EXXON COMPANY, U.S.A.
P.O. BOX 4032 . CONCORD, CA 94524-2032

ENVIRONMENTAL ENGINEERING
MARLA D. GUENSLER
SENIOR ENVIRONMENTAL ENGINEER
(510) 246-8776
(510) 246-8798 FAX

October 11, 1994

10/20/94 ① sparging + Vapor extraction effective for this site
② WP for add'l MWs up + cross gradient (NW + SW) of tank pit area
③ CAP

Ms. Juliet Shin
Alameda County Department of Environmental Health
Hazardous Materials Division
1131 Harbor Bay Parkway
Alameda, California 94502-6577

RE: Exxon RAS #7-0104, 1725 Park Street, Alameda, CA

Dear Ms. Shin:

Attached for your review and comment is a report entitled **Additional Subsurface Environmental Investigation and Air-Sparge and Vapor Extraction Tests** for the above referenced site. This report, prepared by RESNA Industries, Inc., of Fremont, California, details the results of soil boring/vapor and sparge well installations, as well as air-sparge and vapor extraction pilot test results. These tests were conducted to determine the potential effectiveness of enhancing the existing ground water remediation system with vapor extraction and/or air sparging.

Please note that the environmental project file for this site was transferred during the third quarter 1994 to Delta Environmental Consultants, Inc., of Rancho Cordova, California. The project manager for Delta is Mr. Todd Galati, who can be contacted at (916) 638-2085.

Please contact me at (510) 246-8776 if you have any questions or comments.

Sincerely,

Marla D. Guensler

Marla D. Guensler
Senior Environmental Engineer

MDG/mdg

enclosure: RESNA Investigation Report dated August 16, 1994

cc: w/attachment:
Mr. Richard Hiett - San Francisco Bay RWQCB
Mr. Todd Galati - Delta

RESNA
Working To Restore Nature

1710 Main Street
Escalon, CA 95320
Phone: (209) 838-3507
FAX: (209) 838-3509

Aug 1994

ADDITIONAL SUBSURFACE ENVIRONMENTAL INVESTIGATION AND AIR-SPARGE AND VAPOR EXTRACTION TESTS

at

Exxon Station 7-0104
1725 Park Street
Alameda, California

Report prepared for:

Exxon Company, U.S.A.
P.O. Box 4032, 2300 Clayton Road
Concord, California

Jeanne Homsey

Jeanne Homsey, P.E.
CA Registered Civil Engineer No. 47410

12/96

Gregory P. Stahl
CA Registered Geologist 5023 for
Michael L. Siembieda
R.G. 4007

REGISTERED GEOLOGIST
GREGORY P. STAHL
No. 5023
STATE OF CALIFORNIA

August 16, 1994
RESNA Report 170077.06

RESNA
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1710 Main Street
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ADDITIONAL SUBSURFACE ENVIRONMENTAL INVESTIGATION AND AIR-SPARGE AND VAPOR EXTRACTION TESTS

Exxon Station 7-0104
1725 Park Street
Alameda, California

For Exxon Company, U.S.A.

1.0 INTRODUCTION

Exxon Company, U.S.A. (Exxon) contracted with RESNA Industries Inc. (RESNA) to perform an additional subsurface environmental investigation and air-sparge and vapor extraction tests at Exxon Station 7-0104 located at 1725 Park Street in Alameda, California. The purpose of this investigation was to install vapor extraction, air-sparge, and air-sparge monitoring wells, and to perform a combined air-sparge and vapor extraction test to evaluate interim remediation alternatives. Work performed for this investigation included:

- Drilling four soil borings (B-11 through B-14).
- Collecting soil samples from two of the borings (B-11 and B-13).
- Constructing 2-inch inner-diameter vapor extraction wells (VW-1 and VW-2) in borings B-12 and B-14.
- Constructing one 2-inch inner-diameter air-sparge well (SW-1) in boring B-11.
- Constructing one 2-inch inner-diameter air-sparge monitoring well (SM-1) in boring B-13.
- Surveying the well locations and elevations.
- Developing and sampling the air-sparge and air-sparge monitoring wells (SW-1 and SM-1).
- Submitting selected soil and groundwater samples for laboratory analysis.
- Performing a one-day air-sparge test.
- Performing a one-day combined air-sparge/vapor extraction test.
- Preparing this report of results, conclusions, and recommendations.

The field work for this investigation was performed in accordance with RESNA's field protocol (Appendix A), the Site Safety Plan (RESNA, November 9, 1993), and RESNA's Revised Work Plan for Evaluation of Interim Remediation Alternatives (RESNA, August 11, 1993).

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 General

Exxon Station 7-0104 is an operating service station at the western corner of Park Street and Eagle Avenue in Alameda, California (Plate 1). The site is at an elevation of approximately 17 feet above mean sea level and the surrounding topography is relatively flat (U.S. Geological Survey, 1980). The site is in a commercial district which includes two former and one existing retail gasoline stations in the vicinity of the site.

Pertinent site features, include a building with a convenience store, two multi-pump fuel dispenser islands, and three underground gasoline storage tanks (USTs), are shown on the Generalized Site Plan (Plate 2).

2.2 Regional Geology and Hydrogeology

The site is on the eastern edge of the San Francisco Bay on the island of Alameda. Sediments in the area of the site generally consist of fill comprised of gravelly clay and clayey gravel that extends to approximately 5 feet below grade. The fill is underlain by the Quaternary age Merrit San and Posey Formations that extend to 30 to 40 feet below grade. These formations consist of sand, silt, silty and clayey sand, and sandy clay. These formations are underlain by the San Antonio Formation, consisting of silty clay with thin lenses of fine gravel. The silty clay reportedly extends to 120 feet below grade and serves as a confining layer for the overlying aquifer. The San Antonio formation overlies the Alameda Formation which is a 10- to 200-feet thick water-bearing unit. The depth of this formation is unknown.

3.0 PREVIOUS WORK

The site was formerly occupied by a Regal Service Station. In 1986, three gasoline underground storage tanks (USTs) were removed and replaced with three double-walled fiberglass tanks. In 1988, Harding Lawson Associates (HLA) of Novato, California, performed an initial environmental investigation that included drilling six borings, installing groundwater monitoring wells MW-1 through MW-6 in the borings, and analyzing soil and groundwater samples (HLA, March 21, 1989). In 1990, HLA drilled seven shallow soil borings and one deep boring, constructed one groundwater monitoring well onsite, and conducted a series of aquifer slug tests (HLA, May 1, 1990). In December 1991, HLA installed five groundwater extraction wells (EW-1 through EW-5); however, no report is available. In September 1992, HLA performed an offsite groundwater survey (HLA, October 30, 1992). In October 1992, HLA performed a vapor extraction test (HLA, December 28, 1992). In December 1992, a groundwater removal and treatment system was constructed at the site. The system was initially operated in February 1993 with RESNA maintaining the system in May 1993. In May 1993, RESNA installed monitoring wells MW-8 through MW-10 (RESNA, July 13,1993). HLA performed quarterly groundwater sampling at the site from June 1988 through January 1993, when RESNA began sampling. The results of these investigations are presented in the reports listed in the References section and summarized in Appendix B, Previous Work.

4.0 FIELD WORK

4.1 Drilling

The well construction permit was acquired from the Alameda County Flood Control and Water Conservation District, Zone 7, prior to drilling. A copy of the permit is included in Appendix C, Well Construction Permit. To clear the soil boring locations for the presence of underground utilities prior to drilling, RESNA pre-marked the exploratory boring locations, contacted Underground Service Alert (USA), and contracted with Cruz Brothers, a subsurface locator.

Four borings (B-11 through B-14) were drilled November 10, 1993, to install two vapor extraction wells, one air-sparge well, and one air-sparge monitoring well. Borings B-11 through B-14 were located for soil vent/sparging tests. The locations of borings B-11 through B-14 with corresponding well numbers are shown on Plate 2. A summary of the field procedures used by RESNA are included in Appendix A.

4.2 Soil Sampling and Description

Borings B-11 and B-13 were drilled to depths of 20½ feet (air sparge) and borings B-12 and B-14 were drilled to depths of 7 and 7½ feet (vapor extraction wells), respectively. In borings B-11 and B-13, soil samples were collected at intervals of approximately five feet or less, beginning at the 5-foot-depth interval. Soil samples from borings B-11 and B-13 were screened in the field for the presence of petroleum hydrocarbons using a photoionization Organic Vapor Meter (OVM). Samples were described using the Unified Soil Classification System (see Appendix D, Unified Soil Classification System and Symbol Key and Logs of Borings). Subjective evidence of hydrocarbons in the soil was noted and recorded on the boring logs of B-11 through B-14 during drilling. Field OVM readings of samples from borings B-11 through B-14 are listed on the boring logs in the column labeled PID.

Subsurface materials encountered in borings B-11 through B-14 consist primarily of sandy fine-grained sand to sand and silt (see Appendix D and Plates 3 through 6, Geologic Cross Sections A-A', B-B', C-C', and D-D'). Locations of geologic cross sections are shown on Plate 2.

Soil stratigraphy beneath the site consists of an uppermost unit of unsaturated, sandy gravel fill. This unit extended to depths of approximately 2 to 3 feet. This unit was underlain by an unsaturated, fine-grained sand to sand and silt. This unit continued to the maximum depth explored at 20½ feet. Groundwater was encountered between 9½ and 10½ feet.

4.3 Stockpile Soil Sampling

During drilling, soil cuttings from the borings were stockpiled onsite pending disposal. Soil was placed on and covered with 6 millimeter visquene. Four soil samples were collected from the soil stockpile on November 10, 1993. A description of the sampling protocol is included Appendix A.

4.4 Vapor Extraction and Air-Sparge Well Construction

Vapor extraction wells VW-1 and VW-2 were constructed in borings B-12 and B-14, respectively. The wells were completed with 2-inch inner-diameter, Schedule 40, polyvinyl chloride (PVC) casing. Well casings were set to a depth of 7 feet in well VW-1 and well VW-2. The screened casings for the vapor extraction wells were constructed of 2½ feet of 2-inch inner-diameter, 0.020 inch machine-slotted PVC set from the total depth of the wells. Monterey Sand #3 was used as filter pack material and was installed to approximately 1 foot above the well screen. Blank PVC casing was set from the top of the screened casing to within a few inches below the ground surface (see Appendix D for well construction details).

Air-sparge well SW-1 and air-sparge monitoring well SM-1 were constructed in borings B-11 and B-13, respectively. Wells SW-1 and SM-1 were completed with 2-inch inner-diameter, Schedule 40, PVC casing to depths of 20½ feet. The screened interval in wells SW-1 and SM-1 were constructed of 2½ feet of 2-inch inner-diameter, 0.10 inch machine-slotted PVC, with washed ⅜-inch pea-gravel used as filter pack and installed to approximately 1 foot above the well screen. Blank PVC casing was installed from the top of the screened casing to within a few inches below the ground surface (see Appendix D for well construction details).

4.5 Air-Sparge Well Development

Air-sparge well SW-1 and air-sparge monitoring well SM-1 were developed on November 15, 1993, by surge block and pumping techniques until water being removed from the wells was found to be relatively free of sediments. The turbidity of the well remained above 200 NTUs (nephelometric turbidity units).

5.0 SITE SURVEY

On December 7, 1993, the site and locations and elevations of the wells were surveyed by Ron Archer Civil Engineer, Inc., of Pleasanton, California, a licensed land surveyor. The results of this survey are included in Appendix E, Wellhead Survey.

6.0 LABORATORY METHODS

6.1 Soil Samples

Selected soil samples from soil borings B-11 and B-13 were submitted under chain of custody record to PACE Incorporated (PACE), a state-certified laboratory (Certification No. 1282) located in Novato, California, for laboratory analyses for the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total petroleum hydrocarbons as gasoline (TPHg) using modified Environmental Protection Agency (EPA) Methods 5030/8015/8020. These soil samples were selected for laboratory analyses based on:

- areas where the presence of petroleum hydrocarbons were suspected; and
- five-foot intervals and/or change in stratigraphic unit as recommended by the Alameda County Department of Environmental Health (ACDEH) for definition of petroleum hydrocarbons in soil.

6.2 Stockpile Soil Samples

The four soil samples were collected from the stockpile were sent to Pace for compositing and analyses for TPHg and BTEX using modified EPA Methods 5030/8015/8020, lead using EPA method 6010/200.7 ICP, cyanide reactivity using EPA Solid Waste Method SW846 7.3.3.2, sulfide reactivity using EPA Solid Waste Method SW846 7.3.4.1, corrosivity using EPA Method 9040, and ignitability using modified EPA Method 1010.

7.0 LABORATORY RESULTS

7.1 Soil Analyses

Results of laboratory analyses of soil samples are summarized in Table 2, Results of Laboratory Analysis of Soil Samples. Copies of laboratory reports and chain of custody records for soil samples obtained during this investigation are included in Appendix F, Chain of Custody Record and Laboratory Analysis Reports.

Laboratory analyses reports of soil samples from borings B-11 and B-13 indicate:

- concentrations of TPHg and BTEX were not detected above the laboratory method detection limits (MDLs) of 1.0 ppm and 0.005 ppm, respectively, at depths of 11, 14½, and 19½ feet in boring B-11, and at depths of 12½, 15½, and 20 feet in boring B-13 (except for 0.0079 ppm total xylenes).
- concentrations of TPHg was not detected above the MDL for the soil sample collected from boring B-11 at depths of 5 and 9 feet. However, benzene was detected at concentrations of 0.054 ppm at 9 feet and 0.061 ppm at 5 feet. TPHg was detected in soil samples collected in boring B-13 at depths of 5, 7, and 10 feet at concentrations of 1.4 ppm, 1,800 ppm, and 2.9 ppm, respectively, and concentrations of benzene at concentrations of 0.17 ppm, 7.6 ppm, and 0.077 ppm, respectively.

7.2 Stockpile Soil Analyses

Review of laboratory analytical results of the composited soil sample from the stockpile indicted concentrations of 20 ppm TPHg, 0.18 ppm benzene, 0.35 ppm toluene, 0.58 ppm ethylbenzene, and 2.1 ppm total xylenes. The soil had a pH of 8.1 and a flashpoint of >60°C. Reactive cyanide, reactive sulfide, and lead were not detected above the MDL.

7.3 Stockpile Removal

On December 6, 1993, approximately 4 yards of soil was removed from the site by Dillard Environmental Services and taken to BFI Landfill in Livermore, California. Soil removal notice is presented in Appendix G, Soil Removal Records

8.0 AIR SPARGE PILOT TEST

8.1 Purpose

The purpose of performing the air sparge pilot test (AST) was to evaluate the feasibility of removing dissolved and residual gasoline hydrocarbons from the first groundwater surface below the site. Specifically, the objectives of the AST were to validate hydrocarbon removal from the saturated zone as a result of sparging, evaluate the propagation of air and helium injected below the groundwater surface and collect injection flowrate and pressure data for the possible design of an air sparge system.

8.2 Test Procedure

RESNA performed an AST at the site on January 31, 1994. Prior to the start of the test, RESNA field personnel measured depth-to-water (DTW) levels in onsite sparge well SW-1, sparge monitoring well SM-1, and groundwater monitoring wells MW-1 and MW-4. The results

are shown in Table 3, Air Sparge, Vapor Extraction, and Monitoring Well Data Summary. Groundwater samples were collected from wells SW-1, SM-1, MW-1, and MW-4 to establish pre-test dissolved total petroleum hydrocarbons as gasoline (TPHg) concentrations in groundwater. In addition, soil gas samples were collected from wells SM-1, MW-1, MW-4, VW-1, and VW-2 to establish baseline TPHg vapor concentrations in the vadose zone.

Testing equipment included a trailer-mounted air compressor, one particulate filter and two oil coalescing filters, two pressurized helium tanks filled with helium gas, air and helium flowmeters and pressure regulators, air sparge wellhead assembly to allow for injection of air and helium under pressure into the air sparge test well, monitoring point wellhead assemblies to allow for the monitoring of helium gas in the saturated and vadose zones and monitoring/sampling of organic vapors in the vadose zone, and field instruments to measure relative organic vapor concentrations and helium content in percentage. For this AST, a 1.6:1 mixture of air to helium was injected to establish the minimum pressure required to evacuate the sparge well of water. While sparging was ongoing, helium gas measurements were monitored in the saturated zone and organic vapors were monitored in the vadose zone.

The sparge test employed air sparge well SW-1 as an injection point while wells SM-1, MW-1, and MW-4 were used as monitoring points. The distances from well SW-1 to the monitoring points are 11, 16, and 14 feet, respectively. Groundwater and soil-gas samples were collected from wells SM-1, MW-1, and MW-4 at the end of the test. The testing duration was 1 hour and 50 minutes.

8.3 Field Results

Air was injected in well SW-1 to achieved at a flowrate of 0.52 actual cubic feet per minute (acfm) at a delivery pressure of 28 pounds per square inch gauge (psig). RESNA personnel observed groundwater discharging from well SM-1 preventing data collection at this well for the remainder of the test. After 15 minutes of sparging, total air/helium injection to well SW-1 was

initiated at a flowrate of 1.41 acfm at a delivery pressure of 33 psig. After 45 minutes of sparging, the flowrate was increased to 1.84 acfm at a delivery pressure of 32.5 psig. The flowrate was reduced to 1.41 acfm at a delivery pressure of 28.5 psig and sparging continued for 13 minutes before ending the test. Helium was detected in the saturated zone at well MW-4 (located 14 feet from SW-1) within 15 minutes after air/helium injection was initiated. Helium was also detected in the saturated zone at well MW-1 (located 16 feet from SW-1) after 45 minutes of air/helium injection. The saturated zone helium concentration initially detected in well MW-4 at 0.08% increased to 7% at test termination. The initial saturated zone helium concentration detected in well MW-1 at 0.45% increased to 19% at the end of the sparge test. Field data is summarized in Table 4, Air Sparge Test Field and Laboratory Data (January 31, 1994).

8.4 Laboratory Methods and Results

Groundwater and soil-gas samples collected in the field were submitted to Pace Incorporated Laboratories (California State Certification Number 1282) in Novato, California, under chain of custody protocol. The samples were analyzed for TPHg, and BTEX using EPA Methods 5030/8015/8020. Laboratory analytical results for groundwater and soil-gas samples are presented in Table 4.

The laboratory analytical results for groundwater samples for TPHg and benzene concentrations expressed in terms of percent increase or decrease for the following monitoring points were (in order of increasing distance from well SW-1): well SM-1 (28% decrease in TPHg; 52% decrease in benzene), well MW-4 (24% decrease in TPHg; 4% decrease in benzene), and well MW-1 (68% decrease in TPHg; 41% decrease in benzene).

Soil-gas samples were collected before and after testing. Concentrations of TPHg and benzene in soil-gas expressed in terms of percent increase or decrease for the following monitoring points were (in order of increasing distance from well SW-1): well MW-4 (22% decrease in TPHg;

5% increase in benzene), and well MW-1 (100% increase in TPHg; less than the MDL for benzene).

9.0 COMBINED AIR SPARGE AND VAPOR EXTRACTION PILOT TEST

9.1 Purpose

RESNA performed a combined air sparge and vapor extraction pilot test (AST/VET) on February 1, 1994. The first part of the AST/VET was to conduct a VET for 30 minutes to collect site specific data and evaluate the feasibility of using vapor-extraction as a soil remediation alternative. The VET had three main objectives: (1) to evaluate achievable air extraction flowrates from the vapor extraction wells; (2) to evaluate hydrocarbon concentrations of the extracted vapors; and (3) to estimate an effective radius of influence for the vapor-extraction wells for future engineering design, if applicable. The second portion of the AST/VET was to conduct a combined sparging and vapor extraction test to evaluate the effect of sparging on vapor extraction design parameters such as induced vacuum, radius of influence and extraction vacuum. In addition, the second part was conducted to demonstrate the ability of vapor extraction to capture sparge off-gas.

9.2 Test Procedure

The air sparging equipment for the combined AST/VET was the same as previously described. The vapor extraction equipment consisted of a six-cylinder internal combustion (IC) engine with a motor-driven vacuum blower, and instrumentation for measuring air velocity, vacuum, and temperature. The I.C. engine was connected to the vapor extraction test well using polyvinyl chloride (PVC) piping, fittings, and wellhead connections.

Vapor extraction well VW-1 was used as the VET test well while wells VW-2, SM-1, MW-1, and MW-4 were used as the monitoring points. Air sparge well SW-1 was used as the AST test

well for the second portion of the test. During the first portion of the test, the IC engine was used to apply a vacuum to well VW-1 and induce air flow through the soils. Extracted hydrocarbon vapor was abated with the IC engine via combustion.

Extraction flow rates and applied vacuum were measured at the IC engine using a single point pitot tube and magnahelic gauge installed in a 4-inch PVC pipe manifold connecting the wellhead to the IC engine. Extracted vapors accessed through a sample port also installed in the manifold piping were screened for organic vapor concentrations using a PID. Vacuum or pressure response at monitoring points wells VW-2, SM-1, MW-1, and MW-4 were monitored with a magnahelic gauge. During the second portion of the test, vapor extraction continued while air/helium sparging was initiated. Sparge injection pressures and flowrates were monitored along with remote monitoring point pressure or vacuum changes.

Vapor samples were collected from a sample port on the influent and effluent of the IC Engine using an electric sample pump and opaque Mylar sample bags with ¼ inch Tygon tubing connected to a brass wellhead fitting. The samples were sealed in the bags and labeled with the sample number, date, time, and sampler's name. The samples were immediately stored in a cool place for transport to a State Certified analytical laboratory under Chain of Custody documentation.

9.3 Field Results

Test data collected during the first and second portions of the AST/VET test is summarized in Table 5, Combination Air Sparge/Vapor Extraction Test Field Data (February 1, 1994). During the vapor extraction portion of the test, an extraction rate of approximately 11 acfm (10.8 standard cubic feet per minute [scfm]) was achieved at an applied vacuum of 6.5 inches of water column (IWC). Induced vacuum readings ranged from 0.5 to 1.6 IWC in well VW-2 (9 feet from well VW-1); 0.5 to 1.1 IWC in well SM-1 (10 feet from well VW-1); 0.01 to 0.02 IWC

in well MW-1 (15 feet from well VW-1); and 0.25 to 0.60 IWC in well MW-4 (15 feet from well VW-1).

During the second portion of the test, vapor extraction continued at an extraction rate of 11 acfm (10.8 scfm) at an applied vacuum of 6 IWC and helium/air sparge injection was initiated at a flowrate 0.61 acfm (1.81 scfm) at an injection pressure of 29 psig. After 15 minutes, the vapor extraction flowrate was increased to 19.6 acfm (19.3 scfm) and the sparge injection flowrate ranged from 0.68 to 0.86 acfm (1.98 to 2.5 scfm); after 45 minutes, the vapor extraction flowrate was increased to 30.1 acfm (29.4 scfm) and the sparge injection flowrate ranged from 0.44 to 0.65 acfm (1.01 to 1.49 scfm); and after 105 minutes, the vapor extraction flowrate was increased to 40 acfm (38.9 scfm) and the sparge injection flowrate was 0.51 acfm (1 scfm) until the end of the test. The induced vacuum responses at the onset of sparging ranged from 1.0 (well SM-1) to +0.20 (well MW-1) IWC. At the conclusion of the test the vacuums attained values of 1.6 IWC for well VW-2 and +2.0 IWC for well MW-1.

9.4 Laboratory Methods and Results

9.4.1 Analytical Methods

Vapor samples obtained from vapor extraction well VW-1 were analyzed for BTEX and TPHg using modified EPA Methods 8020/8015. The vapor samples were submitted under chain of custody record and analyzed by PACE Incorporated Laboratories. Copies of the analytical report and the chain of custody record are included in Appendix F.

9.4.2 Vapor Concentrations

The results of laboratory testing of vapor samples submitted for analyses are summarized in Table 6, Laboratory Analyses of Vapor Samples. The IC engine influent air samples collected during vapor extraction alone contained reported TPHg and benzene concentrations of 17,000

micrograms per liter (μg/l) and 260 μg/l, respectively. The IC engine effluent air samples collected during combined vapor extraction and air sparging contained reported TPHg and benzene concentrations of 67 μg/l and 2.1 μg/l. An influent air sample was collected during the combined test but the air sample was not usable upon arrival at the laboratory due to an air leak.

10.0 DISCUSSION AND CONCLUSIONS

10.1 Subsurface Investigation

Based on the results of this site investigation, RESNA concludes the following:

- Elevated levels of gasoline hydrocarbons were detected in soil samples collected from the capillary fringe in the vicinity of B-13/SM-1.

10.2 Air Sparge and Combination Air Sparge/Vapor Extraction Pilot Tests

There was a general decrease in dissolved TPHg concentrations during the air sparge only test. Because there was also a general decrease in vadose zone TPHg concentrations, it is difficult to assess sparging effectiveness based on TPHg concentrations alone. Typically, an increase in dissolved TPHg would suggest that residual TPHg was removed from saturated soil and re-dissolved into groundwater as a result of volatilization via sparging. If dissolved TPHg is stripped into the vadose zone, TPHg concentrations in the vadose zone would also be expected to increase. The reason for the decrease of TPHg vapor in the vadose zone TPHg concentration is no known at this time.

The helium concentrations detected in the saturated zone in monitoring wells MW-1 and MW-4 during the first half of the test are more indicative of sparging effectiveness. The increase in helium concentration over time ranged from 0.45% to 19% in the farthest monitoring well located at 16 feet away from the sparge well. A lateral transport of helium in the saturated zone to a distance of 16 feet can be expected.

Our evaluation of field and laboratory data includes the following conclusions:

- Test data indicate that sparging will remove dissolved and residual TPHg from the saturated zone and thus is a feasible technology for the site.
- An effective sparge radius of influence of approximately 15 - 20 feet can be expected if sparge wells are constructed to a minimum depth of 15 feet.
- A sparge injection rate of approximately 2 acfm at an injection pressure of 30 psig per sparge well will be required.
- A vapor extraction flowrate capability of approximately 30 acfm per well may be required to provide for the ability to capture off-gas from the saturated zone.

11.0 LIMITATIONS

This report was prepared in accordance with generally accepted standards of environmental geological practice in California at the time this investigation was performed. This investigation was conducted solely for the purpose of evaluating the presence of gasoline hydrocarbons in the subsurface soil in the vicinity of former underground gasoline-storage tanks (USTs), service islands, and former used-oil UST beneath the site. No soil engineering or geotechnical references are implied or should be inferred. Evaluation of the geologic conditions at the site for the purpose of this investigation is made from a limited number of observation points. Subsurface conditions may vary away from the data points available. This report has been prepared solely for Exxon Company, U.S.A. and any reliance on this report by third parties shall be at such party's sole risk.

12.0 REFERENCES CITED

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Harding Lawson Associates. March 21, 1989. Phase II Evaluation of Petroleum Hydrocarbons, Exxon Station 7-0104, 1725 Park Street, Alameda, California.

Harding Lawson Associates. May 1, 1990. Phase III Evaluation of Petroleum Hydrocarbons, Exxon Station 7-0104, 1725 Park Street, Alameda, California.

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RESNA Industries Inc. April 14, 1993. Groundwater Monitoring Report, Exxon Station 7-0104, 1725 Park Street, Alameda, California. 170077.01.

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RESNA Industries Inc. January 22, 1994. Letter Report, Fourth Quarter 1994 Groundwater Monitoring and Remediation Activities, Exxon Station 7-0104, 1725 Park Street, Alameda, California. 170077.01.

Source: U.S. Geological Survey
7.5-Minute Quadrangles
San Jose West, San Jose East, California
Photorevised 1980

N

Approximate Scale
2000 1000 0 2000
feet

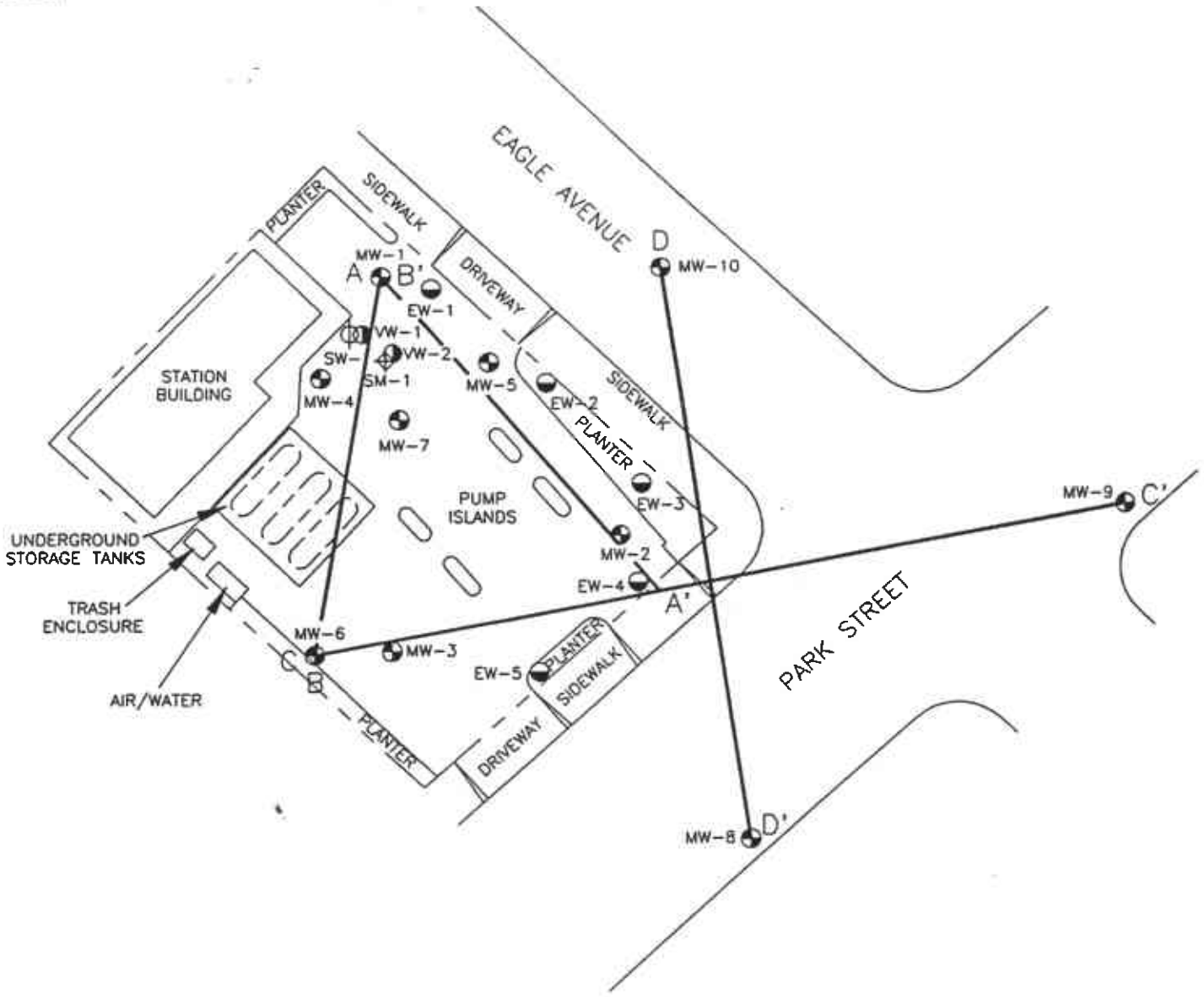
RESNA
Working to Restore Nature

PROJECT 170077.06

SITE VICINITY MAP
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE
1

700776GC



EXPLANATION

MW-10 = Groundwater monitoring well

EW-5 = Groundwater extraction well

VW-2 = Vapor well

SW-1 = Air-sparging well

SM-1 = Sparge monitoring point

D —— D' = Cross section line

N

Approximate Scale

40 20 0 40

feet

Source: Modified from map supplied by Harding Lawson Associates, 1992; survey by Ron Archer, Civil Engineer, Inc., 1993

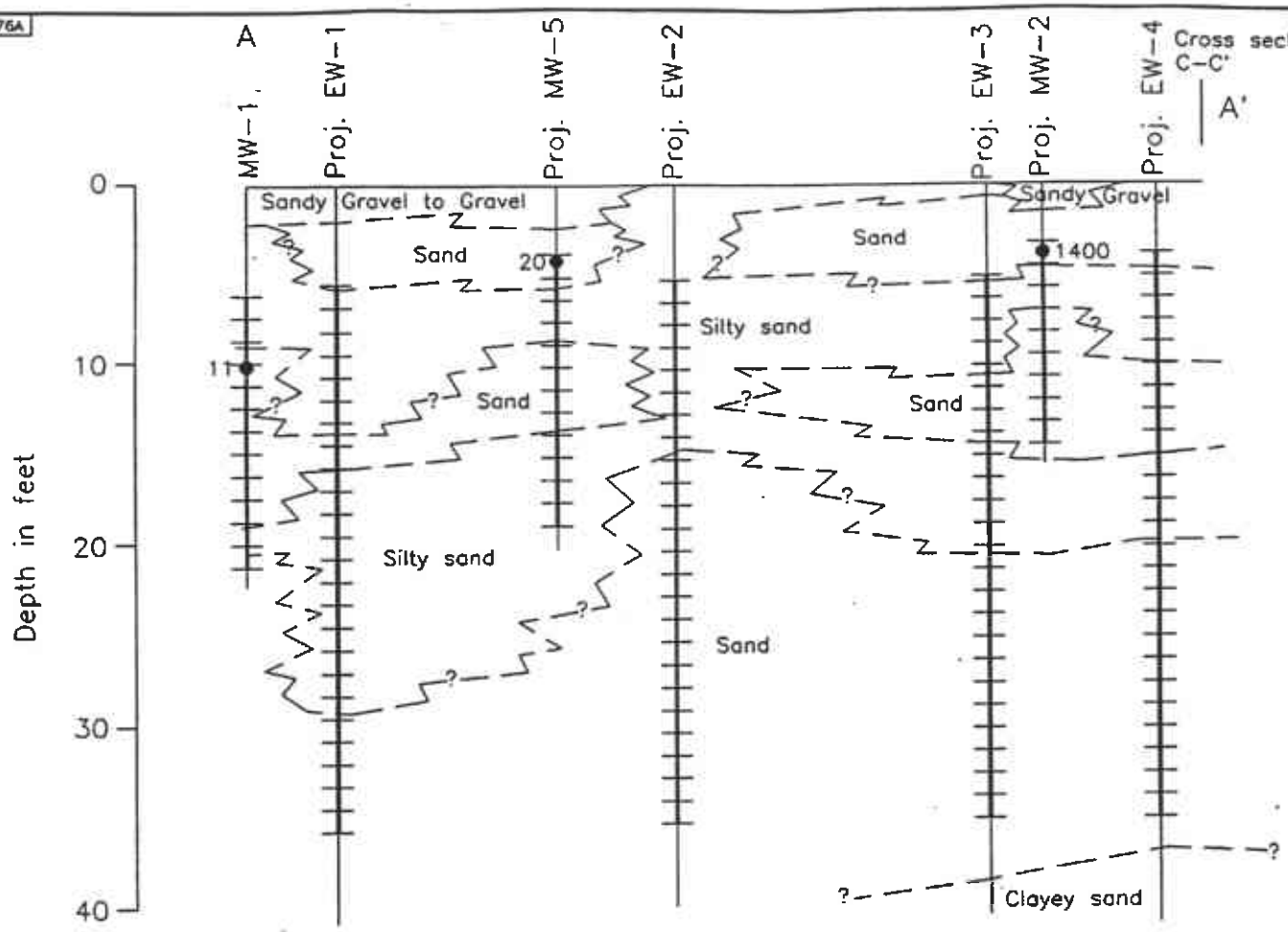
RESNA
Working to Restore Nature

PROJECT 170077.06

GENERALIZED SITE PLAN
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE 2

1700776A



EXPLANATION

1400 = Laboratory analyzed soil sample showing concentration of TPHg in parts per million

= Well casing

= Well screen

= Boring

Approximate Horizontal Scale

20 10 0 20

feet

Approximate Vertical Scale

10 5 0 10

feet

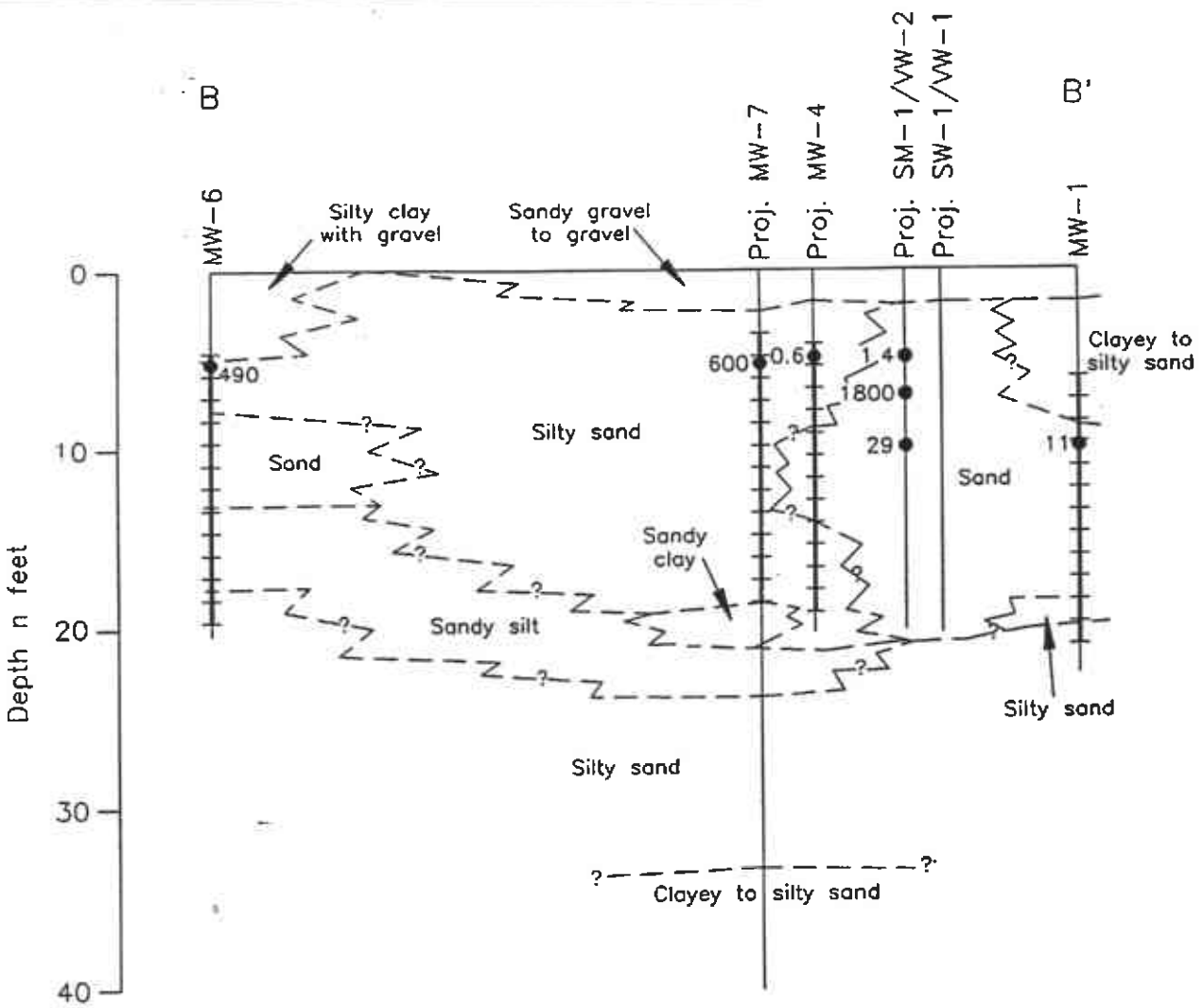
RESNA
Working to Restore Nature

PROJECT 170077.06

GEOLOGIC CROSS SECTION A-A'
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE 3

17007768



EXPLANATION

1800 = Laboratory analyzed soil sample showing concentration of TPHg in parts per million

= Well casing

= Well screen

= Boring

Approximate Horizontal Scale

20 10 0 20

feet

Approximate Vertical Scale

10 5 0 10

feet

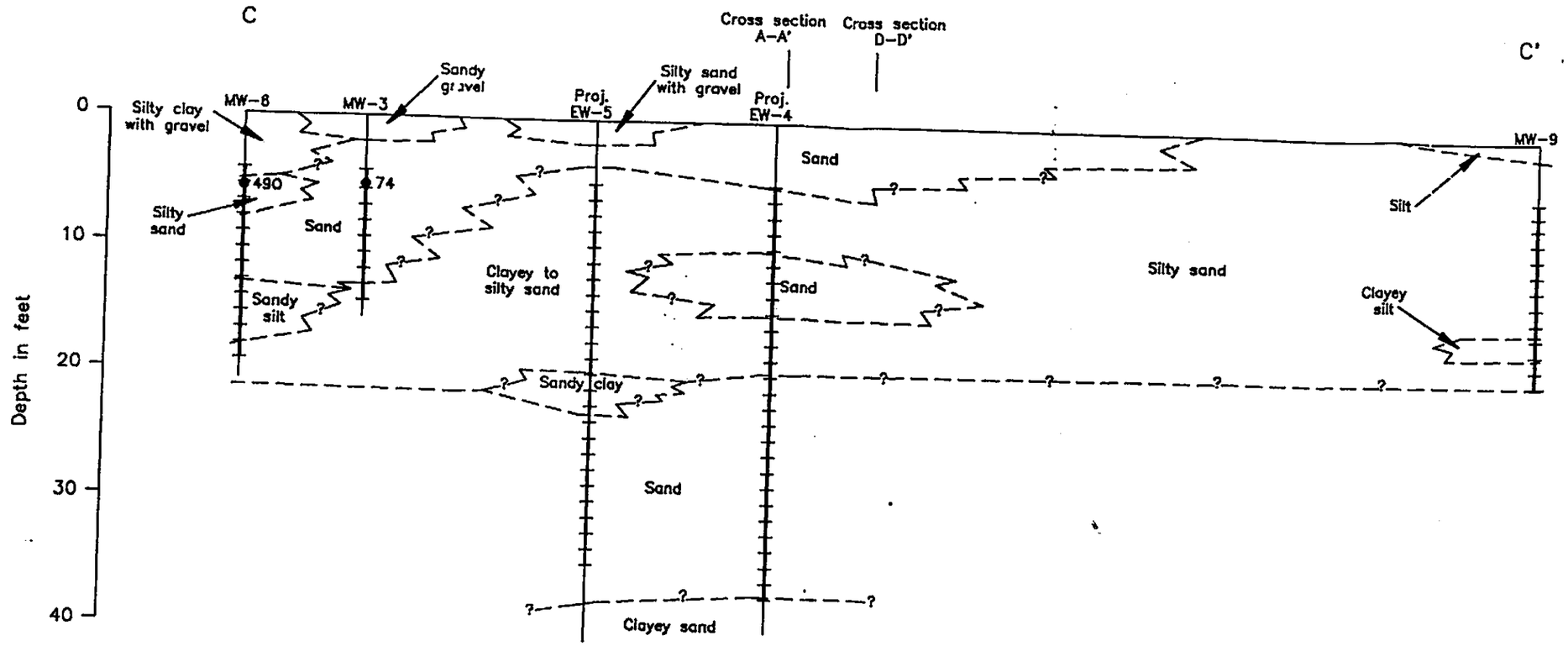
RESNA
Working to Restore Nature

PROJECT 170077.06

GEOLOGIC CROSS SECTION B-B'
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE 4

1700776C



EXPLANATION

490 = Laboratory analyzed soil sample showing concentration of TPHg in parts per million

= Well casing

= Well screen

= Boring

Approximate Horizontal Scale

20 10 0 20

feet

Approximate Vertical Scale

10 5 0 10

feet

RESNA
Working to Restore Nature

PROJECT 170077.06

GEOLOGIC CROSS SECTION C-C'
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE 5

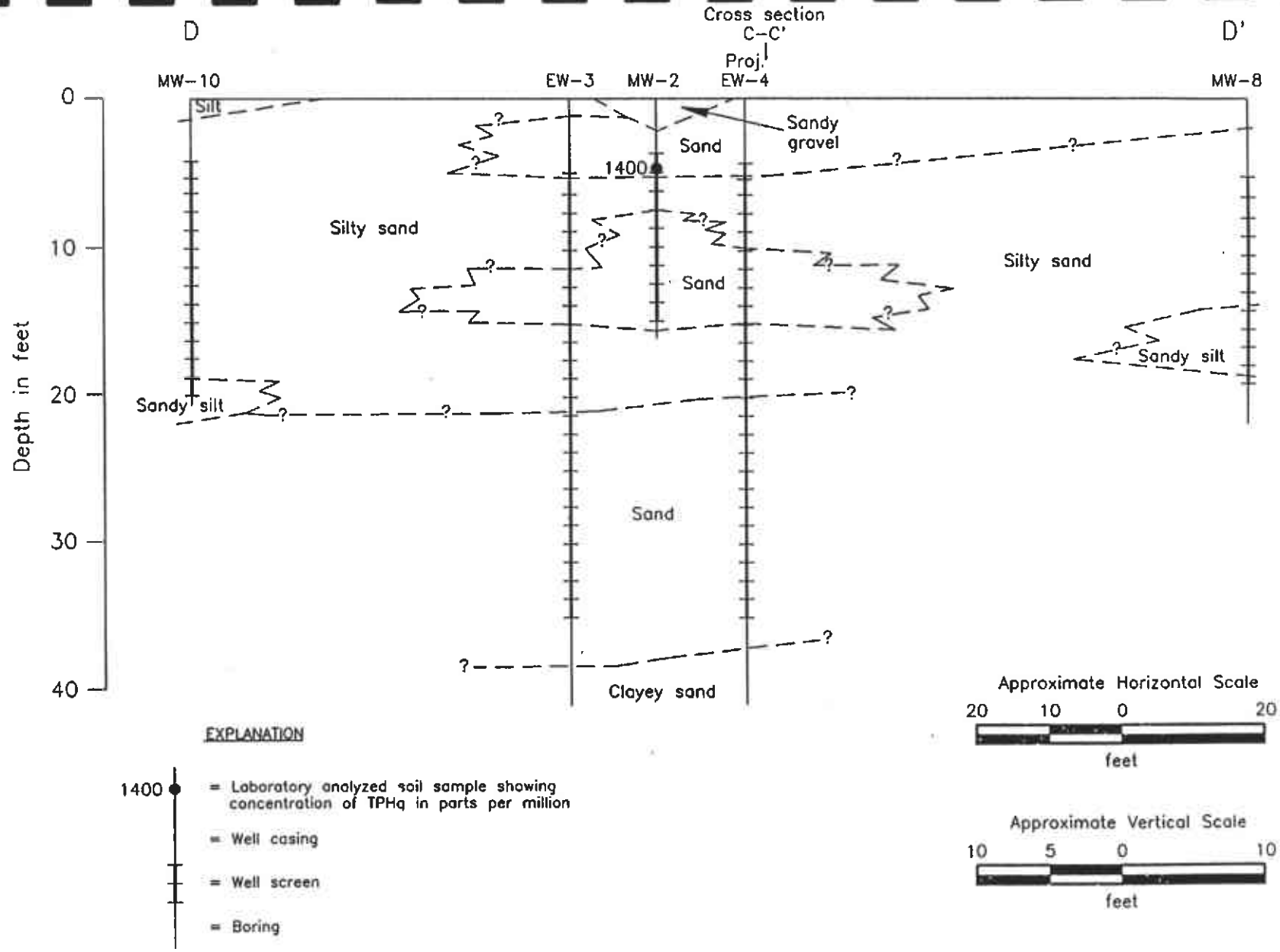


PLATE	GEOLOGIC CROSS SECTION D-D'	RESNA
6	Exxon Service Station 7-0104 1725 Park Street Alameda, California	Working to Restore Nature
		PROJECT 170077.06

TABLE 1
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Exxon Service Station No. 7-0104
1725 Park Street
Alameda, California

Well ID # (TOC)	Sampling Date	SUBJ	DTW	Elev.	TPHg	B	T	E	X
		<	feet	>	<		parts per billion		>
MW-1	06/07/88	NM	NM	---	27,000	5,000	77	1,100	2,700
(17.35)	06/10/88#	NLPH	6.35	11.00					
	01/17/89	NLPH	5.81	11.54	6,800	2,000	91	800	1,600
	01/24/89#	NLPH	5.16	12.19					
	06/01/89	sheen	6.27	11.08	1,700	170	6.9	13	230
	09/18/89	NLPH	7.11	10.24	2,100	9.0	53	18	130
	10/20/89#	NLPH	7.28	10.07					
	11/22/89#	NLPH	7.02	10.33					
	12/11/89	NLPH	6.60	10.75	5,800	200	42	290	330
	02/13/90#	NLPH	6.02	11.33					
	03/07/90a#	NM	NM	---					
	03/13/90	NLPH	5.91	11.44	2,300	430	14	16	220
	04/18/90#	NLPH	6.18	11.17					
	05/23/90#	NLPH	6.29	11.06					
	06/14/90	NLPH	6.19	11.28	32,000	1,400	19	<5	120
	08/21/90#	NLPH	7.03	10.32					
	09/19/90	NLPH	7.26	10.09	950	290	2.9	<0.5	27
	12/17/90	NLPH	6.75	10.60	2,100	550	13	350	110
	01/31/91#	NLPH	6.78	10.57					
	02/25/91#	NLPH	6.59	10.76					
	03/19/91	NLPH	5.85	11.50	1,400	900	45	390	150
	04/22/91#	sheen	5.72	11.63					
	05/17/91#	NLPH	6.00	11.35					
	07/24/91	NLPH	6.79	10.56	9,700	1,300	670	950	2,100
	09/10/91#	NLPH	7.25	10.10					
	09/23/91#	NLPH	7.33	10.02					
	10/21/91#	NLPH	7.53	9.82					
	10/22/91	NM	NM	---	540	220	1.8	110	7.8
	11/18/91#	NLPH	7.13	10.22					
	12/11/91#	NLPH	7.25	10.10					
	01/21/92	NLPH	6.54	10.81	1,800	650	23	300	64
	02/20/92#	NLPH	4.82	12.53					
	03/19/92#	NLPH	5.24	12.11					
	04/24/92	NLPH	5.71	11.64	4,900	1,600	78	660	250
	05/13/92#	NLPH	5.99	11.36					
	06/24/92#	NLPH	6.65	10.70					
	07/16/92	NLPH	6.72	10.63	3,400	1,000	11	550	100
	08/19/92#	NLPH	7.07	10.28					
	09/24/92	NLPH	7.36	9.99	3,700	1,300	21	330	<10
	02/05/93	NLPH	5.21	12.14	11,000	2,400	160	1,400	790
	04/30/93	NLPH	5.88	11.47	6,500	330	320	640	1,300
	05/14/93#	NLPH	7.22	10.13					

See notes on page 10 of 10.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Exxon Service Station No. 7-0104
1725 Park Street
Alameda, California

Well ID # (TOC)	Sampling Date	SUBJ	DTW	Elev.	TPHg	B	T	E	X
		<	feet	>	<		parts per billion		>
MW-1 cont.	07/15/93	NLPH	8.01	9.34	7,600	270	62	1,100	1,000
(17.35)	11/16/93	NLPH	8.69	8.66	840	18	1.4	72	17
	11/30/93#	NM	8.38	8.69					
	02/24-25/94	NLPH	6.23	10.84	810	15	9.0	98	58
	04/04-05/94	NLPH	7.53	9.82	680	12	6.5	42	40
MW-2	06/07/88	---	---	---	110,000	12,000	12,000	2,100	12,000
(16.67)	06/10/88#	NLPH	6.20	10.47					
	01/17/89	NLPH	5.96	10.71	30,000	6,600	3,300	1,600	7,700
	01/24/89#	NLPH	5.04	11.63					
	06/01/89	sheen	6.32	10.35	8,700	330	280	680	1,200
	09/18/89	NLPH	6.73	9.94	17,000	580	280	570	220
	10/20/89#	NLPH	6.87	9.80					
	11/22/89#	NLPH	6.80	9.87					
	12/11/89	NLPH	6.57	10.10	32,000	1,000	850	310	1,200
	02/13/90#	NLPH	6.12	10.55					
	03/13/90	NLPH	6.02	10.65	39,000	3,500	1,500	2,100	3,900
	04/18/90#	NLPH	6.35	10.32					
	05/23/90#	NLPH	6.28	10.39					
	06/14/90	NLPH	6.14	10.53	34,000	3,800	730	1,600	3,900
	08/21/90#	NLPH	6.70	9.97					
	09/19/90	NLPH	6.84	9.83	63,000	670	180	390	1,000
	12/17/90	NLPH	6.46	10.21	140,000	3,700	2,500	3,000	8,300
	01/31/91#	sheen	6.66	10.01					
	02/25/91#	NLPH	6.50	10.17					
	03/19/91	sheen	5.76	10.91	48,000	4,500	1,600	2,100	5,500
	04/22/91#	NLPH	5.78	10.89					
	05/17/91#	NLPH	6.01	10.66					
	07/24/91	NLPH	6.43	10.24	49,000	3,500	2,200	2,000	6,400
	09/10/91#	NLPH	6.81	9.86					
	09/23/91#	NLPH	6.82	9.85					
	10/21/91#	NLPH	7.01	9.66					
	10/22/91	---	---	---	34,000	3,700	1,100	1,800	5,200
	11/18/91#	NLPH	6.66	10.01					
	12/11/91#	NLPH	6.85	9.82					
	01/21/92	NLPH	6.22	10.45	21,000	4,600	1,300	1,700	5,100
	02/20/92#	NLPH	5.28	11.39					
	03/19/92#	NLPH	5.34	11.33					
	04/24/92	sheen	5.75	10.92	36,000	5,000	970	2,300	5,200
	05/13/92#	NLPH	5.95	10.72					
	06/24/92#	NLPH	6.39	10.28					
	07/16/92	sheen	6.50	10.17	42,000	3,500	490	1,800	3,700
	08/19/92#	NLPH	6.69	9.98					

See notes on page 10 of 10.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Exxon Service Station No. 7-0104
1725 Park Street
Alameda, California

Well ID # (TOC)	Sampling Date	SUBJ	DTW	Elev.	TPHg	B	T	E	X
		<	feet	>	<	parts per billion			>
MW-2 cont.	09/24/92	sheen	6.74	9.93	26,000	3,600	670	1,700	3,300
(16.67)	02/05/93#	0.01	5.56	11.10					
	04/30/93	sheen	5.78	10.89	280,000	11,000	6,500	5,500	160,000
	05/14/93#	NA	NA	—					
	07/15/93#	0.01	7.89	8.79					
	11/16/93#	0.02	8.37	8.32					
	11/30/93#	NM	7.93	8.74					
	02/24-25/94	NLPH	6.93	9.74	51,000	11,000	1,700	2,700	5,500
	04/04-05/94#	sheen	7.84	8.83					
MW-3	06/07/88	NM	NM	—	28,000	6,000	80	940	1,900
(17.11)	06/10/88#	NLPH	6.05	11.06					
	01/17/89	NLPH	5.49	11.62	5,300	2,500	230	590	1,100
	01/24/89#	NLPH	5.38	11.73					
	06/01/89	NLPH	5.96	11.15	5,400	330	300	570	680
	09/18/89	NLPH	6.65	10.46	12,000	680	170	350	860
	10/20/89#	NLPH	6.88	10.23					
	11/22/89#	NLPH	6.74	10.37					
	12/11/89	NLPH	6.37	10.74	14,000	1,100	150	670	690
	02/13/90#	NLPH	5.58	11.53					
	03/13/90	NLPH	5.48	11.63	18,000	6,300	200	1,100	1,100
	04/18/90#	NLPH	6.01	11.10					
	05/23/90#	NLPH	6.14	10.97					
	06/14/90	NLPH	5.83	11.28	9,500	1,300	880	310	1,800
	08/21/90#	NLPH	6.67	10.44					
	09/19/90	NLPH	6.88	10.23	16,000	5,000	65	1,500	450
	12/17/90	NLPH	6.46	10.65	6,700	1,500	64	650	460
	01/31/91#	NLPH	6.24	10.87					
	02/25/91#	NLPH	6.18	10.93					
	03/19/91	NLPH	5.35	11.76	18,000	4,200	2,100	1,100	1,200
	04/22/91#	NLPH	5.72	11.39					
	05/17/91#	NLPH	5.55	11.56					
	07/24/91	NLPH	6.41	10.70	38,000	6,200	990	2,900	9,600
	09/10/91#	NLPH	6.80	10.31					
	09/23/91#	NLPH	6.80	10.31					
	10/21/91#	NLPH	7.09	10.02					
	10/22/91	NM	NM	—	23,000	3,400	150	2,500	4,400
	11/18/91#	NLPH	6.74	10.37					
	12/11/91#	NLPH	6.79	10.32					
	01/21/92	NLPH	6.16	10.95	13,000	2,700	30	1,800	740
	02/20/92#	NLPH	4.89	12.22					
	03/19/92#	NLPH	4.85	12.26					
	04/24/92	NLPH	5.28	11.83	17,000	4,200	170	1,600	600

See notes on page 10 of 10.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Exxon Service Station No. 7-0104
1725 Park Street
Alameda, California

Well ID # (TOC)	Sampling Date	SUBJ	DTW	Elev.	TPHg	B	T	E	X
		<	feet	>	<	parts per billion			>
MW-3 cont. (17.11)	05/13/92#	NLPH	5.58	11.53					
	06/24/92#	NLPH	6.22	10.89					
	07/16/92	NLPH	6.36	10.75	11,000	2,700	230	1,100	570
	08/19/92#	NLPH	6.65	10.46					
	09/24/92	NLPH	6.93	10.18	7,100	2,000	44	1,000	220
	02/05/93	NLPH	4.71	12.40	13,000	3,600	110	1,300	430
	04/30/93	NLPH	5.46	11.65	13,000	1,600	370	1,600	1,800
	05/14/93#	NLPH	6.53	10.58					
	07/15/93	NLPH	7.28	9.83	2,100	310	15	230	58
	11/16/93	NLPH	8.02	9.09	4,000	400	400	120	490
	11/30/93	---	7.79	9.32	---	---	---	---	---
	02/24-25/94	NLPH	6.04	11.07	3,300	280	52	150	400
	04/04-05/94	NLPH	6.91	6.53	3,000	180	19	130	330
MW-4 (17.34)	01/17/89	NLPH	5.36	11.98	19,000	1,000	1,500	360	2,200
	01/24/89#	NLPH	5.46	11.88					
	06/01/89	NLPH	6.01	11.33	3,600	180	240	63	810
	09/18/89	NLPH	6.80	10.54	6,000	290	200	28	510
	10/20/89#	NLPH	7.08	10.26					
	11/22/89#	NLPH	6.82	10.52					
	12/11/89	NLPH	6.37	10.97	13,000	750	910	510	1,200
	02/13/90#	NLPH	5.49	11.85					
	03/07/90a#	NM	NM	---					
	03/13/90	NLPH	5.44	11.90	12,000	1,500	1500	470	28,000
	04/18/90#	NLPH	6.14	11.20					
	05/23/90#	NLPH	6.22	11.12					
	06/14/90	NLPH	5.92	11.42	12,000	5,700	400	1,300	760
	08/21/90#	NLPH	6.83	10.51					
	09/19/90	NLPH	7.07	10.27	5,500	670	180	390	1,000
	12/17/90	NLPH	6.50	10.84	14,000	1,400	620	540	2,100
	01/31/91#	NLPH	6.66	10.68					
	02/25/91#	NLPH	6.21	11.13					
	03/19/91	NLPH	5.29	12.05	11,000	1,500	740	620	2,100
	04/22/91#	NLPH	5.26	12.08					
	05/17/91#	NLPH	5.60	11.74					
	07/24/91	NLPH	6.54	10.80	10,000	1,200	440	410	1,200
	09/10/91#	NLPH	7.04	10.30					
	09/23/91#	NLPH	7.14	10.20					
	10/21/91#	sheen	7.30	10.04					
	10/22/91	---	---	---	4,600	750	190	350	780
	11/18/91#	NLPH	6.90	10.44					
	12/11/91#	NLPH	7.01	10.33					
	01/21/92	NLPH	6.25	11.09	6,000	1,300	320	510	1,200

See notes on page 10 of 10.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Exxon Service Station No. 7-0104
1725 Park Street
Alameda, California

Well ID # (TOC)	Sampling Date	SUBJ	DTW	Elev.	TPHg	B	T	E	X
		<	feet	..... >	<		parts per billion		..... >
MW-4 cont.	02/20/92#	NLPH	4.79	12.55					
(17.34)	03/19/92#	NLPH	4.70	12.64					
	04/24/92	sheen	5.25	12.09	11,000	1,700	630	710	1,600
	05/13/92#	sheen	5.62	11.72					
	06/24/92#	sheen	6.19	11.15					
	07/16/92	sheen	6.51	10.83	5,400	870	240	440	700
	08/19/92#	NLPH	6.85	10.49					
	09/24/92	NLPH	7.17	10.17	5,900	1,300	130	530	690
	02/05/93	NLPH	4.61	12.73	15,000	2,300	820	980	2,200
	04/30/93	NLPH	5.59	11.75	21,000	4,000	960	1,500	2,900
	05/14/93#	NLPH	6.50	10.84					
	07/15/93	NLPH	7.50	9.84	2,300	440	55	130	220
	11/16/93	NLPH	8.27	9.07	5,100	820	160	260	760
	11/30/93	---	8.02	9.32	---	---	---	---	---
	02/24-25/94	NLPH	5.78	11.56	9,800	2,200	190	660	1,200
	04/04-05/94	NLPH	6.81	10.53	6,200	1400	100	310	560
MW-5	01/17/89	NLPH	5.39	11.32	26,000	8,700	3,900	990	5,900
(16.71)	01/24/89#	NLPH	5.51	11.20					
	06/01/89	sheen	5.83	10.88	5,200	240	220	130	690
	09/18/89	NLPH	6.52	10.19	8,000	340	150	140	460
	10/20/89#	NLPH	6.72	9.99					
	11/22/89#	NLPH	6.54	10.17					
	12/11/89	NLPH	6.21	10.50	15,000	720	320	450	870
	02/13/90#	NLPH	5.60	11.11					
	03/07/90#	NM	NM	—					
	03/13/90	NLPH	5.54	11.17	10,000	3,400	220	280	800
	04/18/90#	NLPH	5.75	10.96					
	05/23/90#	NLPH	5.98	10.73					
	06/14/90	NLPH	5.81	10.90	12,000	3,300	160	350	730
	08/21/90#	NLPH	6.51	10.20					
	09/19/90	NLPH	6.70	10.01	8,500	1,800	85	120	460
	12/17/90	sheen	6.24	10.47	18,000	2,300	810	430	1,400
	01/31/91#	NLPH	6.31	10.40					
	02/25/91#	NLPH	6.13	10.58					
	03/19/91	NLPH	5.32	11.39	17,000	2,900	610	580	1,200
	04/22/91#	sheen	5.30	11.41					
	05/17/91#	NLPH	5.59	11.12					
	07/24/91	NLPH	6.33	10.38	16,000	3,200	320	690	1,100
	09/10/91#	NLPH	6.66	10.05					
	09/23/91#	NLPH	6.75	9.96					
	10/21/91#	sheen	6.92	9.79					
	10/22/91	NM	NM	—	6,600	2,000	64	320	480

See notes on page 10 of 10.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Exxon Service Station No. 7-0104
1725 Park Street
Alameda, California

Well ID # (TOC)	Sampling Date	SUBJ	DTW	Elev.	TPHg	B	T	E	X
		<	feet	..... >	<		parts per billion	.....	>
MW-5 cont. (16.71)	11/18/91#	NLPH	6.55	10.16					
	12/11/91#	NLPH	6.64	10.07					
	01/21/92	sheen	6.07	10.64	14,000	4,000	190	630	1,300
	02/20/92#	NLPH	4.83	11.88					
	03/19/92#	sheen	4.83	11.88					
	04/24/92	sheen	5.32	11.39	12,000	2,600	120	620	530
	05/13/92#	sheen	5.61	11.10					
	06/24/92#	NLPH	6.17	10.54					
	07/16/92	sheen	6.25	10.46	20,000	4,000	48	880	720
	08/19/92#	sheen	6.53	10.18					
	09/24/92	sheen	6.80	9.91	9,300	2,200	31	330	250
	02/05/93b#	NLPH	4.70	12.01					
	04/30/93	sheen	5.43	11.28	30,000	5,900	450	1,900	1,500
	05/14/93#	NLPH	7.31	9.40					
	07/15/93#	0.07	7.93	8.84					
	11/15/93#	0.04	8.42	8.32					
	11/30/93#	---	8.10	8.61					
	02/24-25/94#	sheen	6.23	10.48					
	04/04-05/94#	0.01	7.57	9.14					
MW-6 (17.56)	01/17/89	NLPH	5.59	11.97	38,000	7,400	9,300	2,000	9,900
	01/24/89#	NLPH	5.27	12.29					
	06/01/89	sheen	6.25	11.31	23,000	1,900	2,500	2,000	6,000
	09/18/89	NLPH	6.95	10.61	17,000	650	410	650	320
	10/20/89#	NLPH	7.24	10.32					
	11/22/89#	NLPH	7.05	10.51					
	12/11/89	NLPH	6.63	10.93	29,000	1,100	810	330	1,500
	02/13/90#	NLPH	5.70	11.86					
	03/07/90#	NM	NM	---					
	03/13/90	NLPH	5.63	11.93	38,000	12,000	15,000	2,500	12,000
	04/18/90#	NLPH	6.26	11.30					
	05/23/90#	NLPH	6.42	11.14					
	06/14/90	NLPH	6.19	11.37	38,000	9,100	7,800	2,900	12,000
	08/21/90#	NLPH	7.01	10.55					
	09/19/90	NLPH	7.23	10.33	22,000	4,200	300	1,400	3,400
	12/17/90	NLPH	6.66	10.90	20,000	3,100	4,100	890	2,700
	01/31/91#	NLPH	6.39	11.17					
	02/25/91#	NLPH	6.39	11.17					
	03/19/91	NLPH	5.57	11.99	180,000	11,000	55,000	5,600	28,000
	04/22/91#	NLPH	5.42	12.14					
	05/17/91#	NLPH	5.73	11.83					
	07/24/91	NLPH	6.72	10.84	48,000	5,400	2,300	2,000	9,000
	09/10/91#	NLPH	7.15	10.41					

See notes on page 10 of 10.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Exxon Service Station No. 7-0104
1725 Park Street
Alameda, California

Well ID # (TOC)	Sampling Date	SUBJ	DTW	Elev.	TPHg	B	T	E	X
		<	feet	>	<		parts per billion		>
MW-6 cont.	09/23/91#	NLPH	7.25	10.31					
(17.56)	10/21/91#	NLPH	7.42	10.14					
	10/22/91	NM	NM	—	18,000	3,100	700	1,400	2,900
	11/18/91#	NLPH	7.08	10.48					
	12/11/91#	NLPH	7.17	10.39					
	01/21/92	NLPH	6.40	11.16	9,400	2,100	370	1,000	1,100
	02/20/92#	NLPH	5.06	12.50					
	03/19/92#	NLPH	4.86	12.70					
	04/24/92	NLPH	5.44	12.12	42,000	3,500	8,000	2,100	8,000
	05/13/92#	NLPH	5.83	11.73					
	06/24/92#	NLPH	6.50	11.06					
	07/16/92	NLPH	6.68	10.88	14,000	1,600	1,000	1,000	2,500
	08/19/92#	NLPH	7.00	10.56					
	09/24/92	NLPH	7.28	10.28	4,700	790	97	640	540
	02/05/93	NLPH	4.84	12.72	26,000	2,500	4,300	1,700	5,300
	04/30/93	NLPH	5.69	11.87	9,600	1,000	410	1,100	1,600
	05/14/93#	NLPH	6.52	11.04					
	07/15/93	NLPH	7.51	10.05	4,600	250	72	540	650
	11/16/93	NLPH	8.29	9.27	410	41	12	47	71
	11/30/93#	NM	8.08	9.48					
	02/24-25/94	NLPH	6.09	11.47	4,300	190	190	300	460
	04/04-05/94	NLPH	6.98	10.58	4,000	290	120	420	600
MW-7	01/09/90	NM	NM	—	17,000	380	180	330	1,300
(17.12)	02/13/90#	NLPH	4.98	12.14					
	03/13/90	NLPH	4.94	12.18	16,000	360	270	83	460
	05/23/90#	NLPH	5.87	11.25					
	06/14/90	NLPH	5.55	11.57	14,000	1,200	2,800	75	930
	09/19/90	NLPH	6.79	10.33	16,000	2,800	95	2,500	1,700
	12/17/90	NLPH	6.15	10.97	75,000	2,600	7,000	3,300	14,000
	01/31/91#	NLPH	6.64	10.48					
	02/25/91#	NLPH	5.80	11.32					
	03/19/91	NLPH	4.96	12.16	44,000	1,600	740	3,400	8,600
	04/22/91#	NLPH	4.82	12.30					
	05/17/91#	NLPH	5.18	11.94					
	07/24/91	NLPH	6.22	10.90	18,000	1,300	160	2,700	1,000
	09/10/91#	NLPH	6.71	10.41					
	09/23/91#	NLPH	6.84	10.28					
	10/21/91#	NLPH	7.00	10.12					
	10/22/91	—	—	—	10,000	990	26	1,900	490
	11/18/91#	NLPH	6.56	10.56					
	12/11/91#	NLPH	6.68	10.44					
	01/21/92	NLPH	5.99	11.13	23,000	2,200	3,000	1,800	6,100

See notes on page 10 of 10.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Exxon Service Station No. 7-0104
1725 Park Street
Alameda, California

Well ID # (TOC)	Sampling Date	SUBJ	DTW	Elev.	TPHg	B	T	E	X
		<	feet	>	<	parts per billion			>
MW-7 cont.	02/20/92#	NLPH	4.36	12.76					
(17.12)	03/19/92#	NLPH	4.22	12.90					
	04/24/92	NLPH	4.84	12.28	25,000	1,400	220	2,100	2,600
	05/13/92#	NLPH	5.24	11.88					
	06/24/92#	NLPH	6.04	11.08					
	07/16/92	NLPH	6.19	10.93	8,700	470	45	970	86
	08/19/92#	NLPH	6.55	10.57					
	09/24/92	NLPH	6.83	10.29	9,200	560	48	1,300	54
	02/05/93	NLPH	4.11	13.01	33,000	1,100	2,300	1,200	4,200
	04/30/93b	NLPH	5.29	11.83	13,000	240	85	710	320
	05/14/93#	NLPH	5.91	11.21					
	07/15/93	NLPH	7.07	10.05	6,900	200	30	500	48
	11/16/93	NLPH	7.85	9.27	7,400	300	85	480	120
	11/30/93#	NM	7.66	9.46					
	02/24-25/94	NLPH	5.52	11.60	7,200	470	120	400	330
	04/04-05/94	NLPH	6.33	10.79	14,000	310	46	240	21
MW-8	05/14/93	NLPH	6.54	9.79	<50	<0.5	<1.0	<0.5	<0.5
(16.33)	07/15/93	NLPH	6.57	9.76	<50	<0.5	<0.5	<0.5	<0.5
	11/16/93	NLPH	7.15	9.18	<50	<0.5	<0.5	<0.5	<0.5
	11/30/93	—	6.94	9.39	—	—	—	—	—
	02/24-25/94	NLPH	5.80	10.53	<50	<0.5	<0.5	<0.5	<0.5
	04/04-05/94	NLPH	6.42	7.91	<50	<0.5	<0.5	<0.5	<0.5
MW-9	05/14/93	NLPH	6.61	9.01	<50	<0.5	<1.0	<0.5	<0.5
(15.62)	07/15/93	NLPH	6.79	8.83	<50	<0.5	<0.5	<0.5	<0.5
	11/16/93	NLPH	7.12	8.50	<50	<0.5	<0.5	<0.5	<0.5
	11/30/93	—	6.98	8.64	—	—	—	—	—
	02/24-25/94	NLPH	6.45	9.17	<50	<0.5	<0.5	<0.5	<0.5
	04/04-05/94	NLPH	6.75	8.87	<50	<0.5	<0.5	<0.5	<0.5
MW-10	05/14/93	NLPH	6.91	9.88	97	<0.5	<0.5	9.8	22
(16.79)	07/15/93	NLPH	7.47	9.32	160	<0.5	<0.5	15	19
	11/16/93	NLPH	8.17	8.62	<50	<0.5	<0.5	<0.5	<0.5
	11/30/93	—	7.96	8.83	—	—	—	—	—
	02/24-25/94	NLPH	6.53	10.26	280	<0.5	<0.5	12	7.0
	04/04-05/94	NLPH	7.27	9.52	280	<0.5	0.5	7.6	2.7
EW-1									
(16.22)	02/24-25/94	NLPH	5.58	10.64	1,000	140	4.5	15	120
	04/04-05/94	NLPH	15.90	0.32	380	26	<0.5	15	22

See notes on page 10 of 10.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Exxon Service Station No. 7-0104
1725 Park Street
Alameda, California

Well ID # (TOC)	Sampling Date	SUBJ	DTW	Elev.	TPHg	B	T	E	X
		<	feet	..... >	<	parts per billion		..... >	
EW-2									
(16.05)	02/24-25/94	LPH	14.30	1.75	5,200	1,200	390	63	410
	02/04-05/94	NLPH	NM	NM	6,300	970	99	22	220
EW-3									
(16.02)	02/24-25/94	NLPH	21.00	-4.98	91	<0.5	<0.5	<0.5	<0.5
	04/04-05/94	NLPH	22.5	-6.53	270	39	12	7.4	18
EW-4									
(15.61)	02/24-25/94	LPH	14.88	0.73	4,600	1,900	140	13	450
	04/04-05/94	NLPH	14.40	1.21	11,000	2,500	220	290	730
EW-5									
(16.51)	02/24-25/94	NLPH	11.95	4.56	1,000	140	45	3.4	190
	04/04-05/94	NLPH	13.96	2.55	820	120	41	16	99
Field	12/11/89	---	---	---	<50	0.88	0.95	0.62	1.7
Blanks	12/17/90	—	—	—	<50	<0.5	<0.5	<0.5	<0.5
	03/19/91	—	—	—	<50	<0.5	<0.5	<0.5	<0.5
	07/24/91	—	—	—	<50	<0.5	<0.5	<0.5	<0.6
	10/22/91	—	—	—	<50	<0.5	<0.5	<0.5	<0.5
	01/21/92	—	—	—	<50	<0.5	<0.5	<0.5	<0.5
	07/16/92	—	—	—	<50	<0.5	<0.5	<0.5	<0.5
Travel	06/14/90	—	—	—	<50	<0.5	<0.5	<0.5	<0.5
Blanks	09/19/90	—	—	—	<50	0.8	<0.5	0.6	1.0
	04/24/92	—	—	—	<50	<0.5	<0.5	<0.5	<0.5
	09/24/92	—	—	—	230	<0.5	<0.5	<0.5	<0.5
	Maximum Contaminant Levels (MCLs) (DHS)				---	1.0	—	680	1,750
	Drinking Water Action Level (DWAL) (DHS)				—	---	100	—	---

Notes:

TOC = Elevation of top of well casing; datum is mean sea level, revised February 10, 1994.
SUBJ = Results of subjective evaluation, liquid-phase product thickness (PT) in feet
DTW = Depth to water
Elev. = Elevation of groundwater; datum is mean sea level; adjusted for free-phase petroleum hydrocarbons when present using the equation: Elev. = TOC - [DTW + (PT * 0.8)] where PT is the product thickness
TPHg = Total petroleum hydrocarbons as gasoline analyzed using EPA method 5030/8015
BTEX = Benzene, Toluene, Ethylbenzene, and total Xylenes analyzed using EPA method 5030/8020
NM = Not Monitored
NLPH = No liquid-phase petroleum hydrocarbons present in well
LPH = Liquid-phase petroluem hydrocarbons present in well, thickness not measured, or not measurable.
NA = Well not accessible on this date
< = Less than the indicated detection limit shown by the laboratory
— = Not applicable
# = Well not sampled on this date
a = 03/07/90 sampling: Total Dissolved Solids were detected in samples from MW-1 and MW-4 at 910 parts-per-million (ppm) and 370 ppm, respectively.
b = a peak eluting before benzene was present in the groundwater samples from MW-5 and MW-7, and is suspected to be methyl-tert-butyl-ether (MTBE).

TABLE 2
RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
Exxon Station 7-0104
Alameda, California

	TPHg	B	T	E	X
	< ..... parts per million ..... >				
June 1988					
MW-1 at 10 feet	11	0.670	<0.025	0.150	0.370
MW-2 at 5 feet	1400	<2.0	32	25	150
MW-3 at 5 feet	74	<0.5	<0.5	<0.5	<0.5
January 1989					
MW-4 at 5 feet	0.6	0.017	0.002	0.007	0.012
MW-5 at 4½ feet	2.0	0.055	0.007	0.066	0.240
MW-6 at 5 feet	490	3.7	0.970	23	94
MW-7 at 5½ feet	600	1.7	3.2	10	29
May 1993					
SB-8 at 5½ feet	<1.0*	<0.005	<0.005	<0.005	<0.005
SB-9 at 6 feet	<1.0*	<0.005	<0.005	<0.005	<0.005
SB-10 at 6 feet	<1.0*	<0.005	<0.005	<0.005	<0.005
November 1993					
S-5-B11	<1.0	0.061	<0.005	0.018	<0.005
S-9-B11	<1.0	0.054	0.0075	0.020	0.029
S-11-B11	<1.0	<0.005	<0.005	<0.005	<0.005
S-14½-B11	<1.0	<0.005	<0.005	<0.005	<0.005
S-19½-B11	<1.0	<0.005	<0.005	<0.005	<0.005
S-5-B13	1.400	0.170	<0.005	0.060	0.0073
S-7-B13	1800	7.6	10.0	37.0	98.0
S-10-B13	2.90	0.077	0.031	0.085	0.270
S-12½-B13	<1.0	<0.005	<0.005	<0.005	<0.005
S-15½-B13	<1.0	<0.005	<0.005	<0.005	<0.005
S-20-B13	<1.0	<0.005	<0.005	<0.005	0.0079
SP-A+B+C+D	20.000	0.180	0.350	0.580	2.100
	8.1 pH, <0.5 ppm reactive cyanide, >60 °C flash point, <0.5 ppm reactive sulfide, <1.0 ppm lead				

See notes on page 2 of 2.

TABLE 2
RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
Exxon Station 7-0104
Alameda, California

<	:	Less than the laboratory detection limit.
*	:	<5.0 ppm total petroleum hydrocarbons as diesel.
B	:	Benzene
T	:	Toluene
E	:	Ethylbenzene
T	:	total Xylene isomers
BTEX	:	Analyzed using EPA method 5030/8020.
TPHg	:	Total petroleum hydrocarbons as gasoline using EPA method 3550/8015.

Sample designation:

S-20-B13
- B13 — Boring number
- 20 — Sample depth in feet below the ground surface
- S — Soil sample

SP-A+B+C+D
- A+B+C+D — Stockpile Composite Sample
- SP — Soil Pile

TABLE 3
AIR SPARGE, VAPOR EXTRACTION, AND MONITORING WELL DATA SUMMARY
Exxon Station 7-0104
1725 Park Street
Alameda, California
(January 31, 1994)

Well ID	Well Type	Depth-to-Water (feet)	Screened Interval (feet)	Depth of Well (feet)
SW-1	Sparge	7.10	17.5 to 20	20
SM-1	Sparge	6.53	17.5 to 20	19.8
MW-1	Monitoring	6.37	5 to 20.5	20.7
MW-4	Monitoring	6.36	4.5 to 19.5	—
VW-1	Vapor Extraction	Dry	4.5 to 7	7
VW-2	Vapor Extraction	Dry	4.5 to 7	7

Measurements in feet below ground surface.
— : Not Accessable

TABLE 4
AIR SPARGE TEST FIELD AND LABORATORY DATA
Exxon Station 7-0104
1725 Park Street
Alameda, California

(January 31, 1994)

Time	SW-1	SM-1	MW-4	MW-1	VW-1	VW-2
Pre-Sparge	$TPHg_{GW}$ = 670	$TPHg_{GW}$ = 70 $TPHg_V$ = <50	$TPHg_{GW}$ = 25,000 $TPHg_V$ = 32,000	$TPHg_{GW}$ = 2,100 $TPHg_V$ = <50	$TPHg_{GW}$ = --- $TPHg_V$ = 51,000	$TPHg_{GW}$ = --- $TPHg_V$ = 18,000
Start Sparge						
1445	Q_A = 0.52 Q_H = --- P_I = 28	--- ---	H_V = --- H_S = ---	H_V = --- H_S = 0	--- ---	--- ---
1500	Q_A = 0.87 Q_H = 0.54 P_I = 33	--- ---	H_V = --- H_S = 0.08	H_V = --- H_S = 0	--- ---	--- ---
1515	--- --- ---	--- ---	H_V = --- H_S = 0.05	H_V = --- H_S = 0	--- ---	--- ---
1530	Q_A = 1.13 Q_H = 0.71 P_I = 32.5	--- ---	H_V = --- H_S = 0.12	H_V = --- H_S = 0.45	--- ---	--- ---
Distance from sparge well		11'	14'	16'	3'	12'

See notes on page 3 of 3.

TABLE 4
AIR SPARGE TEST FIELD AND LABORATORY DATA
Exxon Station 7-0104
1725 Park Street
Alameda, California

(January 31, 1994)

Time	SW-1	SM-1	MW-4	MW-1	VW-1	VW-2
1545	--- --- ---	--- ---	H_V = --- H_S = 1.4	H_V = --- H_S = 3.9	--- ---	--- ---
1600	--- --- ---	--- ---	H_V = --- H_S = 4.7	H_V = --- H_S = 11.0	--- ---	--- ---
1622	Q_A = 0.70 Q_H = 0.71 P_I = 28.5	--- ---	H_V = --- H_S = ---	H_V = --- H_S = ---	--- ---	--- ---
1635	--- --- ---	--- ---	H_V = --- H_S = 7.0	H_V = --- H_S = 19.0	--- ---	--- ---
Post-Sparge		$TPHg_{GW}$ = <50 $TPHg_V$ = ---	$TPHg_{GW}$ = 19,000 $TPHg_V$ = 25,000	$TPHg_{GW}$ = 680 $TPHg_V$ = 100	--- ---	--- ---
Distance from sparge well		11'	14'	16'	3'	12'

See notes on page 3 of 3.

TABLE 4
AIR SPARGE TEST FIELD AND LABORATORY DATA
Exxon Station 7-0104
1725 Park Street
Alameda, California
(page 3 of 3)
(January 31, 1994)

Notes:

TPHg	:	Total petroleum hydrocarbons as gasoline.
$TPHg_V$	:	Concentrations of TPHg vapor in soil gas measured in mg/m^3. (milligram per cubic meter)
$TPHg_{GW}$	:	Concentrations of TPHg dissolved in groundwater measured in ppb (parts per billion).
Q_A	:	Injection flow rate of sparge air measured in ACFM (actual cubic feet per minute).
Q_H	:	Injection flow rate of helium measured in ACFM (actual cubic feet per minute).
P_I	:	Air/Helium injection pressure measured in pounds per square inch, gage (psig).
H_V	:	Levels of helium in vadose zone measured in percent.
H_S	:	Levels of helium in saturated zone measured in percent.
---	:	not applicable or not sampled or not measured.

TABLE 5
COMBINATION AIR SPARGE/VAPOR EXTRACTION TEST FIELD DATA
Exxon Station 7-0104
1725 Park Street
Alameda, California
(February 1, 1994)

Influent Air Stream from VW-1				Injection Well SW-1		Observation Wells			
						VW-2	SM-1	MW-1	MW-4
Elapsed Time (min)	Flow Rate (acfm)	Applied Vacuum ("H_2O)	OVM Readings (ppm)	Flow Rate (acfm)	Applied Pressure (psig)	Induced Vacuum ("H_2O)	Induced Vacuum ("H_2O)	Induced Vacuum ("H_2O)	Induced Vacuum ("H_2O)
0	11.0	6.5	—			0.5	0.5	0.02	0.25
15	11.0	6.5	>10,000			1.6	1.0	0.02	0.6
30	11.0	6.5	>10,000			1.5	1.1	0.01	0.6
Begin Air Sparging									
45	11.0	6.0	>10,000	0.61	29	0.7	1.0	+0.20	+0.09
60	11.0	6.0	>10,000	---	---	0.5	+6.2	+0.48	+0.20
75	19.6	6.6	>10,000	0.68	28	0.4	+8.9	+0.94	+0.24
90	19.6	6.8	>10,000	0.86	28	0.5	+11.0	+0.5	+0.31
105	30.1	9.4	>10,000	0.44	19	1.5	+16.0	+6.5	0.38
120	30.1	9.4	>10,000	0.65	19	1.5	+9.0	+0.8	0.37
135	30.1	9.4	>10,000	---	--	1.5	+4.5	+0.9	0.34
150	30.1	9.6	>10,000	---	--	1.5	+3.5	+1.2	0.31
165	40	10.4	>10,000	0.51	14	1.6	+3.5	+1.6	0.54
180	40	10.4	>10,000	—	–	1.6	+0.5	+1.8	0.55
195	40	10.4	>10,000	---	--	1.6	0	+2.0	0.54
210	40	10.4	>10,000	—	--	1.6	0.36	+2.0	0.50
Distance from extraction well VW-1 (feet):				3'		9'	10'	15'	15'

Notes:
acfm : actual cubic feet per minute
"H_2O : inches of water column
psig : pounds per square inch, gage
OVM : organic vapor meter
ppm : parts per million
> : greater than
+ : positive pressure condition
--- : Not applicable or not sampled or not measured
No detectable background fluctuations in atmospheric pressure.

TABLE 6
LABORATORY ANALYSES OF VAPOR SAMPLES
Exxon Station 7-0104
1725 Park Street
Alameda, California

Sample ID	Sample Location	TPHg	B	T	E	X
VW-1-Inf(30)	VW-1	17,000	260	130	44	95
VW-1-Eff	VW-1	67	2.1	2.4	4.1	13

Concentrations in micrograms per liter (µg/ℓ).

<	:	Below the minimum laboratory detection limit for air.
NA	:	Not Analyzed
TPHg	:	Total Petroleum hydrocarbons as gasoline (analyzed by modified EPA Method 8015).
B: benzene,	T: toluene,	E: ethylbenzene, X total Xylene isomers
BTEX	:	Analyzed by EPA method 8020
*	:	Effluent vapors sampled after abatement by the internal combustion engine.

RESNA
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APPENDIX A

FIELD PROTOCOL

RESNA
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FIELD PROTOCOL

The following presents RESNA Industries' field protocol for a typical site investigation involving gasoline hydrocarbon-impacted soil and/or groundwater.

Site Safety Plan

The Site Safety Plan describes the safety requirements for the evaluation of gasoline hydrocarbons in soil, groundwater, and the vadose-zone at the site. The site Safety Plan is applicable to personnel of RESNA Industries and its subcontractors. RESNA Industries personnel and subcontractors of RESNA Industries scheduled to perform the work at the site are briefed on the contents of the Site Safety Plan before work begins. A copy of the Site Safety Plan is available for reference by appropriate parties during the work. A site Safety Officer is assigned to the project.

Sampling of Stockpiled Soil

One composite soil sample is collected for each 50 cubic yards of stockpiled soil, and for each individual stockpile composed of less than 50 cubic yards. Composite soil samples are obtained by first evaluating relatively high, average, and low areas of hydrocarbon concentration by digging approximately one to two feet into the stockpile and placing the intake probe of a field calibrated OVM against the surface of the soil; and then collecting one sample from the "high" reading area, and three samples from the "average" areas. Field instruments such as the OVM are useful for measuring relative concentrations of vapor content, but cannot be used to measure levels of gasoline hydrocarbons with the accuracy of laboratory analysis. Samples are collected by removing the top one to two feet of soil, then driving laboratory-cleaned brass sleeves into the soil. The samples are sealed in the sleeves using aluminum foil, plastic caps, and plastic zip-lock bags or aluminized duct tape; labeled; and promptly placed in iced storage for transport to the laboratory, where compositing is performed.

Soil Borings

Prior to the drilling of borings and construction of monitoring wells, permits are acquired from the appropriate regulatory agency. In addition to the above-mentioned permits, encroachment permits from the City or State are acquired if drilling of borings offsite on City or State property is necessary. Copies of the permits are included in the appendix of the project report. Prior to drilling, Underground Service Alert (USA) is notified of our intent to drill, and known underground utility lines and structures are approximately marked.

The borings are drilled by a truck-mounted drill rig equipped with 8- or 10-inch-diameter, solid-stem or hollow-stem augers. Other methods such as rotary or casing hammer may be used if special conditions are encountered. The augers, sampling equipment and other equipment that comes into contact with the soil are steam-cleaned prior to drilling each boring to minimize the possibility of cross-contamination. Sampling equipment is cleaned with a trisodium phosphate solution and rinsed with clean water between samples. After drilling the borings, monitoring wells are constructed in the borings, or neat-cement grout with bentonite is used to backfill the borings to the ground surface.

Borings for groundwater monitoring wells are drilled to a depth of no more than 20 feet below the depth at which a saturated zone is first encountered, or a short distance into a stratum beneath the saturated zone which is of sufficient texture, moisture, and consistency to be judged as a perching layer by the field geologist, whichever is shallower. Drilling into a deeper aquifer below the shallowest aquifer is begun only after a conductor casing is properly installed and allowed to set, to seal the shallow aquifer.

Drill Cuttings

Drill cuttings subjectively evaluated as containing gasoline hydrocarbons at levels greater than 100 parts per million (ppm) are separated from those subjectively evaluated as containing gasoline hydrocarbons at levels less than 100 ppm. Evaluation is based either on subjective evidence of soil discoloration, or on measurements made using a field calibrated OVM. Readings are taken by placing a soil sample into a ziplock-type plastic bag and allowing volatilization to occur. The intake probe of the OVM is then inserted into the headspace created in the plastic bag immediately after opening it. The drill cuttings from the borings are placed in labeled 55-gallon drums approved by the Department of Transportation, or on plastic at the site, and covered with plastic. The cuttings remain the responsibility of the client.

Soil Sampling in Borings

Soil samples are collected at no greater than 5-foot intervals from the ground surface to the total depth of the borings. The soil samples are collected by advancing the boring to a point immediately above the sampling depth, and then driving a California-modified, split-spoon sampler containing brass sleeves through the hollow center of the auger into the soil. (A standard penetrometer, which does not contain liners, may be used to collect samples when laboratory analysis for volatile components is not an issue. The sampler and brass sleeves are laboratory-cleaned, steam-cleaned, or washed thoroughly with Alconox® and water, prior to each use. The sampler is driven with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each successive six inches are counted and recorded to evaluate the relative consistency of the soil. When necessary, the sampler

may be pushed by the drill rig hydraulics. In this case, the pressure exerted (in pounds per square inch) is recorded.

The samples selected for laboratory analysis are removed from the sampler and quickly sealed in their brass sleeves with aluminum foil, plastic caps, and plastic zip-lock bags or aluminized duct tape. The samples are then labeled, promptly placed in iced storage, and delivered to a laboratory certified by the State of California to perform the analyses requested.

One of the samples in brass sleeves not selected for laboratory analysis at each sampling interval is tested in the field using an OVM that is field calibrated at the beginning of each day it is used. This testing is performed by inserting the intake probe of the OVM into the headspace in the plastic bag containing the soil sample as described in the Drill Cuttings section above. The OVM readings are presented in Logs of Borings included in the project report.

Logging of Borings

A geologist is present to log the soil cuttings and samples using the Unified Soil Classification System. Samples not selected for chemical analysis, and the soil in the sampler shoe, are extruded in the field for inspection. Logs include texture, color, moisture, plasticity, consistency, blow counts, and any other characteristics noted. Logs also include subjective evidence for the presence of gasoline hydrocarbons, such as soil staining, noticeable or obvious product odor, and OVM readings.

Monitoring Well Construction

Monitoring wells are constructed in selected borings using clean 2- or 4-inch-diameter, thread-jointed, Schedule 40 polyvinyl chloride (PVC) casing. No chemical cements, glues, or solvents are used in well construction. Each casing bottom is sealed with a threaded end-plug, and each casing top with a locking plug. The screened portions of the wells are constructed of machine-slotted PVC casing with 0.020-inch-wide (typical) slots for initial site wells. Slot size for subsequent wells may be based on sieve analysis and/or well development data. The screened sections in groundwater monitoring wells are placed to allow monitoring during seasonal fluctuations of groundwater levels.

The annular space of each well is backfilled with No. 2 by 12 sand or similar sorted sand (groundwater monitoring wells), or pea gravel (vapor extraction wells) to approximately two feet above the top of the screened casing for initial site wells. The sand pack grain size for subsequent wells may be based on sieve analysis and/or well development data. A 1- to 2-foot-thick bentonite plug is placed above the sand as a seal against cement entering the

filter pack. The remaining annulus is then backfilled with a slurry of water, neat cement, and bentonite to approximately one foot below the ground surface.

An aluminum utility box with a PVC apron is placed over each wellhead and set in concrete placed flush with the surrounding ground surface. Each wellhead cover has a seal to protect the monitoring well against surface-water infiltration and requires a special wrench to open. The design discourages vandalism and reduces the possibility of accidental disturbance of the well.

Groundwater Monitoring Well Development

The monitoring wells are developed by bailing or over-pumping and surge-block techniques. The wells are either bailed or pumped, allowed to recharge, and bailed or pumped again until the water removed from the wells is determined to be clear. Turbidity measurements (in NTUs) are recorded during well development and are used in evaluating well development. The development method used, initial turbidity measurement, volume of water removed, final turbidity measurement, and other pertinent field data and observations are recorded. The wells are allowed to equilibrate for at least 48 hours after development prior to sampling. Water generated by well development is stored in 17E Department of Transportation (DOT) 55-gallon drums on site, and remains the responsibility of the client.

Sample Labeling and Handling

Sample containers are labeled in the field with the job number, unique sample location, depth, and date, and promptly placed in iced storage for transport to the laboratory. A Chain of Custody Record is initiated by the field geologist and updated throughout handling of the samples, and accompanies the samples to a laboratory certified by the State of California for the analyses requested. Samples are transported to the laboratory promptly to help ensure that recommended sample holding times are not exceeded. Samples are properly disposed of after their useful life has expired.

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APPENDIX B

PREVIOUS ENVIRONMENTAL WORK

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PREVIOUS ENVIRONMENTAL WORK

The site was formerly occupied by a Regal Service Station. In 1986, three gasoline underground storage tanks (USTs) were removed and replaced with three double-walled fiberglass tanks. An initial investigation performed by Harding Lawson Associates (HLA) of Novato, California, included drilling three soil borings and construction of three groundwater monitoring wells (MW-1 through MW-3) at the site (HLA, June 24, 1988). Total petroleum hydrocarbons as gasoline (TPHg) in the soil ranged from 11 parts per million (ppm) to 1,400 ppm at a depth of 5 feet in boring MW-2. HLA performed an additional investigation which included drilling three soil borings and constructing three groundwater monitoring wells (MW-4 through MW-6) at the site (HLA, March 21, 1989). TPHg in the soil ranged from 0.6 ppm to 490 ppm at a depth of 5 feet in boring MW-6.

HLA subsequently drilled seven shallow soil borings (SB-1 through SB-7) and one deep boring, constructed groundwater monitoring well MW-7 in the deep boring, and conducted a series of aquifer slug tests (HLA, May 1, 1990). TPHg concentrations in the soil ranged from not detectable (less than 1.0 ppm) to 2,600 ppm at a depth of 5 feet in boring SB-1. The aquifer slug test was performed in wells MW-1, MW-2, MW-6, and MW-7. HLA installed five groundwater extraction wells (EW-1 through EW-5) in 1991; however, no information on soil or groundwater sampling is available.

In September 1992, HLA performed an offsite groundwater survey (HLA, October 30, 1992) to evaluate the horizontal extent of petroleum hydrocarbons in groundwater that are related to an onsite release and whether potential offsite sources contributed to dissolved hydrocarbons in the vicinity of the site. HLA concluded that petroleum hydrocarbons from onsite sources appear to be generally limited to the site with possible restricted offsite migration. HLA further concluded that possible additional sources of petroleum hydrocarbons are present to the southeast and southwest of the site. During the field investigation, groundwater monitoring wells were noted at the former service station across Park Street southeast of the site, which is a possible a source of petroleum hydrocarbons beneath the Exxon site. Additionally, results indicated a release of petroleum hydrocarbons may have occurred southwest upgradient of the site. A possible source of petroleum hydrocarbons to the southwest of the Exxon site is an operation Shell service station on Park Street. However, documentation on the Shell station is limited.

In October 1992, HLA performed a vapor extraction test (VET), which included six individual short-term tests in wells MW-2, MW-3, MW-6, MW-7, EW-1, and EW-3 (HLA, December 28, 1992). Results of the test indicated soil-vapor extraction appears to be a viable method for removing hydrocarbons from soil; however, existing wells do not have sufficient slotted intervals to allow adequate air flow. During the tests, the air flow rates from the wells generally did not increase with applied vacuum, indicating that the air flow

paths to the wells did not develop significantly during short-term operation. Air flow rates were generally low (between 1 and 6.5 cubic feet per minute), except for well MW-7, which achieved a flow rate of 26 cubic feet per minute. The induced vacuum created a radius of influence generally between 30 and 50 feet. Soil-vapor hydrocarbon concentrations ranged from 470 parts per million per volume (ppmv) to 49,000 ppmv in well MW-2.

In December 1992, HLA began construction of a groundwater removal and treatment system at the site. The system removes groundwater from the existing extraction wells to an above-ground bioreactor tank, through activated carbon canisters, and to the sanitary sewer system. The system began operating in March 1993.

HLA concluded that onsite groundwater extraction could potentially alter the migration path of offsite plumes and make differentiation of plume boundaries difficult (HLA, October 30, 1992). Additionally, the potential contribution of petroleum hydrocarbons from offsite sources could impact the duration of remediation unless measures are taken by the other respective responsible parties to prevent migration of petroleum hydrocarbons to the Exxon site.

January 1993 - March 1994

A RESNA geologist performed quarterly monitoring of wells at the site on February 2, April 30, July 15, November 11, 1993, and February 24-25, 1994 (RESNA, April 14, June 30, October 22, 1993, and January 19 and April 27, 1994). Groundwater was sampled for laboratory analysis from wells MW-1 through MW-10 and groundwater extraction wells EW-1 through EW-5 (as applicable). The DTW measurements, wellhead elevations, groundwater elevations, and laboratory results are presented in Table 1, Cumulative Groundwater Monitoring Data. The groundwater gradient interpreted during these monitoring episodes was consistent with the previously interpreted groundwater gradients for this site.

Based on field measurements, which have been collected between December 9, 1993, and March 30, 1994, approximately 334,792 gallons of groundwater have been extracted, and approximately 0.29 gallons of TPHg have been removed and treated. The average discharge rate to the sanitary sewer this quarter was approximately 2.76 gpm (3,974 gallons per day). The system has extracted a total of approximately 1,267,720 gallons, and treated a total of 3.96 gallons of TPHg since system start-up in February 1993.

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APPENDIX C

WELL CONSTRUCTION PERMIT

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94566 • (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

1) LOCATION OF PROJECT Exxon 7-0104
1726 Park Street
Alameda, CA 94501

2) CLIENT
Name Exxon Co USA, PO Box 4032
Address 2300 clayton Rd. Phone (510) 246-8776
City Concord, CA Zip 94520

3) APPLICANT
Name RESNA Industries Inc
Address 3315 Almaden Expressway Suite 34 Phone (408) 264-7723
City San Jose, CA Zip 95118

4) DESCRIPTION OF PROJECT
Water Well Construction X Geotechnical ___
Cathodic Protection ___ Well Destruction ___

5) PROPOSED WATER WELL USE
Domestic ___ Industrial ___ Irrigation ___
Municipal ___ Monitoring X Other ___

6) PROPOSED CONSTRUCTION
Drilling Method:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

WELL PROJECTS
Drill Hole Diameter 12 in. Depth(s) 20 ft.
Casing Diameter 2 in. Number of Wells 2
Surface Seal Depth ___ ft.
Driller's License No. 484288

GEOTECHNICAL PROJECTS
Number ___
Diameter ___ in. Maximum Depth ___ ft.

7) ESTIMATED STARTING DATE 11/10/93
ESTIMATED COMPLETION DATE 11/11/93

9) I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S

FOR OFFICE USE

PERMIT NUMBER 93620
LOCATION NUMBER

Approved Wyman Hong Date 4 Nov 93
Wyman Hong

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Notify this office (484-2600) at least one day prior to starting work on permitted work and before placing well seals.
3. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or bore hole logs and location sketch for geotechnical projects. Permitted work is completed when the last surface seal is placed or the last boring is completed.
4. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie, or equivalent.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic, irrigation, and monitoring wells unless a lesser depth is specially approved.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie, or equivalent.

E. WELL DESTRUCTION. See attached.

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APPENDIX D

UNIFIED SOIL CLASSIFICATION SYSTEM AND SYMBOL KEY AND BORING LOGS

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISION		LTR	DESCRIPTION
COARSE-GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel-sand mixtures, little or no fines.
		GP	Poorly-graded gravels or gravel-sand mixtures, little or no fines.
		GM	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravel, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS	SW	Well-graded sand or gravelly sands, little or no fines.
		SP	Poorly-graded sands or gravelly sands, little or no fines.
		SM	Silty sands, sand-silt mixtures.
		SC	Clayey sands, sand-clay mixtures.

MAJOR DIVISION		LTR	DESCRIPTION
FINE-GRAINED SOILS	SILTS AND CLAYS LL<50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		OL	Organic silts and organic silt-clays of low plasticity.
	SILTS AND CLAYS LL>50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
		OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils.

Depth through which sampler is driven

Relatively undisturbed sample

No sample recovered

Static water level observed in well/boring

Initial water level observed in boring

S-10 Sample number

Sand pack

Bentonite

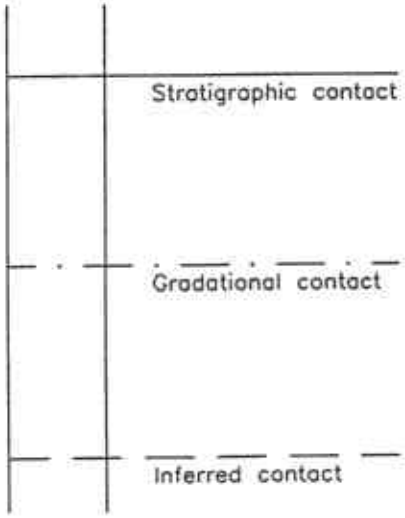
Neat cement

Caved native soil

Blank PVC

Machine-slotted PVC

P.I.D. Photoionization detector



BLOWS REPRESENT THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES TO DRIVE THE SAMPLER THROUGH EACH 6 INCHES OF AN 18-INCH PENETRATION.

GRADATIONAL AND INFERRED CONTACT LINES SEPARATING UNITS ON THE LOG REPRESENT APPROXIMATE BOUNDARIES ONLY. ACTUAL BOUNDARIES MAY BE GRADUAL. LOGS REPRESENT SUBSURFACE CONDITIONS AT THE BORING LOCATION AT THE TIME OF DRILLING ONLY.

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PROJECT 170077.06

UNIFIED SOIL CLASSIFICATION SYSTEM AND SYMBOL KEY
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE D-1

Total depth of boring:	20-1/2 feet	Casing diameter:	2 inches
Diameter of boring:	8 inches	Casing material:	Sch 40 PVC
Date drilled:	11-10-93	Slot size:	0.10-inch
Drilling Company:	Exploration Geoservices	Sand size:	Pea gravel
Driller:	Dave Yeager	Screen Interval:	17-1/2 feet to 20 feet
Drilling method:	Hollow-Stem Auger	Field Geologist:	Jeanne Buckthal

Signature of Registered Professional:

Registration No.: RG 5023 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
2				SW	Asphalt (3 inches).	
				SP	Sand with gravel, fine-grained sand, fine gravel (up to 3/4" in diameter), dark brown, damp, loose; hydrocarbon odor: fill.	
4	S-5	8 13	20.4		Sand, fine-grained sand, gray, damp, medium dense; strong hydrocarbon odor.	
6						
8						
10	S-9	13 16 21	17.3		Moist, dense; hydrocarbon odor.	
	S-11	18 25 36	27.3	▽	Color change to light orange-brown at 11 feet. Wet, very dense; no hydrocarbon odor.	
12						
14	S-14.5	15 17 22	3.8		Dense.	
16						
18						
20	S-19.5	13 18 20	4.1		Gray.	
					Total Depth = 20-1/2 feet.	
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						

RESNA
Working to Restore Nature

PROJECT: 170077.06

LOG OF BORING B-11/SW-1
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE
D-2

Total depth of boring:	7 feet	Casing diameter:	2 inches
Diameter of boring:	8 inches	Casing material:	Sch 40 PVC
Date drilled:	11-10-93	Slot size:	0.020-inch
Drilling Company:	Exploration Geoservices	Sand size:	No. 3 Sand
Driller:	Dave Yeager	Screen Interval:	4-1/2 feet to 7 feet
Drilling method:	Hollow-Stem Auger	Field Geologist:	Jeanne Buckthal

Signature of Registered Professional:

Registration No.: RG 5023 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
2				SW	Asphalt (3 inches).	
				SP	Sand with gravel, fine-grained sand, fine gravel (up to 3/4" in diameter), dark brown, damp, loose; hydrocarbon odor: fill.	
4	S-5	8 13	20.4		Sand, fine-grained sand, gray, damp, medium dense; strong hydrocarbon odor.	
6						
8					Total Depth = 7 feet.	
10						
12						
14						
16						
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						

RESNA
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PROJECT: 170077.06

LOG OF BORING B-12/VW-1
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE
D-3

Total depth of boring:	20-1/2 feet	Casing diameter:	2 inches
Diameter of boring:	8 inches	Casing material:	Sch 40 PVC
Date drilled:	11-10-93	Slot size:	0.10-inch
Drilling Company:	Exploration Geoservices	Sand size:	Pea gravel
Driller:	Dave Yeager	Screen Interval:	17-1/2 feet to 20 feet
Drilling method:	Hollow-Stem Auger	Field Geologist:	Jeanne Buckthal

Signature of Registered Professional:

Registration No.: RG 5023 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
2				GW	Asphalt (3 inches).	
					Sandy gravel, fine gravel (up to 3/4" in diameter), fine- to medium-grained sand, gray-brown, damp, loose; hydrocarbon odor: fill.	
4				SP-SM		
		6 7			Sand with silt, fine-grained sand, greenish-gray, damp, medium dense; hydrocarbon odor.	
6	S-5	8 6	69.5			
	S-7	8 10	127		Decreasing silt content, moist.	
8						
		9 14		SP	Sand, fine-grained sand, greenish-gray, wet, dense; hydrocarbon odor.	
10	S-10	17	488		Color change to light orange-brown at 11 feet.	
		16 22				
12	S-12.5	21	9.1		No hydrocarbon odor.	
14						
		10 17		SP-SM	Sand with silt, fine-grained sand, orange-brown, wet, dense; no hydrocarbon odor.	
16	S-15.5	21	4.8			
18						
		9 13				
20	S-20	18	4.8		Gray.	
					Total Depth = 20-1/2 feet.	
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						

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Working to Restore Nature

PROJECT: 170077.06

LOG OF BORING B-13/SM-1
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE
D-4

Total depth of boring: 7 feet
Diameter of boring: 8 inches
Date drilled: 11-10-93
Drilling Company: Exploration Geoservices
Driller: Dave Yeager
Drilling method: Hollow-Stem Auger

Casing diameter: 2 inches
Casing material: Sch 40 PVC
Slot size: 0.020-inch
Sand size: No. 3 Sand
Screen Interval: 4-1/2 feet to 7 feet
Field Geologist: Jeanne Buckthal

Signature of Registered Professional:

Registration No.: RG 5023 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
2				GW	Asphalt (3 inches).	
					Sandy gravel, fine gravel (up to 3/4" in diameter), fine- to medium-grained sand, gray-brown, damp, loose; hydrocarbon odor: fill.	
4				SP-SM		
		8			Sand with silt, fine-grained sand, greenish-gray, damp, medium	
6	S-5	7 8	69.5		dense; hydrocarbon odor.	
	S-7	6 8 10	127		Decreasing silt content, moist.	
8					Total Depth = 7-1/2 feet.	
10						
12						
14						
16						
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						

RESNA
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PROJECT: 170077.06

LOG OF BORING B-14/VW-2
Exxon Service Station 7-0104
1725 Park Street
Alameda, California

PLATE
D-5

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APPENDIX E

WELLHEAD SURVEY

RECEIVED
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RESNA
SAN JOSE

RON ARCHER
CIVIL ENGINEER, INC.
CONSULTING • PLANNING • DESIGN • SURVEYING

4133 Mohr Ave., Suite E • Pleasanton, CA 94566
(510) 462-9372

REGISTERED PROFESSIONAL ENGINEER
RONALD R. ARCHER
No. 23721
EXP. 12/31/93
CIVIL
STATE OF CALIFORNIA

OCTOBER 30, 1992 JOB NO. 1974
MAY 6, 1993
* REVISED DECEMBER 7, 1993

ELEVATIONS OF EXISTING MONITOR WELLS AT THE EXXON STATION NO. 7-0104, LOCATED AT 1725 PARK STREET AT EAGLE AVENUE, CITY OF ALAMEDA, ALAMEDA COUNTY, CALIFORNIA

FOR: RESNA INDUSTRIES INC.

BENCHMARK:
A FOUND CUT SQUARE IN TOP CURB AT MID RETURN AT THE NORTHWEST CORNER OF PARK STREET AND EAGLE AVENUE
ELEVATION TAKEN AS 16.41 M.S.L.

MONITOR WELL DATA TABLE

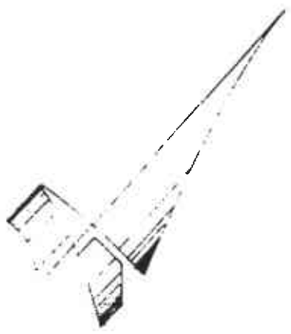
WELL DESIGNATION	ELEV	DESCRIPTION
MW8	16.33	TOP OF PVC CASING
	16.71	TOP OF BOX
MW9	15.62	TOP OF PVC CASING
	15.88	TOP OF BOX
MW10	16.79	TOP OF PVC CASING
	16.99	TOP OF BOX
* VW1	17.34	TOP OF PVC CASING
	17.99	TOP OF BOX
* VW2	17.05	TOP OF PVC CASING
	17.63	TOP OF BOX
* SM1	17.27	TOP OF PVC CASING
	17.67	TOP OF BOX
* SW1	17.64	TOP OF PVC CASING
	18.04	TOP OF BOX

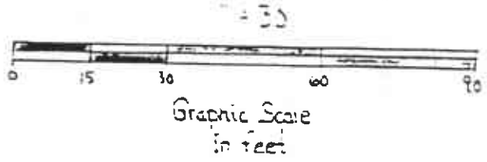
OCTOBER 30, 1992
MAY 6, 1993
* REVISED DECEMBER 7, 1993

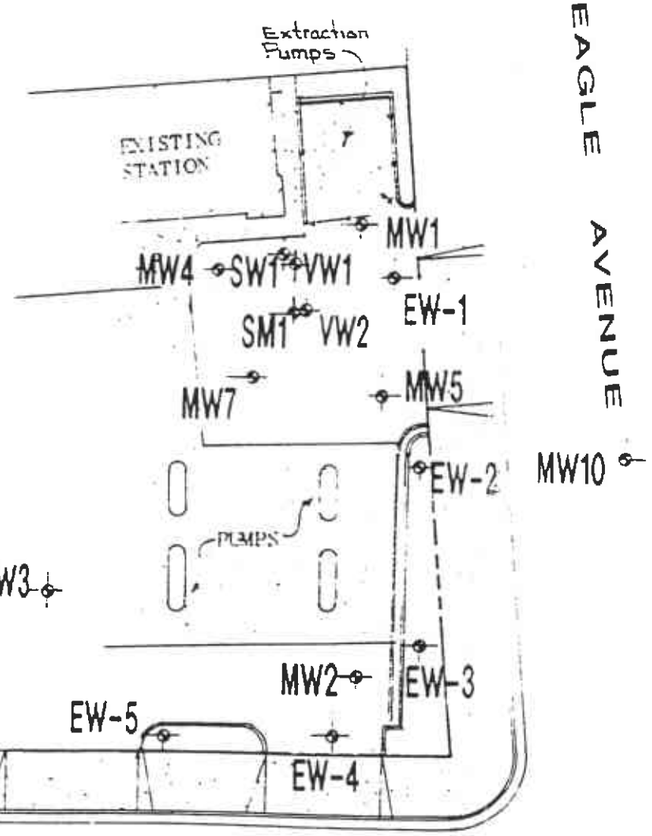
JOB NO. 1974

PLAT SHOWING EXISTING MONITOR WELLS AT THE EXXON STATION NO. 7-0104, LOCATED AT 1725 PARK STREET AT EAGLE AVENUE, CITY OF ALAMEDA, ALAMEDA COUNTY, CALIFORNIA

FOR: RESNA INDUSTRIES INC.







VICINITY MAP
N.T.S

BENCHMARK:
A FOUND CUT SQUARE IN TOP CURB AT MID RETURN AT THE SOUTHWEST CORNER OF PARK STREET AND EAGLE AVENUE
ELEVATION TAKEN AS 16.41 M.S.L.

MONITOR WELL DATA TABLE

WELL DESIGNATION	ELEV	DESCRIPTION
MW8	16.33	TOP OF PVC CASING
	16.71	TOP OF BOX
MW9	15.62	TOP OF PVC CASING
	15.88	TOP OF BOX
MW10	16.79	TOP OF PVC CASING
	16.99	TOP OF BOX
* VW1	17.34	TOP OF PVC CASING
	17.99	TOP OF BOX
* VW2	17.85	TOP OF PVC CASING
	17.63	TOP OF BOX
* SM1	17.27	TOP OF PVC CASING
	17.67	TOP OF BOX
* SW1	17.64	TOP OF PVC CASING
	18.84	TOP OF BOX

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APPENDIX F

LABORATORY ANALYSIS REPORTS AND CHAIN OF CUSTODY RECORDS

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REPORT OF LABORATORY ANALYSIS

November 19, 1993

RECEIVED
1993
RESNA
SAN JOSE

Mr. Marc Briggs
RESNA
3315 Almaden Expressway Suite 34
San Jose, CA 95118

RE: PACE Project No. 431111.516
Client Reference: Exxon 7-0104 (EE)

Dear Mr. Briggs:

Enclosed is the report of laboratory analyses for samples received November 11, 1993.

Footnotes are given at the end of the report.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Renata M. Cohen

for Stephanie Matzo
Project Manager

Enclosures

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FAX: 415-883-2673

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REPORT OF LABORATORY ANALYSIS

Mr. Marc Briggs
Page 2

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0189764	
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			S-7-B13	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	mg/kg wet	40	1800 (PPM)	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	200	7600	11/12/93
Toluene	ug/kg wet	200	10000	11/12/93
Ethylbenzene	ug/kg wet	200	37000	11/12/93
Xylenes, Total	ug/kg wet	200	98000	11/12/93

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REPORT OF LABORATORY ANALYSIS

Mr. Marc Briggs
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November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0189780	
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			S-10-B13	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	2900	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	5.0	77	11/12/93
Toluene	ug/kg wet	5.0	31	11/12/93
Ethylbenzene	ug/kg wet	5.0	85	11/12/93
Xylenes, Total	ug/kg wet	5.0	270	11/12/93

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REPORT OF LABORATORY ANALYSIS

Mr. Marc Briggs
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November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0189799	
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			S-12 1/2-B13	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	5.0	ND	11/12/93
Toluene	ug/kg wet	5.0	ND	11/12/93
Ethylbenzene	ug/kg wet	5.0	ND	11/12/93
Xylenes, Total	ug/kg wet	5.0	ND	11/12/93

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REPORT OF LABORATORY ANALYSIS

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0189810	
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			S-15 1/2-B13	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	5.0	ND	11/12/93
Toluene	ug/kg wet	5.0	ND	11/12/93
Ethylbenzene	ug/kg wet	5.0	ND	11/12/93
Xylenes, Total	ug/kg wet	5.0	ND	11/12/93

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REPORT OF LABORATORY ANALYSIS

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November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0189829	
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			S-20-813	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	5.0	ND	11/12/93
Toluene	ug/kg wet	5.0	ND	11/12/93
Ethylbenzene	ug/kg wet	5.0	ND	11/12/93
Xylenes, Total	ug/kg wet	5.0	7.9	11/12/93

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REPORT OF LABORATORY ANALYSIS

Mr. Marc Briggs
Page 7

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0189837	
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			S-5-B11	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	5.0	61	11/12/93
Toluene	ug/kg wet	5.0	ND	11/12/93
Ethylbenzene	ug/kg wet	5.0	18	11/12/93
Xylenes, Total	ug/kg wet	5.0	ND	11/12/93

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REPORT OF LABORATORY ANALYSIS

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November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0189845	
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			S-9-B11	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/15/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/15/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/15/93
Benzene	ug/kg wet	5.0	54	11/15/93
Toluene	ug/kg wet	5.0	7.5	11/15/93
Ethylbenzene	ug/kg wet	5.0	20	11/15/93
Xylenes, Total	ug/kg wet	5.0	29	11/15/93

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REPORT OF LABORATORY ANALYSIS

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November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0189861	
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			S-11-B11	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	5.0	ND	11/12/93
Toluene	ug/kg wet	5.0	ND	11/12/93
Ethylbenzene	ug/kg wet	5.0	ND	11/12/93
Xylenes, Total	ug/kg wet	5.0	ND	11/12/93

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REPORT OF LABORATORY ANALYSIS

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November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

Parameter	Units	MDL	PACE Sample Number: 70 0189870 Date Collected: 11/10/93 Date Received: 11/11/93 Client Sample ID: S-14 1/2- B11	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	5.0	ND	11/12/93
Toluene	ug/kg wet	5.0	ND	11/12/93
Ethylbenzene	ug/kg wet	5.0	ND	11/12/93
Xylenes, Total	ug/kg wet	5.0	ND	11/12/93

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REPORT OF LABORATORY ANALYSIS

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November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

Parameter	Units	MDL	PACE Sample Number: 70 0189896 Date Collected: 11/10/93 Date Received: 11/11/93 Client Sample ID: S-19 1/2- B11	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	5.0	ND	11/12/93
Toluene	ug/kg wet	5.0	ND	11/12/93
Ethylbenzene	ug/kg wet	5.0	ND	11/12/93
Xylenes, Total	ug/kg wet	5.0	ND	11/12/93

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November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

Parameter	Units	MDL	70 0189942 Composite	DATE ANALYZED
PACE Sample Number:				
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			SP-A+B+C+D	
INORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Corrosivity (pH)	Units	0.1	11	11/15/93
Cyanide, Reactive	mg/kg	0.5	ND	11/17/93
Flash Point, Closed Cup	Degrees C	25	>60	11/16/93
Sulfide, Reactive	mg/kg	0.5	ND	11/16/93
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/12/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	20000	11/12/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/12/93
Benzene	ug/kg wet	5.0	180	11/12/93
Toluene	ug/kg wet	5.0	350	11/12/93
Ethylbenzene	ug/kg wet	5.0	580	11/12/93
Xylenes, Total	ug/kg wet	5.0	2100	11/12/93

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REPORT OF LABORATORY ANALYSIS

Mr. Marc Briggs
Page 13

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:	70 0189950
Date Collected:	11/10/93
Date Received:	11/11/93
Client Sample ID:	SP-A+B+C+D CAM

Parameter	Units	MDL	EXTRACT	DATE ANALYZED
INORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Lead (EPA Method 6010/200.7, ICP)	mg/L	1.0	ND	11/18/93

These data have been reviewed and are approved for release.

for

Darrell C. Cain
Regional Director

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Client Reference: Exxon 7-0104 (EE)

>	Greater than reported value.
MDL	Method Detection Limit
ND	Not detected at or above the MDL.

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Mr. Marc Briggs
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QUALITY CONTROL DATA

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

Corrosivity (pH)
Batch: 70 26399
Samples: 70 0189942

SAMPLE DUPLICATE:

Parameter	Units	MDL	700189640	Duplicate of 70 0189640	RPD
Corrosivity (pH)	Units	0.1	8.1	8.1	0%

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
Corrosivity (pH)	Units	0.1	7.00	100%

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Client Reference: Exxon 7-0104 (EE)

Cyanide, Reactive
Batch: 70 26461
Samples: 70 0189942

METHOD BLANK AND SAMPLE DUPLICATE:

Parameter	Units	MDL	Method Blank	700189640	Duplicate of 70 0189640	RPD
Cyanide, Reactive	mg/kg	0.5	ND	ND	ND	NC

LABORATORY CONTROL SAMPLE:

Parameter	Units	MDL	Reference Value	Recv
Cyanide, Reactive	mg/kg	0.5	1000	15%

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QUALITY CONTROL DATA

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

Flash Point, Closed Cup
Batch: 70 26432
Samples: 70 0189942

SAMPLE DUPLICATE:

Parameter	Units	MDL	700189640	Duplicate of 70 0189640	RPD
Flash Point, Closed Cup	Degrees C	25	>60	>60	

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Flash Point, Closed Cup	Degrees C	25	30	100%	100%	0%

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QUALITY CONTROL DATA

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

Lead (EPA Method 6010/200.7, ICP)
Batch: 70 26490
Samples: 70 0189950

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Lead (EPA Method 6010/200.7, ICP)	mg/L	0.1	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Lead (EPA Method 6010/200.7, ICP)	mg/L	0.1	0.50	112%	110%	1%

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QUALITY CONTROL DATA

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

Sulfide, Reactive
Batch: 70 26441
Samples: 70 0189942

METHOD BLANK AND SAMPLE DUPLICATE:

Parameter	Units	MDL	Method Blank	700189640	Duplicate of 70 0189640	RPD
Sulfide, Reactive	mg/kg	0.5	ND	ND	ND	NC

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Sulfide, Reactive	mg/kg	0.5	450	44%	53%	18%

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QUALITY CONTROL DATA

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PURGEABLE FUELS AND AROMATICS
Batch: 70 26259
Samples: 70 0189764, 70 0189780

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/kg wet	200	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/kg wet	1.0	ND
Toluene	ug/kg wet	1.0	ND
Ethylbenzene	ug/kg wet	1.0	ND
Xylenes, Total	ug/kg wet	1.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/kg wet	200	1000	84%	81%	3%
Benzene	ug/kg wet	1.0	40.0	101%	98%	3%
Toluene	ug/kg wet	1.0	40.0	98%	95%	3%
Ethylbenzene	ug/kg wet	1.0	40.0	100%	97%	3%
Xylenes, Total	ug/kg wet	1.0	120	100%	97%	3%

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QUALITY CONTROL DATA

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

PURGEABLE FUELS AND AROMATICS
Batch: 70 26392
Samples: 70 0189756, 70 0189799, 70 0189810, 70 0189829, 70 0189837
70 0189845, 70 0189861, 70 0189870, 70 0189896, 70 0189942

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/kg wet	200	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/kg wet	1.0	ND
Toluene	ug/kg wet	1.0	ND
Ethylbenzene	ug/kg wet	1.0	ND
Xylenes, Total	ug/kg wet	1.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/kg wet	200	1000	92%	91%	1%
Benzene	ug/kg wet	1.0	40.0	108%	108%	0%
Toluene	ug/kg wet	1.0	40.0	106%	106%	0%
Ethylbenzene	ug/kg wet	1.0	40.0	110%	109%	0%
Xylenes, Total	ug/kg wet	1.0	120	111%	108%	2%

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Mr. Marc Briggs
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FOOTNOTES
for pages 15 through 21

November 19, 1993
PACE Project Number: 431111516

Client Reference: Exxon 7-0104 (EE)

>	Greater than reported value.
MDL	Method Detection Limit
NC	No calculation due to value below detection limit.
ND	Not detected at or above the MDL.
RPD	Relative Percent Difference

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931111.516

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EXXON COMPANY, U.S.A.

P.O. Box 4415, Houston, TX 77210-4415

CHAIN OF CUSTODY

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☐ Huntington Beach, CA, 5702 Bolsa Avenue, 92649 (714) 892-2565

Page 1 of

Consultant's Name: RESNA Industries

Address: 3315 Almaden Exp., Ste. 34, San Jose, CA 95118

Site Location: 1725 Park Ave.

Project #:

Consultant Project #: 170077.06

Consultant Work Release #:

Project Contact: Dave Higgins/Marc Briggs

Phone #: (408) 269-7703 Fax #: 264-2435

Laboratory Work Release #:

EXXON Contact: Marla Guensler ☒ EE ☐ C&M

Phone #: Fax #:

EXXON RAS #: 7-0104

Sampled by (print): Jeanne Bucktal

Sampler's Signature: Jeanne Bucktal

Shipment Method: courier

Air Bill #:

Shipment Date: 11/12/93

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (5 day)

ANALYSIS REQUIRED

Sample Condition as Received
Temperature ° C: ____
Cooler #: ____
Inbound Seal Yes No
Outbound Seal Yes No

Sample Description	Collection Date/Time	Matrix Soil/Water	Prsv	# of Cntr	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	TRPH EPA 418.1	COMMENTS
S-5-B13	11/10/93 830	soil	none	1	18975.6	X			
S-7-B13	840			1	18976.4	X			
S-10-B13	850			1	18978.0	X			
S-12½-B13	925			1	18979.9	X			
S-15½-B13	945			1	18981.0	X			
S-20-B13	950			1	18982.9	X			
S-5-B11	1130			1	18983.7	X			
S-9-B11	1140			1	18984.5	X			
S-11-B11	1145			1	18986.1	X			
S-14½-B11	1245	↓	↓	1	18987.0	X			

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time
Jeanne Bucktal/RESNA	11/11/93	1130			
FAX			Sandra Briones	11/11	5:15

Additional Comments:

Distribution: White - Original Yellow - Exxon Pink - Lab Goldenrod - Consultant Field Staff

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170077.06

REPORT OF LABORATORY ANALYSIS

February 08, 1994

Ms. Dora Beck
RESNA
3315 Almaden Expressway, Suite 34
San Jose, CA 95118

RE: PACE Project No. 440201.501
Client Reference: Exxon 7-0104 (EE)

Dear Ms. Beck:

Enclosed is the report of laboratory analyses for samples received February 01, 1994.

Please note a peak eluting earlier than Benzene and suspected to be methyl tert butyl ether was present in your sample SM-1-2.

Footnotes are given at the end of the report.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Stephanie Matzo

Stephanie Matzo
Project Manager

Enclosures

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

RESNA
3315 Almaden Expressway, Suite 34
San Jose, CA 95118

February 08, 1994
PACE Project Number: 44020501

Attn: Ms. Dora Beck

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238315	
Date Collected:			01/31/94	
Date Received:			02/01/94	
			MW-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	02/04/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	2100	02/04/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	02/04/94
Benzene	ug/L	0.5	32	02/04/94
Toluene	ug/L	0.5	9.1	02/04/94
Ethylbenzene	ug/L	0.5	73	02/04/94
Xylenes, Total	ug/L	0.5	12	02/04/94

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REPORT OF LABORATORY ANALYSIS

Ms. Dora Beck
Page 2

February 08, 1994
PACE Project Number: 44020150I

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238323	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			MW-1-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	02/04/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	680	02/04/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	02/04/94
Benzene	ug/L	0.5	19	02/04/94
Toluene	ug/L	0.5	2.7	02/04/94
Ethylbenzene	ug/L	0.5	15	02/04/94
Xylenes, Total	ug/L	0.5	5.4	02/04/94

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REPORT OF LABORATORY ANALYSIS

RESNA
3315 Almaden Expressway Suite 34
San Jose, CA 95118

November 19, 1993
PACE Project Number: 431111516

Attn: Mr. Marc Briggs

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0189756	
Date Collected:			11/10/93	
Date Received:			11/11/93	
Client Sample ID:			S-5-B13	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	11/13/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	1400	11/13/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	11/13/93
Benzene	ug/kg wet	5.0	170	11/13/93
Toluene	ug/kg wet	5.0	ND	11/13/93
Ethylbenzene	ug/kg wet	5.0	60	11/13/93
Xylenes, Total	ug/kg wet	5.0	7.3	11/13/93

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REPORT OF LABORATORY ANALYSIS

Ms. Dora Beck
Page 3

February 08, 1994
PACE Project Number: 440201501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238331	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			SM-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	02/04/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	70	02/04/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	02/04/94
Benzene	ug/L	0.5	2.1	02/04/94
Toluene	ug/L	0.5	ND	02/04/94
Ethylbenzene	ug/L	0.5	1.1	02/04/94
Xylenes, Total	ug/L	0.5	1.0	02/04/94

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REPORT OF LABORATORY ANALYSIS

Ms. Dora Beck
Page 4

February 08, 1994
PACE Project Number: 440201501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238340	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			SM-1-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	02/03/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	02/03/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	02/03/94
Benzene	ug/L	0.5	1.0	02/03/94
Toluene	ug/L	0.5	ND	02/03/94
Ethylbenzene	ug/L	0.5	ND	02/03/94
Xylenes, Total	ug/L	0.5	ND	02/03/94

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REPORT OF LABORATORY ANALYSIS

February 08, 1994
PACE Project Number: 440201501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238358	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			SW-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	02/04/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	670	02/04/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	02/04/94
Benzene	ug/L	0.5	21	02/04/94
Toluene	ug/L	0.5	13	02/04/94
Ethylbenzene	ug/L	0.5	8.2	02/04/94
Xylenes, Total	ug/L	0.5	27	02/04/94

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REPORT OF LABORATORY ANALYSIS

Ms. Dora Beck
Page 6

February 08, 1994
PACE Project Number: 440201501

Client Reference: Exxon 7-0104 (EE)

Parameter	Units	MDL		DATE ANALYZED
PACE Sample Number:			70 0238366	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			MW-4	
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	02/07/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	2500	25000	02/07/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	02/07/94
Benzene	ug/L	25	4900	02/07/94
Toluene	ug/L	25	230	02/07/94
Ethylbenzene	ug/L	25	1400	02/07/94
Xylenes, Total	ug/L	25	1800	02/07/94

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REPORT OF LABORATORY ANALYSIS

Ms. Dora Beck
Page 7

February 08, 1994
PACE Project Number: 440201501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238374	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			MW-4-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	02/07/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	5000	19000	02/07/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	02/07/94
Benzene	ug/L	50	4700	02/07/94
Toluene	ug/L	50	230	02/07/94
Ethylbenzene	ug/L	50	1200	02/07/94
Xylenes, Total	ug/L	50	1400	02/07/94

These data have been reviewed and are approved for release.

Darrell C. Cain
Regional Director

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Ms. Dora Beck
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FOOTNOTES
for pages 1 through 7

February 08, 1994
PACE Project Number: 44020150l

Client Reference: Exxon 7-0104 (EE)

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Client Reference: Exxon 7-0104 (EE)

PURGEABLE FUELS AND AROMATICS
Batch: 70 28115
Samples: 70 0238340

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	700237980	Spike	Spike Recv	Spike Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND	1000	109%	110%	0%
Benzene	ug/L	0.5	1.0	100	106%	95%	10%
Toluene	ug/L	0.5	ND	100	106%	97%	8%
Ethylbenzene	ug/L	0.5	ND	100	108%	95%	12%
Xylenes, Total	ug/L	0.5	1.1	300	106%	93%	13%

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	1000	116%	108%	7%
Benzene	ug/L	0.5	100	94%	99%	5%
Toluene	ug/L	0.5	100	94%	95%	1%
Ethylbenzene	ug/L	0.5	100	97%	99%	2%
Xylenes, Total	ug/L	0.5	300	96%	98%	2%

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Ms. Dora Beck
Page 10

QUALITY CONTROL DATA

February 08, 1994
PACE Project Number: 440201501

Client Reference: Exxon 7-0104 (EE)

PURGEABLE FUELS AND AROMATICS
Batch: 70 28141
Samples: 70 0238315, 70 0238323, 70 0238331, 70 0238358, 70 0238366
70 0238374

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	700238439	Spike	Spike Recv	Spike Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND	1000	97%	94%	3%
Benzene	ug/L	0.5	ND	100	96%	97%	1%
Toluene	ug/L	0.5	ND	100	96%	97%	1%
Ethylbenzene	ug/L	0.5	ND	100	100%	100%	0%
Xylenes, Total	ug/L	0.5	ND	300	98%	98%	0%

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	1000	78%	77%	1%
Benzene	ug/L	0.5	100	93%	100%	7%
Toluene	ug/L	0.5	100	98%	96%	2%
Ethylbenzene	ug/L	0.5	100	95%	99%	4%
Xylenes, Total	ug/L	0.5	300	94%	98%	4%

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Client Reference: Exxon 7-0104 (EE)

MDL	Method Detection Limit
ND	Not detected at or above the MDL.
RPD	Relative Percent Difference

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EXXON COMPANY, U.S.A.

P.O. Box 4415, Houston, TX 77210-4415

CHAIN OF CUSTODY

440201.501

☒ Novato, CA, 11 Digital Drive, 94949 (415) 883-6100

☐ Huntington Beach, CA, 5702 Bolsa Avenue, 92649 (714) 892-2565

Consultant's Name: RESNA

Page 1 of 1

Address: 3315 Almaden Expwy, suite 34, San Jose, CA 95118

Site Location: 1725 Park St. Alame

Project #: 170077-06

Consultant Project #: 170077-06

Consultant Work Release #: 09300238

Project Contact: Dora Beck

Phone #: 408-264-7723 Fax #: 2435

Laboratory Work Release #:

EXXON Contact: Mayla Guensley ☒ BB ☐ C&M

Phone #: 510-246-8768 Fax #: 8798

EXXON RAS #: 7-0104

Sampled by (print): Dora Beck/Rich Johnson

Sampler's Signature: Dora Beck

Shipment Method: Courier

Air Bill #:

Shipment Date: 2/1/94

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (5 day)

ANALYSIS REQUIRED

Sample Condition as Received
Temperature ° C: ____
Cooler #: ____
Inbound Seal Yes No
Outbound Seal Yes No

Sample Description	Collection Date/Time	Matrix Soil/Water	Prsv	# of Cont	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	TRPH EPA 418.1	COMMENTS
MW-1	1/31/94	Water	HCl	2	23831.5	X			
MW-1-2				2	23832.3	X			
SM-1				2	23833.1	X			
SM-1-2				2	23834.0	X			
SW-1				2	23835.8	X			
MW-4				2	23836.6	X			
MW-4-2				2	23837.4	X			

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time
Dora Beck/Resna	2/1/94	2:29	Daniel Johnson Pace	2/1/94	1430
Daniel Johnson Pace	2/1/94	1550	[illegible]	2/1/94	1550

Additional Comments: 10/2

Distribution: White - Original Yellow - Exxon Pink - Lab Goldenrod - Consultant Field Staff

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EXXON COMPANY, U.S.A.

P.O. Box 4415, Houston, TX 77210-4415

CHAIN OF CUSTODY

440201.501

☒ Novato, CA, 11 Digital Drive, 94949 (415) 883-6100

☐ Huntington Beach, CA, 5702 Bolsa Avenue, 92649 (714) 892-2565

Consultant's Name: RESNA

Address: 3315 Almaden Expwy, suite 34, San Jose, CA 95118

Project #: 170077.06

Project Contact: Dora Beck

EXXON Contact: Marla Guensler ☒ EE ☐ C&M

Sampled by (print): Dora Beck/Rich Johnson

Shipment Method: Courier

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (5 day)

Consultant Project #: 170077-06

Phone #: 408-264-7723 Fax #: 2435

Phone #: 510-246-8768 Fax #: 8798

Sampler's Signature: Dora Beck

Air Bill #:

Site Location: 1725 Park St. Alameda

Consultant Work Release #: 09300238

Laboratory Work Release #:

EXXON RAS #: 7-0104

Shipment Date: 2/1/94

Sample Condition as Received
Temperature ° C: ____
Cooler #: ____
Inbound Seal Yes No
Outbound Seal Yes No

ANALYSIS REQUIRED

Sample Description	Collection Date/Time	Matrix Soil/Water	Prsv	# of Cont	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	TRPH EPA 418.1	COMMENTS
MW-1	1/31/94	Water	HCl	2	23831.5	X			
MW-1-2				2	23832.3	X			
SM-1				2	23833.1	X			
SM-1-2				2	23834.0	X			
SW-1				2	23835.8	X			
MW-4				2	23836.6	X			
MW-4-2				2	23837.4	X			

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time
Dora Beck/RESNA	2/1/94	2:29pm	Donald Johnsoki Pace	2/1/94	1430
Donald Johnsoki Pace	2/1/94	1550	Laurel Stevens Pace	2/1/94	1550

Additional Comments: 10/2

Distribution: White - Original Yellow - Exxon Pink - Lab Goldenrod - Consultant Field Staff

4/3111.516

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EXXON COMPANY, U.S.A.

P.O. Box 4415, Houston, TX 77210-4415

CHAIN OF CUSTODY

☒ Novato, CA, 11 Digital Drive, 94949 (415) 883-6100

☐ Huntington Beach, CA, 5702 Bolsa Avenue, 92649 (714) 892-2565

Consultant's Name: RESNA Industries

Address: 3315 Almaden Exp., Ste 34, San Jose 95118

Project #:

Project Contact: Dave Higgins/Marc Briggs

EXXON Contact: Marla Guensler ☒ BE ☐ C&M

Sampled by (print): Jeanne Buckthal

Shipment Method: courier

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (5 day)

Consultant Project #: 170077.06

Phone #: (415) 264-7723 Fax #: 264-2435

Phone #: (510) 246-8776 Fax #:

Sampler's Signature: Jeanne Buckthal

Air Bill #:

Site Location: 1725 Park Ave.

Consultant Work Release #:

Laboratory Work Release #:

EXXON RAS #: 7-0104

Shipment Date: 11/12/93

ANALYSIS REQUIRED

Sample Condition as Received
Temperature ° C: ____
Cooler #: ____
Inbound Seal Yes No
Outbound Seal Yes No

Sample Description	Collection Date/Time	Matrix Soil/Water	Prsv	# of Cont	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	TRPH EPA 418.1		TPH/BTEX	STLC Lead 6010 (200.7)	Hexavalent Chrome SW846 3113.3.2	Sulfides reactivity SW846 7.3.4	Corrosivity 9040C	Ignitability 1010			COMMENTS
S-19½-B11	11/10/93 1150	Soil	None	1	18989.6	X												
SP-A				1														Composite into one sample
SP-B				1	18994.2					X	X	X	X	X	X			
SP-C				1														
SP-D				1														
Leachate #					18995.0													

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time
Jeanne Buckthal/RESNA FAX	11/11/93	1130	Sandra Brones	11/11	615

Additional Comments:

Distribution: White - Original Yellow - Exxon Pink - Lab Goldenrod - Consultant Field Staff

17CC77 CC

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REPORT OF LABORATORY ANALYSIS

February 08, 1994

Ms. Dora Beck
RESNA
3315 Almaden Expressway, Suite 34
San Jose, CA 95118

RE: PACE Project No. 440201.502
Client Reference: Exxon 7-0104 (EE)

Dear Ms. Beck:

Enclosed is the report of laboratory analyses for samples received February 01, 1994.

Footnotes are given at the end of the report.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Stephanie Matzo
Project Manager

Enclosures

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REPORT OF LABORATORY ANALYSIS

RESNA
3315 Almaden Expressway, Suite 34
San Jose, CA 95118

February 08, 1994
PACE Project Number: 440201502

Attn: Ms. Dora Beck

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238218	
Date Collected:			01/31/94	
Date Received:			02/01/94	
			AS-SM1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
GASOLINE AND AROMATICS-AIR (M8015/8020)				
Non-Methane Hydrocarbons, as n-octane	ug/L	50	ND	02/01/94
Volatile Aromatic Compounds (EPA M8020)			-	02/01/94
Benzene	ug/L	0.5	ND	02/01/94
Toluene	ug/L	0.5	ND	02/01/94
Ethylbenzene	ug/L	0.5	ND	02/01/94
Xylenes, Total	ug/L	0.5	0.9	02/01/94

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REPORT OF LABORATORY ANALYSIS

Ms. Dora Beck
Page 2

February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238226	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			AS-MW1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
GASOLINE AND AROMATICS-AIR (M8015/8020)				
Non-Methane Hydrocarbons, as n-octane	ug/L	50	ND	02/01/94
Volatile Aromatic Compounds (EPA M8020)			-	02/01/94
Benzene	ug/L	0.5	ND	02/01/94
Toluene	ug/L	0.5	ND	02/01/94
Ethylbenzene	ug/L	0.5	ND	02/01/94
Xylenes, Total	ug/L	0.5	1.2	02/01/94

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REPORT OF LABORATORY ANALYSIS

Ms. Dora Beck
Page 3

February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238234	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			AS2-MW1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
GASOLINE AND AROMATICS-AIR (M8015/8020)				
Non-Methane Hydrocarbons, as n-octane	ug/L	50	100	02/02/94
Volatile Aromatic Compounds (EPA M8020)			-	02/02/94
Benzene	ug/L	0.5	ND	02/02/94
Toluene	ug/L	0.5	ND	02/02/94
Ethylbenzene	ug/L	0.5	0.6	02/02/94
Xylenes, Total	ug/L	0.5	1.8	02/02/94

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February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238242	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			AS-VW1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
GASOLINE AND AROMATICS-AIR (M8015/8020)				
Non-Methane Hydrocarbons, as n-octane	ug/L	1250	51000	02/01/94
Volatile Aromatic Compounds (EPA M8020)			-	02/01/94
Benzene	ug/L	2.5	550	02/01/94
Toluene	ug/L	0.5	ND	02/01/94
Ethylbenzene	ug/L	0.5	29	02/01/94
Xylenes, Total	ug/L	0.5	15	02/01/94

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February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238250	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			AS-VW2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
GASOLINE AND AROMATICS-AIR (M8015/8020)				
Non-Methane Hydrocarbons, as n-octane	ug/L	1000	18000	02/01/94
Volatile Aromatic Compounds (EPA M8020)			-	02/01/94
Benzene	ug/L	10	500	02/01/94
Toluene	ug/L	10	58	02/01/94
Ethylbenzene	ug/L	10	23	02/01/94
Xylenes, Total	ug/L	10	21	02/01/94

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February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238269	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			AS-MW4	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
GASOLINE AND AROMATICS-AIR (M8015/8020)				
Non-Methane Hydrocarbons, as n-octane	ug/L	500	32000	02/01/94
Volatile Aromatic Compounds (EPA M8020)			-	02/01/94
Benzene	ug/L	5.0	570	02/01/94
Toluene	ug/L	5.0	95	02/01/94
Ethylbenzene	ug/L	5.0	31	02/01/94
Xylenes, Total	ug/L	5.0	42	02/01/94

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REPORT OF LABORATORY ANALYSIS

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February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238277	
Date Collected:			01/31/94	
Date Received:			02/01/94	
Client Sample ID:			AS2-MW4	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
GASOLINE AND AROMATICS-AIR (M8015/8020)				
Non-Methane Hydrocarbons, as n-octane	ug/L	1000	25000	02/01/94
Volatile Aromatic Compounds (EPA M8020)			-	02/01/94
Benzene	ug/L	10	600	02/01/94
Toluene	ug/L	10	75	02/01/94
Ethylbenzene	ug/L	10	30	02/01/94
Xylenes, Total	ug/L	10	44	02/01/94

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REPORT OF LABORATORY ANALYSIS

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February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

Parameter	Units	MDL	PACE Sample Number: 70 0238285 Date Collected: 02/01/94 Date Received: 02/01/94 Client Sample ID: VW1-Inf (30)	DATE ANALYZED
ORGANIC ANALYSIS				
GASOLINE AND AROMATICS-AIR (M8015/8020)				
Non-Methane Hydrocarbons, as n-octane	ug/L	500	17000	02/01/94
Volatile Aromatic Compounds (EPA M8020)			-	02/01/94
Benzene	ug/L	0.5	260	02/01/94
Toluene	ug/L	0.5	130	02/01/94
Ethylbenzene	ug/L	0.5	44	02/01/94
Xylenes, Total	ug/L	0.5	95	02/01/94

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REPORT OF LABORATORY ANALYSIS

Ms. Dora Beck
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February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0238307	
Date Collected:			02/01/94	
Date Received:			02/01/94	
Client Sample ID:			VW1-Eff	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
GASOLINE AND AROMATICS-AIR (M8015/8020)				
Non-Methane Hydrocarbons, as n-octane	ug/L	50	67	02/01/94
Volatile Aromatic Compounds (EPA M8020)			-	02/01/94
Benzene	ug/L	0.5	2.1	02/01/94
Toluene	ug/L	0.5	2.4	02/01/94
Ethylbenzene	ug/L	0.5	4.1	02/01/94
Xylenes, Total	ug/L	0.5	13	02/01/94

These data have been reviewed and are approved for release.

Darrell C. Cain
Regional Director

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FOOTNOTES
for pages 1 through 9

February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

MDL Method Detection Limit
ND Not detected at or above the MDL.

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QUALITY CONTROL DATA

February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

GASOLINE AND AROMATICS-AIR (M8015/8020)
Batch: 70 27912
Samples: 70 0238218, 70 0238226, 70 0238234, 70 0238242

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Non-Methane Hydrocarbons, as n-octane	ug/L	50	ND
Volatile Aromatic Compounds (EPA M8020)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Non-Methane Hydrocarbons, as n-octane	ug/L	50	496	103%	111%	7%
Benzene	ug/L	0.5	64	99%	112%	12%
Toluene	ug/L	0.5	76	99%	112%	12%
Ethylbenzene	ug/L	0.5	88	101%	113%	11%
Xylenes, Total	ug/L	0.5	268	103%	113%	9%

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Client Reference: Exxon 7-0104 (EE)

GASOLINE AND AROMATICS-AIR (M8015/8020)
Batch: 70 28014
Samples: 70 0238250, 70 0238269, 70 0238277, 70 0238285, 70 0238307

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Non-Methane Hydrocarbons, as n-octane	ug/L	50	ND
Volatile Aromatic Compounds (EPA M8020)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Non-Methane Hydrocarbons, as n-octane	ug/L	50	496	95%	96%	1%
Benzene	ug/L	0.5	64	98%	97%	1%
Toluene	ug/L	0.5	76	97%	96%	1%
Ethylbenzene	ug/L	0.5	88	98%	96%	2%
Xylenes, Total	ug/L	0.5	268	99%	97%	2%

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Ms. Dora Beck
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FOOTNOTES
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February 08, 1994
PACE Project Number: 440201502

Client Reference: Exxon 7-0104 (EE)

MDL	Method Detection Limit
ND	Not detected at or above the MDL.
RPD	Relative Percent Difference

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EXXON COMPANY, U.S.A.

P.O. Box 4415, Houston, TX 77210-4415

CHAIN OF CUSTODY

440201 502

☒ Novato, CA, 11 Digital Drive, 94949 (415) 883-6100

☐ Huntington Beach, CA, 5702 Bolsa Avenue, 92649 (714) 892-2565

Consultant's Name: RESNA

Address: 3315 Almaden Expwy, Suite 34, San Jose, CA 95118

Project #: 170077.06

Project Contact: Dora Beck

EXXON Contact: Marla Guensley ☒ EE ☐ C&M

Sampled by (print): Dora Beck / Rich Johnson

Shipment Method: Courier

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (5 day)

Site Location: 1725 Park St. Alameda

Consultant Work Release #: 09300238

Consultant Project #: 170077.06

Phone #: 408-264-7723 Fax #: 2435

Laboratory Work Release #: -

Phone #: 510-246-8768 Fax #: 8798

EXXON RAS #: 7-0104

Sampler's Signature: Dora Beck

Air Bill #:

Shipment Date: 2/1/94

ANALYSIS REQUIRED

Sample Condition as Received
Temperature ° C: ____
Cooler #: ____
Inbound Seal Yes No
Outbound Seal Yes No

Sample Description	Collection Date/Time 1/31/94	Matrix Soil/Water	Prsv	# of Cont	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	TRPH EPA 418.1	COMMENTS
AS-SM1		AIR	None	1	23821.8	X			
AS-MW1				1	23822.6	X			
AS2-MW1				1	23823.4	X			
AS-VW1				1	23824.2	X			
AS-VW2				1	23825.0	X			
AS-MW4				1	23826.9	X			
AS2-MW4				1	23827.7	X			

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time
Dora Beck / RESNA	2/1/94	2:29pm	Darold Thornton Pace	2/1/94	1430
Darold Thornton Pace	2/1/94	1550	[illegible]	2/1/94	1552

Additional Comments:

White - Original Yellow - Exxon Pink - Lab Goldenrod - Consultant Field Staff

EXXON COMPANY, U.S.A.

P.O. Box 4415, Houston, TX 77210-4415

CHAIN OF CUSTODY

4402.01.502

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☐ Huntington Beach, CA, 5702 Bolsa Avenue, 92649 (714) 892-2565

PACE INCORPORATED — THE ASSURANCE OF QUALITY

Page ____ of ____

Consultant's Name: RESNA

Address: 3315 Almaden Expwy, Suite 34, San Jose, CA 95118

Project #: 170077.01

Project Contact: Dora Beck

EXXON Contact: Marla Brownsley ☒ EE ☐ C&M

Sampled by (print): Dora Beck/Rich Johnson

Shipment Method: Courier

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (5 day)

Consultant Project #: 170077.01.e

Phone #: 408-264-7723 Fax #: 2435

Phone #: 510-246-8716 Fax #: 8796

Sampler's Signature: Dora Beck

Air Bill #:

Site Location: 1425 Park St. Alameda

Consultant Work Release #: 09300238

Laboratory Work Release #:

EXXON RAS #: 7-0004

Shipment Date: 2/1/94

ANALYSIS REQUIRED

Sample Condition as Received
Temperature ° C: ____
Cooler #: ____
Inbound Seal Yes No
Outbound Seal Yes No

Sample Description	Collection Date/Time	Matrix Soil/Water	Prsv	# of Cont	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	TRPH EPA 418.1	COMMENTS
VW1-Inf(30)	2/1/94	AIR	None	1	23828.5	X			Rec'd flat 2/1
VW1-Inf(120)	↓	↓	↓	1	23829.3	X	→ analysis canceled and sample on HOLD per conv. w/DB @RESNA 2/1/94		
VW1-Eff	↓	↓	↓	1	23830.7	X			

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time
Dora Beck/RESNA	2/1/94	2:29pm	Donnell Johnson/Pace	2/1/94	1430
Lauren Johnson/Pace	2/1/94	15:50	Lauren Johnson/Pace	2/1/94	1552

Additional Comments:

White - Original Yellow - Exxon Pink - Lab Goldenrod - Consultant Field Staff

RESNA
Working to Restore Nature

APPENDIX G

SOIL REMOVAL RECORDS

Dillard Environmental Services

A Division of Dillard Trucking, Inc.

P.O. Box 218 • Byron, CA 94514
Phone (510) 634-6850 • Fax (510) 634-0569
EPA #CAD981692809 • D.O.H.S. #1715 • CA LIC. #624665-A HAZ

July 19, 1994

RESNA
42501 Albrae Street
Fremont, CA 94538

Fax# (510) 651-2233

Attn: **Mark Briggs**

Re: **Exxon 7-0104 - 1725 Park St., Alameda, CA**
Removed: 4 yds of Drill Cutting Soil

Dear Mark:

Please be advised that the drill cutting soil from the above referenced site has been removed. The soil was taken to BFI Landfill, Livermore on December 6, 1993. There was a total of 4 cubic yards removed.

I trust that you will find everything in order. If you have any questions, please do not hesitate to call.

Sincerely,

DILLARD TRUCKING, INC.

Donna L. Pedersen
Project Manager

DLP/st

cc: file