Nov-91	9-10 a.m.	8.03	8.66	7.34	0.69
		11-12 a.m.	8.03	8.66	7.26	0.77
		12-1 p.m.	8.03	8.66	7.22	0.81
		2-3 p.m.	8.03	8.66	7.17	0.86
		3-4 p.m.	8.03	8.66	7.18	0.85
		4-5 p.m.	8.03	8.66	7.19	0.84
LF-6	07-Nov-91	9-10 a.m.	11.59	11.89	8.65	2.94
		11-12 a.m.	11.59	11.89	8.59	3.00
		12-1 p.m.	11.59	11.89	8.58	3.01
		2-3 p.m.	11.59	11.89	8.54	3.05
		3-4 p.m.	11.59	11.89	8.55	3.04

TABLE 3
GROUND-WATER ELEVATION DATA
WHITE GMC FACILITY
5050 COLISEUM WAY
OAKLAND, CALIFORNIA

Well ID	Date Measured	Time Measured	Top of PVC Casing Elevation (feet msl)	Top of Well Box Elevation (feet msl)	Depth to Water (feet msl)	Ground-Water Elevation (feet msl)
		4-5 p.m.	11.59	11.89	8.56	3.03
LF-7	07-Nov-91	9-10 a.m.	10.65	11.06	8.79	1.86
		11-12 a.m.	10.65	11.06	8.54	2.11
		12-1 p.m.	10.65	11.06	8.53	2.12
		2-3 p.m.	10.65	11.06	8.51	2.14
		3-4 p.m.	10.65	11.06	8.53	2.12
		4-5 p.m.	10.65	11.06	8.54	2.11
MW-1	07-Nov-91	9-10 a.m.	10.21	10.66	6.13	4.08
		11-12 a.m.	10.21	10.66	5.97	4.24
		12-1 p.m.	10.21	10.66	5.96	4.25
		2-3 p.m.	10.21	10.66	5.97	4.24
		3-4 p.m.	10.21	10.66	5.95	4.26
		4-5 p.m.	10.21	10.66	5.94	4.27
MW-2	07-Nov-91	9-10 a.m.	8.86	9.29	6.14	2.72
		11-12 a.m.	8.86	9.29	5.93	2.93
		12-1 p.m.	8.86	9.29	5.93	2.93
		2-3 p.m.	8.86	9.29	5.92	2.94
		3-4 p.m.	8.86	9.29	5.92	2.94
		4-5 p.m.	8.86	9.29	5.92	2.94
MW-3	07-Nov-91	9-10 a.m.	9.01	9.46	7.09	1.92
		11-12 a.m.	9.01	9.46	6.94	2.07
		12-1 p.m.	9.01	9.46	6.92	2.09
		2-3 p.m.	9.01	9.46	6.91	2.10
		3-4 p.m.	9.01	9.46	6.94	2.07
		4-5 p.m.	9.01	9.46	6.95	2.06
MW-4	07-Nov-91	9-10 a.m.	10.75	10.93	12.98	-2.23
		11-12 a.m.	10.75	10.93	10.26	0.49
		12-1 p.m.	10.75	10.93	8.37	2.38
		2-3 p.m.	10.75	10.93	8.72	2.03
		3-4 p.m.	10.75	10.93	8.60	2.15
		4-5 p.m.	10.75	10.93	8.54	2.21

TABLE 3
GROUND-WATER ELEVATION DATA
WHITE GMC FACILITY
5050 COLISEUM WAY
OAKLAND, CALIFORNIA

Well ID	Date Measured	Time Measured	Top of PVC Casing Elevation (feet msl)	Top of Well Box Elevation (feet msl)	Depth to Water (feet msl)	Ground-Water Elevation (feet msl)
Benchmark on Channel*	07-Nov-91	9-10 a.m.	NA	NA	5.98	NA
		9-10 a.m.	NA	NA	4.16	NA
		11-12 a.m.	NA	NA	3.60	NA
		12-1 p.m.	NA	NA	4.47	NA
		2-3 p.m.	NA	NA	6.57	NA
		3-4 p.m.	NA	NA	Dry @7.90	NA
		4-5 p.m.	NA	NA	Dry	NA

Notes:
All elevations are measured to the mean-sea-level (msl) datum.
The elevations shown were taken on the north side of each box and casing.
* Benchmark (BM) located on wall crossing over the channel.
BM #1094 USGS elevation 7.85 msl was used to calculate elevation.
NA = not applicable.

TABLE 4

CONCENTRATIONS OF PETROLEUM-RELATED COMPOUNDS

IN SOIL SAMPLES

WHITE GMC FACILITY

(All results in mg/kg)

Boring Id	Sample Date	TPH-Extractable (diesel)	Benzene	Toluene	Ethyl-benzene	Total-Xylenes	Oil & Grease	Hydro-Carbons
LF-1-2.5	10/31/91	NA	NA	NA	NA	NA	2200	1700
LF-1-5.5	10/31/91	<1	<0.001	<0.001	<0.001	<0.001	<10	<10
LF-1-7.5	10/31/91	NA	NA	NA	NA	NA	<10	<10
LF-1-10.5	10/31/91	<1	<0.001	<0.001	<0.001	<0.003	<10	<10

Notes:

BTEX analyzed using EPA Method 8020

Oil & Grease analyzed using Method 5520E

Hydrocarbons analyzed using Method 5520F

TPH Extractable analyzed using Method 3550

TPH = Total Petroleum Hydrocarbons

NA = Not Analyzed

TABLE 5

CONCENTRATIONS OF METALS IN SOIL SAMPLES

WHITE GMC FACILITY

(All results in mg/kg)

Boring ID - Sample Depth (ft.)	Sample Date	Arsenic	Barium	Cadmium	Total Chromium	Nickel	Lead	Zinc
LF-1-2.5	10/31/91	270	470	20	46	13	8600	4600
LF-1-7.5	10/31/91	11	560	110	65	130	120	31000
LF-1-21	10/31/91	2	89	38	53	65	13	16000
LF-2-2.5	10/29/91	54	3200	60	36	49	24000	6900
LF-2-5.5	10/29/91	29	76	<20	10	12	<200	300
LF-2-7.5	10/29/91	160	84	0.9	34	33	530	580
LF-2-15.5	10/29/91	5	30	0.6	46	66	6	460
LF-3-2.5	10/30/91	5	270	0.4	<6	8	20	97
LF-3-7	10/30/91	14	4200	<20	<6	<3	<200	<200
LF-3-15	10/30/91	3	230	<0.2	44	52	7	280
LF-4-2	10/29/91	<1	220	0.8	23	31	77	140
LF-4-3.5	10/29/91	34	60000	30	32	82	850	5100
LF-4-15	10/29/91	3	140	<0.2	49	96	11	49
LF-5-2	10/29/91	5	82	0.4	13	19	8	110
LF-5-3.5	10/29/91	97	1600	<20	33	50	1000	2700
LF-5-11	10/29/91	2	80	<0.2	38	59	4	27
LF-5-15	10/29/91	5	28	<0.2	48	98	6	34
LF-6-2	10/28/91	10	100	0.6	9	12	19	120
LF-6-9	10/28/91	200	200	11	31	24	360	1100
LF-6-15.5	10/28/91	5	51	0.3	67	82	6	380
LF-7-2	10/28/91	63	67000	<0.2	8	18	52	72
LF-7-4	10/28/91	12	92000	0.4	11	21	67	200
LF-7-10	10/28/91	4	140	<0.2	44	38	5	20
LF-7-15.5	10/28/91	4	150	0.2	48	97	7	57

Notes:

All metals except Arsenic analyzed using Method 6010. Arsenic analyzed using Method 7060.

< = below the laboratory method detection limit of the analysis.

TABLE 6

CONCENTRATIONS OF PETROLEUM-RELATED COMPOUNDS

IN GROUND-WATER SAMPLES

WHITE GMC FACILITY

(All results in mg/L)

Well ID	Sample Date	TPH- Purgeable	TPH- Extractable	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Oil & Grease	Hydro-Carbons
LF-1	11/04/91	<0.05	0.09 (90 ppb)	<0.005	<0.005	<0.005	<0.01	<0.5	<0.5
LF-2	11/04/91	<0.05	0.3 (300 ppb)	<0.005	<0.005	<0.005	<0.01	NA	NA
LF-3	11/04/91	<0.05	0.2 (200 ppb)	<0.005	<0.005	<0.005	<0.01	NA	NA
LF-4	11/04/91	0.59 (590 ppb)	0.1 (100 ppb)	<0.005	<0.005	<0.005	<0.01	NA	NA
LF-4BB	11/04/91	<0.05	NA	<0.005	<0.005	<0.005	<0.01	NA	NA
LF-5	11/04/91	NA	NA	<0.005	<0.005	<0.005	<0.01	NA	NA
LF-6	11/05/91	NA	NA	<0.005	<0.005	<0.005	<0.01	NA	NA
LF-7	11/04/91	NA	NA	<0.005	<0.005	<0.005	<0.01	NA	NA
MW-2	11/05/91	NA	<0.05	<0.0003	<0.0003	<0.0003	<0.001	NA	NA
TRIP BLANK	11/04/91	<0.05	NA	<0.005	<0.005	<0.005	<0.01	NA	NA

Notes:

BTEX analyzed using EPA Method 624, except Well MW-2 by EPA Method 8020

Oil & Grease analyzed using Method 5520C

Hydrocarbons analyzed using Method 5520F

LF-4BB is a Bailer Blank

TPH = Total Petroleum Hydrocarbons

NA = Not Analyzed

TABLE 7
CONCENTRATIONS OF METALS
IN GROUND-WATER SAMPLES
WHITE GMC FACILITY
(All results in mg/L)

Well ID	LF-1	LF-2	LF-3	LF-4	LF-5	LF-6	LF-7	MW-1	MW-2	MW-3	MW-4
Sample Date	11/04/91	11/04/91	11/04/91	11/04/91	11/04/91	11/05/91	11/05/91	11/05/91	11/05/91	11/05/91	11/05/91
Parameter											
Antimony	<0.2	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02
Arsenic	0.004	0.028	3.1	0.026	<0.002	0.008	0.004	0.073	2.1	<0.002	0.007
Barium	0.046	0.026	0.077	0.082	0.018	0.019	0.13	0.085	0.013	0.017	0.017
Beryllium	0.11	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.001	<0.001
Cadmium	130	0.009	<0.005	<0.005	0.049	0.079	<0.005	<0.005	7	0.57	<0.005
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	5.7	0.18	0.016	<0.005	0.03	0.58	<0.005	0.008	0.42	0.42	<0.005
Copper	1.9	0.008	<0.004	<0.004	<0.005	<0.005	0.006	<0.005	0.093	0.28	<0.005
Lead	0.5	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.2	0.005	<0.005
Mercury	<0.0003	<0.0003	<0.0003	<0.0003	0.0004	0.0009	0.0011	<0.0003	0.0055	0.0028	0.0027
Molybdenum	0.11	<0.01	0.16	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01
Nickel	20	0.52	0.012	0.013	0.23	2.1	0.01	0.032	1.2	1.2	0.012
Selenium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Silver	0.054	<0.002	<0.002	<0.002	0.004	0.011	<0.002	<0.002	0.008	0.005	<0.002
Thallium	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	<0.005	<0.005	0.006	0.01	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005
Zinc	40000	4.2	3.1	0.034	11	8.1	<0.005	2.7	4200	600	<0.005

Notes:

All Metals analyzed using Method 6010 except:
Arsenic analyzed using Method 7060
Mercury analyzed using Method 7470
Selenium analyzed using Method 7740

Lithopone = mixture of ZnS, $BaSO_4$, ZnO

TABLE 8
CONCENTRATIONS OF GENERAL MINERALS
IN GROUND WATER
WHITE GMC FACILITY

Parameter	Well ID / Sample Date	LF-1 11/04/91	LF-2 11/04/91	LF-3 11/04/91	LF-4 11/04/91	LF-5 11/04/91	LF-6 11/05/91	LF-7 11/05/91	MW-1 11/05/91	MW-2 11/05/91	MW-3 11/05/91	MW-4 11/05/91
Bicarbonate Alkalinity		<2	53	530	570	550	22	420	250	<2	<2	260
Calcium		240	270	88	49	200	200	49	60	170	280	150
Carbonate Alkalinity		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chloride		2300	460	250	690	1100	540	320	28	470	2100	200
Conductivity		49000	5100	4900	4200	11000	7300	2100	930	10000	8000	3100
Copper		1.9	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.09	0.28	<0.04
Hardness		4400	920	320	350	2000	2300	350	270	960	1500	1100
Hydroxide Alkalinity		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Iron		2900	40	55	<0.05	0.34	25	<0.05	<0.05	210	12	<0.05
Magnesium		860	62	24	55	360	430	56	29	130	190	180
Manganese		350	11	4.3	0.35	17	65	0.73	2	30	23	0.13
Sodium		2500	670	920	850	2800	990	360	45	310	740	290
Sulfate		91000	2100	1600	560	4800	4200	250	190	9500	1600	1300
Sulfide		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Dissolved Solids		33000	3700	3100	2600	9100	6900	1200	620	16000	5900	2400
Zinc		40000	4.2	3.1	0.034	11	8.1	<0.005	2.7	4200	600	<0.005
pH		4	5.6	6.4	7	6.7	5	7.3	6.8	4.4	5	6.7

Compare C J
How is this possible? Ba

Notes:

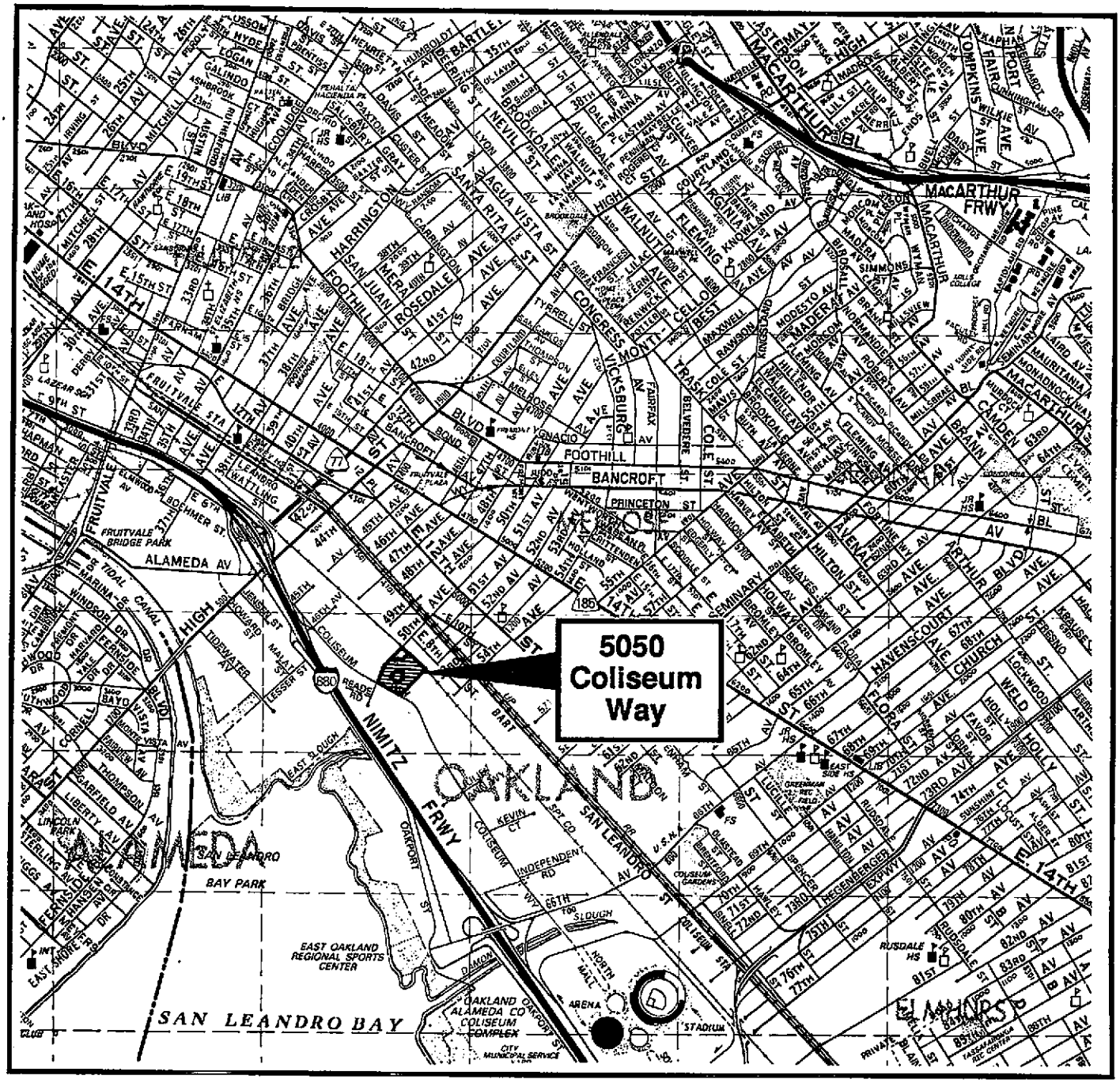
Conductivity reported in units of umhos/cm
pH reported in standard units
All other parameters reported in mg/L
Bicarbonate Alkalinity, Carbonate Alkalinity & Hydroxide Alkanity analyzed using Method 310.1
Calcium, Copper, Iron, Magnesium, Manganese, Sodium & Zinc analyzed using Method 6010
Chloride & Sulfate analyzed using Method 300
Sulfide Analyzed using EPA Method 367.2

91000 SO_4

LF-1 = Ba =

Ba # SO_4 = 137 MW / 96 MW = 1:43

1/07/92



SOURCE: Thomas Bros. map
Alameda and Contra Costa
1990

N

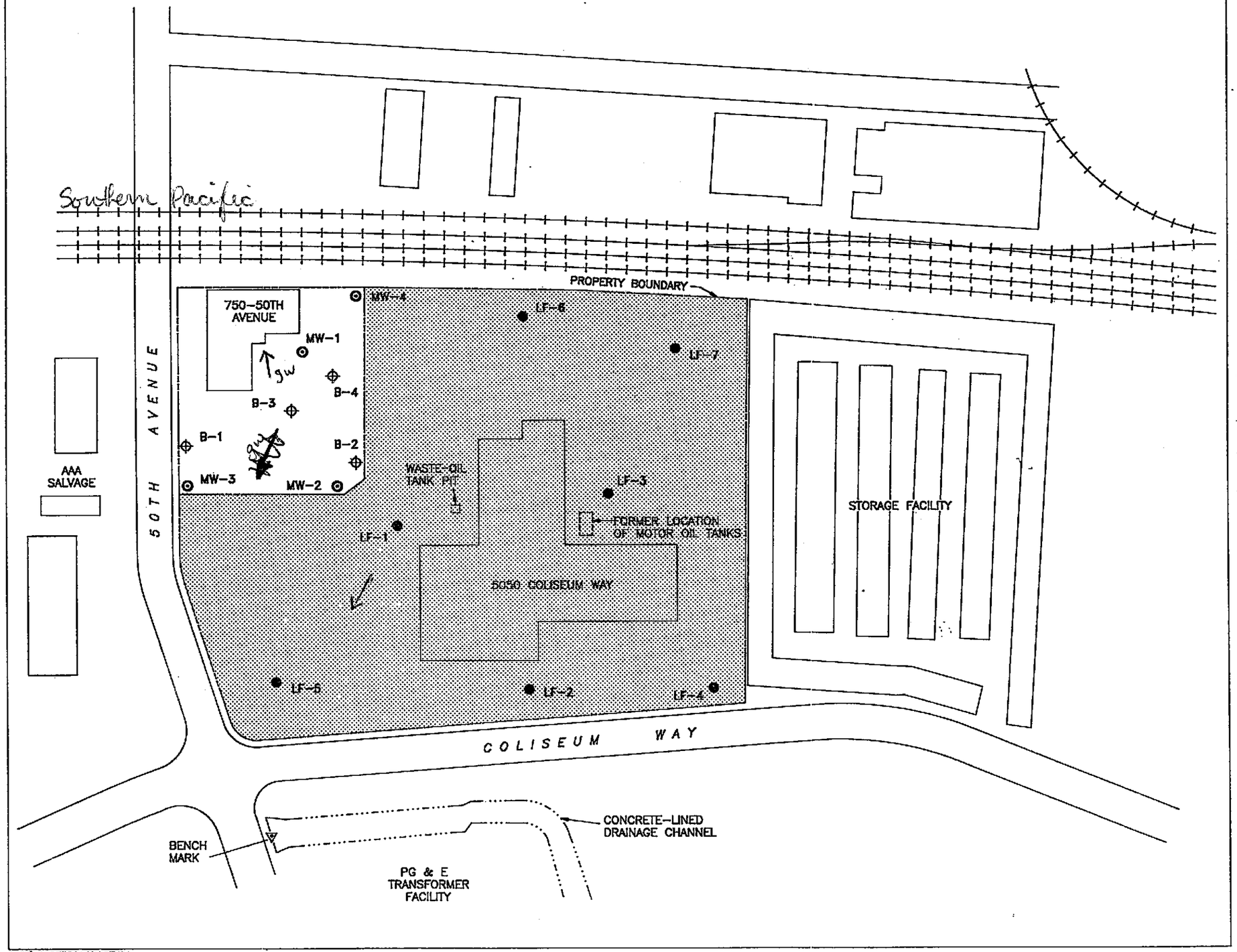
0 1/2 1 MILE

Figure 1 : SITE LOCATION MAP

Project No. 2407.02

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

KAI 09AUG91 jsm



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N

EXPLANATION

- ● Monitoring well installed by Levine•Fricke
- ⊙ Monitoring well installed by Aqua Terra Associates
- ⊕ Soil boring drilled by Aqua Terra Associates

0 50 100 FEET

Figure 2:

SITE VICINITY MAP WITH MONITORING WELL LOCATIONS AND FORMER TANK LOCATONS

Project No. 2407.06 **LEVINE•FRICKE**
ENGINEERS, HYDROGEOLOGISTS, & APPLIED SCIENTISTS

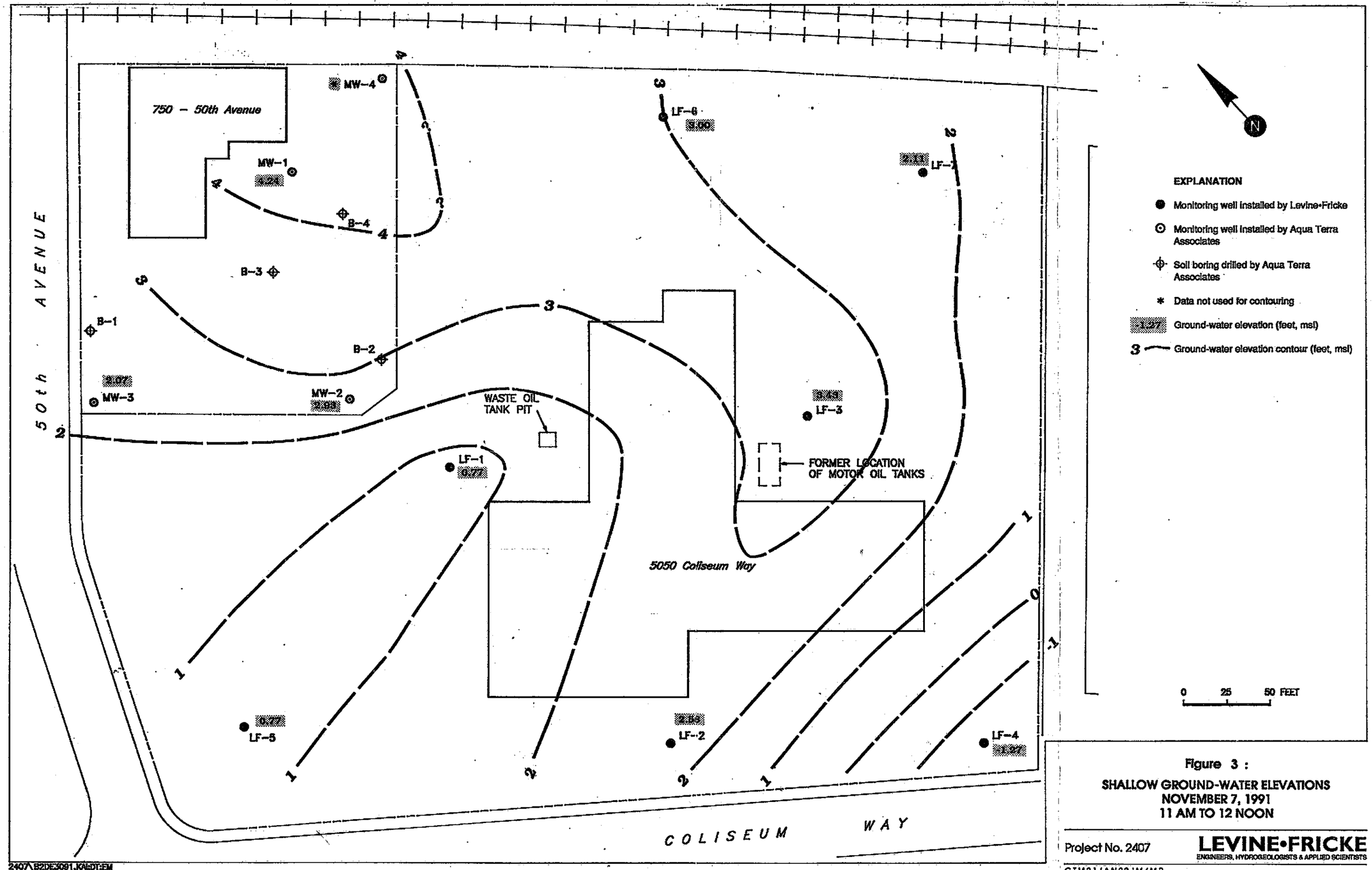

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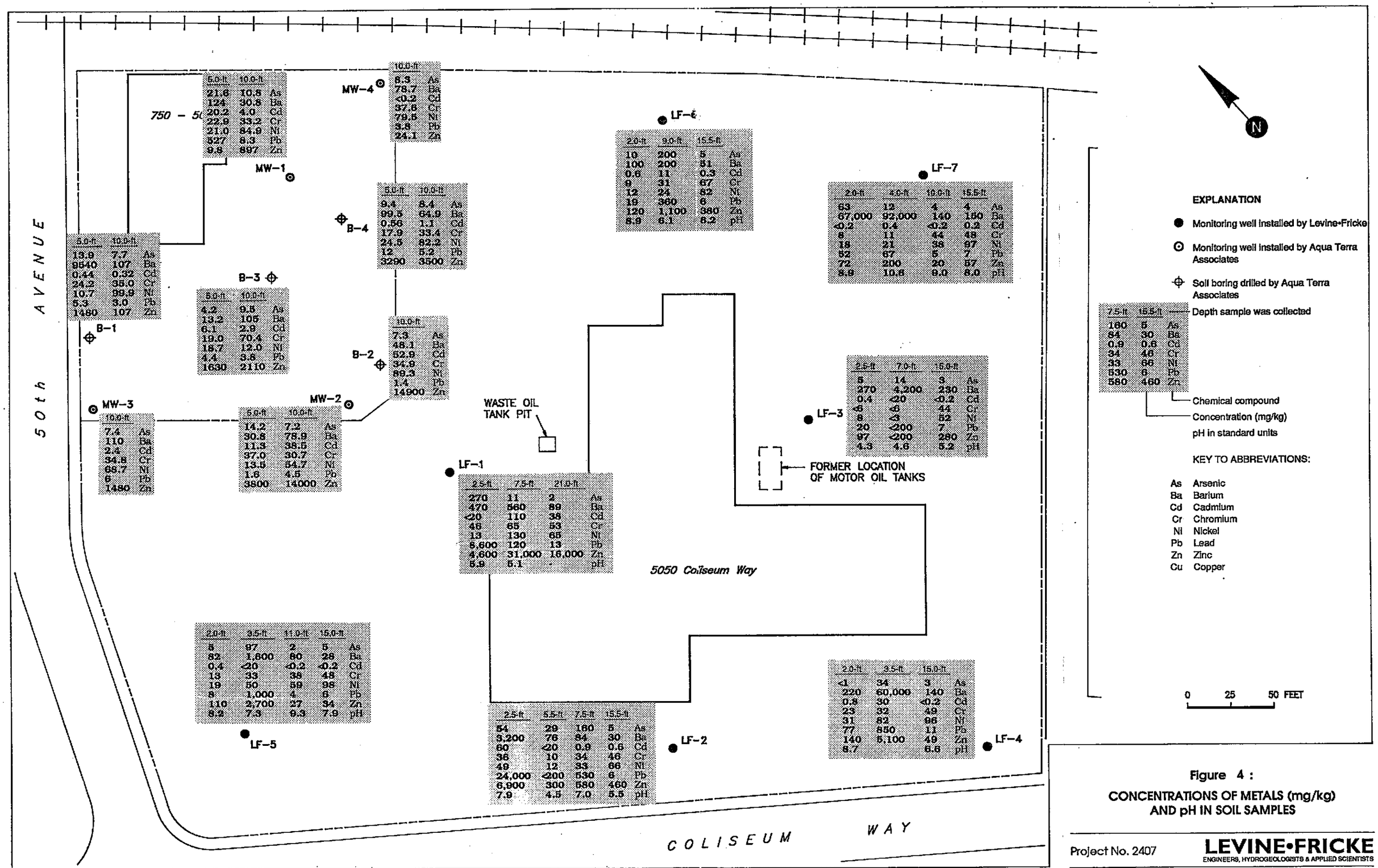
Figure 3 :

SHALLOW GROUND-WATER ELEVATIONS
NOVEMBER 7, 1991
11 AM TO 12 NOON

Project No. 2407

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

GTM21JAN92JM/MP



5.0-ft	10.0-ft	
21.6	10.8	As
124	30.8	Ba
20.2	4.0	Cd
22.9	33.2	Cr
21.0	84.9	Ni
527	8.3	Pb
9.8	897	Zn

10.0-ft	
6.3	As
78.7	Ba
<0.2	Cd
37.6	Cr
79.5	Ni
3.8	Pb
24.1	Zn

5.0-ft	10.0-ft	
13.9	7.7	As
9540	107	Ba
0.44	0.32	Cd
24.2	35.0	Cr
10.7	99.9	Ni
5.3	3.0	Pb
1480	107	Zn

5.0-ft	10.0-ft	
9.4	8.4	As
99.5	64.9	Ba
0.56	1.1	Cd
17.9	33.4	Cr
24.5	82.2	Ni
12	5.2	Pb
3290	3500	Zn

5.0-ft	10.0-ft	
4.2	9.5	As
13.2	105	Ba
6.1	2.9	Cd
19.0	70.4	Cr
18.7	12.0	Ni
4.4	3.8	Pb
1630	2110	Zn

10.0-ft	
7.3	As
46.1	Ba
52.9	Cd
34.9	Cr
89.3	Ni
1.4	Pb
14900	Zn

10.0-ft	
7.4	As
110	Ba
2.4	Cd
34.8	Cr
68.7	Ni
6	Pb
1480	Zn

5.0-ft	10.0-ft	
14.2	7.2	As
30.8	78.9	Ba
11.3	38.5	Cd
97.0	30.7	Cr
13.5	54.7	Ni
1.6	4.5	Pb
3800	14000	Zn

2.5-ft	7.5-ft	21.0-ft	
270	11	2	As
470	560	89	Ba
<20	110	38	Cd
45	65	53	Cr
13	130	65	Ni
8,600	120	13	Pb
4,600	31,000	16,000	Zn
5.9	5.1	-	pH

2.0-ft	9.0-ft	15.5-ft	
10	200	5	As
100	200	51	Ba
0.6	11	0.3	Cd
9	31	67	Cr
12	24	82	Ni
19	360	6	Pb
120	1,100	380	Zn
8.9	6.1	8.2	pH

2.0-ft	4.0-ft	10.0-ft	15.5-ft	
63	12	4	4	As
67,000	92,000	140	150	Ba
<0.2	0.4	<0.2	0.2	Cd
8	11	44	48	Cr
18	21	38	87	Ni
52	67	5	7	Pb
72	200	20	57	Zn
8.9	10.6	9.0	8.0	pH

2.5-ft	7.0-ft	15.0-ft	
5	14	3	As
270	4,200	230	Ba
0.4	<20	<0.2	Cd
<6	<6	44	Cr
8	<3	52	Ni
20	<200	7	Pb
97	<200	280	Zn
4.3	4.6	5.2	pH

2.0-ft	3.5-ft	11.0-ft	15.0-ft	
5	97	2	5	As
82	1,600	80	28	Ba
0.4	<20	<0.2	<0.2	Cd
13	33	35	48	Cr
19	50	59	98	Ni
8	1,000	4	6	Pb
110	2,700	27	34	Zn
8.2	7.3	9.3	7.9	pH

2.5-ft	5.5-ft	7.5-ft	15.5-ft	
54	29	160	5	As
5,200	76	84	30	Ba
60	<20	0.9	0.6	Cd
36	10	34	46	Cr
49	12	33	66	Ni
24,000	<200	530	6	Pb
6,900	300	580	460	Zn
7.9	4.5	7.0	5.5	pH

2.0-ft	3.5-ft	15.0-ft	
<1	34	3	As
220	60,000	140	Ba
0.8	30	<0.2	Cd
23	32	49	Cr
31	82	96	Ni
77	850	11	Pb
140	5,100	49	Zn
8.7		6.8	pH

7.5-ft	15.5-ft	
160	5	As
84	30	Ba
0.9	0.6	Cd
34	46	Cr
33	66	Ni
530	6	Pb
580	460	Zn

Figure 4 :

CONCENTRATIONS OF METALS (mg/kg) AND pH IN SOIL SAMPLES

Project No. 2407

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

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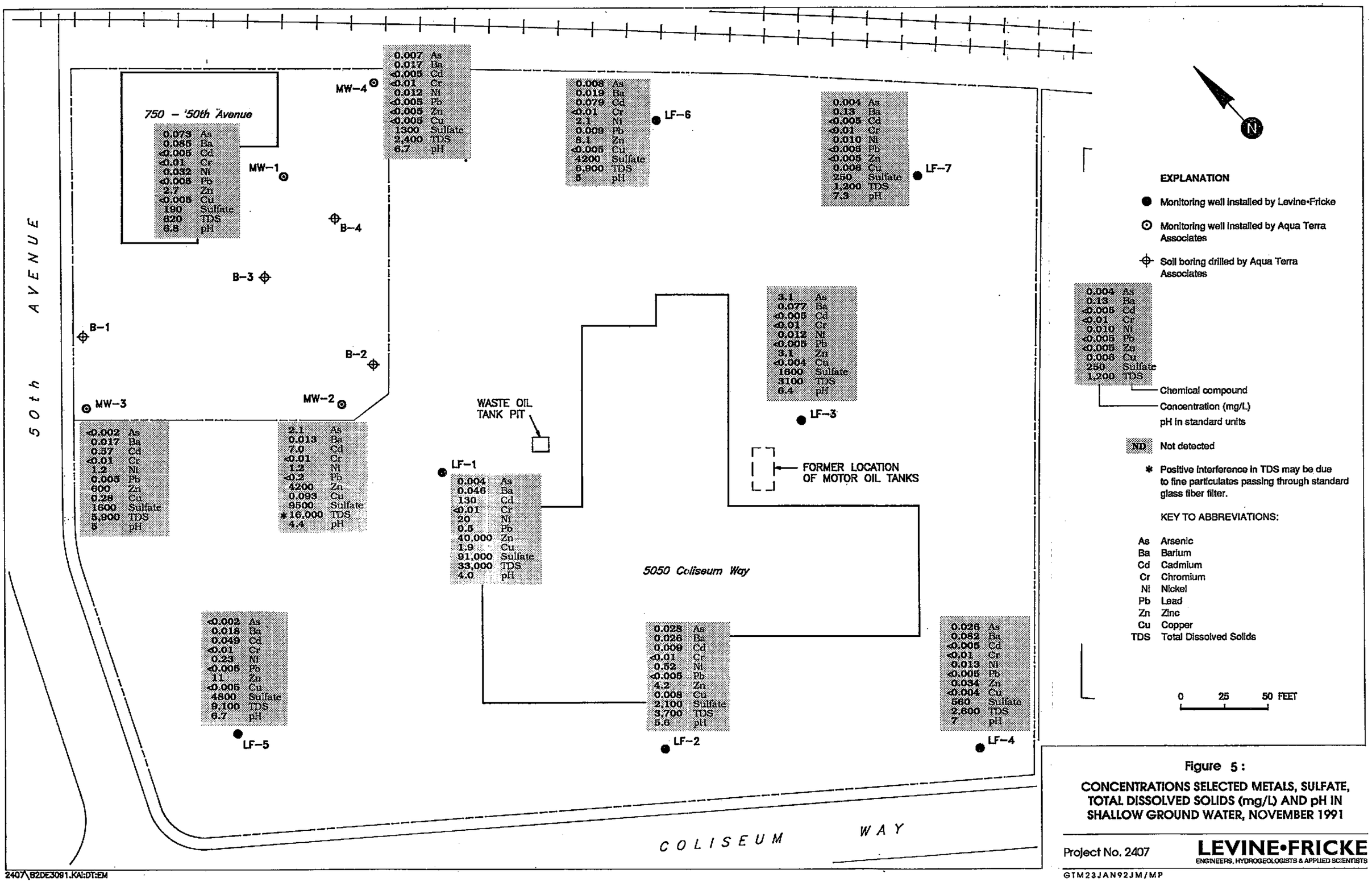

Figure 5 :

CONCENTRATIONS SELECTED METALS, SULFATE, TOTAL DISSOLVED SOLIDS (mg/L) AND pH IN SHALLOW GROUND WATER, NOVEMBER 1991

Project No. 2407

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

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APPENDIX A

SOIL SAMPLING AND WELL INSTALLATION, DEVELOPMENT, AND SAMPLING PROCEDURES

APPENDIX A

SOIL SAMPLING AND WELL INSTALLATION, DEVELOPMENT, AND SAMPLING PROCEDURES

A1.0 GROUND-WATER MONITORING WELL INSTALLATION PROCEDURES

During the week of October 28, 1991, under the direction of a Levine·Fricke geologist, Spectrum Exploration of Stockton, California, a licensed well drilling contractor, drilled seven well borings and installed seven ground-water monitoring wells, LF-1, LF-2, LF-3, LF-4, LF-5, LF-6 and LF-7, at the Site (Figure 2). Well borings were drilled using a truck-mounted drilling rig equipped with nominal 8-inch-outside-diameter hollow-stem augers to a depth of from about 15 to 25 feet bgs. All drilling and sampling equipment was steam cleaned before use at each drilling location. Soil cuttings from each borehole were placed in labeled 55-gallon steel drums and are being stored on site until an appropriate disposal method is determined based on analytical results.

A2.0 SOIL SAMPLE COLLECTION

Soil samples for lithologic description were collected with a 5-foot-long, 6-inch-diameter, continuous core sampling barrel situated in the lead auger. Soil samples were collected at discrete depths by driving a 2-inch-diameter, 18-inch-long, split-spoon sampler ahead of the augers into undisturbed soil. The sampler was lined with three clean, 2-inch-diameter, 6-inch-long acetate tubes. Additionally, grab samples were collected in clean 2-inch-diameter, 6-inch-long acetate tubes from the continuous core sampling barrel, and retained for possible chemical analysis. All soil samples were described using the Unified Soil Classification System. Lithologic logs for the seven well borings are presented in Appendix C.

Selected soil samples were collected for analysis from each well boring. The ends of the tubes were covered with polyethylene caps and placed in a ice-chilled cooler. The samples from LF-1, LF-2, LF-3, LF-4, LF-5, LF-6, and LF-7 were submitted for analysis under strict chain-of-custody procedures to Med-Tox of Pleasant Hill, California, a State-certified laboratory.

A3.0 GROUND-WATER MONITORING WELL INSTALLATION

Ground-water monitoring wells were installed in each of the seven well borings. The wells were constructed of 2-inch-diameter, flush-threaded well screen and well casing inserted through the hollow-stem auger. The wells were installed at total depths ranging from 14.5 to 21.5 feet bgs.

Well construction details are included on Table 1. A filter pack consisting of number 2-/16 graded sand was poured into the annular space between the hollow-stem auger and the slotted PVC well casing as the auger was gradually removed from the borehole. The filter pack was installed to approximately 1 to 2 feet above the top of the well screen. A 1-foot-thick layer of bentonite was placed on top of the filter pack and the remainder of the annular space was sealed with neat cement grout containing approximately 3 percent bentonite. At the ground surface, a 10-inch-long, 12-inch-diameter, road-rated, cylindrical well box was installed flush to grade to maintain the integrity of the well. Alameda County Flood Control and Water Conservation District (ACFCWCD) was contacted to observe grouting. Wyman Hong of ACFCWCD stated that the borings should be grouted whether or not an ACFCWCD representative was present. Well construction details are presented in the lithologic logs in Appendix C.

Elevation of the top of the PVC casing and top of the well box for each well was surveyed relative to a known reference point to the nearest 0.01 foot by Stedman & Associates, Inc., of Walnut Creek, California, a licensed surveyor.

A4.0 DEVELOPMENT AND SAMPLING OF WELLS

On November 4 and 5, 1991, wells LF-1 through LF-7 were developed to improve hydraulic communication between the well and adjacent water-bearing sediments.

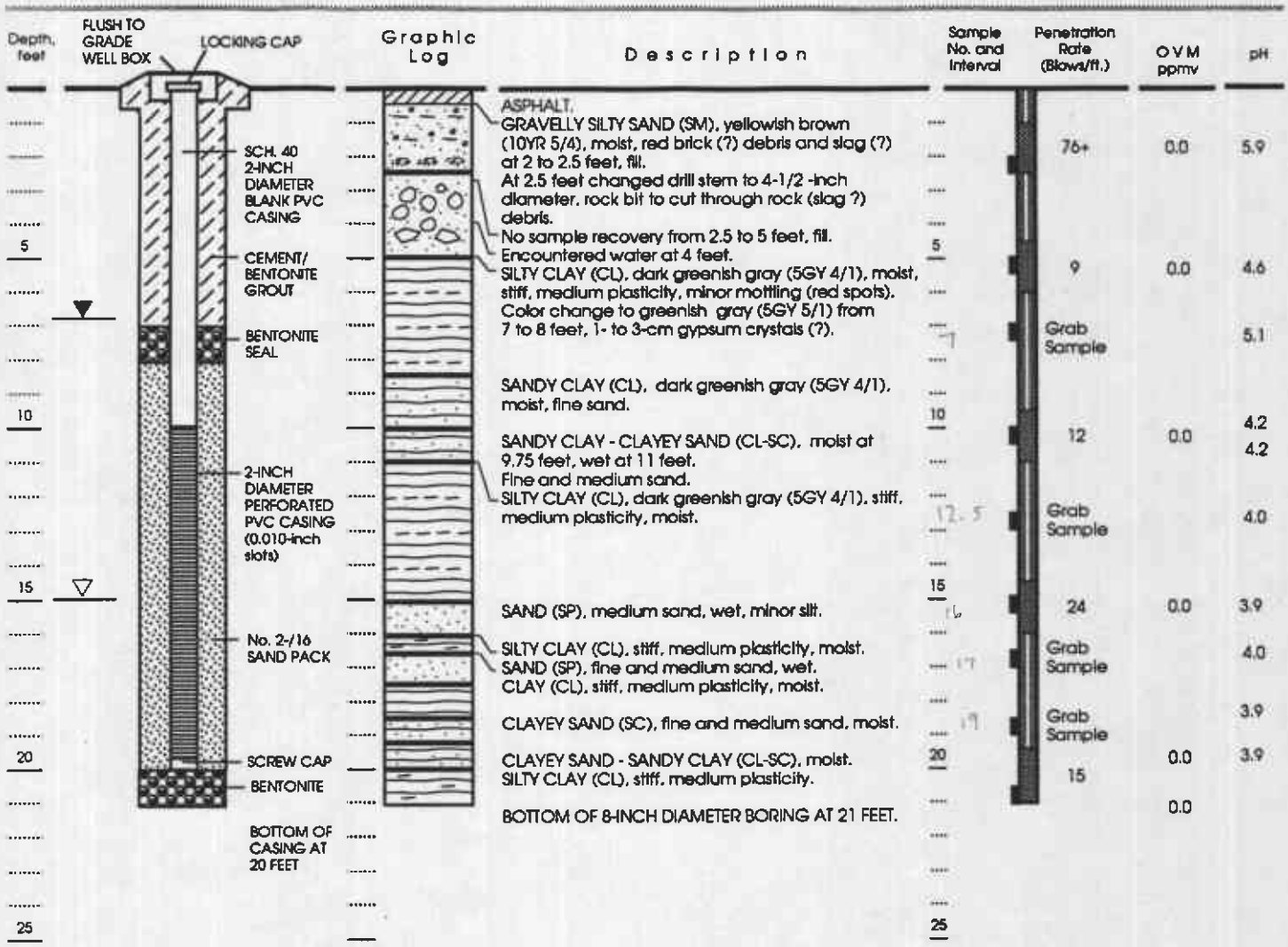
The wells were developed by purging approximately 6 well volumes from each well with a clean Teflon bailer. Well LF-5 was developed by purging 5 well volumes using a centrifugal pump. Specific conductance, pH, and temperature for ground water purged from each well were recorded on water-quality sampling sheets during the purging process. Copies of these sheets are included in Appendix D. Ground-water samples were collected for analysis from the well after parameters

stabilized. Ground-water samples were also collected from previously existing wells MW-1 through MW-4 after approximately 3 well volumes were purged from each well.

Ground-water samples from each well were placed in the appropriate laboratory supplied containers for the specified analyses (Table 2). Ground-water samples for metals analysis were filtered in the field and collected in preserved 1-liter plastic bottles. Immediately after collection, samples were labeled and placed in an ice-chilled cooler. Ground-water samples from LF-1 through LF-7 and MW-1 through MW-4 were delivered under strict chain-of-custody protocol to Med-Tox for analysis. Purge water generated during well development and sample collection has been placed into labeled 55-gallon drums and stored on site until an appropriate disposal method based on analytical results is determined.

APPENDIX B

BORING LOGS



EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Well Permit No.: 91620
Date well drilled: October 31, 1991
Hammer weight and drop: 140 lbs./30 inches
Date Water Level measured:
LF Geologist: Greg Murray

OVM Organic Vapor Meter

ppmv parts per million volume

- Continuous Core Sampler
- Modified California Sampler
- Sample retained for chemical analysis
- First water encountered during drilling in naturally occurring sediments
- Static water on Nov. 7, 11-12 noon

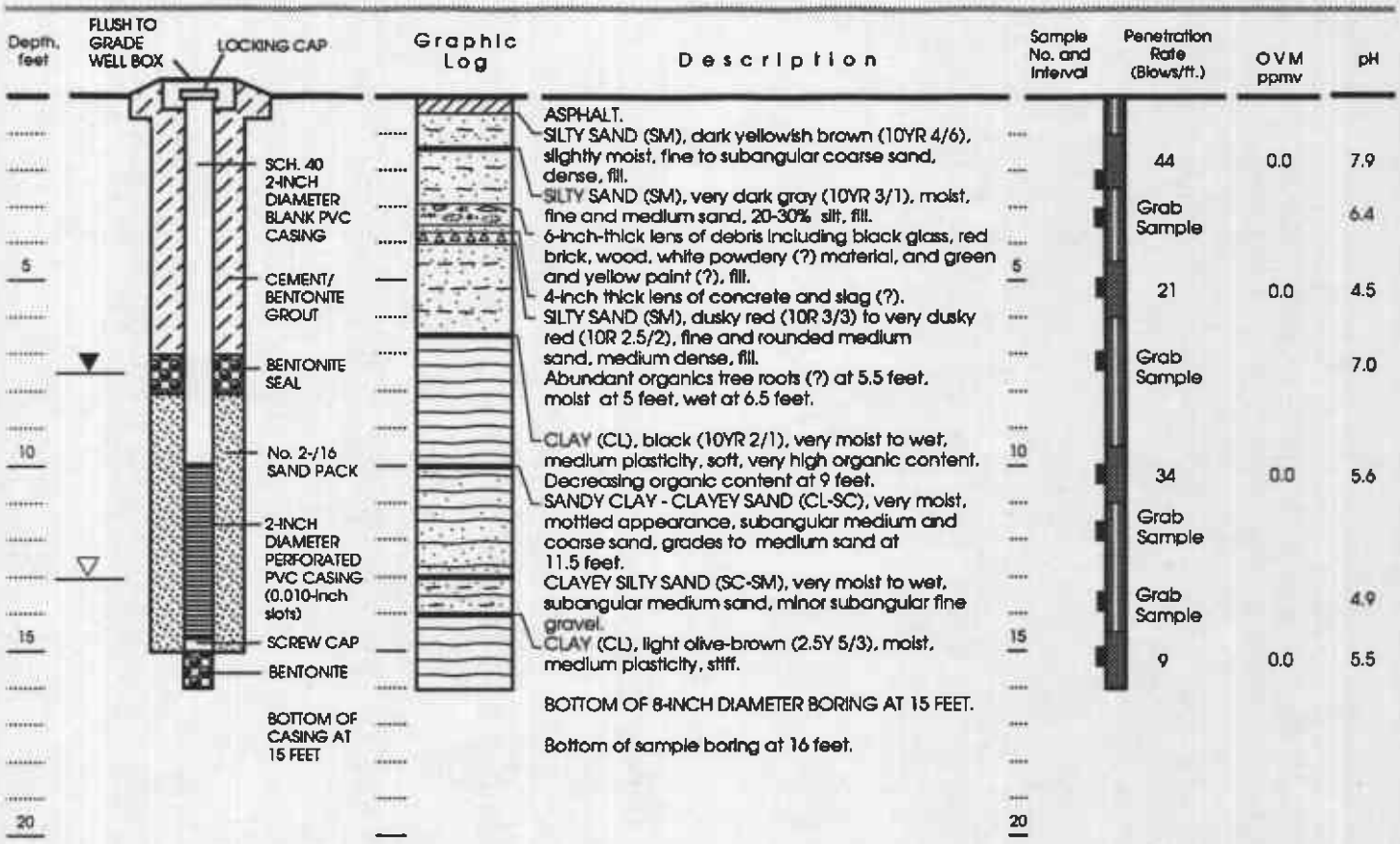
Approved by: Richard Fricke R.G. # 5106

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-1

Project No. 2407.05

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

23JAN92djc/mp



EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Well Permit No.: 91620
Date well drilled: October 29, 1991
Hammer weight and drop: 140 lbs./30 inches
Date Water Level measured:
LF Geologist: Greg Murray

OVM Organic Vapor Meter
ppmv parts per million volume

- Continuous Core Sampler
- Modified California Sampler
- Sample retained for chemical analysis
- First water encountered during drilling in naturally occurring sediments
- Static water on Nov. 7, 11-12 noon

Approved by: Kathleen Baum R.G. # 5106

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-2

Project No. 2407.05

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

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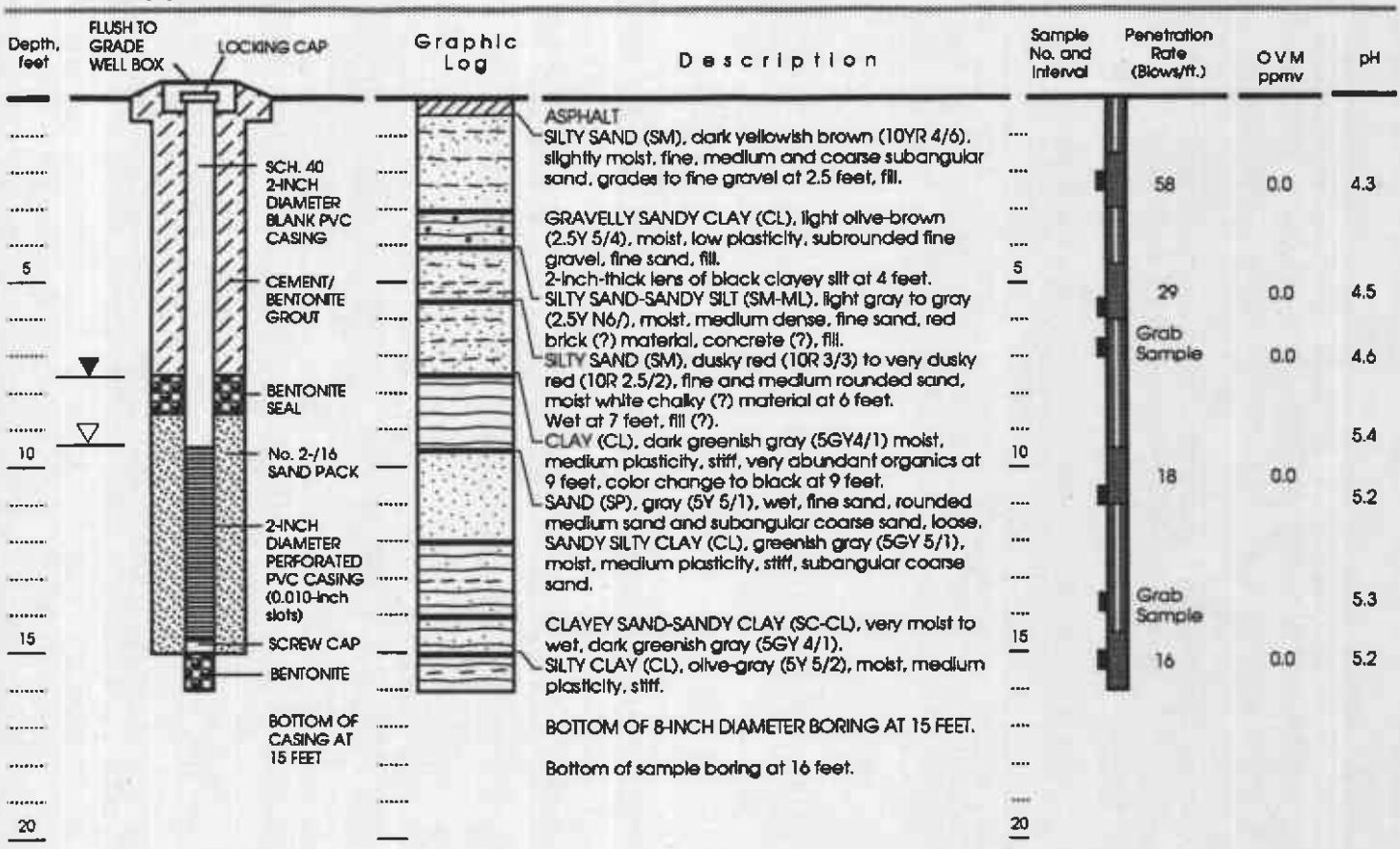

EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Well Permit No.: 91620
Date well drilled: October 30, 1991
Hammer weight and drop: 140 lbs./30 inches
Date Water Level measured:
LF Geologist: Greg Murray

OVM Organic Vapor Meter
ppmv parts per million volume

- Continuous Core Sampler
- Modified California Sampler
- Sample retained for chemical analysis
- First water encountered during drilling in naturally occurring sediments
- Static water on Nov. 7, 11-12 noon

Approved by: Kathleen Dawson #5106

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-3

Project No. 2407.05

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

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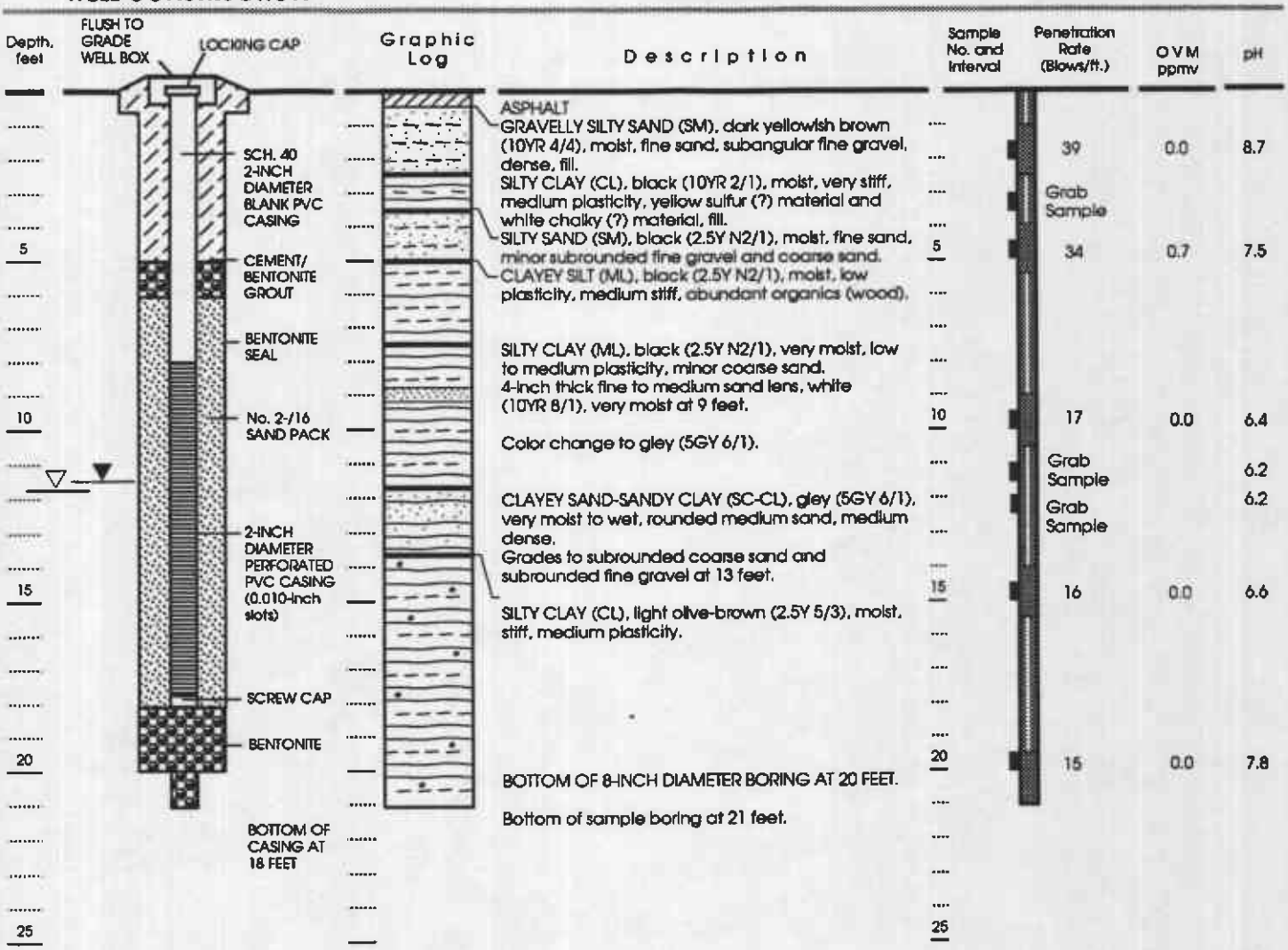

EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Well Permit No.: 91620
Date well drilled: October 29, 1991
Hammer weight and drop: 140 lbs./30 inches
Date Water Level measured:
LF Geologist: Greg Murray

OVM Organic Vapor Meter

ppmv parts per million volume

- Continuous Core Sampler
- Modified California Sampler
- Sample retained for chemical analysis
- First water encountered during drilling in naturally occurring sediments
- Static water on Nov. 7, 11-12 noon

Approved by: Kathleen A. Brown R.G. # 5106

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-4

Project No. 2407.05

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

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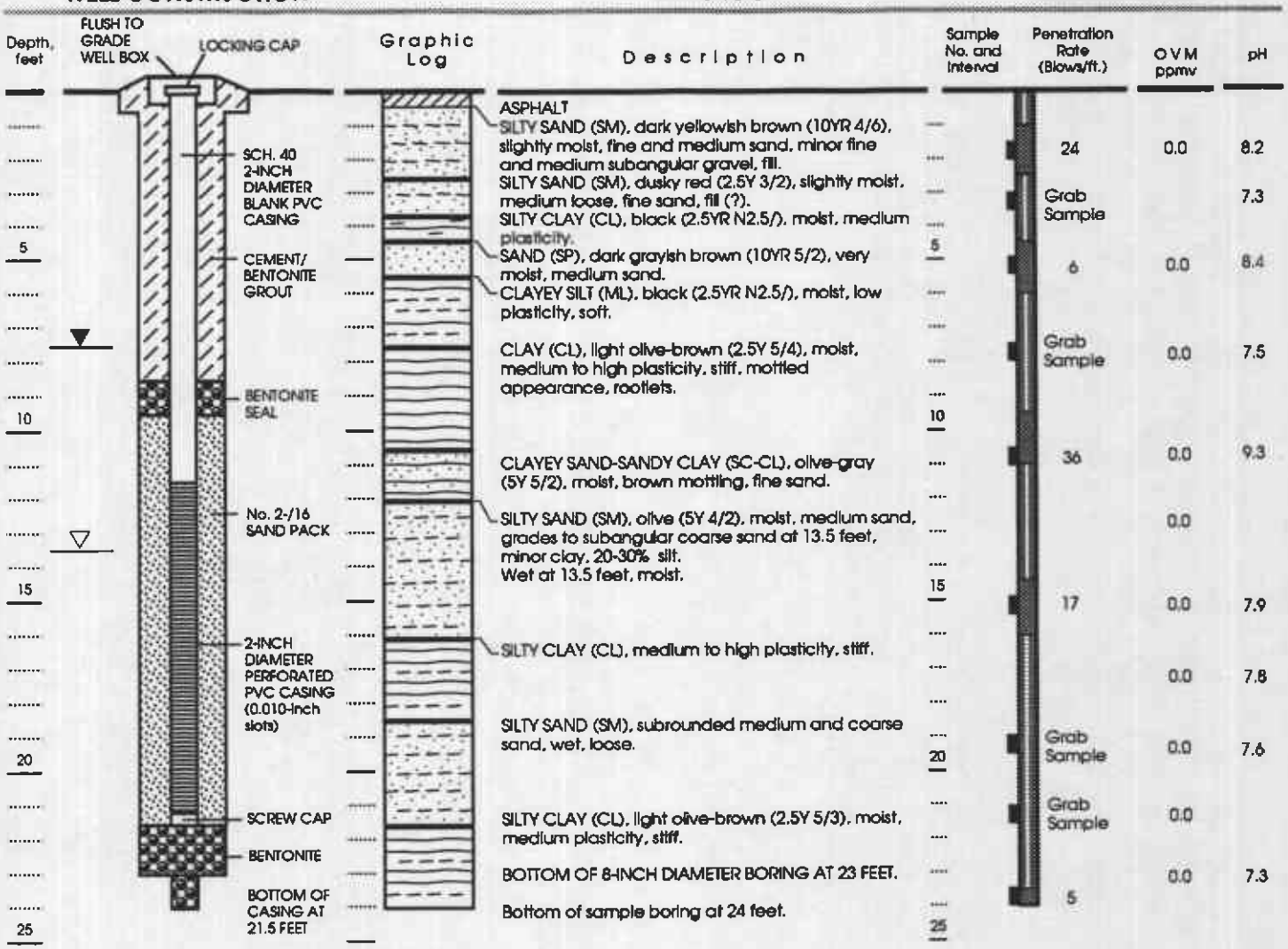


EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Well Permit No.: 91620
Date well drilled: October 29, 1991
Hammer weight and drop: 140 lbs./30 inches
Date Water Level measured:
LF Geologist: Greg Murray

OVM Organic Vapor Meter
ppmv parts per million volume

- Continuous Core Sampler
- Modified California Sampler
- Sample retained for chemical analysis
- First water encountered during drilling in naturally occurring sediments
- Static water on Nov. 7, 11-12 noon

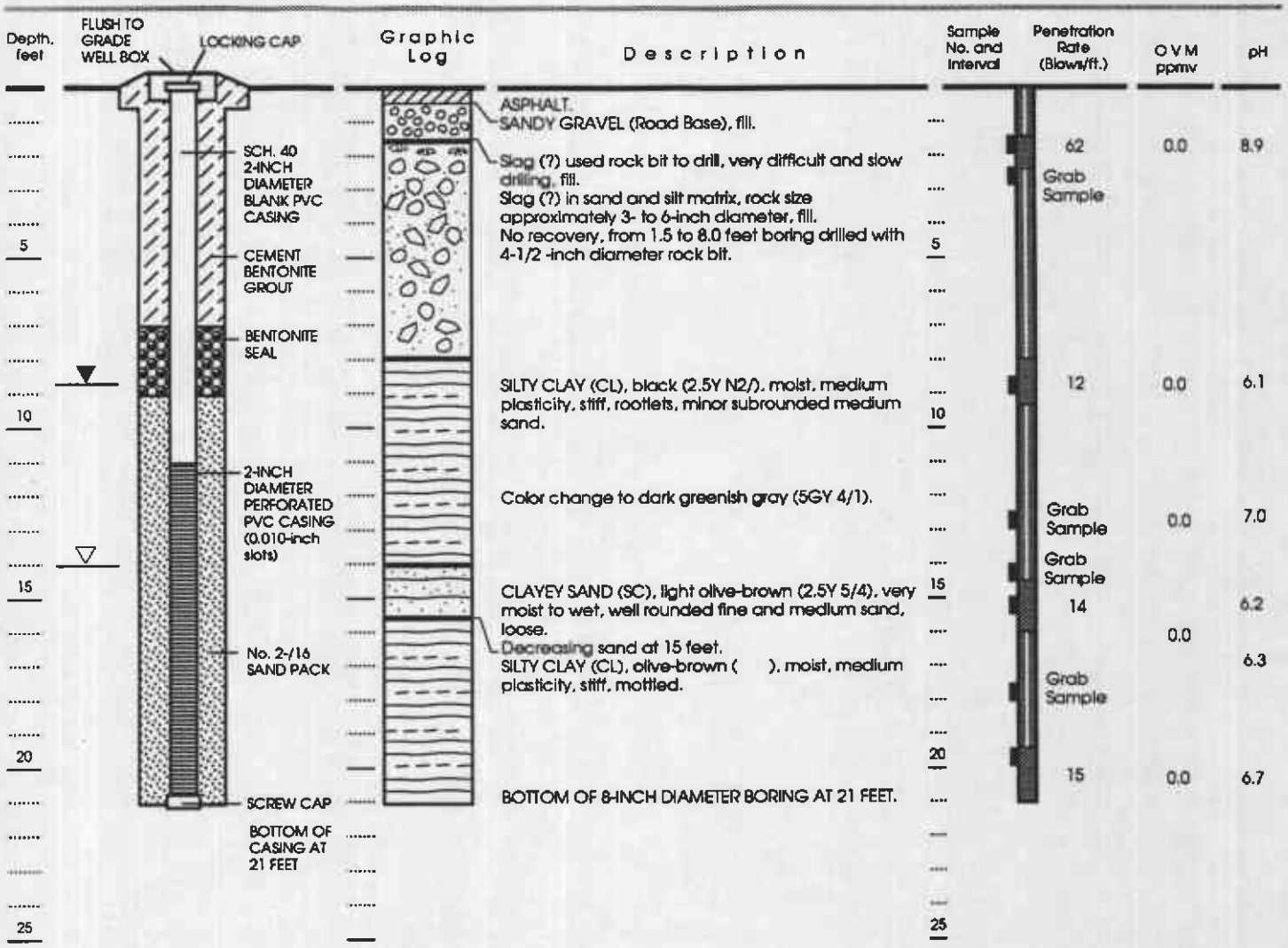
Approved by: Kathleen A. Brown R.G. # 5106

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-5

Project No. 2407.05

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

19JUNE92djc/mp/ryl



EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Well Permit No.: 91620
Date well drilled: October 28, 1991
Hammer weight and drop: 140 lbs./30 inches
Date Water Level measured:
LF Geologist: Greg Murray

OVM Organic Vapor Meter
ppmv parts per million volume

- Continuous Core Sampler
- Modified California Sampler
- Sample retained for chemical analysis
- First water encountered during drilling in naturally occurring sediments
- Static water on Nov. 7, 11-12 noon

Approved by: Kathleen A. Baan R.G # 5106

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-6

Project No. 2407.05

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

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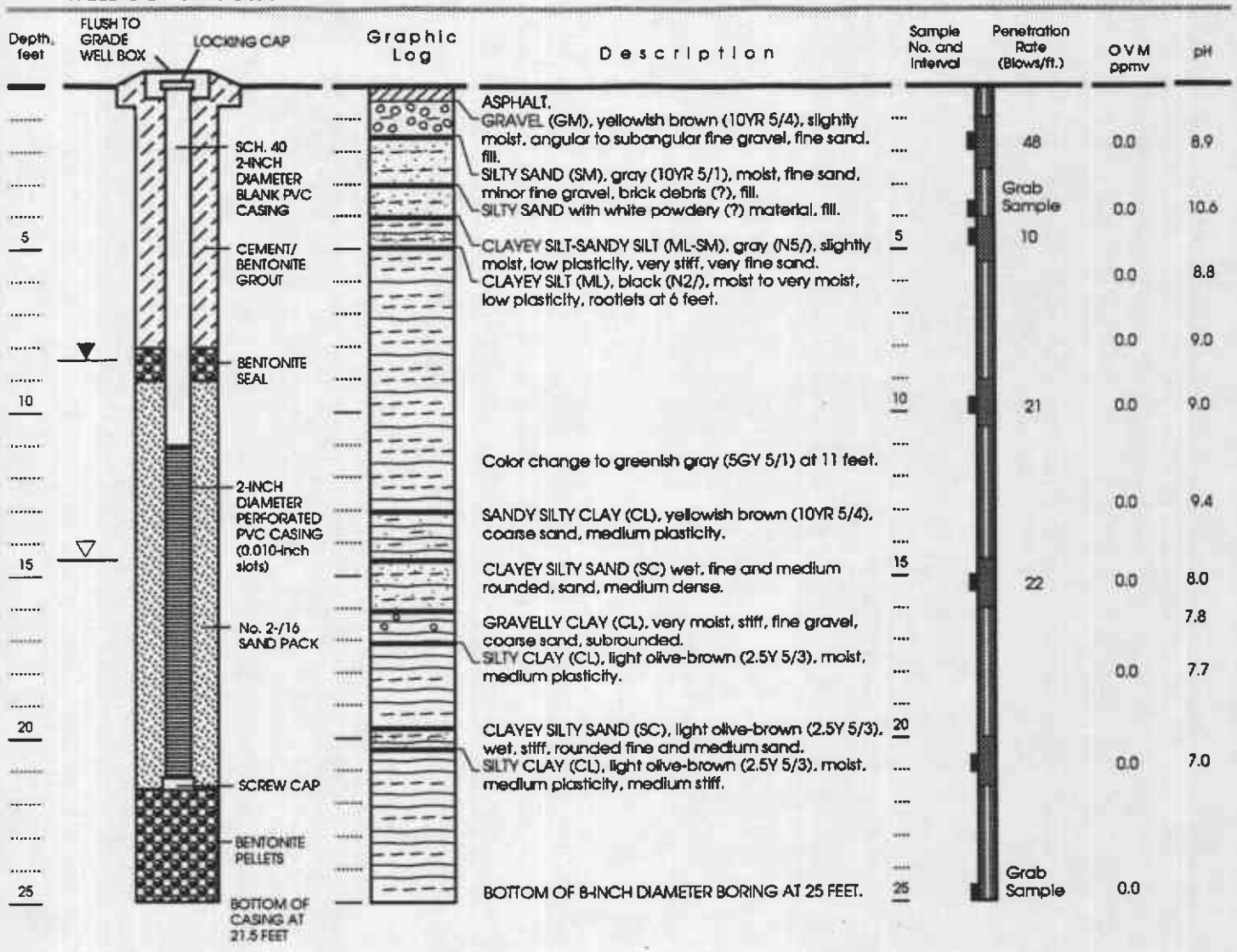


EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Well Permit No.: 91620
Date well drilled: October 28, 1991
Hammer weight and drop: 140 lbs./30 inches
Date Water Level measured:
LF Geologist: Greg Murray

OVM Organic Vapor Meter

ppmv parts per million volume

- Continuous Core Sampler
- Modified California Sampler
- Sample retained for chemical analysis
- First water encountered during drilling in naturally occurring sediments
- Static water on Nov. 7, 11-12 noon

Approved by: Kathleen Dam RG# 5106

WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-7

Project No. 2407.05

LEVINE•FRICKE
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

23JAN92djc/mp

APPENDIX C

WATER-QUALITY SAMPLING SHEETS

file 2407.05

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name Valero GM

Project No. 2407.05

Date 11/4/91

Sample No. LF-1

Samplers Name GM THB

Sampling Location

Sampling Method Teflon Bailer

Analyses Requested

Number and Types of Sample Bottles used

Method of Shipment

GROUND WATER

Well No. LF-1

Well Diameter (in.) 2"

Depth to Water, Static (ft) 6.82

Water in Well Box NO

Well Depth (ft) 20.00

Height of Water Column in Well 13.18

Water Volume in Well 2.0

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

~~20.00~~
6.82
13.18

13
.16
78
130
2.08

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
1405								Start Bailing
1407		2	22.5	4.25	5150			Turbid
1409		4	22.4	4.19	5190			"
1415		6	22.2	4.05	5170			"
1419		8	21.5	4.15	5230			turbid well steady dewatering
1423		10	21.6	4.18	4626			turbid
1430	18.56							
1520								Sampled

Suggested Method for Purging Well Hand bail

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM

Project No. 2407.05

Date 11/4/91

Sample No. LF-2

Samplers Name GTM TH/B

Sampling Location

Sampling Method teflon bailer

Analyses Requested

Number and Types of Sample Bottles used

Method of Shipment

GROUND WATER

Well No. LF-2

Well Diameter (in.) 2"

Depth to Water, Static (ft) 7.28

Water in Well Box No

Well Depth (ft) 14.75

Height of Water Column in Well

Water Volume in Well 1 GAL

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

14.75
7.28
7.47

2 4
7.47
.16
4482
2470
11952

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WTHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
13:00								start bailing
13:04		1 gal	22.8	5.94	6300			very turbid
13:07		3 gal	22.6	6.03	6450			" "
13:09		4	22.5	5.83	6470			" "
13:10		5	22.4	5.73	6200			" "
13:14	13.34	6	22.4	5.70	5990			" "
1330	1355							
								Sampled

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM

Project No. 2407

Date 11/4/91

Sample No. LF-3

Samplers Name GM

Sampling Location LF 3

Sampling Method Hand Bail

Analyses Requested

Number and Types of Sample Bottles used

Method of Shipment

15.0
-7.65
7.35
x 0.16
.441
.735
1.176

LOCATION MAP

GROUND WATER

Well No. LF-3

Well Diameter (in.) 2

Depth to Water, Static (ft) 7.65

Water in Well Box

Well Depth (ft) 15.0

Height of Water Column in Well

Water Volume in Well ~1.2

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
11:20								Start bailing
11:22		1.2	23.3	6.25	5350			very turbid
11:23		2.4	233	6.42	4960			" "
11:25		4.0	233	6.25	5140			"
11:27		5.0	23.2	6.26	5130			"
11:30		8.0	23.2	6.25	5250			"
11:34		10.0	23.3	6.29	5170			" stop bailing
11:36	9.54							
12:30								Sampled

Suggested Method for Purging Well try centrifugal

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name: Volvo GM
Project No.: 2407
Date: 11/4/91
Sample No.: LF-4
Samplers Name: GTM THB
Sampling Location: LF-4
Sampling Method: Hand Bail
Analyses Requested:
Number and Types of Sample Bottles used:
Method of Shipment:

GROUND WATER

Well No.: LF-4
Well Diameter (in.): 2"
Depth to Water, Static (ft): 9.09
Water in Well Box:
Well Depth (ft): 18.25
Height of Water Column in Well: 9.16
Water Volume in Well: 1.5 Gallons

SURFACE WATER

Stream Width:
Stream Depth:
Stream Velocity:
Rained recently ?:
Other:

2-inch casing = 0.16 gal/ft
4-inch casing = 0.65 gal/ft
5-inch casing = 1.02 gal/ft
6-inch casing = 1.47 gal/ft

18.25
9.09
9.16

3
9.16
.16
5496
9160
1.4656

18.25
17.13
1.12

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
10:15	9.09	EPA 624, TPH (gas)						bailer blank collected
[illegible]								[illegible]
[illegible]		[illegible]	20.7	6.52	5230			clear
10:[illegible]		[illegible]	[illegible]1.0	[illegible]	5150			"
10:[illegible]	[illegible]	5.0	20.3	6.76	5910			"
10:21		6.0						well dewatered
10:32	17.13							[illegible]
10:40								Sampled

Suggested Method for Purging Well:

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo/GMC

Project No. 2407.5

Date 11/4/91

Sample No. LF-5

Samplers Name TH B

Sampling Location

Sampling Method centrif pump; teflon bailer

Analyses Requested

Number and Types of Sample Bottles used

Method of Shipment

21.1
8.30
12.8
× 0.16
.768
1.28
2.048

GROUND WATER

Well No. LF-5

Well Diameter (in.) 2"

Depth to Water, Static (ft) 8.30

Water in Well Box

Well Depth (ft) 21.1

Height of Water Column in Well

Water Volume in Well 2 gal

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
15:11								start + pump
15:12		2.0	22.3	6.22	21,400			v. turbid
15:14		4.0	22.3	5.70	19,400			" "
15:16		6.	22.9	5.74	21,000			" " , pump off, dewatered
15:20		8.0	23.9	5.62	22,200			" " , pump off, dewatered
15:22					*			Pump on
15:23		10:0	24.1	5.77	21,000			pump off, well dewatered
15:29	14.55							
15:45								Sampled

Suggested Method for Purging Well hand bail

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM

Project No. 2467

Date 11/5/91

Sample No. LF-6

Samplers Name GTM

Sampling Location

Sampling Method Teflon bailer

Analyses Requested

Number and Types of Sample Bottles used

Method of Shipment

GROUND WATER

Well No. LF-6

Well Diameter (in.) 2"

Depth to Water, Static (ft) 8.69

Water in Well Box NO

Well Depth (ft) 20.00

Height of Water Column in Well 11.31

Water Volume in Well [illegible] gallons

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

20.00
8.69
11.3

11.31
.16
[illegible]

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
7:00								Start Bailing
9:01		2.0	19.9	5.94	790			slightly turbid
9:04		4.0	20.0	5.89	810			turbid
9:09		6.0	20.1	5.61	770			"
9:13		8.0	20.1	5.51	760			"
9:16		10.0	20.1	5.[illegible]	710			"
9:19		12.[illegible]	20.1	5.32	730			"
9:21	13.30							
10:00								Sampled

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name: Valve GM

Project No. 2407.05

Date: 11/5/91

Sample No. LF-7

Samplers Name: GTM

Sampling Location:

Sampling Method: teflon bailer

Analyses Requested:

Number and Types of Sample Bottles used:

Method of Shipment: Courier

21.50
8.50
13.00

13
.16
78
130
208

LOCATION MAP

GROUND WATER

Well No. LF-7

Well Diameter (in.) 2"

Depth to Water, Static (ft) 8.50

Water in Well Box: No

Well Depth (ft) 21.50

Height of Water Column in Well: 13

Water Volume in Well: 2 Gallons

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
1006								START bailing
1013		2.0	22.1	7.51	330			Turbid
1016		5.0	21.9	7.26	270			"
1024		10.0	21.4	7.30	290			"
1029		12.0	21.4	8.67	270			"
1034		14.0	21.2	6.84	260			"
1036	>18.5							
11:00								Sampled

Suggested Method for Purging Well: bailer

345EPT316

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM

Project No. 2407

Date 11/5/91

Sample No. MW-1

Samplers Name GTM

Sampling Location

Sampling Method Teflon bailer

Analyses Requested

Number and Types of Sample Bottles used

Method of Shipment

2.8
6
22

LOCATION MAP

GROUND WATER

Well No. MW-1

Well Diameter (in.) 2"

Depth to Water, Static (ft) 6.29

Water in Well Box Nope

Well Depth (ft) 28.5

Height of Water Column in Well

Water Volume in Well 3.3

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
1445								Start Bailing
1448		3.5	21.3	7.00	773			Turbid
1452		7.0	20.7	6.99	821			turbid
1459		10.5	20.2	6.96	—			"
1515								Sampled
*	conductivity		meter	died				

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name Velva GM

Project No. 2407

Date 11/5/91

Sample No. MW-2

Samplers Name GM

Sampling Location

Sampling Method hand bail

Analyses Requested

Number and Types of Sample Bottles used

Method of Shipment

27
6

21
.16

126
21 0

3.36

LOCATION MAP

GROUND WATER

Well No. MW-2

Well Diameter (in.) 2"

Depth to Water, Static (ft) 5.85

Water in Well Box yes

Well Depth (ft) 27.00

Height of Water Column in Well

Water Volume in Well 3.3

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
1318								start bailing
1321		3.3	23.7	3.90	1020			Turbid
1325		6.6	21.9	3.69	1020			"
1329		9.9	21.6	3.68	1030			"
1400								sampled

Suggested Method for Purging Well hand bail

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name Valley Grn

Project No. 2407.05

Date 11/5/91

Sample No. MW-3

Samplers Name GTM

Sampling Location

Sampling Method hand bail

Analyses Requested

Number and Types of Sample Bottles used

Method of Shipment Courier

20
.16
120
21 0
2.30

LOCATION MAP

GROUND WATER

Well No. MW-3

Well Diameter (in.) 2"

Depth to Water, Static (ft) 6.95

Water in Well Box NO

Well Depth (ft) 27.00

Height of Water Column in Well 20 Feet

Water Volume in Well 2.3

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
1120								start bailing
1122		2.3	21.0	4.65	750			Turbid
1124		4.6	20.9	4.55	740			"
1128		6.9	20.8	4.62	750			"
								Sampled

Suggested Method for Purging Well

LEVINE•FRICKE

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM

Project No. 2407

Date 11/5/91

Sample No. MW-4

Samplers Name ETM

Sampling Location

Sampling Method Teflon bailer

Analyses Requested

Number and Types of Sample Bottles used

Method of Shipment Courier

30
9
21
.16

LOCATION MAP

GROUND WATER

Well No. MW-4

Well Diameter (in.) 2"

Depth to Water, Static (ft) 8.45

Water in Well Box NO

Well Depth (ft) 29.5

Height of Water Column in Well

Water Volume in Well 3.3

SURFACE WATER

Stream Width

Stream Depth

Stream Velocity

Rained recently ?

Other

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (umhos/cm)	OTHER		REMARKS
1407								start bailing
1410		3.3	21.9	6.36	210			clear
1417		6.6	21.3	6.55	260			slightly turbid
1421		10.0	21.0	6.55	290			slightly turbid
1430								sampled

Suggested Method for Purging Well bailer

APPENDIX D

WELL SURVEY DATA

file 2407.05

[illegible]edman & Associates, Inc.
[illegible] N. California Blvd.
Suite 240, Walnut Creek
California 945[illegible]
[illegible]
FAX [illegible]

Civil Engineering
Land Planning
Land Surveying

November 8, 1991
Job No. 10096-50

LEVINE - FRICKE
Monitoring Wells at
5050 Coliseum Way
Oakland, California

Well #	Top of Box Elevation	Top of PVC Pipe Casing Elevation
LF-1	7.93	7.56
LF-2	10.17	9.84
LF-3	11.33	10.98
LF-4	10.54	10.36
LF-5	8.66	8.03
LF-6	11.89	11.59
LF-7	11.06	10.65
MW-1	10.66	10.21
MW-2	9.29	8.86
MW-3	9.46	9.01
MW-4	10.93	10.75

NOTES:

1. All elevations are on mean sea level datum.
2. The elevations shown were taken on the north side of each box and casing.
3. Benchmark: City of Oakland BM #1094, elevation 7.85 mean sea level datum.

file 2407.05

Stedman & Associates, Inc.
1646 N. California Blvd.
Suite 240, Walnut Creek
California 94596
415-935-9140

Civil Engineering
Land Planning
Land Surveying

Mail

TRANSMITTAL MEMORANDUM

DATE: November 15, 1991

PROJECT: 5050 Coliseum Way

TO: Greg Murray
Levine - Fricke
1900 Powell Street
Emeryville, CA 94608

OUR JOB NO.: 10096-50

ENCLOSED [x]

SEPARATE COVER [ ]

WE ARE SENDING YOU THE FOLLOWING ITEMS:

Description	Copy	Print	Sepia	Orig.	Per Your Request	For Your Use	For Approval	For Review	For Sig.
Monitoring Well Elevations					1	x	x	_	

REMARKS:

CC:

SDW

By: Scot D. Wilson
Project Surveyor

APPENDIX E

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS - SOIL

File

ANALYTICAL SERVICES

MED-TOX ASSOCIATES, INC

2407.05

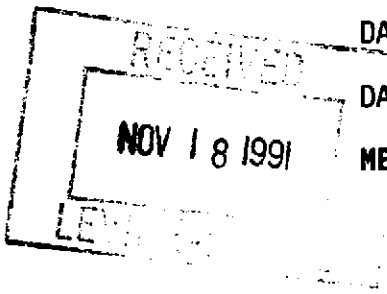
DHS CERTIFICATION NO: E772

CERTIFICATE OF ANALYSIS

LEVINE-FRICKE
1900 POWELL ST., 12TH FL.
EMERYVILLE, CA 94608

ATTN: KATHLEEN ISAACSON

CLIENT PROJ. ID: 2407.05
C.O.C. NOS: 7573, 8361



REPORT DATE: 11/15/91

DATE SAMPLED: 10/30-31/91

DATE RECEIVED: 11/01/91

MED-TOX JOB NO: 9111012

ANALYSIS OF: SOIL SAMPLES

Sample Identification Client Id.	Lab No.	Oil & Grease (mg/kg)	Hydrocarbons (mg/kg)	Extractable Hydrocarbons as Diesel (mg/kg)
LF-1-2.5	08A	2,200	1,700	---
LF-1-5.5	09A	ND	ND	ND
LF-1-7.5	10A	ND	ND	---
LF-1-10.5	11A	ND	ND	ND
Detection Limit		10	10	1
Method:		5520E	5520F	3550 GCFID
Instrument:		IR	IR	E
Date Extracted		11/13/91	11/13/91	11/07/91
Date Analyzed:		11/13/91	11/13/91	11/07/91

ND = Not Detected

Andrew Bradeen, Manager
Organic Laboratory

Dave Sandusky, Manager
Inorganic Laboratory

Results FAXed 11/08-13/91

LEVINE-FRICKE

DATE SAMPLED: 10/30/91
DATE RECEIVED: 11/01/91
CLIENT PROJ. ID: 2407.05

REPORT DATE: 11/15/91

MED-TOX JOB NO: 9111012

Sample Identification Client Id.	Lab No.	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
LF-3-2.5	01A	5	270	0.4	ND	8	20	97
LF-3-15	04A	3	230	ND	44	52	7	280
LF-3-7	05A	14	4,200	ND (20)	ND	ND	ND (200)	ND (200)
LF-1-2.5	08A	270	470	20 (20)	46	13	8,600	4,600
LF-1-7.5	10A	11	560	110	65	130	120	31,000
LF-1-21	16A	2	89	38	53	65	13	16,000
Detection Limit		1	5	0.2	6	3	2	2
Method:		7060	6010	6010	6010	6010	6010	6010
Instrument:		V22	ICP	ICP	ICP	ICP	ICP	ICP

Date Analyzed: 11/05-07/91

ND = Not Detected

Note: Detection limits elevated where noted due to matrix (spectral) interference.

LEVINE-FRICKE

CLIENT ID: LF-1-5.5
CLIENT PROJ. ID: 2407.05
DATE SAMPLED: 10/31/91
DATE RECEIVED: 11/01/91
REPORT DATE: 11/15/91

MED-TOX LAB NO: 9111012-09A
MED-TOX JOB NO: 9111012
DATE ANALYZED: 11/04/91
INSTRUMENT: H

BTEX AND HYDROCARBONS (SOIL MATRIX)

METHOD: EPA 8020, 5030 GCFID

	CAS #	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
Benzene	71-43-2	ND	1
Toluene	108-88-3	ND	1
Ethylbenzene	100-41-4	ND	1
Xylenes, Total	1330-20-7	ND	3
PURGEABLE HYDROCARBONS AS:			
Gasoline		ND mg/kg	0.2 mg/kg

ND = Not Detected

LEVINE-FRICKE

CLIENT ID: LF-1-10.5
CLIENT PROJ. ID: 2407.05
DATE SAMPLED: 10/31/91
DATE RECEIVED: 11/01/91
REPORT DATE: 11/15/91

MED-TOX LAB NO: 9111012-11A
MED-TOX JOB NO: 9111012
DATE ANALYZED: 11/04/91
INSTRUMENT: H

BTEX AND HYDROCARBONS (SOIL MATRIX)

METHOD: EPA 8020, 5030 GCFID

	CAS #	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
Benzene	71-43-2	ND	1
Toluene	108-88-3	ND	1
Ethylbenzene	100-41-4	ND	1
Xylenes, Total	1330-20-7	ND	3
PURGEABLE HYDROCARBONS AS:			
Gasoline		ND mg/kg	0.2 mg/kg

ND = Not Detected

MED-TOX ASSOCIATES, INC.

QUALITY CONTROL DATA

LEVINE-FRICKE

CLIENT PROJECT ID: 2407.05

MED-TOX JOB NO: 9111012

DATE EXTRACTED: 11/12/91
DATE ANALYZED: 11/13/91
SAMPLE SPIKED: 9111012-11A

MED-TOX JOB NO: 9111012
CLIENT PROJ. ID: 2407.05
INSTRUMENT: IR

IR DETERMINATION FOR OIL & GREASE/HYDROCARBONS
METHOD SPIKE RECOVERY SUMMARY
SOIL MATRIX

ANALYTE	MS Conc. (mg/kg)	Sample Result (mg/kg)	MS Result (mg/kg)	MSD Result (mg/kg)	Average Percent Recovery	RPD
Oil	232	ND	216	221	94.2	2.2

CURRENT QC LIMITS (Revised 08/14/91)

Analyte	Percent Recovery	RPD
Oil	(66-130)	10

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE EXTRACTED: 11/07/91
DATE ANALYZED: 11/07/91
SAMPLE SPIKED: 9110227-05A

MED-TOX JOB NO: 9111012
CLIENT PROJ. ID: 2407.05
INSTRUMENT: E

MATRIX SPIKE RECOVERY SUMMARY
TPH EXTRACTABLE SOILS
METHOD 3550
(SOIL MATRIX; EXTRACTION METHOD)

ANALYTE	Spike Conc. (mg/kg)	Sample Result (mg/kg)	MS Result (mg/kg)	MSD Result (mg/kg)	Average Percent Recovery	RPD
Diesel	50.9	ND	37.5	32.4	68.7	14.6

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Diesel	(60.3-116.2)	19.7

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 11/04/91
SAMPLE SPIKED: 9111012-09A
CLIENT PROJ. ID: 2407.05

MED-TOX JOB NO: 9111012

INSTRUMENT: H

MATRIX SPIKE RECOVERY SUMMARY
METHOD 5030 w/GCFID/8020
(SOIL MATRIX)

ANALYTE	Spike Conc. (ug/kg)	Sample Result (ug/kg)	MS Result (ug/kg)	MSD Result (ug/kg)	Average Percent Recovery	RPD
Benzene	22.4	ND	23.0	23.8	104.5	3.4
Toluene	100	ND	102	105	103.5	2.9
Hydrocarbons as Gasoline	1040	ND	1100	1010	101.4	8.5

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Benzene	(80.8-125.2)	9.6
Toluene	(82.7-119.1)	10.2
Gasoline	(54.0-120.1)	14.8

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

MATRIX: SOIL

MED-TOX JOB NO: 9111012

SAMPLE SPIKED: 9111012-04A

CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

COMPOUND	INST./ METHOD	SAMPLE RESULT	SPIKE ADDED	OBSERVED RECOVERIES (mg/kg) MS	MSD	% REC.	RPD	QC CONTROL LIMITS REC. % LIMIT	RPD LIMIT
As, Arsenic	V22/7060	3.2	20	21.0	19.9	86.2	5.4	63.9-125.0	12.6
Ba, Barium	ICP/6010	231.7	400	593	592	90.2	0.27	69.0-106.1	5.0
Cd, Cadmium	ICP/6010	ND	20	15.98	16.12	80.3	0.86	66.3- 90.7	5.0
Cr, Chromium	ICP/6010	43.8	100	135.5	135.0	91.5	0.41	49.3-110.1	5.0
Ni, Nickel	ICP/6010	51.7	100	137.4	136.6	85.3	0.53	50.7-104.2	5.0
Pb, Lead	ICP/6010	7.2	100	98.4	96.9	90.4	1.56	69.9- 94.9	5.0
Zn, Zinc	ICP/6010	275.6	100	350.1	348.9	73.9	0.34	46.7- 98.6	5.0

ND = Not Detected

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

9111012

Project No.: 2407.05	Field Logbook No.:	Date: 10/31/91	Serial No.: 8361
Project Name: Volvo GM	Project Location: Oakland		
Sampler (Signature): [signature]			Samplers: GFM

SAMPLES / ANALYSES

SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CON-TAINERS	SAMPLE TYPE	EPA 601	TPH Diesel	TPH gas and BTEX	Ba, Cd, Zn	Pb, Ni, As, Cr	Oil and Grease 5520 D+E	HOLD	RUSH	REMARKS
LF-1-2.5	10/31	940	08A	1	Soil				X		X			
LF-1-5.5	|	1000	09A	|	|		X	X			X			Metals by series 6010/7000
LF-1-7.5	|	11:45	10A	|	|				X		X			
LF-1-10.5	|	1040	11A	|	|		X	X			X			
LF-1-13	|	1150	12A	|	|							H		
LF-1-15.5	|	10.50	13A	|	|							H		
LF-1-17	|	1140	14A	|	|							H		Please call
LF-1-19	↓	1155	15A	↓	↓							H		Kathleen Isaacson
LF-1-21	↓	1120	16A	↓	↓				X					with questions

RELINQUISHED BY: (Signature) [signature]	DATE 10/31/91	TIME 1800	RECEIVED BY: (Signature) K [signature]	DATE 10/31	TIME
RELINQUISHED BY: (Signature) K [signature]	DATE 11/1/91	TIME	RECEIVED BY: (Signature) Kim Flores	DATE 11/1/91	TIME 4:00
RELINQUISHED BY: (Signature) Kim Flores	DATE 11/1/91	TIME 5:30	RECEIVED BY: (Signature) Gina Gillespie	DATE 11/1/91	TIME 1730
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector: LEVINE-FRICKE 1900 Powell Street, 12th Floor Emeryville, Ca 94608 (415) 652-4500	Analytical Laboratory:

Shipping ' (White) Lab Copy (Green) File Copy (Yellow) ld Copy (Pink) FORM ' 36/COC/ARF

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

Project No.:	Field Logbook No.:	Date: 10/30/91	Serial No.: 7573
Project Name: Volvo Gm	Project Location:		

Sampler (Signature) :

Samplers: GTM

SAMPLES						ANALYSES								
SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CONTAINERS	SAMPLE TYPE	EPA 601	EPA 624	[illegible]				HOLD	RUSH	REMARKS
LF-3-2.5					Soil			X				B		
LF-3	10/											H		
LF-3-11												H		
LF-3-15	10/30	11.40												
LF-3-7	10/30	12:00						X						
LF-1-2A												A		
				1	↓							H		

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	DATE	TIME
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector:

LEVINE-FRICKE
1900 Powell Street, 12th Floor
Emeryville, Ca 94608
(415) 652-4500

Analytical Laboratory:

Shipping Copy (White) Lab Copy (Green) File Copy (Yellow) Field Copy (Pink) FORM NO. 85/COC/ARF

File

ANALYTICAL SERVICES

MED-TOX ASSOCIATES, INC

2407.05

S CERTIFICATION NO: E772

CERTIFICATE OF ANALYSIS

LEVINE-FRICKE
1900 POWELL ST., 12TH FL.
EMERYVILLE, CA 94608

ATTN: KATHLEEN ISAACSON

CLIENT PROJ. ID: 2407.05
C.O.C. NOS: 7879, 7870, 7574

REPORT DATE: 11/21/91

DATE SAMPLED: 10/28-29/91

DATE RECEIVED: 10/30/91

MED-TOX JOB NO: 9110238

ANALYSIS OF: SOIL SAMPLES

Sample Identification Client Id.	Lab No.	Total* Organic Carbon (mg/kg)
LF-2-7.5	06A	5,200
Detection Limit		1

Method: 9060

Date Analyzed: 11/13/91

* Subcontracted to a DOHS certified laboratory

Sherri Moore

Sherri Moore, Manager
Inorganic Laboratory

Results FAXed 11/08-14/91

MED-TOX ASSOCIATES, INC.

LEVINE-FRICKE

DATE SAMPLED: 10/28-29/91
DATE RECEIVED: 10/30/91
CLIENT PROJ. ID: 2407.05

REPORT DATE: 11/21/91

MED-TOX JOB NO: 9110238

(.101 x 2000) dilution

Sample Identification Client Id.	Lab No.	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
LF-2-2.5	04A	54	3,200	60 (20)	36	49	~~24,000~~	6,900
LF-2-5.5	05A	29	76	ND (20)	10	12	ND (200)	300
LF-2-7.5	06A	160	84	0.9	34	33	530	580
LF-2-15.5	07A	5	30	0.6	46	66	6	460
Detection Limit		1	5	0.2	6	3	2	2
Method:		7060	6010	6010	6010	6010	6010	6010
Instrument:		V22	ICP	ICP	ICP	ICP	ICP	ICP

Too High

Date Analyzed: 11/05-07/91

ND = Not Detected

Note: Detection limits elevated where noted in parentheses, due to matrix (spectral) interference.

MED-TOX ASSOCIATES, INC.

QUALITY CONTROL DATA

LEVINE-FRICKE

CLIENT PROJECT ID: 2407.05

MED-TOX JOB NO: 9110238

MATRIX: SOIL

MED-TOX JOB NO: 9110238

CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

COMPOUND	INST./ METHOD	SAMPLE SPIKED	SAMPLE RESULT	SPIKE ADDED	OBSERVED RECOVERIES (mg/kg) MS	MSD	% REC.	RPD	QC CONTROL LIMITS REC. % LIMIT	RPD LIMIT
As, Arsenic	V22/7060	9110238-01A	ND	20	20.2	20.2	101.0	0.0	63.9-125.0	12.6
Ba, Barium	ICP/6010	9110238-14A	51	400	412	403	89.0	2.16	69.0-106.1	5.0
Cd, Cadmium	ICP/6010	9110238-14A	0.33	20	16.46	16.46	80.6	0.00	66.3- 90.7	5.0
Cr, Chromium	ICP/6010	9110238-14A	67.1	100	140.9	139.2	73.0	1.20	49.3-110.1	5.0
Ni, Nickel	ICP/6010	9110238-14A	82.3	100	161.5	159.6	78.3	1.24	50.7-104.2	5.0
Pb, Lead	ICP/6010	9110238-14A	6.0	100	94.2	93.0	87.6	1.33	69.9- 94.9	5.0
Zn, Zinc	ICP/6010	9110238-14A	378.9	100	461.1	456.8	80.0	0.92	46.7- 98.6	5.0

ND = Not Detected

[redacted] ANALYTICAL REQUEST/CHAIN OF CUSTODY FORM [redacted]
(Complete Information on Opposite Side)

Date: 10-31-91

CLIENT MED-TOX Associates
CLIENT JOB REF.: 9110238
LAB PROJECT NO: _____ (lab use only)

NOTE: Please FAX signed copy of COC for verification of sample receipt

SAMPLER(S): X

CLIENT SAMPLE IDENTIFICATION	DATE Taken	Lab Number (lab use only)	AIR VOLUME (Liters)	NO. CONT.	SAMPLE TYPE *	ANALYSES: TOC	COMMENTS/ INTERFERENCES
9110238-6A	10/29			1	9	x	TOC det limit 50mg/Kg

Relinquished by: (Signature) Gina Gillespie	Date 10-31-91	Time 4:30pm	Received by: (Signature) Kevin Van Zandbergen	Date 10-31-91	Time 4:30pm
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Dispatched by: (Signature)	Date	Time	Received for lab by: (Signature)	Date	Time
Method of Shipment: Courier			Lab Comments:		

*SAMPLE TYPE (SPECIFY): (1) 37 mm 0.8 um MCEF; 2) 25 mm 0.8 um MCEF; (3) 25 mm 0.4 um polycarb. filter; (4) PVC filter, diam. ____ pore size ____; (5) Charcoal tube; (6) Silica gel tube (7) Water; (8) Soil; (9) Bulk Sample; (10) Oth[illegible] (11) [illegible]er _____

[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]NAL[redacted]AL [redacted]UEST[redacted]AIN[redacted]CUS[redacted] FO[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

(Complete Information on Opposite Side)

Date: 11-1-91

CLIENT MED-TOX Associates

CLIENT JOB REF.: 9110238

LAB PROJECT NO: _____ (lab use only)

SAMPLER(S): _____

NOTE: Please FAX signed copy of COC for verification of sample receipt

CLIENT SAMPLE IDENTIFICATION	DATE Taken	Lab Number (lab use only)	AIR VOLUME (Liters)	NO. CONT.	SAMPLE TYPE *	ANALYSES: TOTAL SULFUR											COMMENTS/ INTERFERENCE
9110238-2A	10/29			1	8	X											

Relinquished by: (Signature) Denise Harrington	Date 10/1/91	Time 0930	Received by: (Signature) Kim Flores	Date 11/1/91	Time 9:25
Relinquished by: (Signature) Kim Flores	Date 11/1/91	Time 10:05	Received by: (Signature)	Date	Time
Dispatched by: (Signature)	Date	Time	Received for lab by: (Signature) Nancy Wilson	Date 11/1/91	Time 10:05
Method of Shipment:			Lab Comments:		

*SAMPLE TYPE (SPECIFY): (1) 37 mm 0.8 um MCEF; 2) 25 mm 0.8 um MCEF; (3) 25 mm 0.4 um polycarb. filter; (4) PVC filter, diam. ____ pore size ____; (5) Charcoal tube; (6) Silica gel tube (7) Water; (8) Soil; (9) Bulk Sample: (10) her _____ (1 Other _____

9110238

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

Project No.: 2407	Field Logbook No.:	Date: 10/29/91	Serial No.: 7879
Project Name: Volvo GM	Project Location: Oakland		
Sampler (Signature): [signature]			Samplers: [illegible]

SAMPLES / ANALYSES

SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CONTAINERS	SAMPLE TYPE	~~EPA 601~~	~~EPA 624~~	Ba Zn Cd Cr Pb Ni As		Total Sulfur	TOC	HOLD	RUSH	REMARKS
LF-4-2	10/29	8:00	01A	1	Soil			X						
LF-4-5	10/29	8:15	20A	1	↓							H		
LF-4-3.5	10/29	8:20	02A	1	↓			X		X				Metals by 6010/7000 series
LF-4-10	10/29	8:30	21A	1	↓							H		
LF-4-15	10/29	8:40	03A	1	↓			X						
LF-4-20	10/29	8:50	22A	1	↓							H		
LF-4-12.5	10/29	9:40	23A	1	↓							H		
LF-4-11.5	10/29	9:50	24A	1	↓							H		Please call
LF-2-2.5	10/29	11:30	04A	1	↓			X				*		Kathleen Isaacson
LF-2-5.5	10/29	11:40	05A	1	↓			X						with questions
LF-2-3.5	10/29	11:50	25A	1	↓							H		
LF-2-7.5	10/29	12:20	06A	1	↓			X			X			
LF-2-10.5	10/29	1223	26A	1	↓							H		
LF-2-15.5	10/29	1250	07A	1	↓			X						
~~LF-2-14~~	10/29	1315		1	↓							H		did not receive
LF-2-11	10/29	1325	27A	1	↓							H		

RELINQUISHED BY: (Signature) [signature]	DATE 10/30/91	TIME 4:30	RECEIVED BY: (Signature) [signature]	DATE 10/30	TIME 5:15pm
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature) Gina Gillespie	DATE 10/30/91	TIME 1820
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	DATE	TIME
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector: LEVINE-FRICKE
1900 Powell Street, 12th Floor
Emeryville, Ca 94608
(415) 652-4500

Analytical Laboratory: Med Tox

Shipping C (White) Lab Copy (Green) File Copy (Yellow) d Copy (Pink) FORM N 6/COC/ARF

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

9110238

Project No.: 2407.05	Field Logbook No.:	Date: 10/28/91	Serial No.: 7870
Project Name: Volvo-6M	Project Location: Oakland		
Sampler (Signature):			Samplers: GTM

SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CONTAINERS	SAMPLE TYPE	EPA 601	EPA 624	Ba, Zn, Cr, Pb, Ni, As	HOLD	RUSH	REMARKS
LF-7-2	10/28	1045	08A	1	soil			X			
LF-7-5	10/28	1050	~~09A~~	1					H		
LF-7-4		1050	09A	1				X			Metals by 6010/7000 series
LF-7-10		11:00	10A	1				X			LF-7-4 recd two
LF-7-15.5		11:05	11A	1				X			
LF-7-21		11:30	28A	1					H		
LF-7-25		12:30	29A	1					H		
LF-6-2		15:00	12A	1				X			
~~LF-6-3~~		15:15	~~X~~	1					H		Please call did not receive
LF-6-9		16:15	13A	1				X			Kathleen Isaacson
LF-6-13		1150	30A	1					H		with questions
LF-6-15.5		1655	31A	1					H		
LF-6-15.5		1700	14A	1				X			
LF-6-20		1705	32A	1					H		
LF-6-18		1715	33A	1					H		

RELINQUISHED BY: (Signature) Kathleen Isaacson	DATE 10/30/91	TIME 4:30	RECEIVED BY: (Signature)	DATE 10/30/91	TIME 5:15pm
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature) Lynn Gillespie	DATE 10/31/91	TIME 1820
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	DATE	TIME
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector:
LEVINE-FRICKE
1900 Powell Street, 12th Floor
Emeryville, Ca 94608
(415) 652-4500

Analytical Laboratory: Med Tox

Shipping C (White) Lab Copy (Green) File Copy (Yellow) d Copy (Pink) FORM N 86/COC/ARF

(3)

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

9110238

Project No.: 2407	Field Logbook No.:	Date: 10/29/91	Serial No.: 7574
Project Name: Volvo Gm	Project Location: Oakland		
Sampler (Signature):			Samplers: GM

SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CONTAINERS	SAMPLE TYPE	EPA 601	EPA 624	Ba, Zn, Cd, Pb, Ni, As	Total Sulfur	HOLD	RUSH	REMARKS
LF-5-2	10/29	1600	15A	1	Soil			X				
LF-5-5.5	10/29	1605	~~35A~~ 34A	1	↓					X		
LF-5-11	10/29	1620	16A	1	↓			X				
LF-5-15	10/29	1640	17A	1	↓			X				
~~LF-5-3.5~~	~~10/29~~	~~1700~~		~~1~~	↓					X		
LF-5-8	10/29	1705	~~29A~~ 35A	1	↓					X		
LF-5-19.5	10/29	1710	~~30A~~ 36A	1	↓					X		
LF-5-21.5	10/29	1730	~~31A~~ 37A	1	↓					X		Please call Kathleen Isaacson with questions
LF-5-24	10/29	1740	~~32A~~ 38A	1	↓					X		
LF-5-3.5	10/29	1700	18A	1	↓			X				
LF-4-14	10/29	13:15	19A							X		not listed on cox, what analysis?

RELINQUISHED BY: (Signature) Kathleen Isaacson	DATE 10/30/91	TIME 4:30	RECEIVED BY: (Signature)	DATE 10/30/91	TIME 5:15PM
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature) Cynia Gillespie	DATE 10/30/91	TIME 1830
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	DATE	TIME
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector: LEVINE-FRICKE
1900 Powell Street, 12th Floor
Emeryville, Ca 94608
(415) 652-4500

Analytical Laboratory: Med Tox

Shipping C (White) Lab Copy (Green) File Copy (Yellow) d Copy (Pink) FORM N 36/COC/ARF

ANALYTICAL SERVICES

MED-TOX ASSOCIATES INC

'S CERTIFICATION NO: E772

CERTIFICATE OF ANALYSIS

LEVINE-FRICKE
1900 POWELL ST., 12TH FL.
EMERYVILLE, CA 94608

ATTN: KATHLEEN ISAACSON

CLIENT PROJ. ID: 2407.05
C.O.C. NOS: 7879, 7870, 7574

REPORT DATE: 11/21/91

DATE SAMPLED: 10/28-29/91

DATE RECEIVED: 10/30/91

MED-TOX JOB NO: 9110238

ANALYSIS OF: SOIL SAMPLES

Sample Identification Client Id.	Lab No.	Sulfur* (%)
LF-4-3.5	02A	1.08

Method: ASTM D129

Date Analyzed: 11/06/91

* Subcontracted to a DOHS certified laboratory

RECEIVED
NOV 26
LEVINE-FRICKE

Sherri Moore
Sherri Moore, Manager
Inorganic Laboratory

Results FAXed 11/08-14/91

LEVINE-FRICKE

DATE SAMPLED: 10/28-29/91
DATE RECEIVED: 10/30/91
CLIENT PROJ. ID: 2407.05

REPORT DATE: 11/21/91

MED-TOX JOB NO: 9110238

Sample Identification Client Id.	Lab No.	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
LF-4-2	01A	ND	220	0.8	23	31	77	140
LF-4-3.5	02A	34	60,000	30	32	82	850	5,100
LF-4-15	03A	3	140	ND	49	96	11	49
LF-7-2	08A	63	67,000	ND	8	18	52	72
LF-7-4	09A	12	92,000	0.4	11	21	67	200
LF-7-10	10A	4	140	ND	44	38	5	20
LF-7-15.5	11A	4	150	0.2	48	97	7	57
LF-6-2	12A	10	100	0.6	9	12	19	120
LF-6-9	13A	200	200	11	31	24	360	1,100
LF-6-15.5	14A	5	51	0.3	67	82	6	380
LF-5-2	15A	5	82	0.4	13	19	8	110
LF-5-11	16A	2	80	ND	38	59	4	27
LF-5-15	17A	5	28	ND	48	98	6	34
LF-5-3.5	18A	97	1,600	ND (20)	33	50	1,000 (200)	2,700 (200)
Detection Limit		1	5	0.2	6	3	2	2
Method:		7060	6010	6010	6010	6010	6010	6010
Instrument:		V22	ICP	ICP	ICP	ICP	ICP	ICP

Date Analyzed: 11/05-07/91

ND = Not Detected

Note: Detection limits elevated where noted in parentheses, due to matrix (spectral) interference.

MED-TOX ASSOCIATES, INC.

QUALITY CONTROL DATA

LEVINE-FRICKE

CLIENT PROJECT ID: 2407.05

MED-TOX JOB NO: 9110238

MATRIX: SOIL

MED-TOX JOB NO: 9110238

CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

COMPOUND	INST./ METHOD	SAMPLE SPIKED	SAMPLE RESULT	SPIKE ADDED	OBSERVED RECOVERIES (mg/kg) MS	MSD	% REC.	RPD	QC CONTROL LIMITS REC. % LIMIT	RPD LIMIT
As, Arsenic	V22/7060	9110238-01A	ND	20	20.2	20.2	101.0	0.0	63.9-125.0	12.6
Ba, Barium	ICP/6010	9110238-14A	51	400	412	403	89.0	2.16	69.0-106.1	5.0
Cd, Cadmium	ICP/6010	9110238-14A	0.33	20	16.46	16.46	80.6	0.00	66.3- 90.7	5.0
Cr, Chromium	ICP/6010	9110238-14A	67.1	100	140.9	139.2	73.0	1.20	49.3-110.1	5.0
Ni, Nickel	ICP/6010	9110238-14A	82.3	100	161.5	159.6	78.3	1.24	50.7-104.2	5.0
Pb, Lead	ICP/6010	9110238-14A	6.0	100	94.2	93.0	87.6	1.33	69.9- 94.9	5.0
Zn, Zinc	ICP/6010	9110238-14A	378.9	100	461.1	456.8	80.0	0.92	46.7- 98.6	5.0

ND = Not Detected

APPENDIX F

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS - GROUND WATER

FILE

ANALYTICAL SERVICES

MED-TOX ASSOCIATES, INC

2407.03

CERTIFICATION NO: E772

CERTIFICATE OF ANALYSIS

LEVINE-FRICKE
1900 POWELL ST., 12TH FL.
EMERYVILLE, CA 94608

ATTN: KATHLEEN ISAACSON

CLIENT PROJ. ID: 2407.05
C.O.C. NOS: 7572

REPORT DATE: 11/21/91
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
MED-TOX JOB NO: 9111029

NOV 26 1991

ANALYSIS OF: WATER SAMPLES

Sample Identification Client Id.	Lab No.	Purgeable Hydrocarbons as Gasoline (mg/L)	Extractable Hydrocarbons as Diesel (mg/L)	Sulfide (mg/L)
LF-4BB	01A	ND	---	---
LF-4	02A	0.59	---	---
LF-4	02E	---	0.1	---
LF-4	02G	---	---	ND
Detection Limit		0.05	0.05	1
Method:		5030 GCFID	3510 GCFID	367.2
Instrument:		F	C	NOVASPEC
Date Extracted		---	11/13/91	---
Date Analyzed:		11/08/91	11/13/91	11/13/91

ND = Not Detected

Sherri Moore, Manager
Inorganic Laboratory

Andrew Bradeen, Manager
Organic Laboratory

Results FAXed 11/14/91

LEVINE-FRICKE

CLIENT ID: [redacted]
CLIENT PROJ. ID: 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-01C
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/12/91
INSTRUMENT: 12

EPA METHOD 8240 (WATER MATRIX)
GC/MS VOLATILE ORGANIC COMPOUNDS

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acetone	67-64-1	ND	100
Benzene	71-43-2	ND	5
Bromodichloromethane	75-27-4	ND	5
Bromoform	75-25-2	ND	5
Bromomethane	74-83-9	ND	10
2-Butanone	78-93-3	ND	100
Carbon Disulfide	75-15-0	ND	10
Carbon Tetrachloride	56-23-5	ND	5
Chlorobenzene	108-90-7	ND	5
Chloroethane	75-00-3	ND	10
2-Chloroethyl Vinyl Ether	110-75-8	ND	10
Chloroform	67-66-3	ND	5
Chloromethane	74-87-3	ND	10
Dibromochloromethane	124-48-1	ND	5
1,1-Dichloroethane	75-34-3	ND	5
1,2-Dichloroethane	107-06-2	ND	5
1,1-Dichloroethene	75-35-4	ND	5
cis-1,2-Dichloroethene	156-69-9	ND	5
trans-1,2-Dichloroethene	156-60-5	ND	5
1,2-Dichloropropane	78-87-5	ND	5
cis-1,3-Dichloropropene	10061-01-5	ND	5
trans-1,3-Dichloropropene	10061-02-6	ND	5
Ethylbenzene	100-41-4	ND	5
2-Hexanone	591-78-6	ND	50
Methylene Chloride	75-09-2	ND	5
4-Methyl-2-pentanone	108-10-1	ND	50
Styrene	100-42-5	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	5
Tetrachloroethene	127-18-4	ND	5
Toluene	108-88-3	ND	5
1,1,1-Trichloroethane	71-55-6	ND	5
1,1,2-Trichloroethane	79-00-5	ND	5
Trichloroethene	79-01-6	ND	5
Vinyl Acetate	108-05-4	ND	50
Vinyl Chloride	75-01-4	ND	10
Xylenes, total	1330-20-7	ND	10

ND = Not Detected

MED-TOX ASSOCIATES, INC.

LEVINE-FRICKE

CLIENT ID: LF-4
CLIENT PROJ. ID: 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-02C
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/12-13/91
INSTRUMENT: 12

EPA METHOD 8240 (WATER MATRIX)
GC/MS VOLATILE ORGANIC COMPOUNDS

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acetone	67-64-1	ND	100
Benzene	71-43-2	ND	5
Bromodichloromethane	75-27-4	ND	5
Bromoform	75-25-2	ND	5
Bromomethane	74-83-9	ND	10
2-Butanone	78-93-3	ND	100
Carbon Disulfide	75-15-0	ND	10
Carbon Tetrachloride	56-23-5	ND	5
Chlorobenzene	108-90-7	ND	5
Chloroethane	75-00-3	ND	10
2-Chloroethyl Vinyl Ether	110-75-8	ND	10
Chloroform	67-66-3	ND	5
Chloromethane	74-87-3	ND	10
Dibromochloromethane	124-48-1	ND	5
1,1-Dichloroethane	75-34-3	ND	5
1,2-Dichloroethane	107-06-2	ND	5
1,1-Dichloroethene	75-35-4	ND	5
cis-1,2-Dichloroethene	156-69-9	ND	5
trans-1,2-Dichloroethene	156-60-5	ND	5
1,2-Dichloropropane	78-87-5	ND	5
cis-1,3-Dichloropropene	10061-01-5	ND	5
trans-1,3-Dichloropropene	10061-02-6	ND	5
Ethylbenzene	100-41-4	ND	5
2-Hexanone	591-78-6	ND	50
Methylene Chloride	75-09-2	ND	5
4-Methyl-2-pentanone	108-10-1	ND	50
Styrene	100-42-5	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	5
Tetrachloroethene	127-18-4	ND	5
Toluene	108-88-3	ND	5
1,1,1-Trichloroethane	71-55-6	ND	5
1,1,2-Trichloroethane	79-00-5	ND	5
Trichloroethene	79-01-6	ND	5
Vinyl Acetate	108-05-4	ND	50
Vinyl Chloride	75-01-4	ND	10
Xylenes, total	1330-20-7	ND	10

ND = Not Detected

LEVINE-FRICKE

CLIENT ID: LF-4
CLIENT PROJ. ID: 2407.05
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-021
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/06-13/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.002	6010	ICP
As	Arsenic	0.026	0.002	7060	V22
Ba	Barium	0.082	0.002	6010	ICP
Be	Beryllium	ND	0.001	6010	ICP
Cd	Cadmium	ND	0.005	6010	ICP
Co	Cobalt	ND	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.004	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	0.013	0.003	6010	ICP
Pb	Lead	ND	0.005	6010	ICP
Sb	Antimony	0.03	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	0.010	0.005	6010	ICP
Zn	Zinc	0.034	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: LF-4
CLIENT PROJ. ID: 2407.05
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-02G
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/05-13/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	570 *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	49	0.03	6010	ICP
	Chloride	690	0.1	300	DIONEX
Cu	Copper	ND	0.04	6010	ICP
Fe	Iron	ND	0.05	6010	ICP
Mg	Magnesium	55	0.04	6010	ICP
Mn	Manganese	0.35	0.002	6010	ICP
	pH	7.0 **	NA	9040	ISE
Na	Sodium	850	0.05	6010	ICP
	Sulfate	560	0.5	300	DIONEX
	Conductivity	4,200 ***	20	120.1	YSI
	Total Dissolved Solids	2,600	10	160.1	ME-1
	Hardness	350 *	1	314-A	ICP
Zn	Zinc	0.034	0.005	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

MED-TOX ASSOCIATES, INC

QUALITY CONTROL DATA

LEVINE-FRICKE

CLIENT PROJECT ID: 2407.05

MED-TOX JOB NO: 9111029

DATE EXTRACTED: 11/13/91
DATE ANALYZED: 11/13/91
SAMPLE SPIKED: D.I. WATER

MED-TOX JOB NO: 9111029
CLIENT PROJ. ID: 2407.05
INSTRUMENT: C

MATRIX SPIKE RECOVERY SUMMARY
TPH EXTRACTABLE WATERS
METHOD 3510
(WATER MATRIX; EXTRACTION METHOD)

ANALYTE	Spike Conc. (mg/L)	Sample Result (mg/L)	MS Result (mg/L)	MSD Result (mg/L)	Average Percent Recovery	RPD
Diesel	0.636	ND	0.405	0.450	67.2	10.5

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Diesel	(49.3-101.4)	29.0

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 11/08/91
SAMPLE SPIKED: 9111029-01A
CLIENT PROJ. ID: 2407.05

MED-TOX JOB NO: 9111029

INSTRUMENT: F

MATRIX SPIKE RECOVERY SUMMARY
METHOD 5030 w/GCFID/8020
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
Benzene	16.9	ND	15.6	15.0	90.5	3.9
Toluene	71.1	ND	67.9	66.4	94.4	2.2
Hydrocarbons as Gasoline	519	ND	511	526	99.9	2.9

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Benzene	(77.7-118.0)	10.3
Toluene	(80.7-116.2)	10.1
Gasoline	(72.5-110.7)	13.6

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

INSTRUMENT: 12

MED-TOX JOB NO: 9111029

CLIENT PROJ. ID: 2407.05

SURROGATE STANDARD RECOVERY SUMMARY

METHOD 8240
(WATER MATRIX)

SAMPLE IDENTIFICATION			SURROGATE RECOVERY (PERCENT)		
Date Analyzed	Client Id.	Lab No.	1,2-Dichloro-ethane-d_4	Toluene-d_8	p-Bromofluoro-benzene
11/12/91	LF-4BB	01C	100.0	107.1	104.6
11/13/91	LF-4	02D	91.6	101.7	98.9

CURRENT QC LIMITS

ANALYTE	PERCENT RECOVERY
1,2-Dichloroethane-d_4	(83-127)
Toluene-d_8	(90-108)
p-Bromofluorobenzene	(91-109)

DATE ANALYZED: 11/12/91
SAMPLE SPIKED: 9111029-05C
INSTRUMENT: 12

MED-TOX JOB NO: 9111029
CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

METHOD 8240
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
1,1-Dichloroethene	50.0	ND	53.8	53.8	107.6	0.0
Trichloroethene	50.0	ND	50.7	48.9	99.6	3.6
Benzene	50.0	ND	52.8	51.9	104.7	1.7
Toluene	50.0	ND	51.5	48.7	100.2	5.6
Chlorobenzene	50.0	ND	50.4	50.1	100.5	0.6

CURRENT QC LIMITS (Revised 08/13/91)

Analyte	Percent Recovery	RPD
1,1-Dichloroethene	(65-133)	13.5
Trichloroethene	(84-120)	8.7
Benzene	(84-121)	9.4
Toluene	(89-119)	8.4
Chlorobenzene	(83-116)	7.5

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

MATRIX: WATER

MED-TOX JOB NO: 9111029

CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

COMPOUND	INST./ METHOD	SAMPLE SPIKED	SAMPLE RESULT	SPIKE ADDED	OBSERVED RECOVERIES (mg/L) MS	MSD	% REC.	RPD	QC CONTROL LIMITS REC. % LIMIT	RPD LIMIT
As, Arsenic	V22/7060	9111029-02I	0.0261	0.04	0.0561	0.0574	76.6	2.3	56.1-141.7	16.0
Ba, Barium	ICP/6010	9111029-02I	0.082	2.00	2.07	2.09	99.9	1.27	82.4-107.9	5.0
Cd, Cadmium	ICP/6010	9111029-02I	ND	0.10	0.0960	0.0957	95.8	0.25	60.3-114.4	8.0
Cr, Chromium	ICP/6010	9111029-02I	ND	0.50	0.480	0.484	96.4	0.82	72.9-109.7	5.0
Cu, Copper	ICP/6010	9111029-02I	ND	0.50	0.492	0.497	98.9	1.09	78.1-111.9	5.0
Hg, Mercury	Hg/7470	9111035-01D	ND	2.0 ug/L	2.004	2.004	100.2	0.08	95.0-105.0	2.0
Ni, Nickel	ICP/6010	9111029-02I	0.017	0.50	0.493	0.500	95.9	1.23	74.6-108.7	5.0
Pb, Lead	ICP/6010	9111029-02I	ND	0.50	0.498	0.502	100.0	0.62	74.8-110.9	5.0
Se, Selenium	V22/7740	9111029-02I	ND	0.08	0.0588	0.0577	72.8	1.9	51.1-136.2	17.4
Zn, Zinc	ICP/6010	9111029-02I	0.034	0.50	0.526	0.529	98.7	0.52	67.4-109.8	5.0
Chloride	DIONEX/300	9111037-05A	78.2	50	134.6	135.6	113.8	0.74	84.8-133.0	5.3
Sulfate	DIONEX/300	9111037-05A	34.0	100	138	139	104.2	1.0	82.6-116.2	7.1
Sulfide	NOVASPEC/367.2	9111029-02G	ND	0.2	0.197	0.199	99.1	0.81	80-120	15

ND = Not Detected

ANALYTICAL SERVICES

'S CERTIFICATION NO: E772

MED-TOX ASSOCIATES INC

2407.05

CERTIFICATE OF ANALYSIS

LEVINE-FRICKE
1900 POWELL ST., 12TH FL.
EMERYVILLE, CA 94608

ATTN: KATHLEEN ISAACSON

CLIENT PROJ. ID: 2407.05
C.O.C. NOS: 7572

REPORT DATE: 11/21/91

DATE SAMPLED: 11/04/91

DATE RECEIVED: 11/05/91

MED-TOX JOB NOS: 9111029, 9111031

ANALYSIS OF: WATER SAMPLES

See attached for results

Sherri Moore, Manager
Inorganic Laboratory

Andrew Bradeen, Manager
Organic Laboratory

Results FAXed 11/14/91

LEVINE-FRICKE

DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
CLIENT PROJ. ID: 2407.05

REPORT DATE: 11/21/91

MED-TOX JOB NOS: 9111029, 9111031

Sample Identification Client Id.	Lab No.	Oil & Grease (mg/L)	Hydrocarbons (mg/L)	Purgeable Hydrocarbons as Gasoline (mg/L)	Extractable Hydrocarbons as Diesel (mg/L)	Sulfide (mg/L)
9111029						
LF-3	03A	---	---	ND	---	---
LF-3	03E	---	---	---	0.2	---
LF-3	03F	---	---	---	---	ND
TRIP BLANK	04A	---	---	ND	---	---
LF-2	05A	---	---	ND	---	---
LF-2	05E	---	---	---	0.3	---
LF-2	05G	---	---	---	---	ND
9111031						
LF-1	01A	---	---	ND	---	---
LF-1	01E	---	---	---	0.09	---
LF-1	01F	---	---	---	---	ND
LF-1	01J	ND	ND	---	---	---
Detection Limit		0.5	0.5	0.05	0.05	1
Method:		5520C	5520F	5030 GCFID	3510 GCFID	367.2
Instrument:		IR	IR	F	C	NOVASPEC
Date Extracted		11/11/91	11/11/91	---	11/13/91	---
Date Analyzed:		11/12/91	11/12/91	11/08/91	11/13/91	11/13/91

ND = Not Detected

MED-TOX ASSOCIATES, INC.

LEVINE-FRICKE

CLIENT ID: LF-3
CLIENT PROJ. ~~ID:~~ 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-03C
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/12-13/91
INSTRUMENT: 12

EPA METHOD 8240 (WATER MATRIX)
GC/MS VOLATILE ORGANIC COMPOUNDS

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acetone	67-64-1	ND	100
Benzene	71-43-2	ND	5
Bromodichloromethane	75-27-4	ND	5
Bromoform	75-25-2	ND	5
Bromomethane	74-83-9	ND	10
2-Butanone	78-93-3	ND	100
Carbon Disulfide	75-15-0	ND	10
Carbon Tetrachloride	56-23-5	ND	5
Chlorobenzene	108-90-7	ND	5
Chloroethane	75-00-3	ND	10
2-Chloroethyl Vinyl Ether	110-75-8	ND	10
Chloroform	67-66-3	ND	5
Chloromethane	74-87-3	ND	10
Dibromochloromethane	124-48-1	ND	5
1,1-Dichloroethane	75-34-3	ND	5
1,2-Dichloroethane	107-06-2	ND	5
1,1-Dichloroethene	75-35-4	ND	5
cis-1,2-Dichloroethene	156-69-9	ND	5
trans-1,2-Dichloroethene	156-60-5	ND	5
1,2-Dichloropropane	78-87-5	ND	5
cis-1,3-Dichloropropene	10061-01-5	ND	5
trans-1,3-Dichloropropene	10061-02-6	ND	5
Ethylbenzene	100-41-4	ND	5
2-Hexanone	591-78-6	ND	50
Methylene Chloride	75-09-2	ND	5
4-Methyl-2-pentanone	108-10-1	ND	50
Styrene	100-42-5	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	5
Tetrachloroethene	127-18-4	ND	5
Toluene	108-88-3	ND	5
1,1,1-Trichloroethane	71-55-6	ND	5
1,1,2-Trichloroethane	79-00-5	ND	5
Trichloroethene	79-01-6	ND	5
Vinyl Acetate	108-05-4	ND	50
Vinyl Chloride	75-01-4	ND	10
Xylenes, total	1330-20-7	ND	10

ND = Not Detected

LEVINE-FRICKE

CLIENT ID: TRIP BLANK
CLIENT PROJ. ID: 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-04C
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/12-13/91
INSTRUMENT: 12

EPA METHOD 8240 (WATER MATRIX)
GC/MS VOLATILE ORGANIC COMPOUNDS

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acetone	67-64-1	ND	100
Benzene	71-43-2	ND	5
Bromodichloromethane	75-27-4	ND	5
Bromoform	75-25-2	ND	5
Bromomethane	74-83-9	ND	10
2-Butanone	78-93-3	ND	100
Carbon Disulfide	75-15-0	ND	10
Carbon Tetrachloride	56-23-5	ND	5
Chlorobenzene	108-90-7	ND	5
Chloroethane	75-00-3	ND	10
2-Chloroethyl Vinyl Ether	110-75-8	ND	10
Chloroform	67-66-3	ND	5
Chloromethane	74-87-3	ND	10
Dibromochloromethane	124-48-1	ND	5
1,1-Dichloroethane	75-34-3	ND	5
1,2-Dichloroethane	107-06-2	ND	5
1,1-Dichloroethene	75-35-4	ND	5
cis-1,2-Dichloroethene	156-69-9	ND	5
trans-1,2-Dichloroethene	156-60-5	ND	5
1,2-Dichloropropane	78-87-5	ND	5
cis-1,3-Dichloropropene	10061-01-5	ND	5
trans-1,3-Dichloropropene	10061-02-6	ND	5
Ethylbenzene	100-41-4	ND	5
2-Hexanone	591-78-6	ND	50
Methylene Chloride	75-09-2	ND	5
4-Methyl-2-pentanone	108-10-1	ND	50
Styrene	100-42-5	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	5
Tetrachloroethene	127-18-4	ND	5
Toluene	108-88-3	ND	5
1,1,1-Trichloroethane	71-55-6	ND	5
1,1,2-Trichloroethane	79-00-5	ND	5
Trichloroethene	79-01-6	ND	5
Vinyl Acetate	108-05-4	ND	50
Vinyl Chloride	75-01-4	ND	10
Xylenes, total	1330-20-7	ND	10

ND = Not Detected

MED-TOX ASSOCIATES, INC.

LEVINE-FRICKE

CLIENT ID: LF-2
CLIENT PROJ ID: 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-05C
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/12/91
INSTRUMENT: 12

EPA METHOD 8240 (WATER MATRIX)
GC/MS VOLATILE ORGANIC COMPOUNDS

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acetone	67-64-1	ND	100
Benzene	71-43-2	ND	5
Bromodichloromethane	75-27-4	ND	5
Bromoform	75-25-2	ND	5
Bromomethane	74-83-9	ND	10
2-Butanone	78-93-3	ND	100
Carbon Disulfide	75-15-0	ND	10
Carbon Tetrachloride	56-23-5	ND	5
Chlorobenzene	108-90-7	ND	5
Chloroethane	75-00-3	ND	10
2-Chloroethyl Vinyl Ether	110-75-8	ND	10
Chloroform	67-66-3	ND	5
Chloromethane	74-87-3	ND	10
Dibromochloromethane	124-48-1	ND	5
1,1-Dichloroethane	75-34-3	ND	5
1,2-Dichloroethane	107-06-2	ND	5
1,1-Dichloroethene	75-35-4	ND	5
cis-1,2-Dichloroethene	156-69-9	ND	5
trans-1,2-Dichloroethene	156-60-5	ND	5
1,2-Dichloropropane	78-87-5	ND	5
cis-1,3-Dichloropropene	10061-01-5	ND	5
trans-1,3-Dichloropropene	10061-02-6	ND	5
Ethylbenzene	100-41-4	ND	5
2-Hexanone	591-78-6	ND	50
Methylene Chloride	75-09-2	ND	5
4-Methyl-2-pentanone	108-10-1	ND	50
Styrene	100-42-5	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	5
Tetrachloroethene	127-18-4	ND	5
Toluene	108-88-3	ND	5
1,1,1-Trichloroethane	71-55-6	ND	5
1,1,2-Trichloroethane	79-00-5	ND	5
Trichloroethene	79-01-6	ND	5
Vinyl Acetate	108-05-4	ND	50
Vinyl Chloride	75-01-4	ND	10
Xylenes, total	1330-20-7	ND	10

ND = Not Detected

MED-TOX ASSOCIATES, INC.

LEVINE-FRICKE

CLIENT ID: LF-1
CLIENT PROJ. ID: 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111031-01C
MED-TOX JOB NO: 9111031
DATE ANALYZED: 11/10/91
INSTRUMENT: 12

EPA METHOD 8240 (WATER MATRIX)
GC/MS VOLATILE ORGANIC COMPOUNDS

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acetone	67-64-1	ND	100
Benzene	71-43-2	ND	5
Bromodichloromethane	75-27-4	ND	5
Bromoform	75-25-2	ND	5
Bromomethane	74-83-9	ND	10
2-Butanone	78-93-3	ND	100
Carbon Disulfide	75-15-0	ND	10
Carbon Tetrachloride	56-23-5	ND	5
Chlorobenzene	108-90-7	ND	5
Chloroethane	75-00-3	ND	10
2-Chloroethyl Vinyl Ether	110-75-8	ND	10
Chloroform	67-66-3	ND	5
Chloromethane	74-87-3	ND	10
Dibromochloromethane	124-48-1	ND	5
1,1-Dichloroethane	75-34-3	ND	5
1,2-Dichloroethane	107-06-2	ND	5
1,1-Dichloroethene	75-35-4	ND	5
cis-1,2-Dichloroethene	156-69-9	ND	5
trans-1,2-Dichloroethene	156-60-5	ND	5
1,2-Dichloropropane	78-87-5	ND	5
cis-1,3-Dichloropropene	10061-01-5	ND	5
trans-1,3-Dichloropropene	10061-02-6	ND	5
Ethylbenzene	100-41-4	ND	5
2-Hexanone	591-78-6	ND	50
Methylene Chloride	75-09-2	ND	5
4-Methyl-2-pentanone	108-10-1	ND	50
Styrene	100-42-5	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	5
Tetrachloroethene	127-18-4	ND	5
Toluene	108-88-3	ND	5
1,1,1-Trichloroethane	71-55-6	ND	5
1,1,2-Trichloroethane	79-00-5	ND	5
Trichloroethene	79-01-6	ND	5
Vinyl Acetate	108-05-4	ND	50
Vinyl Chloride	75-01-4	ND	10
Xylenes, total	1330-20-7	ND	10

ND = Not Detected

CLIENT ID: LF-2
CLIENT JOB NO: 2407.5
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
INSTRUMENT: 11

MED-TOX LAB NO: 9111029-05J
MED-TOX JOB NO: 9111029
DATE EXTRACTED: 11/11/91
DATE ANALYZED: 11/14/91
REPORT DATE: 11/21/91

EPA METHOD 8270
BASE NEUTRAL EXTRACTABLES
(WATER MATRIX)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acenaphthene	83-32-9	ND	10
Acenaphthylene	208-96-8	ND	10
Anthracene	120-12-7	ND	10
Benzidine	92-87-5	ND	50
Benzoic Acid	65-85-0	ND	50
Benzo(a)anthracene	56-55-3	ND	10
Benzo(b)fluoranthene	205-99-2	ND	10
Benzo(k)fluoranthene	207-08-9	ND	10
Benzo(g,h,i)perylene	191-24-2	ND	10
Benzo(a)pyrene	50-32-8	ND	10
Benzyl Alcohol	100-51-6	ND	20
Bis(2-chloroethoxy) methane	111-91-1	ND	10
Bis(2-chloroethyl)ether	111-44-4	ND	10
Bis(2-chloroisopropyl) ether	39638-32-9	ND	10
Bis(2-ethylhexyl) phthalate	117-81-7	ND	20
4-Bromophenyl phenyl ether	101-55-3	ND	10
Butylbenzyl phthalate	85-68-7	ND	10
4-Chloroaniline	106-47-8	ND	20
2-Chloronaphthalene	91-58-7	ND	10
4-Chlorophenyl phenyl ether	7005-72-3	ND	10
Chrysene	218-01-9	ND	10
Dibenzo(a,h)anthracene	53-70-3	ND	10
Dibenzofuran	132-64-9	ND	10
Di-n-butylphthalate	84-74-2	ND	10
1,2-Dichlorobenzene	95-50-1	ND	10

ND = Not Detected

CLIENT ID: LF-2
CLIENT JOB NO: 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
INSTRUMENT: 11

MED-TOX LAB NO: 9111029-05J
MED-TOX JOB NO: 9111029
DATE EXTRACTED: 11/11/91
DATE ANALYZED: 11/14/91
REPORT DATE: 11/21/91

EPA METHOD 8270
BASE NEUTRAL EXTRACTABLES (cont.)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1,3-Dichlorobenzene	541-73-1	ND	10
1,4-Dichlorobenzene	106-46-7	ND	10
3,3'-Dichlorobenzidine	91-94-1	ND	20
Diethylphthalate	84-66-2	ND	10
Dimethylphthalate	131-11-3	ND	10
2,4-Dinitrotoluene	121-14-2	ND	10
2,6-Dinitrotoluene	606-20-2	ND	10
Di-n-octylphthalate	117-84-0	ND	10
1,2-Diphenylhydrazine	122-66-7	ND	10
Fluoranthene	206-44-0	ND	10
Fluorene	86-73-7	ND	10
Hexachlorobenzene	118-74-1	ND	10
Hexachlorobutadiene	87-68-3	ND	10
Hexachlorocyclopentadiene	77-47-4	ND	10
Hexachloroethane	67-72-1	ND	10
Indeno(1,2,3-cd)pyrene	193-39-5	ND	10
Isophorone	78-59-1	ND	10
2-Methylnaphthalene	91-57-6	ND	10
Naphthalene	91-20-3	ND	10
2-Nitroaniline	88-74-4	ND	50
3-Nitroaniline	99-09-2	ND	50
4-Nitroaniline	100-01-6	ND	50
Nitrobenzene	98-95-3	ND	10
N-nitrosodimethylamine	62-75-9	ND	10
N-nitrosodiphenylamine	86-30-6	ND	10
N-nitroso-di-n-propylamine	621-64-7	ND	10
Phenanthrene	85-01-8	ND	10
Pyrene	129-00-0	ND	10
1,2,4-Trichlorobenzene	120-82-1	ND	10

ND = Not Detected

CLIENT ID: LF-2
CLIENT JOB NO: 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
INSTRUMENT: 11

MED-TOX LAB NO: 9111029-05J
MED-TOX JOB NO: 9111029
DATE EXTRACTED: 11/11/91
DATE ANALYZED: 11/14/91
REPORT DATE: 11/21/91

EPA METHOD 8270
BASE NEUTRAL EXTRACTABLES (cont.)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
PCB-1016	12674-11-2	ND	50
PCB-1221	11104-28-2	ND	50
PCB-1232	11141-16-5	ND	50
PCB-1242	53469-21-9	ND	50
PCB-1248	12672-29-6	ND	50
PCB-1254	11097-69-1	ND	50
PCB-1260	11096-82-5	ND	50

EPA METHOD 8270
ACID EXTRACTABLES

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
4-Chloro-3-methylphenol	59-50-7	ND	10
2-Chlorophenol	95-57-8	ND	10
2,4-Dichlorophenol	120-83-2	ND	10
2,4-Dimethylphenol	105-67-9	ND	10
4,6-Dinitro-2-methylphenol	534-52-1	ND	50
2,4-Dinitrophenol	51-28-5	ND	50
2-Methylphenol	95-48-7	ND	10
4-Methylphenol	106-44-5	ND	10
2-Nitrophenol	88-75-5	ND	10
4-Nitrophenol	100-02-7	ND	50
Pentachlorophenol	87-86-5	ND	50
Phenol	108-95-2	ND	10
2,4,5-Trichlorophenol	95-95-4	ND	10
2,4,6-Trichlorophenol	88-06-2	ND	10

ND = Not Detected

LEVINE-FRICKE

CLIENT ID: LF-3
CLIENT PROJ. ID: 2407.05
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-03H
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/06-13/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.002	6010	ICP
As	Arsenic	3.1	0.002	7060	V22
Ba	Barium	0.077	0.002	6010	ICP
Be	Beryllium	0.001	0.001	6010	ICP
Cd	Cadmium	ND	0.005	6010	ICP
Co	Cobalt	0.016	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.004	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	0.16	0.01	6010	ICP
Ni	Nickel	0.012	0.003	6010	ICP
Pb	Lead	ND	0.005	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	0.006	0.005	6010	ICP
Zn	Zinc	3.1	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: LF-2
CLIENT PROJ. ID: 2407.05
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-05I
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/06-13/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.002	6010	ICP
As	Arsenic	0.028	0.002	7060	V22
Ba	Barium	0.026	0.002	6010	ICP
Be	Beryllium	ND	0.001	6010	ICP
Cd	Cadmium	0.009	0.005	6010	ICP
Co	Cobalt	0.18	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	0.008	0.004	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	0.52	0.003	6010	ICP
Pb	Lead	ND	0.005	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	4.2	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: LF-1
CLIENT PROJ. ID: 2407.05
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111031-01H
MED-TOX JOB NO: 9111031
DATE ANALYZED: 11/06-08/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	0.054	0.005	6010	ICP
As	Arsenic	0.004	0.002	7060	V22
Ba	Barium	0.046	0.002	6010	ICP
Be	Beryllium	0.11	0.001	6010	ICP
Cd	Cadmium	130	0.05 *	6010	ICP
Co	Cobalt	5.7	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	1.9	0.04	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	0.11	0.01	6010	ICP
Ni	Nickel	20	0.01 *	6010	ICP
Pb	Lead	0.5	0.2 *	6010	ICP
Sb	Antimony	ND	0.2	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	1 *	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	40,000	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

* Elevated detection limits due to spectral interference.

LEVINE-FRICKE

CLIENT ID: LF-3
CLIENT PROJ. ID: 2407.05
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-03F
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/05-13/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	530 *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	88	0.03	6010	ICP
	Chloride	250	0.1	300	DIONEX
Cu	Copper	ND	0.04	6010	ICP
Fe	Iron	55	0.05	6010	ICP
Mg	Magnesium	24	0.04	6010	ICP
Mn	Manganese	4.3	0.002	6010	ICP
	pH	6.4 **	NA	9040	ISE
Na	Sodium	920	0.05	6010	ICP
	Sulfate	1,600	0.5	300	DIONEX
	Conductivity	4,900 ***	20	120.1	YSI
	Total Dissolved Solids	3,100	10	160.1	ME-1
	Hardness	320 *	1	314-A	ICP
Zn	Zinc	3.1	0.005	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: LF-2
CLIENT PROJ. ID: 2407.05
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111029-05G
MED-TOX JOB NO: 9111029
DATE ANALYZED: 11/05-13/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	53 *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	270	0.03	6010	ICP
	Chloride	460	0.1	300	DIONEX
Cu	Copper	ND	0.04	6010	ICP
Fe	Iron	40	0.05	6010	ICP
Mg	Magnesium	62	0.04	6010	ICP
Mn	Manganese	11	0.002	6010	ICP
	pH	5.6 **	NA	9040	ISE
Na	Sodium	670	0.05	6010	ICP
	Sulfate	2,100	0.5	300	DIONEX
	Conductivity	5,100 ***	20	120.1	YSI
	Total Dissolved Solids	3,700	10	160.1	ME-1
	Hardness	920 *	1	314-A	ICP
Zn	Zinc	4.2	0.005	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: LF-1
CLIENT PROJ. ID: 2407.05
DATE RECEIVED: 11/05/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111031-01F
MED-TOX JOB NO: 9111031
DATE ANALYZED: 11/05-13/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	ND *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	240	0.03	6010	ICP
	Chloride	2,300	0.1	300	DIONEX
Cu	Copper	1.9	0.04	6010	ICP
Fe	Iron	2,900	0.05	6010	ICP
Mg	Magnesium	860	0.04	6010	ICP
Mn	Manganese	350	0.002	6010	ICP
	pH	4.0 **	NA	9040	ISE
Na	Sodium	2,500	0.05	6010	ICP
	Sulfate	91,000	0.5	300	DIONEX
	Conductivity	49,000 ***	20	120.1	YSI
	Total Dissolved Solids	33,000	10	160.1	ME-1
	Hardness	4,400 *	1	314-A	ICP
Zn	Zinc	40,000	0.005	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

MED-TOX ASSOCIATES, INC

QUALITY CONTROL DATA

LEVINE-FRICKE

CLIENT PROJECT ID: 2407.05

MED-TOX JOB NOS: 9111029 & 9111031

DATE EXTRACTED: 11/11/91
DATE ANALYZED: 11/12/91
SAMPLE SPIKED: D.I. WATER

MED-TOX JOB NO: 9111031
CLIENT PROJ. ID: 2407.05
INSTRUMENT: IR

IR DETERMINATION FOR OIL & GREASE/HYDROCARBONS
METHOD SPIKE RECOVERY SUMMARY
WATER MATRIX

ANALYTE	MS Conc. (mg/L)	Sample Result (mg/L)	MS Result (mg/L)	MSD Result (mg/L)	Average Percent Recovery	RPD
Oil	6.95	ND	6.48	6.79	95.5	4.7

CURRENT QC LIMITS (Revised 08/14/91)

Analyte	Percent Recovery	RPD
Oil	(87-116)	6.5

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE EXTRACTED: 11/13/91
DATE ANALYZED: 11/13/91
SAMPLE SPIKED: D.I. WATER

MED-TOX JOB NOS: 9111029, 9111031
CLIENT PROJ. ID: 2407.05
INSTRUMENT: C

MATRIX SPIKE RECOVERY SUMMARY
TPH EXTRACTABLE WATERS
METHOD 3510
(WATER MATRIX; EXTRACTION METHOD)

ANALYTE	Spike Conc. (mg/L)	Sample Result (mg/L)	MS Result (mg/L)	MSD Result (mg/L)	Average Percent Recovery	RPD
Diesel	0.636	ND	0.405	0.450	67.2	10.5

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Diesel	(49.3-101.4)	29.0

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 11/08/91
SAMPLE SPIKED: 9111029-01A
CLIENT PROJ. ID: 2407.05

MED-TOX JOB NOS: 9111029, 9111031
INSTRUMENT: F

MATRIX SPIKE RECOVERY SUMMARY
METHOD 5030 w/GCFID/8020
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
Benzene	16.9	ND	15.6	15.0	90.5	3.9
Toluene	71.1	ND	67.9	66.4	94.4	2.2
Hydrocarbons as Gasoline	519	ND	511	526	99.9	2.9

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Benzene	(77.7-118.0)	10.3
Toluene	(80.7-116.2)	10.1
Gasoline	(72.5-110.7)	13.6

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

INSTRUMENT: 12

MED-TOX JOB NOS: 9111029, 9111031

CLIENT PROJ. ID: 2407.05

SURROGATE STANDARD RECOVERY SUMMARY

METHOD 8240
(WATER MATRIX)

SAMPLE IDENTIFICATION			SURROGATE RECOVERY (PERCENT)		
Date Analyzed	Client Id.	Lab No.	1,2-Dichloroethane-d_4	Toluene-d_8	p-Bromofluorobenzene
9111029					
11/13/91	LF-3	03D	102.5	94.7	101.6
11/13/91	TRIP BLANK	04D	100.7	103.4	103.4
11/12/91	LF-2	05C	106.8	107.3	108.2
9111031					
11/10/91	LF-1	01C	120.8	101.0	101.8

CURRENT QC LIMITS

ANALYTE	PERCENT RECOVERY
1,2-Dichloroethane-d_4	(83-127)
Toluene-d_8	(90-108)
p-Bromofluorobenzene	(91-109)

DATE ANALYZED: 11/10/91
SAMPLE SPIKED: 9111032-02A
INSTRUMENT: 12

MED-TOX JOB NO: 9111031
CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

METHOD 8240
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
1,1-Dichloroethene	50.0	ND	52.7	51.2	103.9	2.9
Trichloroethene	50.0	ND	52.5	48.4	100.9	8.1
Benzene	50.0	ND	50.4	48.9	99.3	3.0
Toluene	50.0	ND	49.9	47.8	97.7	4.3
Chlorobenzene	50.0	ND	53.9	51.1	105.0	5.3

CURRENT QC LIMITS (Revised 08/13/91)

Analyte	Percent Recovery	RPD
1,1-Dichloroethene	(65-133)	13.5
Trichloroethene	(84-120)	8.7
Benzene	(84-121)	9.4
Toluene	(89-119)	8.4
Chlorobenzene	(83-116)	7.5

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 11/12/91
SAMPLE SPIKED: 9111029-05C
INSTRUMENT: 12

MED-TOX JOB NO: 9111029
CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

METHOD 8240
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
1,1-Dichloroethene	50.0	ND	53.8	53.8	107.6	0.0
Trichloroethene	50.0	ND	50.7	48.9	99.6	3.6
Benzene	50.0	ND	52.8	51.9	104.7	1.7
Toluene	50.0	ND	51.5	48.7	100.2	5.6
Chlorobenzene	50.0	ND	50.4	50.1	100.5	0.6

CURRENT QC LIMITS (Revised 08/13/91)

Analyte	Percent Recovery	RPD
1,1-Dichloroethene	(65-133)	13.5
Trichloroethene	(84-120)	8.7
Benzene	(84-121)	9.4
Toluene	(89-119)	8.4
Chlorobenzene	(83-116)	7.5

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 11/14/91

INSTRUMENT: 11

MED-TOX JOB NO: 9111029

CLIENT PROJ. ID: 2407.05

SURROGATE STANDARD RECOVERY SUMMARY

METHOD 8270
(WATER MATRIX)

SAMPLE IDENTIFICATION			SURROGATE RECOVERY (PERCENT)					
Date Extracted	Client Id.	Lab No.	Nitro-benzene-d_5	2-Fluoro-biphenyl	Terphenyl-d_{14}	Phenol-d_5	2-Fluoro-phenol	2,4,6-Tribromo-phenol
11/11/91	LF-2	051	83.5	82.5	80.2	80.9	75.4	112.0

CURRENT QC LIMITS

ANALYTE	PERCENT RECOVERY
Nitrobenzene-d_5	(41-105)
2-Fluorobiphenyl	(45-110)
Terphenyl-d_{14}	(31-139)
Phenol-d_5	(37-107)
2-Fluorophenol	(34- 95)
2,4,6-Tribromophenol	(33-145)

DATE EXTRACTED: 11/11/91
DATE ANALYZED: 11/14/91
CLIENT PROJ. ID: 910339

MED-TOX JOB NO: 9111029
SAMPLE SPIKED: POLAR WATER
INSTRUMENT: 11

MATRIX SPIKE RECOVERY SUMMARY
METHOD 8270
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
Phenol	234	ND	164	187	75.0	13.1
2-Chlorophenol	203	ND	132	152	70.0	14.1
1,4-Dichlorobenzene	201	ND	118	136	63.2	14.2
N-Nitroso-di-n-propylamine	201	ND	131	140	67.4	6.6
1,2,4-Trichlorobenzene	209	ND	134	151	68.2	11.9
4-Chloro-3-methylphenol	204	ND	160	172	81.4	7.2
Acenaphthene	205	ND	152	160	76.1	5.1
4-Nitrophenol	201	ND	160	172	82.6	7.2
2,4-Dinitrotoluene	404	ND	302	323	77.4	6.7
Pentachlorophenol	408	ND	373	405	95.3	8.2
Pyrene	202	ND	159	172	81.9	7.9

CURRENT QC LIMITS

Analyte	Percent Recovery	RPD
Phenol	(46- 92)	19
2-Chlorophenol	(51- 85)	26
1,4-Dichlorobenzene	(32- 85)	26
N-Nitroso-di-n-propylamine	(36-107)	17
1,2,4-Trichlorobenzene	(34- 87)	20
4-Chloro-3-methylphenol	(48-103)	14
Acenaphthene	(49-117)	15
4-Nitrophenol	(23-104)	16
2,4-Dinitrotoluene	(48-102)	16
Pentachlorophenol	(20-125)	22
Pyrene	(34-138)	10

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

MATRIX: WATER

MED-TOX JOB NOS: 9111029, 9111031

CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

COMPOUND	INST./ METHOD	SAMPLE SPIKED	SAMPLE RESULT	SPIKE ADDED	OBSERVED RECOVERIES (mg/L) MS	MSD	% REC.	RPD	QC CONTROL LIMITS REC. % LIMIT	RPD LIMIT
As, Arsenic	V22/7060	9111029-02I	0.0261	0.04	0.0561	0.0574	76.6	2.3	56.1-141.7	16.0
Ba, Barium	ICP/6010	9111029-02I	0.082	2.00	2.07	2.09	99.9	1.27	82.4-107.9	5.0
Cd, Cadmium	ICP/6010	9111029-02I	ND	0.10	0.0960	0.0957	95.8	0.25	60.3-114.4	8.0
Cr, Chromium	ICP/6010	9111029-02I	ND	0.50	0.480	0.484	96.4	0.82	72.9-109.7	5.0
Cu, Copper	ICP/6010	9111029-02I	ND	0.50	0.492	0.497	98.9	1.09	78.1-111.9	5.0
Hg, Mercury	Hg/7470	9111035-01D	ND	2.0 ug/L	2.004	2.004	100.2	0.08	95.0-105.0	2.0
Ni, Nickel	ICP/6010	9111029-02I	0.017	0.50	0.493	0.500	95.9	1.23	74.6-108.7	5.0
Pb, Lead	ICP/6010	9111029-02I	ND	0.50	0.498	0.502	100.0	0.62	74.8-110.9	5.0
Se, Selenium	V22/7740	9111029-02I	ND	0.08	0.0588	0.0577	72.8	1.9	51.1-136.2	17.4
Zn, Zinc	ICP/6010	9111029-02I	0.034	0.50	0.526	0.529	98.7	0.52	67.4-109.8	5.0
Chloride	DIONEX/300	9111037-05A	78.2	50	134.6	135.6	113.8	0.74	84.8-133.0	5.3
Sulfate	DIONEX/300	9111037-05A	34.0	100	138	139	104.2	1.0	82.6-116.2	7.1
Sulfide	NOVASPEC/367.2	9111029-02G	ND	0.2	0.197	0.199	99.1	0.81	80-120	15

ND = Not Detected

RI, SF
RS, SH
Cl, SI

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

9111029

Project No.: 2407.05	Field Logbook No.:	Date: 11/4/91	Serial No.: 7572
Project Name: Volvo GM	Project Location: Oakland		
Sampler (Signature): [signature]			Samplers: GTM THB

SAMPLES						ANALYSES										REMARKS
SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CON-TAINERS	SAMPLE TYPE	TPH G (~~EPA 602~~)	~~EPA 624~~ EPA 8240	TPH diesel	General Minerals + Sulfate	Title 22 Metals	TDS		HOLD	RUSH EPA 5520	EPA 8270 + PCB	
LF-4BB	11/4	10:15	1A-D	4	water	X	X									
LF-4	11/4	10:40	2A-J	10			X	X	X	X	X	X					
LF-3	11/4	12:30	3A-I				X	X	X	X	X	X					No dup for diesel on LF-3 + LF-1
Trip Blank	11/4	8:00	4A-D	4			X	X									
LF-2	11/4	13:30	5A-K	10			X	X	X	X	X					X	
LF-1	11/4	15:30		11			X	X	X	X	X	X			X		9111031-1A-K

RELINQUISHED BY: (Signature) [signature]	DATE 11/4/91	TIME 1700	RECEIVED BY: (Signature) Kim Flores	DATE 11/5/91	TIME 2:45
RELINQUISHED BY: (Signature) Kim Flores	DATE 11/5/91	TIME 3:55	RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature) Denise Harrington	DATE 11/5/91	TIME 1555
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector: LEVINE-FRICKE
1900 Powell Street, 12th Floor
Emeryville, Ca 94608
(415) 652-4500

Analytical Laboratory: Med Tox

Shipping C (White) Lab Copy (Green) File Copy (Yellow) d Copy (Pink) FORM N 5/COC/A

FILE

ANALYTICAL SERVICES

MED-TOX ASSOCIATES, INC

2407.05

S CERTIFICATION NO: E772

CERTIFICATE OF ANALYSIS

LEVINE-FRICKE
1900 POWELL ST., 12TH FL.
EMERYVILLE, CA 94608

ATTN: KATHLEEN ISAACSON

CLIENT PROJ. ID: 2407.05
C.O.C. NOS: 8378

REPORT DATE: 11/21/91

DATE SAMPLED: 11/04-05/91

DATE RECEIVED: 11/06/91

MED-TOX JOB NO: 9111043

ANALYSIS OF: WATER SAMPLES

Sample Identification Client Id.	Lab No.	Sulfide (mg/L)
LF-5	01F	ND
LF-6	02D	ND
LF-7	03D	ND
MW-3	04B	ND
MW-4	06B	ND
MW-1	07B	ND
Detection limit		1

EPA Method: 367.2

Instrument: NOVASPEC

Date analyzed: 11/13/91

ND = Not Detected

Sherri Moore, Manager
Inorganic Laboratory

Andrew Bradeen, Manager
Organic Laboratory

Results FAXed 11/15-18/91

MED-TOX ASSOCIATES, INC

LEVINE-FRICKE

CLIENT ID: LF-5
CLIENT PROJ. ID: 2407.5
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-01B
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/10/91
INSTRUMENT: 12

EPA METHOD 8240 (WATER MATRIX)
GC/MS VOLATILE ORGANIC COMPOUNDS

VOCs

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acetone	67-64-1	ND	100
Benzene	71-43-2	ND	5
Bromodichloromethane	75-27-4	ND	5
Bromoform	75-25-2	ND	5
Bromomethane	74-83-9	ND	10
2-Butanone	78-93-3	ND	100
Carbon Disulfide	75-15-0	ND	10
Carbon Tetrachloride	56-23-5	ND	5
Chlorobenzene	108-90-7	ND	5
Chloroethane	75-00-3	ND	10
2-Chloroethyl Vinyl Ether	110-75-8	ND	10
Chloroform	67-66-3	ND	5
Chloromethane	74-87-3	ND	10
Dibromochloromethane	124-48-1	ND	5
1,1-Dichloroethane	75-34-3	ND	5
1,2-Dichloroethane	107-06-2	ND	5
1,1-Dichloroethene	75-35-4	ND	5
cis-1,2-Dichloroethene	156-69-9	ND	5
trans-1,2-Dichloroethene	156-60-5	ND	5
1,2-Dichloropropane	78-87-5	ND	5
cis-1,3-Dichloropropene	10061-01-5	ND	5
trans-1,3-Dichloropropene	10061-02-6	ND	5
Ethylbenzene	100-41-4	ND	5
2-Hexanone	591-78-6	ND	50
Methylene Chloride	75-09-2	ND	5
4-Methyl-2-pentanone	108-10-1	ND	50
Styrene	100-42-5	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	5
Tetrachloroethene	127-18-4	ND	5
Toluene	108-88-3	ND	5
1,1,1-Trichloroethane	71-55-6	ND	5
1,1,2-Trichloroethane	79-00-5	ND	5
Trichloroethene	79-01-6	ND	5
Vinyl Acetate	108-05-4	ND	50
Vinyl Chloride	75-01-4	ND	10
Xylenes, total	1330-20-7	ND	10

ND = Not Detected

MED-TOX ASSOCIATES, INC.

LEVINE-FRICKE

CLIENT ID: LF-6
CLIENT PROJ. ID: 2407.5
DATE SAMPLED: 11/05/91
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-02B
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/10/91
INSTRUMENT: 12

EPA METHOD 8240 (WATER MATRIX)
GC/MS VOLATILE ORGANIC COMPOUNDS

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acetone	67-64-1	ND	100
Benzene	71-43-2	ND	5
Bromodichloromethane	75-27-4	ND	5
Bromoform	75-25-2	ND	5
Bromomethane	74-83-9	ND	10
2-Butanone	78-93-3	ND	100
Carbon Disulfide	75-15-0	ND	10
Carbon Tetrachloride	56-23-5	ND	5
Chlorobenzene	108-90-7	ND	5
Chloroethane	75-00-3	ND	10
2-Chloroethyl Vinyl Ether	110-75-8	ND	10
Chloroform	67-66-3	ND	5
Chloromethane	74-87-3	ND	10
Dibromochloromethane	124-48-1	ND	5
1,1-Dichloroethane	75-34-3	ND	5
1,2-Dichloroethane	107-06-2	ND	5
1,1-Dichloroethene	75-35-4	ND	5
cis-1,2-Dichloroethene	156-69-9	ND	5
trans-1,2-Dichloroethene	156-60-5	ND	5
1,2-Dichloropropane	78-87-5	ND	5
cis-1,3-Dichloropropene	10061-01-5	ND	5
trans-1,3-Dichloropropene	10061-02-6	ND	5
Ethylbenzene	100-41-4	ND	5
2-Hexanone	591-78-6	ND	50
Methylene Chloride	75-09-2	ND	5
4-Methyl-2-pentanone	108-10-1	ND	50
Styrene	100-42-5	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	5
Tetrachloroethene	127-18-4	ND	5
Toluene	108-88-3	ND	5
1,1,1-Trichloroethane	71-55-6	ND	5
1,1,2-Trichloroethane	79-00-5	ND	5
Trichloroethene	79-01-6	ND	5
Vinyl Acetate	108-05-4	ND	50
Vinyl Chloride	75-01-4	ND	10
Xylenes, total	1330-20-7	ND	10

ND = Not Detected

MED-TOX ASSOCIATES, INC.

LEVINE-FRICKE

CLIENT ID: LF-7
CLIENT PROJ. ID: 2407.5
DATE SAMPLED: 11/05/91
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-03B
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/10/91
INSTRUMENT: 12

EPA METHOD 8240 (WATER MATRIX)
GC/MS VOLATILE ORGANIC COMPOUNDS

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acetone	67-64-1	ND	100
Benzene	71-43-2	ND	5
Bromodichloromethane	75-27-4	ND	5
Bromoform	75-25-2	ND	5
Bromomethane	74-83-9	ND	10
2-Butanone	78-93-3	ND	100
Carbon Disulfide	75-15-0	ND	10
Carbon Tetrachloride	56-23-5	ND	5
Chlorobenzene	108-90-7	ND	5
Chloroethane	75-00-3	ND	10
2-Chloroethyl Vinyl Ether	110-75-8	ND	10
Chloroform	67-66-3	ND	5
Chloromethane	74-87-3	ND	10
Dibromochloromethane	124-48-1	ND	5
1,1-Dichloroethane	75-34-3	ND	5
1,2-Dichloroethane	107-06-2	ND	5
1,1-Dichloroethene	75-35-4	ND	5
cis-1,2-Dichloroethene	156-69-9	ND	5
trans-1,2-Dichloroethene	156-60-5	ND	5
1,2-Dichloropropane	78-87-5	ND	5
cis-1,3-Dichloropropene	10061-01-5	ND	5
trans-1,3-Dichloropropene	10061-02-6	ND	5
Ethylbenzene	100-41-4	ND	5
2-Hexanone	591-78-6	ND	50
Methylene Chloride	75-09-2	ND	5
4-Methyl-2-pentanone	108-10-1	ND	50
Styrene	100-42-5	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	5
Tetrachloroethene	127-18-4	ND	5
Toluene	108-88-3	ND	5
1,1,1-Trichloroethane	71-55-6	ND	5
1,1,2-Trichloroethane	79-00-5	ND	5
Trichloroethene	79-01-6	ND	5
Vinyl Acetate	108-05-4	ND	50
Vinyl Chloride	75-01-4	ND	10
Xylenes, total	1330-20-7	ND	10

ND = Not Detected

CLIENT ID: LF-5
CLIENT JOB NO: 2407.5
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
INSTRUMENT: 11

MED-TOX LAB NO: 9111043-01D
MED-TOX JOB NO: 9111043
DATE EXTRACTED: 11/11/91
DATE ANALYZED: 11/14/91
REPORT DATE: 11/21/91

EPA METHOD 8270
BASE NEUTRAL EXTRACTABLES
(WATER MATRIX)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Acenaphthene	83-32-9	ND	10
Acenaphthylene	208-96-8	ND	10
Anthracene	120-12-7	ND	10
Benzidine	92-87-5	ND	50
Benzoic Acid	65-85-0	ND	50
Benzo(a)anthracene	56-55-3	ND	10
Benzo(b)fluoranthene	205-99-2	ND	10
Benzo(k)fluoranthene	207-08-9	ND	10
Benzo(g,h,i)perylene	191-24-2	ND	10
Benzo(a)pyrene	50-32-8	ND	10
Benzyl Alcohol	100-51-6	ND	20
Bis(2-chloroethoxy) methane	111-91-1	ND	10
Bis(2-chloroethyl)ether	111-44-4	ND	10
Bis(2-chloroisopropyl) ether	39638-32-9	ND	10
Bis(2-ethylhexyl) phthalate	117-81-7	ND	20
4-Bromophenyl phenyl ether	101-55-3	ND	10
Butylbenzyl phthalate	85-68-7	ND	10
4-Chloroaniline	106-47-8	ND	20
2-Chloronaphthalene	91-58-7	ND	10
4-Chlorophenyl phenyl ether	7005-72-3	ND	10
Chrysene	218-01-9	ND	10
Dibenzo(a,h)anthracene	53-70-3	ND	10
Dibenzofuran	132-64-9	ND	10
Di-n-butylphthalate	84-74-2	ND	10
1,2-Dichlorobenzene	95-50-1	ND	10

ND = Not Detected

CLIENT ID: LF-5
CLIENT JOB NO: 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
INSTRUMENT: 11

MED-TOX LAB NO: 9111043-01D
MED-TOX JOB NO: 9111043
DATE EXTRACTED: 11/11/91
DATE ANALYZED: 11/14/91
REPORT DATE: 11/21/91

EPA METHOD 8270
BASE NEUTRAL EXTRACTABLES (cont.)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1,3-Dichlorobenzene	541-73-1	ND	10
1,4-Dichlorobenzene	106-46-7	ND	10
3,3'-Dichlorobenzidine	91-94-1	ND	20
Diethylphthalate	84-66-2	ND	10
Dimethylphthalate	131-11-3	ND	10
2,4-Dinitrotoluene	121-14-2	ND	10
2,6-Dinitrotoluene	606-20-2	ND	10
Di-n-octylphthalate	117-84-0	ND	10
1,2-Diphenylhydrazine	122-66-7	ND	10
Fluoranthene	206-44-0	ND	10
Fluorene	86-73-7	ND	10
Hexachlorobenzene	118-74-1	ND	10
Hexachlorobutadiene	87-68-3	ND	10
Hexachlorocyclopentadiene	77-47-4	ND	10
Hexachloroethane	67-72-1	ND	10
Indeno(1,2,3-cd)pyrene	193-39-5	ND	10
Isophorone	78-59-1	ND	10
2-Methylnaphthalene	91-57-6	ND	10
Naphthalene	91-20-3	ND	10
2-Nitroaniline	88-74-4	ND	50
3-Nitroaniline	99-09-2	ND	50
4-Nitroaniline	100-01-6	ND	50
Nitrobenzene	98-95-3	ND	10
N-nitrosodimethylamine	62-75-9	ND	10
N-nitrosodiphenylamine	86-30-6	ND	10
N-nitroso-di-n-propylamine	621-64-7	ND	10
Phenanthrene	85-01-8	ND	10
Pyrene	129-00-0	ND	10
1,2,4-Trichlorobenzene	120-82-1	ND	10

ND = Not Detected

CLIENT ID: LF-5
CLIENT JOB NO: 2407.05
DATE SAMPLED: 11/04/91
DATE RECEIVED: 11/05/91
INSTRUMENT: 11

MED-TOX LAB NO: 9111043-01D
MED-TOX JOB NO: 9111043
DATE EXTRACTED: 11/11/91
DATE ANALYZED: 11/14/91
REPORT DATE: 11/21/91

EPA METHOD 8270
BASE NEUTRAL EXTRACTABLES (cont.)

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
PCB-1016	12674-11-2	ND	50
PCB-1221	11104-28-2	ND	50
PCB-1232	11141-16-5	ND	50
PCB-1242	53469-21-9	ND	50
PCB-1248	12672-29-6	ND	50
PCB-1254	11097-69-1	ND	50
PCB-1260	11096-82-5	ND	50

EPA METHOD 8270
ACID EXTRACTABLES

COMPOUND	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
4-Chloro-3-methylphenol	59-50-7	ND	10
2-Chlorophenol	95-57-8	ND	10
2,4-Dichlorophenol	120-83-2	ND	10
2,4-Dimethylphenol	105-67-9	ND	10
4,6-Dinitro-2-methylphenol	534-52-1	ND	50
2,4-Dinitrophenol	51-28-5	ND	50
2-Methylphenol	95-48-7	ND	10
4-Methylphenol	106-44-5	ND	10
2-Nitrophenol	88-75-5	ND	10
4-Nitrophenol	100-02-7	ND	50
Pentachlorophenol	87-86-5	ND	50
Phenol	108-95-2	ND	10
2,4,5-Trichlorophenol	95-95-4	ND	10
2,4,6-Trichlorophenol	88-06-2	ND	10

ND = Not Detected

LEVINE-FRICKE

CLIENT ID: LF-5
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-01A
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/12-13/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	0.004	0.002	6010	ICP
As	Arsenic	ND	0.002	7060	V22
Ba	Barium	0.018	0.002	6010	ICP
Be	Beryllium	ND	0.001	6010	ICP
Cd	Cadmium	0.049	0.005	6010	ICP
Co	Cobalt	0.030	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.005	6010	ICP
Hg	Mercury	0.0004	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	0.23	0.003	6010	ICP
Pb	Lead	ND	0.005	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	11	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: LF-6
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-02A
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/12-13/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	0.011	0.002	6010	ICP
As	Arsenic	0.008	0.002	7060	V22
Ba	Barium	0.019	0.002	6010	ICP
Be	Beryllium	ND	0.001	6010	ICP
Cd	Cadmium	0.079	0.005	6010	ICP
Co	Cobalt	0.58	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.005	6010	ICP
Hg	Mercury	0.0009	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	2.1	0.003	6010	ICP
Pb	Lead	0.009	0.005	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	8.1	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: LF-7
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-03A
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/12-13/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.002	6010	ICP
As	Arsenic	0.004	0.002	7060	V22
Ba	Barium	0.13	0.002	6010	ICP
Be	Beryllium	ND	0.001	6010	ICP
Cd	Cadmium	ND	0.005	6010	ICP
Co	Cobalt	ND	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	0.006	0.005	6010	ICP
Hg	Mercury	0.0011	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	0.010	0.003	6010	ICP
Pb	Lead	ND	0.005	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	0.006	0.005	6010	ICP
Zn	Zinc	ND	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: MW-3
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-04A
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/12-13/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	0.005	0.002	6010	ICP
As	Arsenic	ND	0.002	7060	V22
Ba	Barium	0.017	0.002	6010	ICP
Be	Beryllium	0.001	0.001	6010	ICP
Cd	Cadmium	0.57	0.005	6010	ICP
Co	Cobalt	0.42	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	0.28	0.005	6010	ICP
Hg	Mercury	0.0028	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	1.2	0.003	6010	ICP
Pb	Lead	0.005	0.005	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	600	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: MW-4
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-06A
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/12-13/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.002	6010	ICP
As	Arsenic	0.007	0.002	7060	V22
Ba	Barium	0.017	0.002	6010	ICP
Be	Beryllium	ND	0.001	6010	ICP
Cd	Cadmium	ND	0.005	6010	ICP
Co	Cobalt	ND	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.005	6010	ICP
Hg	Mercury	0.0027	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	0.012	0.003	6010	ICP
Pb	Lead	ND	0.005	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	ND	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: MW-1
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-07A
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/12-13/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.002	6010	ICP
As	Arsenic	0.073	0.002	7060	V22
Ba	Barium	0.085	0.002	6010	ICP
Be	Beryllium	ND	0.001	6010	ICP
Cd	Cadmium	ND	0.005	6010	ICP
Co	Cobalt	0.008	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.005	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	0.02	0.01	6010	ICP
Ni	Nickel	0.032	0.003	6010	ICP
Pb	Lead	ND	0.005	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	2.7	0.005	6010	ICP

ND = Not Detected

INST. = Instrument Number

Note: Sample was filtered and preserved with Nitric Acid on 11/06/91.

LEVINE-FRICKE

CLIENT ID: LF-5
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-01F
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/06-14/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	550 *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	200	0.03	6010	ICP
	Chloride	1,100	0.1	300	DIONEX
Cu	Copper	ND	0.04	6010	ICP
Fe	Iron	0.34	0.05	6010	ICP
Mg	Magnesium	360	0.04	6010	ICP
Mn	Manganese	17	0.002	6010	ICP
	pH	6.7 **	NA	9040	ISE
Na	Sodium	2,800	0.05	6010	ICP
	Sulfate	4,800	0.5	300	DIONEX
	Conductivity	11,000 ***	20	120.1	YSI
	Total Dissolved Solids	9,100	10	160.1	ME-1
	Hardness	2,000 *	1	314-A	ICP
Zn	Zinc	11	0.005	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: LF-6
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-02D
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/06-14/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	22 *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	200	0.03	6010	ICP
	Chloride	540	0.1	300	DIONEX
Cu	Copper	ND	0.04	6010	ICP
Fe	Iron	25	0.05	6010	ICP
Mg	Magnesium	430	0.04	6010	ICP
Mn	Manganese	65	0.002	6010	ICP
	pH	5.0 **	NA	9040	ISE
Na	Sodium	990	0.05	6010	ICP
	Sulfate	4,200	0.5	300	DIONEX
	Conductivity	7,300 ***	20	120.1	YSI
	Total Dissolved Solids	6,900	10	160.1	ME-1
	Hardness	2,300 *	1	314-A	ICP
Zn	Zinc	8.1	0.005	6010	ICP

* mg $CaCO_3$/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: LF-7
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-03D
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/06-14/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	420 *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	49	0.03	6010	ICP
	Chloride	320	0.1	300	DIONEX
Cu	Copper	ND	0.04	6010	ICP
Fe	Iron	ND	0.05	6010	ICP
Mg	Magnesium	56	0.04	6010	ICP
Mn	Manganese	0.73	0.002	6010	ICP
	pH	7.3 **	NA	9040	ISE
Na	Sodium	360	0.05	6010	ICP
	Sulfate	250	0.5	300	DIONEX
	Conductivity	2,100 ***	20	120.1	YSI
	Total Dissolved Solids	1,200	10	160.1	ME-1
	Hardness	350 *	1	314-A	ICP
Zn	Zinc	ND	0.005	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: MW-3
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-04B
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/06-14/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	3 *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	280	0.03	6010	ICP
	Chloride	2,100	0.1	300	DIONEX
Cu	Copper	0.28	0.04	6010	ICP
Fe	Iron	12	0.05	6010	ICP
Mg	Magnesium	190	0.04	6010	ICP
Mn	Manganese	23	0.002	6010	ICP
	pH	5.0 **	NA	9040	ISE
Na	Sodium	740	0.05	6010	ICP
	Sulfate	1,600	0.5	300	DIONEX
	Conductivity	8,000 ***	20	120.1	YSI
	Total Dissolved Solids	5,900	10	160.1	ME-1
	Hardness	1,500 *	1	314-A	ICP
Zn	Zinc	600	0.005	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: MW-4
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-06B
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/06-14/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	260 *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	150	0.03	6010	ICP
	Chloride	200	0.1	300	DIONEX
Cu	Copper	ND	0.04	6010	ICP
Fe	Iron	ND	0.05	6010	ICP
Mg	Magnesium	180	0.04	6010	ICP
Mn	Manganese	0.13	0.002	6010	ICP
	pH	6.7 **	NA	9040	ISE
Na	Sodium	290	0.05	6010	ICP
	Sulfate	1,300	0.5	300	DIONEX
	Conductivity	3,100 ***	20	120.1	YSI
	Total Dissolved Solids	2,400	10	160.1	ME-1
	Hardness	1,100 *	1	314-A	ICP
Zn	Zinc	ND	0.005	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

LEVINE-FRICKE

CLIENT ID: MW-1
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-07B
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/06-14/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	250 *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	60	0.03	6010	ICP
	Chloride	28	0.1	300	DIONEX
Cu	Copper	ND	0.04	6010	ICP
Fe	Iron	ND	0.05	6010	ICP
Mg	Magnesium	29	0.04	6010	ICP
Mn	Manganese	2.0	0.002	6010	ICP
	pH	6.8 **	NA	9040	ISE
Na	Sodium	45	0.05	6010	ICP
	Sulfate	190	0.5	300	DIONEX
	Conductivity	930 ***	20	120.1	YSI
	Total Dissolved Solids	620	10	160.1	ME-1
	Hardness	270 *	1	314-A	ICP
Zn	Zinc	2.7	0.005	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

MED-TOX ASSOCIATES, INC.

QUALITY CONTROL DATA

LEVINE-FRICKE

CLIENT PROJECT ID: 2407.05

MED-TOX JOB NO: 9111043

INSTRUMENT: 12

MED-TOX JOB NO: 9111043

CLIENT PROJ. ID: 2407.05

SURROGATE STANDARD RECOVERY SUMMARY

METHOD 8240
(WATER MATRIX)

SAMPLE IDENTIFICATION			SURROGATE RECOVERY (PERCENT)		
Date Analyzed	Client Id.	Lab No.	1,2-Dichloro-ethane-d_4	Toluene-d_8	p-Bromofluoro-benzene
11/10/91	LF-5	01B	111.6	107.6	97.3
11/10/91	LF-6	02B	111.4	104.3	99.3
11/10/91	LF-7	03B	114.4	102.7	98.7

CURRENT QC LIMITS

ANALYTE	PERCENT RECOVERY
1,2-Dichloroethane-d_4	(83-127)
Toluene-d_8	(90-108)
p-Bromofluorobenzene	(91-109)

DATE ANALYZED: 11/10/91
SAMPLE SPIKED: 9111032-02A
INSTRUMENT: 12

MED-TOX JOB NO: 9111043
CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

METHOD 8240
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
1,1-Dichloroethene	50.0	ND	52.7	51.2	103.9	2.9
Trichloroethene	50.0	ND	52.5	48.4	100.9	8.1
Benzene	50.0	ND	50.4	48.9	99.3	3.0
Toluene	50.0	ND	49.9	47.8	97.7	4.3
Chlorobenzene	50.0	ND	53.9	51.1	105.0	5.3

CURRENT QC LIMITS (Revised 08/13/91)

Analyte	Percent Recovery	RPD
1,1-Dichloroethene	(65-133)	13.5
Trichloroethene	(84-120)	8.7
Benzene	(84-121)	9.4
Toluene	(89-119)	8.4
Chlorobenzene	(83-116)	7.5

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 11/14/91

INSTRUMENT: 11

MED-TOX JOB NO: 9111043

CLIENT PROJ. ID: 2407.05

SURROGATE STANDARD RECOVERY SUMMARY

METHOD 8270
(WATER MATRIX)

SAMPLE IDENTIFICATION			SURROGATE RECOVERY (PERCENT)					
Date Extracted	Client Id.	Lab No.	Nitrobenzene-d_5	2-Fluorobiphenyl	Terphenyl-d_{14}	Phenol-d_5	2-Fluorophenol	2,4,6-Tribromophenol
11/11/91	LF-5	010	80.0	74.9	78.6	79.4	68.9	97.0

CURRENT QC LIMITS

ANALYTE	PERCENT RECOVERY
Nitrobenzene-d_5	(41-105)
2-Fluorobiphenyl	(45-110)
Terphenyl-d_{14}	(31-139)
Phenol-d_5	(37-107)
2-Fluorophenol	(34- 95)
2,4,6-Tribromophenol	(33-145)

DATE EXTRACTED: 11/11/91
DATE ANALYZED: 11/14/91
CLIENT PROJ. ID: 2407.05

MED-TOX JOB NO: 9111043
SAMPLE SPIKED: POLAR WATER
INSTRUMENT: 11

MATRIX SPIKE RECOVERY SUMMARY
METHOD 8270
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
Phenol	234	ND	164	187	75.0	13.1
2-Chlorophenol	203	ND	132	152	70.0	14.1
1,4-Dichlorobenzene	201	ND	118	136	63.2	14.2
N-Nitroso-di-n-propylamine	201	ND	131	140	67.4	6.6
1,2,4-Trichlorobenzene	209	ND	134	151	68.2	11.9
4-Chloro-3-methylphenol	204	ND	160	172	81.4	7.2
Acenaphthene	205	ND	152	160	76.1	5.1
4-Nitrophenol	20[illegible]	ND	160	172	82.6	7.2
2,4-Dinitrotoluene	404	ND	302	323	77.4	6.7
Pentachlorophenol	408	ND	373	405	95.3	8.2
Pyrene	202	ND	159	172	81.9	7.9

CURRENT QC LIMITS

Analyte	Percent Recovery	RPD
Phenol	(46- 92)	19
2-Chlorophenol	(51- 85)	26
1,4-Dichlorobenzene	(32- 85)	26
N-Nitroso-di-n-propylamine	(36-107)	17
1,2,4-Trichlorobenzene	(34- 87)	20
4-Chloro-3-methylphenol	(48-103)	14
Acenaphthene	(49-117)	15
4-Nitrophenol	(23-104)	16
2,4-Dinitrotoluene	(48-102)	16
Pentachlorophenol	(20-125)	22
Pyrene	(34-138)	10

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

MATRIX: WATER

MED-TOX JOB NO: 9111043

CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

COMPOUND	INST./ METHOD	SAMPLE SPIKED	SAMPLE RESULT	SPIKE ADDED	OBSERVED RECOVERIES (mg/L) MS	MSD	% REC.	RPD	QC CONTROL LIMITS REC. % LIMIT	RPD LIMIT
As, Arsenic	V22/7060	9111041-01A	0.042	0.040	0.0796	0.0789	93.1	0.88	56.1-141.7	16.0
Ba, Barium	ICP/6010	9111068-01A	0.011	2.00	2.01	2.02	100.1	0.52	82.4-107.9	5.0
Cd, Cadmium	ICP/6010	9111068-01A	ND	0.10	0.0920	0.0928	92.4	0.80	60.3-114.4	8.0
Cr, Chromium	ICP/6010	9111068-01A	ND	0.50	0.500	0.504	100.3	0.82	72.9-109.7	5.0
Cu, Copper	ICP/6010	9111068-01A	1.314	0.50	1.784	1.778	93.4	0.36	78.1-111.9	5.0
Hg, Mercury	Hg/7470	9111043-07A	ND	2.0 ug/L	2.000	2.028	100.7	1.35	95.0-105.0	2.0
Ni, Nickel	ICP/6010	9111068-01A	0.369	0.50	0.870	0.873	100.5	0.33	74.6-108.7	5.0
Pb, Lead	ICP/6010	9111068-01A	0.026	0.50	0.499	0.498	94.6	0.19	74.8-110.9	5.0
Se, Selenium	V22/7740	9111041-01A	0.0913	0.080	0.1663	0.1605	90.1	3.5	51.1-136.2	17.4
Zn, Zinc	ICP/6010	9111068-01A	0.099	0.50	0.545	0.546	89.3	0.32	67.4-109.8	5.0
Chloride	DIONEX/300	9111043-07B	27.8	25	56.6	56.6	115.1	0.07	88-120	15
Sulfate	DIONEX/300	9111043-07B	194	50	246	245	102.1	0.26	80-120	15
Sulfide	NOVASPEC/367.2	9111029-02G	ND	0.2	0.197	0.199	99.1	0.81	80-120	15

ND = Not Detected

ANALYTICAL SERVICES

MED-TOX ASSOCIATES, INC

2407.05

'S CERTIFICATION NO: E772

CERTIFICATE OF ANALYSIS

LEVINE-FRICKE
1900 POWELL ST., 12TH FL.
EMERYVILLE, CA 94608

ATTN: KATHLEEN ISAACSON

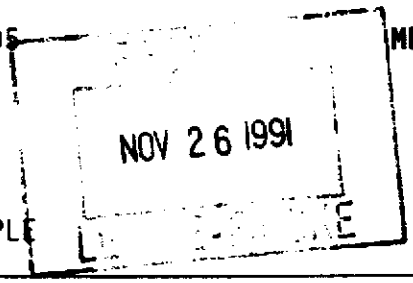
CLIENT PROJ. ID: 2407.05
C.O.C. NOS: 8378

REPORT DATE: 11/21/91

DATE SAMPLED: 11/05/91

DATE RECEIVED: 11/06/91

MED-TOX JOB NO: 9111043



ANALYSIS OF: WATER SAMPLE

Sample Identification Client Id.	Lab No.	Extractable Hydrocarbons as Diesel (mg/L)	Extractable Hydrocarbons as Oil (mg/L)	Sulfide (mg/L)
MW-2	05D	ND	ND	---
MW-2	05F	---	---	ND
Detection Limit		0.05	0.1	1
Method:		3510 GCFID	3510 GCFID	367.2
Instrument:		C	C	NOVASPEC
Date Extracted		11/14/91	11/14/91	---
Date Analyzed:		11/14/91	11/14/91	11/13/91

ND = Not Detected

Sherri Moore, Manager
Inorganic Laboratory

Andrew Bradeen, Manager
Organic Laboratory

Results FAXed 11/15-18/91

LEVINE-FRICKE

CLIENT ID: MW-2
CLIENT PROJ. ID: 2407.5
DATE SAMPLED: 11/05/91
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-05B
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/08/91
INSTRUMENT: F

BTEX AND HYDROCARBONS (WATER MATRIX)

METHOD: EPA 8020, 5030 GCFID

	CAS #	CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
Benzene	71-43-2	ND	0.3
Toluene	108-88-2	ND	0.3
Ethylbenzene	100-41-4	ND	0.3
Xylenes, Total	1330-20-7	ND	1
PURGEABLE HYDROCARBONS AS:			
Gasoline		ND mg/L	0.05 mg/L

ND = Not Detected

LEVINE-FRICKE

CLIENT ID: MW-2
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-05A
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/12-15/91

CCR 17 METALS
(WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	0.008	0.002	6010	ICP
As	Arsenic	2.1	0.002	7060	V22
Ba	Barium	0.013	0.002	6010	ICP
Be	Beryllium	0.002	0.001	6010	ICP
Cd	Cadmium	7.0	0.005	6010	ICP
Co	Cobalt	0.42	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	0.093	0.005	6010	ICP
Hg	Mercury	0.0055	0.0003	7470	Hg
Mo	Molybdenum	0.01	0.01	6010	ICP
Ni	Nickel	1.2	0.003	6010	ICP
Pb	Lead	ND	0.2 *	6010	ICP
Sb	Antimony	ND	0.2 *	6010	ICP
Se	Selenium	ND	0.004	7740	V22
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	4,200	0.5	6010	ICP

ND = Not Detected

INST. = Instrument Number

* Elevated detection limits due to spectral interference.

LEVINE-FRICKE

CLIENT ID: MW-2
CLIENT PROJ. ID: 2407.5
DATE RECEIVED: 11/06/91
REPORT DATE: 11/21/91

MED-TOX LAB NO: 9111043-05F
MED-TOX JOB NO: 9111043
DATE ANALYZED: 11/06-14/91

GENERAL MINERALS
(WATER MATRIX)

CODE	PARAMETER	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)	METHOD REFERENCE	INST.
	Bicarbonate Alkalinity	ND *	2	310.1	ISE
	Carbonate Alkalinity	ND *	2	310.1	ISE
	Hydroxide Alkalinity	ND *	2	310.1	ISE
Ca	Calcium	170	0.03	6010	ICP
	Chloride	470	0.1	300	DIONEX
Cu	Copper	0.09	0.04	6010	ICP
Fe	Iron	210	0.05	6010	ICP
Mg	Magnesium	130	0.04	6010	ICP
Mn	Manganese	30	0.002	6010	ICP
	pH	4.4 **	NA	9040	ISE
Na	Sodium	310	0.05	6010	ICP
	Sulfate	9,500	0.5	300	DIONEX
	Conductivity	10,000 ***	20	120.1	YSI
	Total Dissolved Solids	# 16,000	10	160.1	ME-1
	Hardness	960 *	1	314-A	ICP
Zn	Zinc	4,200	0.5	6010	ICP

* mg CaCO3/L
** standard units
*** umhos/cm

ND = Not Detected

NA = Not Applicable

INST. = Instrument Number

Positive interference in Total Dissolved Solids possibly due to fine particulate passing through the standard glass fiber filter.

MED-TOX ASSOCIATES, INC.

QUALITY CONTROL DATA

LEVINE-FRICKE

CLIENT PROJECT ID: 2407.05

MED-TOX JOB NO: 9111043

DATE EXTRACTED: 11/14/91
DATE ANALYZED: 11/14/91
SAMPLE SPIKED: D.I. WATER

MED-TOX JOB NO: 9111043
CLIENT PROJ. ID: 2407.05
INSTRUMENT: C

MATRIX SPIKE RECOVERY SUMMARY
TPH EXTRACTABLE WATERS
METHOD 3510
(WATER MATRIX; EXTRACTION METHOD)

ANALYTE	Spike Conc. (mg/L)	Sample Result (mg/L)	MS Result (mg/L)	MSD Result (mg/L)	Average Percent Recovery	RPD
Diesel	0.636	ND	0.405	0.450	67.2	10.5

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Diesel	(49.3-101.4)	29.0

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

DATE ANALYZED: 11/08/91
SAMPLE SPIKED: 9111029-01A
CLIENT PROJ. ID: 2407.05

MED-TOX JOB NO: 9111043
INSTRUMENT: F

MATRIX SPIKE RECOVERY SUMMARY
METHOD 5030 w/GCFID/8020
(WATER MATRIX)

ANALYTE	Spike Conc. (ug/L)	Sample Result (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	Average Percent Recovery	RPD
Benzene	16.9	ND	15.6	15.0	90.5	3.9
Toluene	71.1	ND	67.9	66.4	94.4	2.2
Hydrocarbons as Gasoline	519	ND	511	526	99.9	2.9

CURRENT QC LIMITS (Revised 08/15/91)

Analyte	Percent Recovery	RPD
Benzene	(77.7-118.0)	10.3
Toluene	(80.7-116.2)	10.1
Gasoline	(72.5-110.7)	13.6

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected

MATRIX: WATER

MED-TOX JOB NO: 9111043

CLIENT PROJ. ID: 2407.05

MATRIX SPIKE RECOVERY SUMMARY

COMPOUND	INST./ METHOD	SAMPLE SPIKED	SAMPLE RESULT	SPIKE ADDED	OBSERVED RECOVERIES (mg/L) MS	MSD	% REC.	RPD	QC CONTROL LIMITS REC. % LIMIT	RPD LIMIT
As, Arsenic	V22/7060	9111041-01A	0.042	0.040	0.0796	0.0789	93.1	0.88	56.1-141.7	16.0
Ba, Barium	ICP/6010	9111068-01A	0.011	2.00	2.01	2.02	100.1	0.52	82.4-107.9	5.0
Cd, Cadmium	ICP/6010	9111068-01A	ND	0.10	0.0920	0.0928	92.4	0.80	60.3-114.4	8.0
Cr, Chromium	ICP/6010	9111068-01A	ND	0.50	0.500	0.504	100.3	0.82	72.9-109.7	5.0
Cu, Copper	ICP/6010	9111068-01A	1.314	0.50	1.784	1.778	93.4	0.36	78.1-111.9	5.0
Hg, Mercury	Hg/7470	9111043-07A	ND	2.0 ug/L	2.000	2.028	100.7	1.35	95.0-105.0	2.0
Ni, Nickel	ICP/6010	9111068-01A	0.369	0.50	0.870	0.873	100.5	0.33	74.6-108.7	5.0
Pb, Lead	ICP/6010	9111068-01A	0.026	0.50	0.499	0.498	94.6	0.19	74.8-110.9	5.0
Se, Selenium	V22/7740	9111041-01A	0.0913	0.080	0.1663	0.1605	90.1	3.5	51.1-136.2	17.4
Zn, Zinc	ICP/6010	9111068-01A	0.099	0.50	0.545	0.546	89.3	0.32	67.4-109.8	5.0
Chloride	DIONEX/300	9111043-07B	27.8	25	56.6	56.6	115.1	0.07	88-120	15
Sulfate	DIONEX/300	9111043-07B	194	50	246	245	102.1	0.26	80-120	15
Sulfide	NOVASPEC/367.2	9111029-02G	ND	0.2	0.197	0.199	99.1	0.81	80-120	15

ND = Not Detected

C-1,S-I R-1,S-G
R-3,S-I R-5,S-I

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

9111043

Project No.: 2407.5	Field Logbook No.:	Date: 11/4/91	Serial No.: 8378
Project Name: GMC/Volvo	Project Location: Oakland, CA		

Sampler (Signature) :

Samplers: THB, GTM

SAMPLES						ANALYSES										
SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CONTAINERS	SAMPLE TYPE	Title 22 + EPA 601 metals	EPA 624 EPA 8240	TPH (gas) + BTEX	TPH (diesel)	EPA 5520	EPA 8270 + PCB	HOLD	RUSH	General Minerals + Sulfide	TDS	REMARKS
LF-5	11/4/91	15:45	01A-H	8	water	X	X				X		X	X		
LF-6	11/5/91	10:00	02A-E	5		X	X						X			
LF-7	11/5	11:00	03A-E	5		X	X						X			note: The Two VOAs for LF-7 are unpreserved
MW-3	11/5	12:00	04A-D	4		X							X	X		
MW-2	11/5	1400	05A-G	7		X		X	X				X			
MW-4	11/5	1930	06A-C	3		X							X			
MW-1	11/5	1515	07A-C	3		*X							X			
																Use Basin plan detection limits for Title 22
																Note: The Two Liters for MW-2 are UNpreserved

* Note: 1 litre plastic bottle for Title 22 metals needs to filtered and preserved (Sample MW-1)

RELINQUISHED BY: (Signature)	DATE 11/5/91	TIME 1700	RECEIVED BY: (Signature)	DATE 11/6/91	TIME 1100
RELINQUISHED BY: (Signature)	DATE 11/6/91	TIME 10:00 AM	RECEIVED BY: (Signature) Kim Flores	DATE 11/6/91	TIME 10:00
RELINQUISHED BY: (Signature) Kim Flores	DATE 11/6/91	TIME 10:40	RECEIVED BY: (Signature) Gina Gillespie	DATE 11-6-91	TIME 1040
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector:
LEVINE-FRICKE
1900 Powell Street, 12th Floor
Emeryville, Ca 94608
(415) 652-4500

Analytical Laboratory: Med Tox

Shipping Copy (White) Lab Copy (Green) File Copy (Yellow) Field Copy (Pink)

FORM NO. 86/COC/ARF