April 25, 2013

Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Attention: Mr. Keith Nowell

Re: Report Transmittal
Rolls-Royce Engine Services - Oakland, Inc.
Test Cell Facility
6701 Old Earhart Road
Oakland, California

Dear Mr. Nowell:

Submitted herewith as you requested in electronic correspondence dated April 1, 2013 to Rolls-Royce Engine Services – Oakland, Inc. (RRESO) is a letter entitled *Case File Review of Reports for Test Cell at ACEH ftp Site* for the RRESO Test Cell Facility in Oakland, California prepared by PES Environmental, Inc. Attached to that letter are two reports: (1) *Soil and Groundwater Investigation, National Airmotive Corporation Facility, Oakland, California* dated January 16, 1996 prepared by EMCON; and (2) *Quarterly Groundwater Monitoring Report, First Quarter 2006 at Rolls-Royce Engine Services Test Facility, 6701 Old Earhart Road, Oakland, California, 94621* dated April 24, 2006 prepared by Applied Remediation Company, Inc.

I declare, under penalty of perjury, that the information and recommendations contained in the attached documents are true and correct to the best of my knowledge. Please note that the report entitled *Soil and Groundwater Investigation, National Airmotive Corporation Facility, Oakland, California* was prepared for National Airmotive and was prepared prior to my involvement with the Test Cell facility.

Very truly yours,

Rolls Royce Engine Services - Oakland, Inc.

David Goldberg
Facilities HS&E Specialist

cc: Colleen Liang – Port of Oakland
Yane Nordhav – BASELINE

PES Environmental, Inc.
Engineering & Environmental Services

April 30, 2013

1091.002.01.001

Rolls-Royce Engine Services – Oakland, Inc.
7200 Earhart Road
Oakland, California 94621-4504

Attention: Mr. David Goldberg

Re: Case File Review of Reports for Test Cell at ACEH ftp Site
Rolls-Royce Engine Services - Oakland, Inc.
Test Cell Facility
6701 Old Earhart Road
Oakland, California

Dear Mr. Goldberg:

PES Environmental, Inc. (PES) has prepared this letter to document the results of a case file review of reports available at the Alameda County Environmental Health (ACEH) ftp site regarding the Rolls-Royce Engine Services - Oakland, Inc. (RRESO) Test Cell facility located at 6701 Old Earhart Road, Oakland, California. The objective of the case file review was to identify reports that have been prepared for the Test Cell facility that are missing from the ACEH ftp site. This letter has been prepared in accordance with a written request dated April 1, 2013 from Mr. Keith Nowell of ACEH to RRESO. Based on PES' review of reports available on the ACEH ftp site, there are two reports that have been prepared for the Test Cell facility that are not available on the ACEH ftp site. The two missing reports are: (1) *Soil and Groundwater Investigation, National Airmotive Corporation Facility, Oakland, California* dated January 16, 1996 prepared by EMCON; and (2) *Quarterly Groundwater Monitoring Report, First Quarter 2006 at Rolls-Royce Engine Services Test Facility, 6701 Old Earhart Road, Oakland, California, 94621* dated April 24, 2006 prepared by Applied Remediation Company, Inc.

Copies of the two missing reports are attached to this letter and should be uploaded to the ACEH ftp site along with a perjury letter from RRESO. Should you require additional information or have questions concerning this letter please contact me at (415) 899-1600.

Very truly yours,

PES ENVIRONMENTAL, INC.

Kyle S. Flory, P.G.
Principal Geologist

Attachments: *Soil and Groundwater Investigation* dated January 16, 1996
Quarterly Groundwater Monitoring Report dated April 24, 2006

cc: Colleen Liang – Port of Oakland
Yane Nordhav – BASELINE

ATTACHMENTS

SOIL AND GROUNDWATER INVESTIGATION DATED JANUARY 16, 1996

REPORT ID#154
pdf-1-9-09

SOIL AND GROUNDWATER INVESTIGATION

NATIONAL AIRMOTIVE CORPORATION FACILITY

OAKLAND, CALIFORNIA

Prepared for

National Airmotive Corporation

January 16, 1996

SL
NatAir
GW
1/16/96
12461

Prepared by

EMCON
1921 Ringwood Avenue
San Jose, California 95131

Project 22077-001.001

1 INTRODUCTION

EMCON conducted a site investigation to evaluate soil and groundwater conditions at the National Airmotive Corporation (NAC) test facility at 6701 Earhart Road in Oakland, California. The test facility is located at the northern terminus of Earhart Road (Figure 1), and is used for conducting performance tests of aircraft engines. The investigation was two-phased, and included on-site and off-site investigations. The following sections outline the purpose of the soil and groundwater characterization.

1.1 Jet Fuel UST Area

The NAC test cell is used to conduct performance tests of rebuilt jet engines. The test cell area investigated consists of the main test cell and engine preparation building, two storage sheds, one 30,000-gallon aboveground storage tank (AST) containing liquefied petroleum (LP) gas, and two 8,000-gallon underground storage tanks (USTs) containing jet fuel. In September 1992, an accidental spill occurred in the immediate vicinity of the jet fuel UST's resulting in the release of approximately 1,150 gallons of Jet-A fuel. NAC requested that EMCON conduct an investigation to evaluate soil and groundwater quality in the vicinity of the jet fuel release.

As part of the jet fuel UST area investigation, EMCON drilled eight exploratory borings (B-1 through B-8) across the test cell area on NAC property, and a ninth boring (OB-1),in the off-site area southwest of the USTs. EMCON collected soil and grab groundwater samples from each boring (Figures 2 and 3). The work was originally proposed in a May 24, 1994, workplan prepared by EMCON and was subsequently modified on February 17, 1995, to include an additional boring near the high-speed test cell. The scope of work, with modifications, was reviewed and approved by Alameda County Health Care Services Agency (ACHCSA) in a February 8, 1995, letter to NAC. Borings B-1 through B-8 were drilled and sampled on April 6, 1995. The ninth boring (OB-1) was sampled on November 3, 1995.

1.2 Graywater Discharge Area

NAC has used the area shown in Figure 4 for jet engine testing since the late 1960s. From the late 1960s until 1978, graywater from engine cleaning would on occasion flow through a shallow concrete channel that drained into an unlined storm culvert bounding the site to

the west. In 1978, NAC began treating the graywater discharge by using an oil-water separator before it drained to the culvert. In 1992, NAC stopped discharging the graywater to the culvert, and began to transport the water off site.

On May 12, 1994, the Alameda County Hazardous Materials Unit collected surface soil samples from the area west of the testing facility, at the locations shown in Figure 4. The total oil and grease analyses indicated concentrations between 0.1 and 15.1 percent, but did not exclude decaying vegetable matter and animal fats. The metals analyses indicated that soil sample S-4 contained lead concentrations that exceeded ten times the Title 22 soluble threshold limit concentration. The ACHCSA requested that NAC conduct a preliminary investigation to evaluate soil and groundwater quality in the vicinity of the graywater discharge area. The scope of work was originally proposed in a May 24, 1994, workplan prepared by EMCON, and was modified on March 14, 1995, to include additional analyses requested by the ACHCSA. The ACHCSA reviewed and approved the workplan with the subsequent modifications.

On November 3, 1995, as part of the graywater discharge area investigation, EMCON drilled five exploratory borings (OB-2 through OB-6) in and near the graywater discharge path and collected soil and grab groundwater samples from each boring (Figures 5 and 6). The placement of the borings was directed by Mr. Scott Seery of the ACHCSA.

2 FIELD INVESTIGATION

This section describes the methods and procedures used during the field investigations in the jet fuel UST area and the graywater discharge area.

2.1 Jet Fuel UST Area

EMCON conducted the jet fuel UST area field investigation on April 6, 1995 (on-site borings B-1 through B-8), and November 3, 1995 (off-site boring OB-1), drilling nine borings to groundwater and collecting soil and grab groundwater samples from each boring. The borings surround the UST and the locations are shown on Figures 2 and 3.

The exploratory borings were drilled with 7-inch-diameter hollow-stem augers. The augers and bit, as well as all other down-hole equipment, were steam-cleaned before re-use, to prevent possible cross-contamination of samples. The subsurface materials were logged under the direct supervision of a California-registered geologist, according to the Unified Soil Classification System. Boring logs and a copy of the drilling permit are included in Appendix A.

Soil samples were collected from the borings at depths of approximately 3 and 4.5 feet below ground surface (BGS). At some borings, the interval between ground surface and first-encountered groundwater was too short to permit collection of two unsaturated soil samples. Soil samples were collected in stainless-steel sleeves fitted into a modified California split-spoon sampler. A portion of each sample was set aside and field-screened for petroleum hydrocarbons, using a photoionization detector (PID). Where multiple samples were available, the samples that gave the highest PID reading were selected for analysis. Samples selected for analysis were sealed in the rings using Teflon® tape and vinyl end-caps, labeled, and chilled pending transport.

After all soil samples were collected from each boring, the auger was advanced into the groundwater to a sufficient depth to facilitate recharge of the boring (total boring depths ranged from 6 to 8 feet BGS). Grab groundwater samples were collected from all borings, using disposable Teflon bailers, or a stainless-steel bailer. The stainless steel bailer was steam-cleaned and triple-rinsed between borings to avoid possible cross-contamination of samples. All borings except B-6 recharged within ½ hour. A length of steam-cleaned, triple-rinsed polyvinyl chloride (PVC) casing with 0.01-inch slots was left

in the B-6 borehole to act as a temporary well point, and the boring was successfully sampled within an hour.

Groundwater samples were decanted from the bailer into 40-milliliter (ml) and 1,000-ml amber bottles appropriate to the analyses to be performed; bottles were overfilled to reduce possible loss of volatile compounds to headspace. Before decanting, the water in the bailer was visually examined for the presence of floating product; none was observed in any groundwater sample collected. After groundwater samples were collected from borings B-3 through B-7, the borings were allowed to stand open for at least ½ hour, to allow possible dispersed petroleum product to re-accumulate on the groundwater surface. Water collected at the end of that time did not contain any floating product.

"Sheen" noted on GW encountered in B-7.

After collection, groundwater and soil samples were properly labeled, stored in a chilled container, and transported, with appropriate chain-of-custody documentation, to a state-certified laboratory for chemical analysis. After all sampling and observation was complete, the soil borings were sealed to the surface with bentonite. Soil cuttings and cleaning rinseate generated during the investigation were placed in sealed 55-gallon drums, appropriately labeled, and stored on site.

2.2 Graywater Discharge Area

EMCON conducted the field investigation of the graywater discharge area on November 3, 1995, by drilling five off-site borings to groundwater and collecting soil and grab groundwater samples from each boring. Two of the borings (OB-2 and OB-3) were drilled with hollow-stem augers, at the southwest corner of the storage shed. The remaining three borings (OB-4, OB-5, and OB-6) were drilled with hand-augers, in the storm culvert that drains the graywater area. Boring OB-4 was drilled nearest the original discharge point, immediately adjacent to the channel that formerly emptied graywater into the storm culvert. Boring OB-5 was drilled next to the outlet pipe connecting the culvert with the property to the south. Boring OB-6 was drilled in the southeast corner of the culvert. Based on a visual evaluation and the relative shallowness of groundwater, the culvert appears to grade downward from OB-4 to OB-6, and to grade slightly upward from OB-6 to OB-5. Boring locations can be seen in Figures 5 and 6.

Sample logging and equipment decontamination procedures are as described in Section 2.1. Boring logs and a copy of the drilling permit are included in Appendix A.

Soil samples were collected from the borings at depths of approximately 0.5 and 2 feet BGS, conditions permitting. At borings OB-5 and OB-6, the interval between ground surface and first-encountered groundwater was too short to permit collection of two unsaturated soil samples. Soil samples at borings OB-2 and OB-3 were collected in stainless-steel sleeves fitted into a modified California split-spoon sampler; samples from the remaining borings were collected in the hand sampler and packed into stainless-steel

sleeves. A portion of each sample was set aside and field-screened for petroleum hydrocarbons, using a PID. Where multiple samples were available, the samples with the highest PID readings were selected for analysis.

After all soil samples were collected from each boring, the boring was advanced into the groundwater to a sufficient depth to facilitate recharge of the boring (total boring depths ranged from 2 to 9 feet BGS). Grab groundwater samples were collected in disposable Teflon bailers from borings OB-2 and OB-3; groundwater was collected in a PVC well cap from the remaining borings (the cap was steam-cleaned and triple-rinsed between borings, to avoid possible cross-contamination of samples). All borings except OB-2 recharged within ¼ hour. A length of steam-cleaned, triple-rinsed PVC casing with 0.01-inch slots was left in the OB-2 borehole to act as a temporary well point, and the boring was successfully sampled within ½ hour. Groundwater samples were decanted, labeled, and stored as described in Section 2.1; samples for metals analysis were field-filtered to remove sediment. Before decanting, the water in the bailer or cup was visually examined for the presence of floating petroleum product. A sheen was observed on water collected at boring OB-4; free product was not observed at any other boring.

After collection, groundwater and soil samples were labeled, stored, and transported as described in Section 2.1; borings were sealed and cuttings stored as previously described.

3 LABORATORY ANALYSIS OF SOIL AND GROUNDWATER

A total of 20 soil samples (12 from the jet fuel UST investigation and 8 from the graywater investigation) and 14 groundwater samples (9 from the jet fuel UST investigation and 5 from the graywater investigation) was delivered, with appropriate chain-of-custody documentation, to Columbia Analytical Services, a state-certified laboratory, for analysis. The following section describe the analyses conducted on the various samples.

3.1 Jet Fuel UST Area

The jet fuel UST area samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by U.S. Environmental Protection Agency (USEPA) method 8020, and for total petroleum hydrocarbons as gasoline (TPHG) and high-boiling-point hydrocarbons (HBHCs) by the methods recommended by the Department of Toxic Substances Control (DTSC) in the *Leaking Underground Fuel Tank* (LUFT) *Field Manual* (State Water Resources Control Board, October 1989). Samples were prepared for TPHG analysis by USEPA method 5030 (purge and trap), and for HBHC analysis by USEPA extraction methods 3550 (soil) and 3510 (water). At the request of ACHCSA, the HBHC analysis was modified to include peaks in the motor-oil range.

Analytical and quality assurance/quality control (QA/QC) procedures used in the analyses included preparation of a matrix spike and a matrix spike duplicate (MS/MSD), as well as evaluation of surrogate recovery in the matrix. The QA/QC data indicate that the analytical results are of acceptable quality, with the following exceptions. Surrogate recoveries of HBHCs were outside the laboratory acceptance limits for soil samples B-2 (3.5'), B-4 (3'), B-5 (3.5'), and B-7 (3.5'), due to matrix dilution or to the interference of target components with the identification of the surrogate. Surrogate recoveries of TPHG and BTEX were within the laboratory acceptance limits, as were MS/MSD results. Soil samples OB-1 (2-2.5) and OB-1 (3.5-4') were outside the acceptance limits for surrogate recovery of HBHCs as a result of matrix dilution. The impact of the surrogate recovery excursions discussed above is diminished by the relatively high analyte concentrations observed in soil and groundwater samples. Soil and groundwater analytical results for the jet fuel spill investigation are summarized in Tables 1 and 2 and presented graphically in Figures 2 and 3. Analytical reports are presented in Appendix B.

3.2 Graywater Discharge Area

The graywater discharge area samples were analyzed for HBHCs and BTEX compounds by the methods described above, for halogenated volatile organic compounds (HVOCs) by USEPA method 8010, for semivolatile organic compounds (SVOCs) by USEPA method 8270, and for 17 California Assessment Manual (CAM 17) metals. QA/QC procedures included evaluation of surrogate recovery in the matrix. The QA/QC data indicate that the analytical results are of acceptable quality, with the following exceptions. Surrogate recovery of HBHCs from soil samples OB-3 (2-2.5') and OB-4 (0-0.5') were outside the acceptance limits because matrix dilution brought the surrogate concentration below the method reporting limit. Surrogate recovery of HBHCs from groundwater sample OB-6 was outside the acceptance limits as a result of matrix interference from high analyte concentrations. Surrogate recovery of SVOCs in the soil and groundwater samples was not applicable due to a high dilution factor for the matrix. The impact on data quality of the surrogate recovery excursions discussed above is diminished by the relatively high analyte concentrations observed in soil and groundwater samples.

Soil and groundwater analytical results for the graywater area investigation are summarized in Tables 3 and 4 and presented graphically in Figures 5 and 6. Analytical reports are presented in Appendix B.

4 ANALYTICAL RESULTS

This section summarizes the analytical results obtained from the jet fuel UST area and graywater discharge area investigations.

4.1 Jet Fuel UST Area

4.1.1 Soil Analytical Results

HBHC compounds, primarily jet fuel and motor oil, were detected in all soil samples collected from the jet fuel UST area (Table 1). Jet fuel was detected in the soil samples at concentrations ranging from 4 to 6,100 parts per million (ppm); motor oil was present at concentrations ranging from 17 to 1,100 ppm. HBHC concentrations exceeding 1,000 ppm were limited to borings B-1 and B-2, which are immediately adjacent to the USTs (Figure 2).

TPHG was detected in soil samples from borings OB-1, B-1, B-2, and B-8, at concentrations ranging from 26 to 1,500 ppm (Table 1). The highest TPHG concentrations appeared in samples from boring B-2, immediately east of the USTs. Ethylbenzene and xylenes were detected in only three borings (B-1, B-2, and B-8). The highest xylene concentrations (16 ppm) were selected at boring B-2. Benzene was not detected in any of the soil samples collected from the jet fuel area. Borings B-4 through B-7 did not contain TPHG or BTEX compounds.

4.1.2 Groundwater Analytical Results

HBHCs, primarily jet fuel, diesel, and motor oil, were detected in groundwater from borings B-1, B-2, B-3, and OB-1 (Table 2). The concentration of jet fuel ranged from 6,300 to 270,000 parts per billion (ppb), and the concentration of motor oil ranged from 520 to 8,900 ppb. The highest HBHC concentrations appeared in samples collected from borings B-1 and B-2. However, samples collected from borings B-6, B-7, and B-8 on the eastern portion of the jet fuel area, did not contain any HBHCs.

TPHG was detected in groundwater from borings OB-1, B-1, B-2, and B-3, at concentrations ranging from 89 to 5,100 ppb. The highest concentrations appeared in

samples from the on-site borings bounding the USTs (B-1, B-2, and B-3) (Table 2). Toluene, ethylbenzene, and xylenes were detected in groundwater from borings OB-1, B-1, B-2, and B-3, at concentrations ranging from 0.6 to 88 ppb; as with the TPHG, the highest concentrations appeared in samples from borings B-1 and B-2 (Figure 3). Benzene was not detected in any of the groundwater samples collected from the jet fuel UST area investigation. In addition, TPHG and BTEX compounds were not detected in groundwater samples collected from borings B-4 through B-8.

4.2 Graywater Discharge Area

4.2.1 Soil Analytical Results

BTEX compounds were not detected in any of the soil samples collected from the graywater discharge area. VOCs and SVOCs were not detected in any of the graywater investigation samples, with two exceptions: *bis* (2-ethylhexyl) phthalate was detected in samples from borings OB-3 and OB-5, at concentrations just above the method reporting limit (MRL), and Freon 113 was detected at the MRL in a sample from boring OB-2 (Table 3). These compounds are common laboratory contaminants, and their detection in these samples is considered anomalous; they are therefore not included in Table 3. HBHCs, primarily diesel and motor oil, were detected in all soil samples from the graywater area, at concentrations ranging from 22 to 1,300 ppm. The highest HBHC concentrations were observed in the surface sample from boring OB-4, the boring nearest the graywater discharge source (Figure 5).

Cadmium, chromium, copper, lead, and mercury are found in soil at one or more locations at concentrations that exceed the Title 22 soluble threshold limit concentration (STLC) limits by a factor of 10 or more. Lead is found at concentrations that exceed the Title 22 total threshold limit concentration (TTLC) limits (1,000 ppm). The TTLC defines a waste as hazardous for the purposes of disposal. The highest metals concentrations are observed at borings OB-2 and OB-3, near the storage shed. These borings are outside the unlined storm culvert. EMCON understands that this area was used as a landfill by the Port of Oakland. The elevated metals concentrations could be associated with the fill material.

4.2.2 Groundwater Analytical Results

BTEX compounds detected in groundwater were limited to ethylbenzene and xylenes (concentrations of 0.7 to 38 ppb) (Table 4), with the highest concentrations appearing at boring OB-6 (Figure 6). Benzene was not detected in any of the groundwater samples collected from the graywater area. SVOCs detected in groundwater were limited to naphthalene compounds, which were detected in samples from borings OB-5 (10 µg/L) and OB-6 (up to 520 µg/L). VOCs were not detected in any of the groundwater samples.

HBHCs, primarily jet fuel, were detected in groundwater at concentrations ranging from 80 to 190,000 µg/L. The highest HBHC concentrations appeared in samples collected from the storm culvert, nearest the graywater discharge source.

Soil metals impact to groundwater appears to be minimal. Metals detected in groundwater were limited to arsenic, barium, lead, and zinc. Only barium was present at levels exceeding the maximum contaminant level (MCL) for drinking water.

5 CONCLUSIONS AND RECOMMENDATIONS

Analysis of samples collected in the jet fuel UST area confirmed petroleum-hydrocarbon impact to both soil and groundwater. However, the soil concentrations exceeding 1,000 ppm are limited to the area immediately adjacent to the USTs. In addition, floating product was not observed on the groundwater at any of the borings and benzene was not present in soil or groundwater samples.

Analysis of samples in the graywater discharge area indicates that the impact of graywater discharge to soil and groundwater in the area is limited to petroleum hydrocarbons, characterized primarily by concentrations of motor oil. Although a sheen was observed on groundwater at boring OB-4, measurable floating product was not observed on the groundwater at any of the borings. Benzene was not detected in soil or groundwater collected from the area.

The elevated HBHC concentrations observed at OB-6 in the corner of the storm culvert are likely associated with the fact that this area lies downslope of the original discharge point and served as a collection point for drainage. The HBHC concentrations observed at OB-5 (regionally downgradient) are significantly lower than those observed at OB-6. This indicates that there has been limited lateral migration since the late 1960s when NAC began jet engine testing and associated graywater discharge in this area.

The potential for harm to persons or wildlife from the presence of petroleum hydrocarbons at the site appears to be limited. Groundwater in the area can be presumed to be nonpotable because of the likely presence of high salinity due to the close proximity to the San Francisco Bay. The storm culvert was observed in April and November 1995, and at neither time was flowing water observed in the ditch. Surface water in the culvert would be transient and an unlikely water or food source for wildlife. The NAC site is bounded by open fields with no residential structures. The nearest cultural feature is the planned football practice stadium on the Port of Oakland property to the west. Therefore, it is unlikely that humans or wildlife would routinely contact soil or groundwater.

NAC is scheduled to replace the present jet fuel USTs with double-walled USTs by 1998. The shallow groundwater at the site will likely be exposed during the necessary excavation. During this excavation, EMCON recommends that NAC monitor for free product in the pit and be prepared to remove such free product if observed. The petroleum hydrocarbons identified in soil and groundwater during this investigation are likely to

naturally biodegrade in place, over time. Given the present use of the site and groundwater in the area (nonpotable), further action does not appear necessary.

The metals observed in the graywater area soil appear to be the result of the historical uses of the site; formerly a refuse disposal area. Metals solubility in area soils appears to be low; metals do not appear in groundwater in significant concentrations. As discussed above, human and wildlife contacts with soil and groundwater are expected to be minimal. Therefore, it does not appear that further action regarding the concentrations of metals in soil and groundwater beneath the site is necessary.

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2077-001.01**

PROJECT NAME: **National Airmotive Corporation**

BY: **L.Gallagher**

DATE: **04/06/95**

BORING NO.: **B-1**

PAGE: **1 of 1**

SURFACE ELEVATION: **ft.**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							FILL, gravel,pale brown (10YR, 6/3); trace sand; fine angular gravel; dry; no hydrocarbon odor.	
0/1.5	0	16						
1.2/1.5	20	16		5			@4': (from shoe) sandy gravel; 20% well-graded medium sand; 80% fine gravel, subangular to angular; some glass fragments and trash (small toy and shoe fragment); dry; no hydrocarbon odor.	
			▽ 4/6/95				@6': gravel as above, with 2 inch layer of gravelly sandy silt marbled with hydrocarbons; black plant debris and wood fragments 1 to 2 inches in length at sample base; strong hydrocarbon odor.	
				10			@6.5': black plant debris as above; wet; strong hydrocarbon odor.	
							BOTTOM OF BORING AT 8 FEET BELOW GROUND SURFACE.	
				15				
				20				

EMCON ASSOCIATES

REMARKS

Boring drilled by a CME 75 portable rig driving an 8-inch diameter, continuous flight auger. Samples collected with a modified California split-spoon sampler fitted with stainless-steel liners. After sampling was complete, the boring was sealed to the ground surface with bentonite.

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2077-001.01**

BORING NO.: **B-2**

PROJECT NAME: **National Airmotive**

PAGE: **1 of 1**

BY: **L.Gallagher**

DATE: **04/06/95**

SURFACE ELEVATION: **ft.**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							FILL, sandy gravel, pale brown (10YR,6/3); 5-10% coarse sand, 90-95% fine gravel, angular; dry; no hydrocarbon odor.	
0.7/1.5	0	34						
1.2/1.5	15	15	▽ 4/6/95	5			@4': light yellow brown (10YR, 6/4); some brick fragments; medium dense; dry; no hydrocarbon odor. @ 5.25': silty wood fragments and masonry fragments; black (10YR, 2/1); moist; strong hydrocarbon odor. @5.6': wet. BOTTOM OF BORING AT 7 FEET BELOW GROUND SURFACE	
				10				
				15				
				20				

EMCON ASSOCIATES

REMARKS

Boring drilled by a CME 75 drill rig driving an 8-inch diameter continous flight auger. Samples collected with a modified California split-spoon sampler fitted with stainless-steel liners. After sampling was complete, the boring was sealed to the ground surface with bentonite.

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2077-001.01**

BORING NO.: **B-3**

PROJECT NAME: **National Airmotive**

PAGE: **1 of 1**

BY: **L.Gallagher**

DATE: **04/06/95**

SURFACE ELEVATION: **ft.**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							FILL, sandy gravel, pale brown (10YR,6/3); 10% coarse sand, 90% fine gravel, subangular to angular; dry; no hydrocarbon odor.	
0.9/1.5	0	40					@3.2': sandy clay, dark yellow brown (10YR, 4/4); 40% coarse sand; damp to moist; no hydrocarbon odor.	
0.5/1.5	0	28	▽ 4/6/95	5			@ 5': wood fragments, glass, wire and fine gravel in black (10YR,2/1) silt matrix; moderate hydrocarbon odor; wet.	
							BOTTOM OF BORING AT 6 FEET BELOW GROUND SURFACE	
				10				
				15				
				20				

REMARKS

Boring drilled with a CME 75 drill rig driving an 8-inch diameter continous flight auger. Samples collected with a modified California split-spoon sampler fitted with stainless-steel liners. After sampling was complete, the boring was sealed to the ground surface with bentonite.

EMCON ASSOCIATES

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2077-001.01**

BORING NO.: **B-4**

PROJECT NAME: **National Airmotive**

PAGE: **1 of 1**

BY: **L.Gallagher**

DATE: **04/06/95**

SURFACE ELEVATION: **ft.**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.3/1.5	0	29					FILL, sandy gravel, dark brown (10YR, 4/3); 20% coarse sand, 80% fine gravel, angular; dry; no hydrocarbon odor.	
1.2/1.5	2	26	4/6/95	5			@ 4': 1" layer of sandy clay, dark yellow brown (10YR, 4/4); 60% moderate plasicity fines; 40% coarse sand; stiff; damp; no hydrocarbon odor. @ 5': black wood fragments, length approximately 1.5 inches; no soil matrix; moderate hydrocarbon odor; moist. @5.5':approximately 50% coarse sand to fine gravel clasts and wire, glass and wood fragments in approximately 50% matrix of low plasticity fines; moist to wet; slight hydrocarbon odor. BOTTOM OF BORING AT 7 FEET BELOW GROUND SURFACE	
				10				
				15				
				20				

REMARKS

Boring drilled with a CME 75 drill rig driving an 8-inch diameter continous flight auger. Samples collected with a modified California split-spoon sampler fitted with stainless-steel liners. After sampling was complete, the boring was sealed to the ground surface with bentonite.

EMCON ASSOCIATES

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2077-001.01**

BORING NO.: **OB-1**

PROJECT NAME: **National Airmotive**

PAGE: **1 of 1**

BY: **L.Gallagher**

DATE: **11/03/95**

SURFACE ELEVATION: **ft.**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.5/1.5	13	18					FILL, silty sandy gravel, dark brown (10YR, 4/3); 20% low plastic icity fines; 20% fine to medium sand; 50% wood fragments 1" diameter and masonry fragments less than 1/8"; dry; loose; no hydrocarbon odor.	
0.6/1.5	28	13					@ 4.4': sandy silt, 10% sand, 60% low to medium plasticity fines; 30% wood fragments less than 1/2" diameter; firm; damp; hydrocarbon odor detected.	
			11/03/95	5			BOTTOM OF BORING AT 7 FEET BELOW GROUND SURFACE	
				10				
				15				
				20				

REMARKS

Boring drilled with a B-61 drill rig driving an 8-inch diameter, continous flight hollow-stem auger. Samples collected with a modified California split-spoon sampler fitted with brass liners. After sampling was completed, the boring was sealed to the ground surface with a bentonite-cement grout.

EMCON ASSOCIATES

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2077-001.01**

BORING NO.: **OB-2**

PROJECT NAME: **National Airmotive**

PAGE: **1 of 1**

BY: **L.Gallagher**

DATE: **11/03/95**

SURFACE ELEVATION: **ft.**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
1.0/1.5	0	20					FILL, dark brown (7.5YR, 3.2); trace low plasticity fines; 20% fine to medium sand; 80% wood and masonry fragments less than 3/4"; medium dense; dry; no hydrocarbon odor.	
1.0/1.5	0	30					@ 1.5': small scraps of ceramic tile and paper in sample; some rounded coarse gravel; damp.	
			▽ 11/03/95					
				5			Boring suspended at 6' BGS for grab groundwater sampling. Boring continued to 9' BGS and set with temporary well casing after insufficient recharge at 6'BGS.	
				10			BOTTOM OF BORING AT 9 FEET BELOW GROUND SURFACE	
				15				
				20				

EMCON ASSOCIATES

REMARKS

Boring drilled with a B-61 drill rig driving an 8-inch diameter, continous flight hollow-stem auger. Samples collected with a modified California split-spoon sampler fitted with brass liners. After sampling was completed, the boring was sealed to the ground surface with a bentonite-cement grout.

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2077-001.01**

BORING NO.: **OB-3**

PROJECT NAME: **National Airmotive**

PAGE: **1 of 1**

BY: **L.Gallagher**

DATE: **11/03/95**

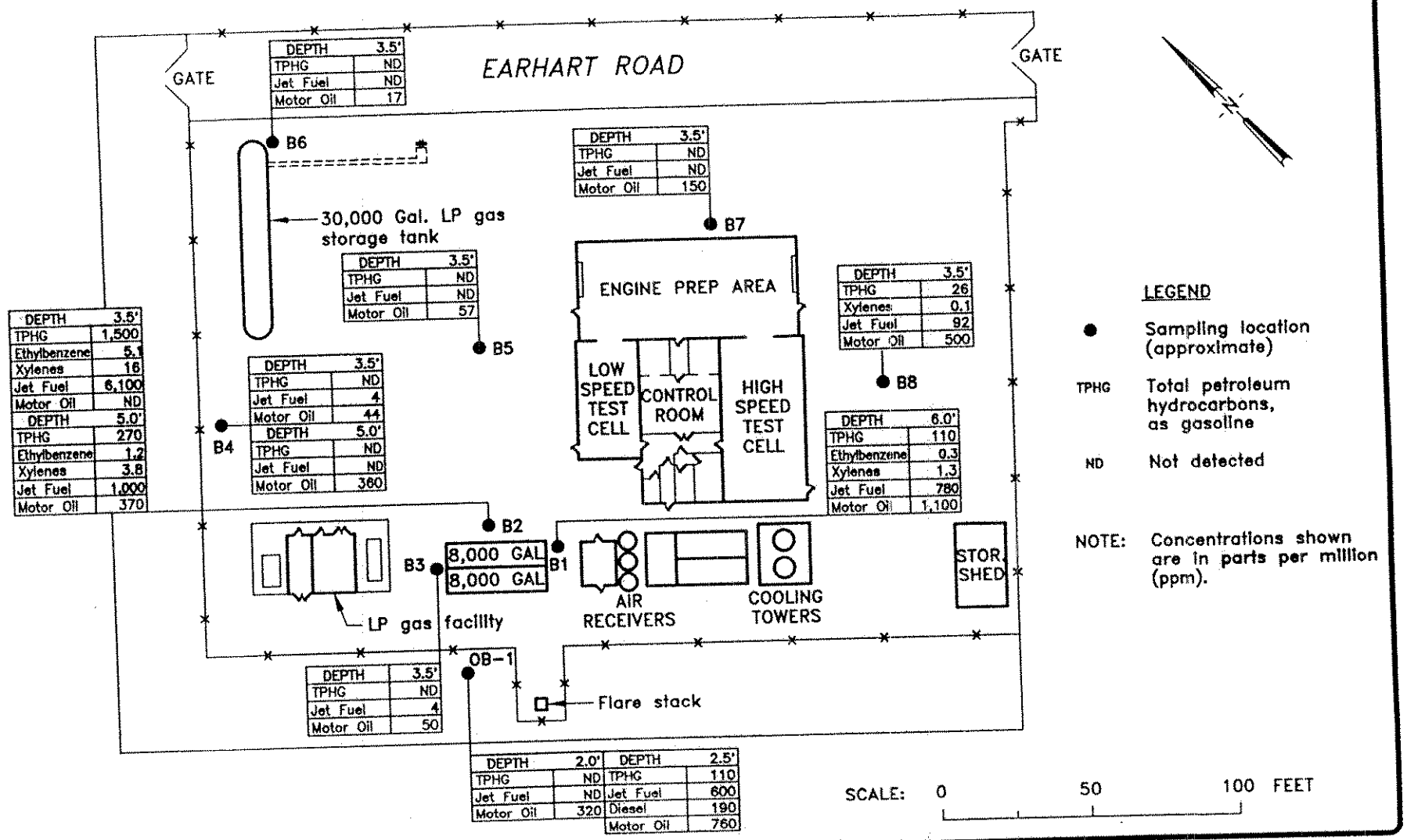
SURFACE ELEVATION: **ft.**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/ft)	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
0.8/1.5	0	26					FILL, dark brown (7.5YR, 4/3); 10% low plasticity fines; 40% fine sand; 20% wood and 30% glass and masonry fragments 1/4"- 3/4" diameter; medium dense; dry; no hydrocarbon odor.	
0.8/1.5	0.3	9					@ 1.5': very dark grey; 20% non- to low-plasticity fines; 30% fine sand; 50% clean friable wood fragments 1/16"- 1" diameter; damp; organic odor.	
			▽ 11/03/95	5			Boring suspended at 6' BGS for grab groundwater sampling. Boring continued to 9' BGS after insufficient recharge at 6'BGS.	
				10			BOTTOM OF BORING AT 9 FEET BELOW GROUND SURFACE	
				15				
				20				

EMCON ASSOCIATES

REMARKS

Boring drilled with a B-61 drill rig driving an 8-inch diameter, continous flight hollow-stem auger. Samples collected with a modified California split-spoon sampler fitted with brass liners. After sampling was completed, the boring was sealed to the ground surface with a bentonite-cement grout.



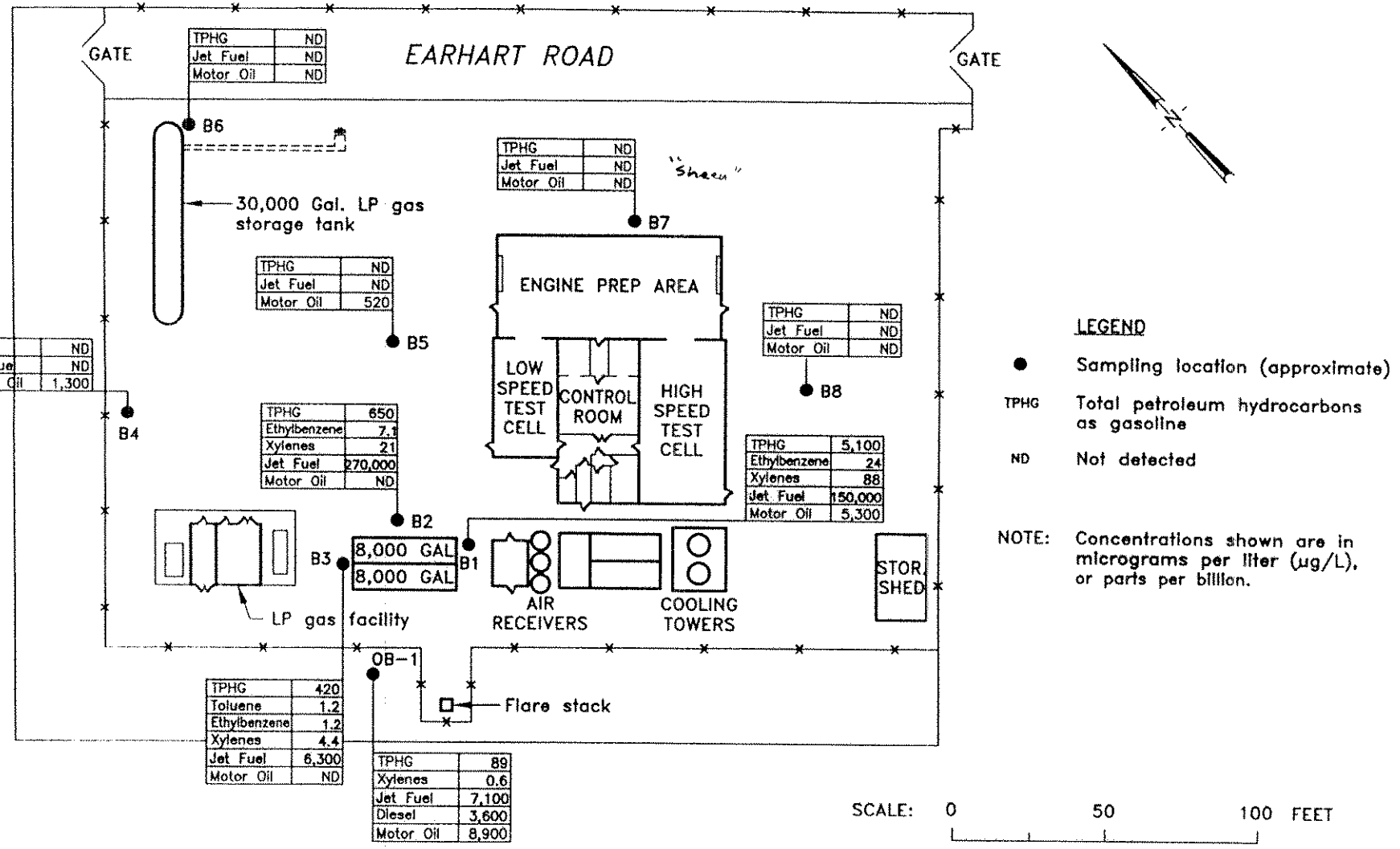
emcon

NATIONAL AIRMOTIVE CORPORATION
7200 LOCKHEED STREET
SOIL AND GROUNDWATER CHARACTERIZATION
OAKLAND, CALIFORNIA

JET FUEL UST AREA SOIL ANALYTICAL RESULTS

FIGURE 2

PROJECT NO. 2077-001.01

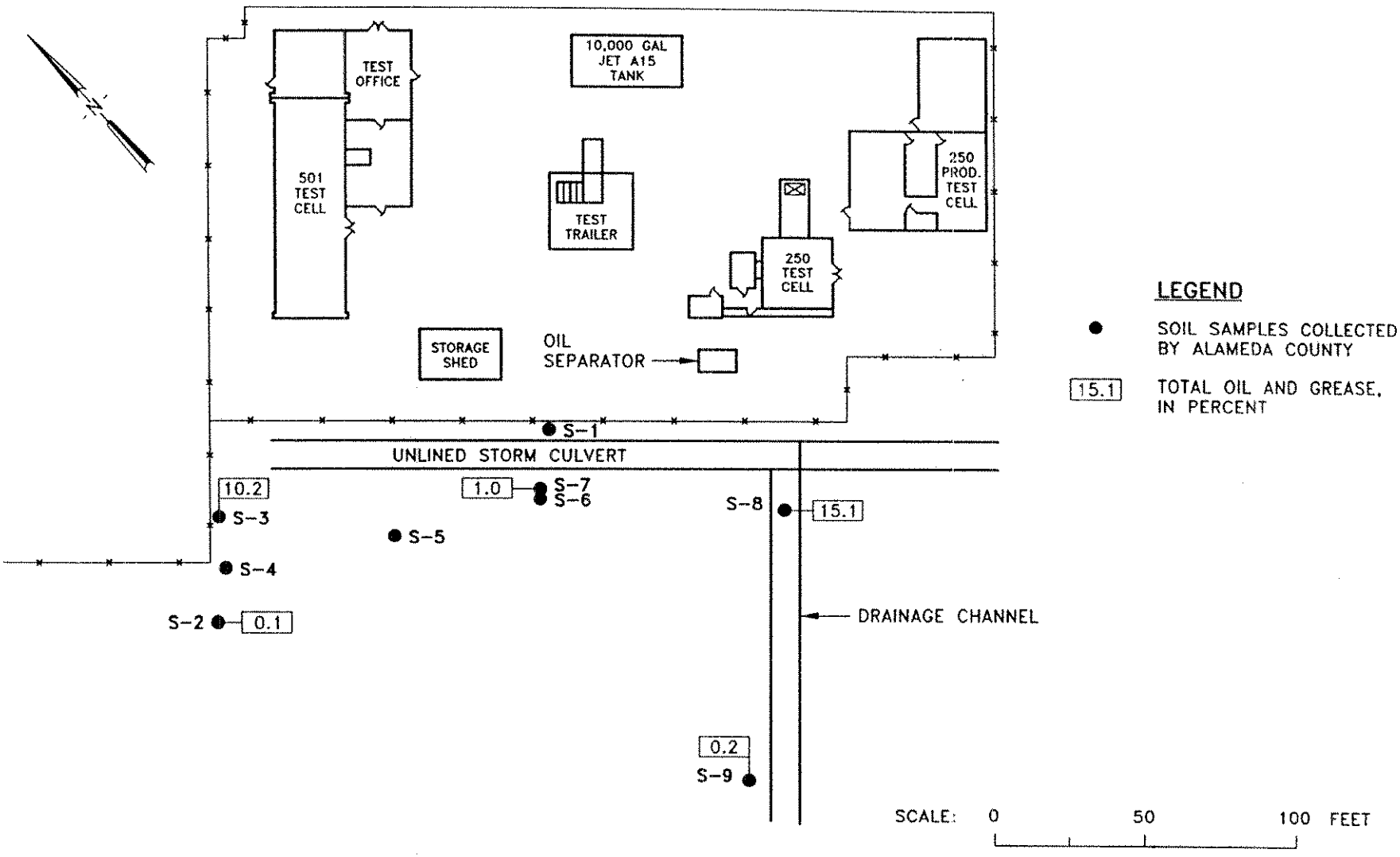


EMCON

NATIONAL AIRMOTIVE CORPORATION
7200 LOCKHEED STREET
SOIL AND GROUNDWATER CHARACTERIZATION
OAKLAND, CALIFORNIA

JET FUEL UST AREA GROUNDWATER ANALYTICAL RESULTS

FIGURE
3
PROJECT NO.
2077-001.01



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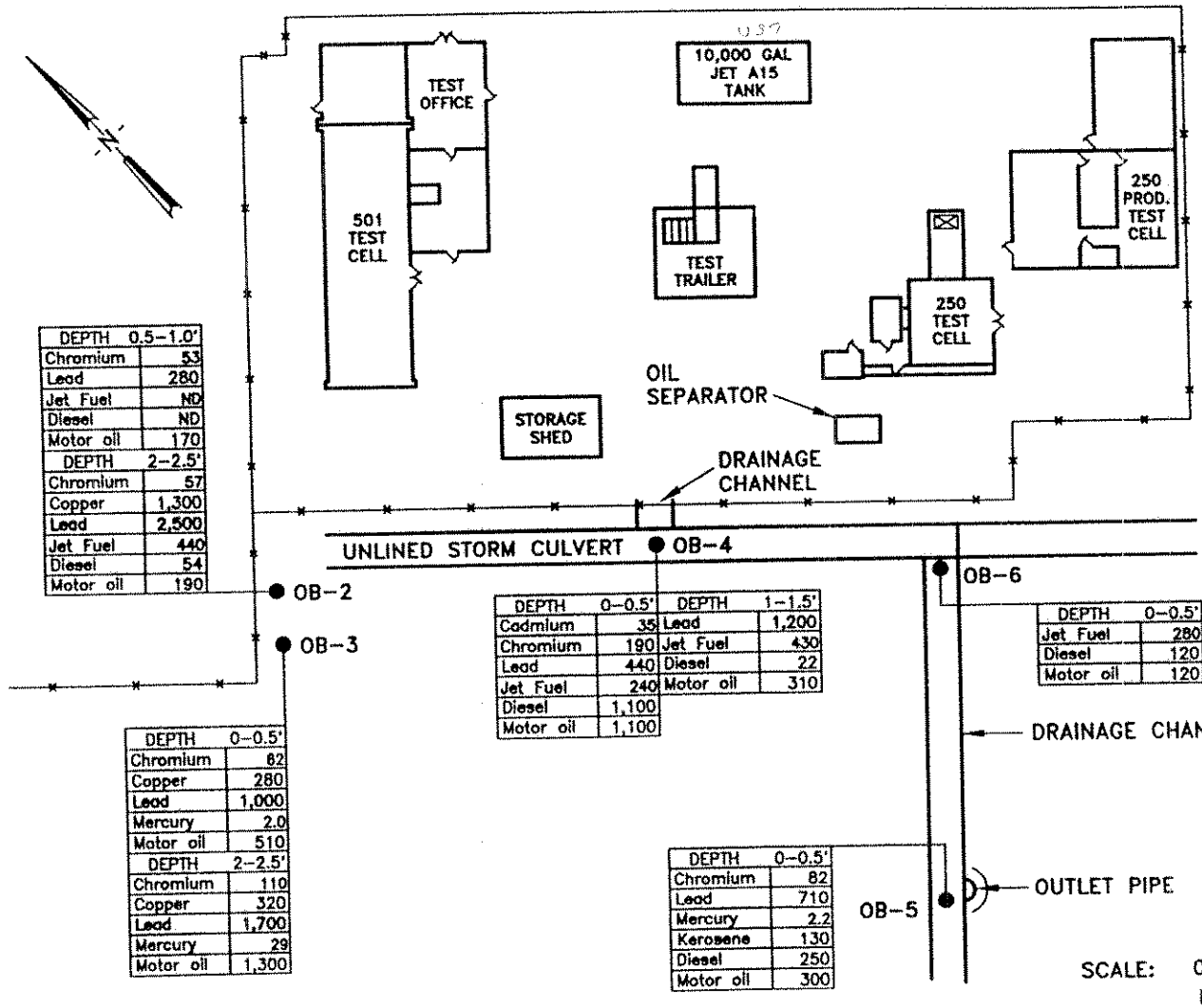
NATIONAL AIRMOTIVE CORPORATION
7200 LOCKHEED STREET
SOIL AND GROUNDWATER CHARACTERIZATION
OAKLAND, CALIFORNIA

GRAY WATER AREA PLAN

FIGURE
4
PROJECT NO.
2077-001.01

APPENDIX A



DEPTH	0.5–1.0'
Chromium	53
Lead	280
Jet Fuel	ND
Diesel	ND
Motor oil	170
DEPTH	2–2.5'
Chromium	57
Copper	1,300
Lead	2,500
Jet Fuel	440
Diesel	54
Motor oil	190

DEPTH	0–0.5'
Chromium	82
Copper	280
Lead	1,000
Mercury	2.0
Motor oil	510
DEPTH	2–2.5'
Chromium	110
Copper	320
Lead	1,700
Mercury	29
Motor oil	1,300

DEPTH	0–0.5'	DEPTH	1–1.5'
Cadmium	35	Lead	1,200
Chromium	190	Jet Fuel	430
Lead	440	Diesel	22
Jet Fuel	240	Motor oil	310
Diesel	1,100		
Motor oil	1,100		

DEPTH	0–0.5'
Chromium	82
Lead	710
Mercury	2.2
Kerosene	130
Diesel	250
Motor oil	300

DEPTH	0–0.5'
Jet Fuel	280
Diesel	120
Motor oil	120

LEGEND

● Sampling location (approximate)

Metals shown exceeded the soluble threshold limit concentration (STLC) by a factor of 10 or more

Cadmium STLC	1 ppm
Chromium STLC	5 ppm
Copper STLC	25 ppm
Lead STLC	5 ppm
Mercury STLC	0.2 ppm

ND Not detected

NOTE: Concentrations shown are in parts per million (ppm).

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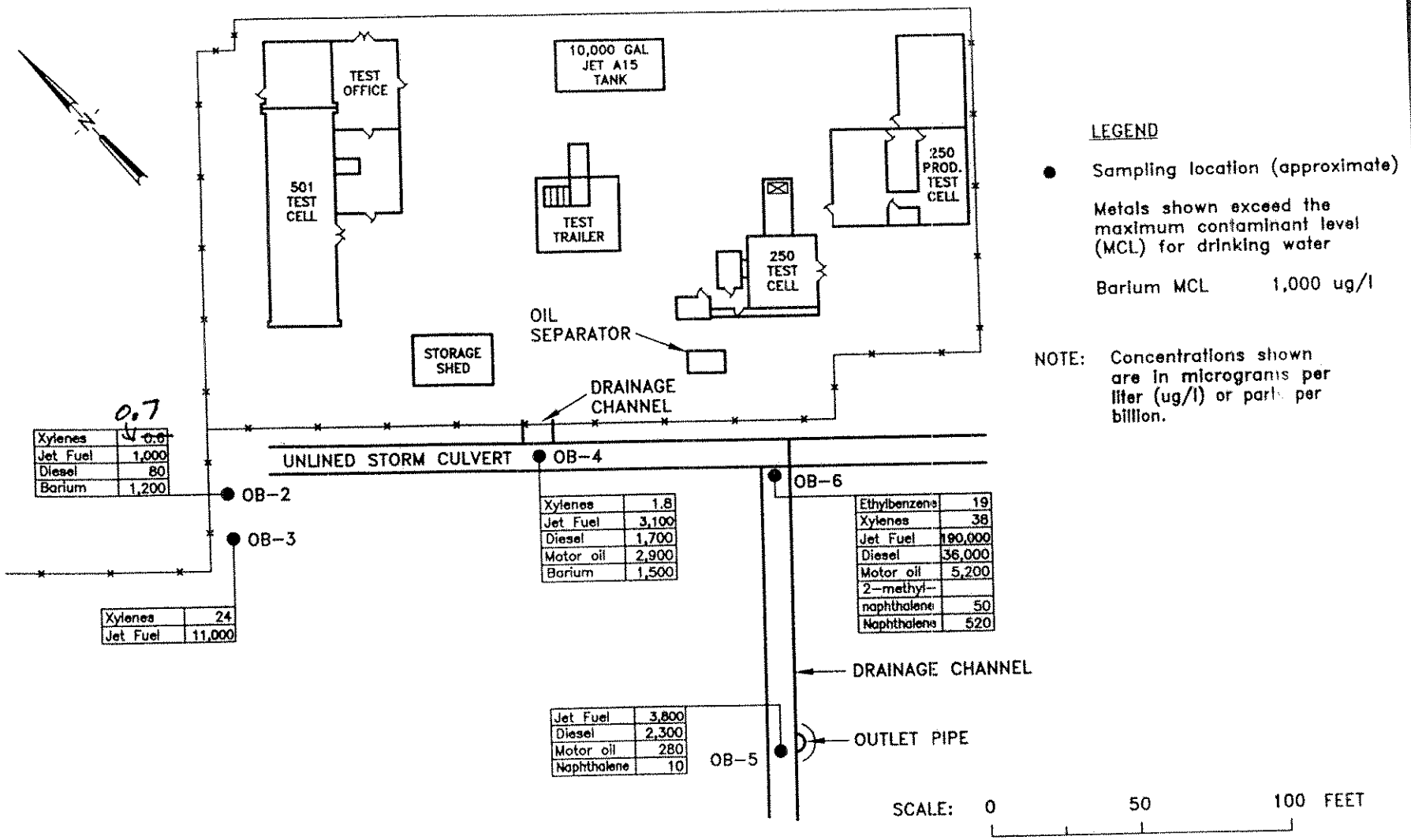
NATIONAL AIRMOTIVE CORPORATION
7200 LOCKHEED STREET
SOIL AND GROUNDWATER CHARACTERIZATION
OAKLAND, CALIFORNIA

GRAY WATER AREA SOIL ANAYTICAL RESULTS

FIGURE
5
PROJECT NO.
2077-001.01

APPENDIX A



LEGEND

● Sampling location (approximate)

Metals shown exceed the maximum contaminant level (MCL) for drinking water

Barium MCL 1,000 ug/l

NOTE: Concentrations shown are in micrograms per liter (ug/l) or parts per billion.

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NATIONAL AIRMOTIVE CORPORATION
7200 LOCKHEED STREET
SOIL AND GROUNDWATER CHARACTERIZATION
OAKLAND, CALIFORNIA

GRAY WATER AREA GROUNDWATER ANAYTICAL RESULTS

FIGURE 6

PROJECT NO. 2077-001.01

Table 1

Soil Analytical Results[1]
Jet Fuel Spill Area
National Airmotive Corporation
Oakland, California

Sample Location	Sample Depth (ft)	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes	Jet Fuel	Kerosene	Diesel	Motor Oil
OB-1	2	<5	<0.05	<0.1	<0.1	<0.1	<1	<1	<1	320
	3.5	110	<0.2[2]	<0.4[2]	<0.4[2]	<0.5[3]	600	<5[2]	190[7]	760
B-1	6	110	<0.1[2]	<0.2	0.3	1.3	780[4]	<10[2]	<10[2]	1,100[3]
B-2	3.5	1,500	<1[2]	<2[2]	5.1	16	6,100[5]	<10[2]	<10[2]	<10[2]
	5	270	<0.2[2]	<0.4[2]	1.2	3.8	1,000[4]	<10[2]	<10[2]	370[4]
B-3	3.5	<5	<0.05	<0.1	<0.1	<0.1	4[4]	<1	<1	50[4]
B-4	3	<5	<0.05	<0.1	<0.1	<0.1	4[4]	<1	<1	44[4]
	5	<5	<0.05	<0.1	<0.1	<0.1	<10[2]	<10[2]	<10[2]	360[4]
B-5	3.5	<5	<0.05	<0.1	<0.1	<0.1	<1	<1	<1	57[6]
B-6	3.5	<5	<0.05	<0.1	<0.1	<0.1	<1	<1	<1	17[6]
B-7	3.5	<5	<0.05	<0.1	<0.1	<0.1	<10[2]	<10[2]	<10[2]	150[6]
B-8	3.5	26	<0.05	<0.1	<0.1	0.1	92[4]	<10[2]	<10[2]	500[4]

1 Results are presented in milligrams per kilogram, or parts per million
2 Raised MRL; analyte concentration required sample dilution
3 Raised MRL due to matrix interference
4 The chromatogram fingerprint resembles a mixture of jet fuel and motor oil
5 The chromatogram fingerprint resembles jet fuel
6 The chromatogram fingerprint resembles motor oil
7 The chromatogram does not match the typical diesel fingerprint
8 The chromatogram does not match the typical jet fuel fingerprint

Table 2

Groundwater Analytical Results[1]
Jet Fuel Spill Area
Oakland, California

Sample Location	TPHG	Benzene	Toluene	Ethylbenzene	Total Xylenes	Jet Fuel	Kerosene	Diesel	Motor Oil
OB-1	89	<0.5	<0.5	<0.5	0.6	7,100	<250[2]	3,600	8,900
B-1	5,100	<2.5[2]	<2.5	24	88	150,000[3]	<500[2]	<500[2]	5,300[3]
B-2	650	<2.5[2]	<2.5	7.1	21	270,000[4]	<500[2]	<500[2]	<500[2]
B-3	420	<0.5	1.2	1.2	4.4	6,300[4]	<500[2]	<500[2]	<500[2]
B-4	<50	<0.5	<0.5	<0.5	<0.5	<50	<50	<50	1,300[5]
B-5	<50	<0.5	<0.5	<0.5	<0.5	<50	<50	<50	520[5]
B-6	<50	<0.5	<0.5	<0.5	<0.5	<50	<50	<50	250
B-7	<50	<0.5	<0.5	<0.5	<0.5	<50	<50	<50	250
B-8	<50	<0.5	<0.5	<0.5	<0.5	<50	<50	<50	250

1 Results are presented in micrograms per liter, or parts per billion
2 Raised MRL; high analyte concentration required sample dilution
3 The chromatogram fingerprint resembles a mixture of jet fuel and motor oil
4 The chromatogram fingerprint resembles jet fuel
5 The chromatogram fingerprint resembles motor oil

Table 3

Soil Analytical Results[1]
Graywater Discharge Area
National Airmotive Corporation
Oakland, California

Sample Location	Sample Depth (ft)	Organic Compounds									
		Jet Fuel	Kerosene	Diesel	Motor Oil	VOCs	SVOCs	Benzene	Toluene	Ethylbenzene	Xylenes
OB-2	0.5	<1	<1	<1	170	ND	ND	<0.05	<0.1	<0.1	<0.1
	2	440	<1	54	190	ND	ND	<0.05	<0.1	<0.1	<0.1
OB-3	0	<10[2]	<10[2]	<10[2]	510	ND	ND	<0.05	<0.1	<0.1	<0.1
	2	<10[2]	<10[2]	<10[2]	1,300	ND	ND	<0.05	<0.1	<0.1	<0.1
OB-4	0	240	<10[2]	1,100	1,100	ND	ND	<0.05	<0.1	<0.1	<0.1
	1	430	<5[2]	22	310	ND	ND	<0.05	<0.1	<0.1	<0.1
OB-5	0	<5	130	250	300	ND	ND	<0.05	<0.1	<0.1	<0.1
OB-6	0	280	<1	120	120	ND	ND	<0.05	<0.1	<0.1	<0.1

		Metals												
		Antimony	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Silver	Vanadium	Zinc
OB-2	0.5	<10	8	220	2	53[4]	12	89	280[5]	0.5	<10	60	1	38	340
	2	<10	<5	730	5	57[4]	25	1,300[4]	2,500[5]	0.5	<10	69	6	39	1,300
OB-3	0	<10	8	810	8	62[4]	18	280[4]	1,000[5]	2.0[4]	16	160	2	37	1,100
	2	11	10	750	6	110[4]	16	320[4]	1,700[5]	29[5]	10	63	3	28	1,600
OB-4	0	<10	<5	260	35[4]	190[4]	15	170	440[4]	1.7	10	90	4	25	820
	1	<10	<5	500	5	49	6	100	1,200[5]	0.7	<10	32	<1	21	1,400
OB-5	0	10	9	410	4	82[4]	6	240	710[4]	2.2[4]	<10	37	3	26	320
OB-6	0	<10	<5	93	2	33	7	120	38	0.3	<10	30	<1	27	150

[1] Results are presented in parts per million

[2] Raised MRL; high analyte concentration required sample dilution

[3] Chromatogram does not match the typical jet fuel fingerprint

[4] Metal concentration meets or exceeds Title 22 soluble threshold limit concentration by a factor of 10 or more

[5] Metal concentration meet or exceeds Title 22 total threshold limit concentration

Note:

VOCs Volatile organic compounds by Method 8010

SVOCs Semivolatile organic compounds by method 8270

Rev. 0, 1/11/96

Table 4

Groundwater Analytical Results[1]
Graywater Discharge Area
National Airmotive Corporation
Oakland, California

Sample Location	Organic Compounds							
	Jet Fuel	Kerosene	Diesel	Motor Oil	Naphthalene	2-Methyl-Naphthalene	Ethylbenzene	Total Xylenes
OB-2	1,000	ND	80[3]	ND	ND	ND	ND	0.7
OB-3	11,000	<100[3]	<100[3]	<500[3]	ND	ND	ND	24
OB-4	3,100	<500[4]	1,700[2]	2,900	ND	ND	ND	1.8
OB-5	3,800	ND	2,300[2]	280	10	ND	ND	ND
OB-6	190,000	<500[4]	36,000[2]	5,200	520	50	19	38

Sample Location	Metals			
	Arsenic	Barium	Lead	Zinc
OB-2	ND	1,200[5]	ND	30
OB-3	11	920	ND	10
OB-4	ND	1,500[5]	4	110
OB-5	9	880	ND	ND
OB-6	ND	840	ND	20

1 Results are presented in micrograms per liter, or parts per billion

2 The chromatogram does not match the typical diesel fingerprint

3 Raised MRL due to matrix interference (high sediment)

4 Raised MRL; high analyte concentration required sample dilution

5 Metal concentration exceeds maximum contaminant level for drinking water

Note:

Naphthalene and 2-Methyl-Naphthalene based on Method 8270 analyses. All other 8270 compounds were not detected.

Samples OB-2 through OB-6 were also analyzed for volatile organic compounds by Method 8010. No VOCs were detected.

QUARTERLY GROUNDWATER MONITORING REPORT DATED APRIL 24, 2006

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QUARTERLY GROUNDWATER MONITORING REPORT

REPORT ID # 569
pdf - 3-24-09

FIRST QUARTER 2006

AT

ROLLS-ROYCE ENGINE SERVICES TEST FACILITY
6701 OLD EARHART ROAD
OAKLAND, CALIFORNIA 94621

APRIL 24, 2006

PREPARED ON BEHALF OF:

ROLLS-ROYCE ENGINE SERVICES-OAKLAND INC
ATTN.: DAVE GOLDBERG
7200 EARHART ROAD
OAKLAND, CALIFORNIA 94621

BY

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QUARTERLY GROUNDWATER MONITORING REPORT

FIRST QUARTER 2006

APRIL 24, 2006

PREPARED FOR:
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1.0 INTRODUCTION

It was agreed during a meeting at Port of Oakland Office on December 9, 2005 that Rolls-Royce Engine Services-Oakland Inc. (RRESO) should assume conducting quarterly groundwater monitoring and reporting activities on Port of Oakland's monitoring well MW-4 and surface sampling location SW-3. RRESO is undertaking this responsibility without admitting that the Total Petroleum Hydrocarbons (TPH), benzene, toluene, ethyl benzene and total xylenes (BTE&X), and methyl tertiary butyl ether (MTBE) found in the Port of Oakland's monitoring well MW-4 and surface sampling location SW-3 are the results of releases at and from RRESO Test Cell Facility located at 6701 Old Earhart Road, Oakland, California. Port of Oakland's monitoring well MW-4 and surface sampling location SW-3 are off-site of RRESO Test Cell Facility.

Applied Remediation Company, Inc. (ARCI) presents this quarterly groundwater monitoring report that details all the major activities that were performed on the Port's monitoring well MW-4 and surface sampling location SW-3 during the first quarter of 2006. The first quarter 2006 groundwater monitoring activities for Port of Oakland monitoring well MW-4 and surface water sampling location SW-3 included water level measurement, purging, sample collection and chemical analysis of all the groundwater and grab water samples collected by Torrent Laboratory, Inc., Milpitas, California. Monitoring well MW-4 and surface sampling location SW-3 are currently required to be monitored on a quarterly basis to collect data required to evaluate chemical (TPH and BTE&X/MTBE) conditions at the Rolls-Royce Engine Services Test Cell Facility's site.

This report documents the procedures (see Appendix A) and findings that were conducted by ARCI on behalf of Rolls-Royce Engine Services-Oakland Inc. (RRESO) at North of Port of Oakland Refuse and Disposal (NPORD) site on March 28, 2006 with ETIC personnel. Approximately, 24 gallons of contaminated groundwater were purged from Port's monitoring well MW-4 by ETIC personnel using Waterra pump into several buckets and finally stored in one labeled 55-gallon drum pending removal by the Port of Oakland's Waste Disposal Contractor.

1.1 LOCATION OF SITE

The project site is the RRESO Test Cell Facility located at 6701 Old Earhart Road, Metropolitan Oakland International Airport (MOIA)-North Field, Oakland, California. In the past, the site and north end of the airport were used as a U.S. Naval Base for aircraft engine tests. The site had also been part of the former North Port of Oakland Refuse Disposal (NPORD) property and adjacent to City of Alameda Landfill. The tidal marsh east of the site is considered a protected wetland.

1.2 BACKGROUND INFORMATION

According to the August 23, 2002, Kleinfelder "Report of Supplemental Site Investigation", Rolls-Royce Engine Services Test Cell Facility, 6701 Old Earhart Road, Oakland, California, the Test Cell Facility is built on artificial fill material adjacent to

tidal wetlands at the north end of Old Earhart Road on the MOIA property. It is surrounded by fencing and comprises an area of approximately 2.3 acres. The Test Cell Facility consists of six engine test cells with auxiliary structures (sheds, pump house, waste water sumps, oil/water separator, control buildings, gas conditioning facility, air receivers, cooling towers, and flare stack), one 30,000 gallons aboveground fuel tank for liquefied petroleum (LP) gas and three underground storage tanks (USTs) for jet-A-fuel (one 10,000 gallon and two paired 8,000 gallon tanks).

Groundwater beneath the site is typically shallow and is encountered between approximately 3 to 5 feet below ground surface (bgs). According to ETIC Engineering "Third Quarter 2005 Monitoring Report", North Port of Oakland Refuse Disposal Site, December 30, 5 pp, previous site investigations and data collected adjacent to the site indicate that groundwater flows toward the east. The depth to water table at the nearby site varies seasonally and may be tidally influenced to a limited extent by the wetland east of the site. There are three existing shallow groundwater monitoring wells (MW-1, MW-2 and MW-3) at the site. Groundwater level is also influenced by irrigation to a soccer field operated by the City of Oakland located to the west of the test cell facility.

An unlined ditch that borders the southwestern side of the site currently receives stormwater and runoff of products used in connection with the operation of Test Cell #s 1, 2, 3 and 4. The unlined ditch drains southward through an underground pipe to a channel on the Air Port Property. A pumping station lifts water from the channel across the Earhart Road levee to the tidal wetland east of the site where it flows to San Leandro Bay

1.2.1 SITE HISTORY

The following site summary is taken from the reviewed site investigation reports on the Test Cell Facility obtained from Roll-Royce by ARCI. The Test Cell Facility is thought to have been built circa World War II by the U.S Navy to test repaired aircraft engines. A portion of the Test Cell may have been built over the eastern side of the former North Port of Oakland Refuse Disposal (NPORD) Site to the west. According to the cross-sections prepared by Golder Associates (1989), a portion of the site does not appear to be underlain by the building demolition debris (wood, concrete, brick, and steel) reportedly disposed of in the landfill until about 1960. However, Rolls-Royce has indicated that construction debris and other refuse were uncovered during the construction of test cells 5, 6 and 7 as well as replacement of an underground cistern south of test cells 5, 6 and 7.

National Airmotive Corporation (NAC), under a lease from the Port, took over the Test Cell Facility from the Navy as part of their aircraft engine maintenance operations at MOIA in the late 1960s and subsequently enlarged it. NAC's operations in Oakland including the Test Cell and the Maintenance Facility at 7200 Earhart Road (formerly Lockheed Street) were purchased by Rolls-Royce in 1999. According to the terms of the Lease, Rolls-Royce assumed the environmental responsibilities involving the former NAC operations and its facilities. Rolls-Royce continues to operate the Test Cell Facility under a lease from the Port of Oakland.

1.2.2 DOCUMENTED RELEASES

According to the legal consul for NAC (Kleinfelder, August 23, 2002), General Counsel Associates (GCA, 1999b), there were three documented instances of chemical releases at the Test Cell Facility in the 1990s.

In September 1992, an accidental release of 1,143 gallons of jet-A-fuel apparently occurred adjacent to the two USTs in the northwest corner of the facility. The released product was mostly contained but some were speculated to have entered the uncapped backfill near the two USTs (ACDEH, 1996a).

In April or May of 1994, an accidental discharge of "gray water", or water containing oil from Test Cell Engine wash down operations, occurred near the southwest corner of the facility. Prior to the 1960s and until 1978, gray water reportedly was discharged to an unlined ditch west of the facility. In 1978, NAC began treating the gray water using an oil/water separator prior to discharge. In 1992, NAC stopped discharging treated gray water from the site and had it transported off-site for disposal (EMCON, 1996). After the 1994 release, ACDEH conducted surface soil sampling west of the Test Cell Facility in and around the drainage channel in May 1994. In the ACDEH soil samples, 15 % unspecified "oil and grease" and one elevated concentration of lead were detected in the nine samples that were collected and analyzed.

Finally in October 1998, petroleum hydrocarbons identified as a mixture of "old motor oil, diesel, and/or kerosene" was discovered during trenching operations for upgrades to the 10,000-gallon jet-A-fuel underground storage tank and associated product lines. The source of the hydrocarbons was suspected to be from "unidentified leak (s) in the 10,000-gallon jet-A-fuel underground storage tank and its associated product pipes, or from one or more historical surface spills in and around the storage tank (GCA, 1998). Since 1998, no further release incidents have been reported, although incidents of stormwater and runoffs from the site to the west apparently continue.

1.2.3 CONSENT JUDGMENT

As a result of the first two above incidents, a Complaint of Civil Penalties and Injunctive Relief was filed against NAC on October 17, 1994, accompanied by a Concurrent Stipulation for Consent Judgment reflecting settlement terms between Alameda County and NAC. It was stipulated that NAC pay costs and penalties of $200,000 and one year to "investigate, monitor, and/or remediate the effects of the discharges of jet-A-fuel and the "gray water" oil-containing water at or near the Test Cell Facility". However, NAC could receive credit for the latter amount against costs incurred with complying with the terms of the Consent Judgment. The consent agreement was later closed.

1.2.4 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

Approximately six major known investigations have been conducted at the site. The "initial investigation (Jet-A-Fuel Release Investigation) was conducted to assess environmental impact of the 1992 jet-A-fuel release. EMCON conducted the subsurface investigation within the vicinity of the two USTs in the northwest corner of the Test Cell Facility for NAC in April and November of 1995. Petroleum hydrocarbons in excess of 1,000 mg/Kg were detected in the soil samples collected and analyzed from the immediate vicinity of the two USTs. Groundwater next to the two USTs and to the west was locally impacted by petroleum hydrocarbons and aromatic hydrocarbon compounds (except benzene). Soil and groundwater in other directions away from the two USTs did not appear to be impacted by the release of the jet-A-fuel. No soil or groundwater remediation was undertaken by NAC in the vicinity of the two 8,000 gallon USTs as a result of that subsurface investigation.

In the second investigation, the 1994 gray water release, (Gray Water Release Investigation), EMCON was retained by NAC to perform a subsurface investigation by advancing five soil borings in the unlined drainage ditch area immediately west of the Test Cell Facility boundary in November 1995. The results of two soil samples collected in two of the boreholes indicated elevated levels of petroleum hydrocarbons greater than 1,000 mg/Kg. Cadmium, chromium, copper, lead, and mercury were detected in the surface soil samples at concentrations exceeding hazardous waste disposal limits. However, the investigated area was adjacent to NPORD, and EMCON in its report speculated that the metals detected could have been associated with disposal activities at the adjacent landfill (EMCON, 1996). A November 3, 1995 ACDEH memorandum on file, noted that there are two monitoring wells (MW-3 and MW-4) associated with the NPORD, and in a meeting held that day, ACDEH recommended that NAC gain access to these two monitoring wells for sampling on the western side of the Test Cell. No further investigation or remediation of elevated petroleum hydrocarbons and metals concentrations west of the Test Cell Facility was performed by NAC.

On February 20, 1996, ACDEH notified the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), that results of sampling groundwater monitoring wells at NPORD site indicated that "the presence of organic compounds (jet fuel constituents) in sampled groundwater monitoring wells from the southeast portion of the (landfill) site (that portion adjoining the NAC Test Site) is from a source not associated with the landfill". In ACDEH's opinion, metals identified in the soil samples collected in the drainage ditch area "appear (s) to be from soil materials incorporated into the fill overlying the landfill site, and not from the known releases occurring at the NAC Facility". Further, ACDEH noted that "surface water collects at a pumping station located a short distance southeast of both the subject landfill and the NAC Test Site. Collected water is subsequently pumped into a tidal marsh located immediately east of Earhart Road". Water from the unlined surface ditch west of the Test Site flows to the pond via a pipe through a levee. ACDEH suggested that "discharges to the tidal marsh would be subject to a National Pollutant Discharge Elimination System (NPDES) permit evaluation and subsequent testing prior to discharge".

On February 21, 1996, ACDEH requested that NAC install three groundwater monitoring wells along the eastern side of the Test Cell Facility to "ensure that the jet fuel plume is stable and not migrating towards the tidal marsh" to the east. NAC retained EMC to install the three monitoring wells (two along Old Earhart Road and one in the southwest corner of the facility) in March 1996 (EMC, 1996a and b). The wells were sampled annually in 1996 through 1998. Initial concentrations of jet fuel and/or diesel fuel detected in 1996 diminished and were not detected by 1998. No aromatic or semi-volatile organic compounds were detected in the groundwater samples. EMC indicated that the groundwater flow direction over the three monitored years was consistently westward away from the tidal march. The final groundwater monitoring report provided by NAC in mid 1998 indicated no detectable spread of jet-A-fuel from the 1992 release and a case closure was requested (EMC, 1998).

After the 1998 petroleum product release in a pipeline trench, Foss Environmental Services, Inc (FES) in the Pipeline Release Response, contained the product, disposed of excavated impacted soil, and installed a passive product recovery device in a sump constructed in the trench backfill (FES, 1998). The amount of free product recovered diminished rapidly from the initial amounts, and according to NAC records, a total of approximately 3.6 gallons of products were recovered between October 1998 and May 2000 (NAC, 2000a). Soil samples obtained from stained areas remaining in the trenches after excavation was completed contained between 230 and 18,000 mg/Kg levels of jet-A-fuel (FES, 1998). The single-wall fuel lines were reportedly removed from the trenches prior to backfilling; Trenches 1 and 3 now contain double-wall fuel lines. Trench 2 no longer contains a fuel line.

In July 2002, Kleinfelder conducted a Supplemental Site Investigation at the Test Cell Facility that involved the advancing of 26 supplemental soil borings to further evaluate the on-site areas of environmental concerns (the three jet fuel USTs, the vicinity of the 1998 fuel release into pipeline trenches, the off-site storm water drainage ditch system, the oily discharge from the gas compressors and the existing groundwater monitoring wells). As a result of this subsurface investigation, Kleinfelder recommended that the subsurface soil and groundwater in the vicinity of the former fuel pipeline trenches and the unlined drainage ditch be remediated to remove the continuing source of hydrocarbons and prevent future impacts to soil, groundwater, and potentially surface water. Kleinfelder further recommended that the soil within the unlined ditch west of the facility be excavated to remove impacted soil and groundwater, and that the stormwater runoff system at the Test Cell Facility be reviewed and upgraded to improve its function and prevent off-site discharge during storm events.

1.2.5 CURRENT OWNER/TYPE OF BUSINESS

Rolls-Royce Engine Service-Oakland is leasing the property (Test Cell Facility) at 6701 Old Earhart Road from Port of Oakland for aircraft engine testing. The Rolls-Royce Oakland facility provides overhaul and maintenance services for several variants of the T56 engine for military transport and reconnaissance aircraft. It also reworks Model 250 turboshaft engines for a broad range of helicopters and its turboprop variant for a variety

of small fixed-wing aircraft. The main contact person for the Test Cell Facility environmental issues is Mr. David Goldberg. Mr. Goldberg can be reached at (510) 615-5095.

1.3 MONITORING NETWORK

The NPORD site monitoring network for RRESO consists of one groundwater monitoring well (MW-4) and one surface water sampling location SW-3. Monitoring well MW-4 is screened from 4 feet to 12 feet below ground surface (see Table 3-2) and is located off-site (west) of the Test Cell Facility. The surface water sampling location SW-3 is located off-site (southwest) of Test Cell Facility.

1.4 CONSTITUENTS OF POTENTIAL CONCERN

The NPORD site groundwater and surface water samples are analyzed in general in accordance with current requirements for municipal solid waste landfills. According to ETIC, the comparison of the concentrations observed during previous site monitoring results to Tier 1 Environmental Screening Levels (ESLs) for groundwater that is not a source or potential drinking water resource (RWQCB, 2005-Table F-1b) and California primary drinking water maximum contaminant levels (MCLs) (RWQCB, 2005-Table F-3), and for surface water in estuary habitats (RWQCB, 2005-Table F-2c) are used to evaluate analytical results.

1.5 QUARTERLY GROUNDWATER MONITORING OBJECTIVES

RRESO without admitting that TPH and BTE&X/MTBE compounds found in the Port's MW-4 and SW-3 monitoring locations are the results of releases from its Test Cell Facility, it has agreed to bear the expense of monitoring MW-4 and SW-3 quarterly for a period of five years or upon a determination by ACDEH that such monitoring is no longer needed, whichever comes sooner. The overall objective was to perform quarterly groundwater monitoring and reporting (monitoring (water level measurements), purging, sampling and chemical analysis) on the Port's monitoring well MW-4 and SW-3 at NPORD for TPH and BTE&X contamination caused by petroleum hydrocarbons releases at and from the RRESO Test Cell Facility. RRESO will monitor MW-4 and SW-3 on quarterly basis and the two locations will be included in its future overall groundwater monitoring program.

1.6 SCOPE OF WORK PERFORMED/APPROACH

The specific tasks that were performed in order to achieve the objectives of the quarterly groundwater monitoring program for the site were to:

- Perform water level measurements on the Port's monitoring well MW-4 prior to purging.
- Purge adequate casing volume volumes (minimum of three casing volumes) of water from monitoring well MW-4.

- Collect groundwater and grab water samples from MW-4 and SW-3 respectively and have the samples analyzed by Torrent Laboratory, Inc. in Milpitas, California for TPH-d w/si-gel standard cleanup/TPH-jet-A-fuel/TPH-motor oil using EPA Method 8015B. These samples were also analyzed for benzene, toluene, ethyl benzene and total xylenes (BTE&X) and methyl tertiary ethyl ether (MTBE) using EPA Method 8260B.

- Prepare all the necessary maps, figures and tables and the final quarterly groundwater monitoring report (after the draft has been reviewed by RRESO) to be submitted to RRESO and Port of Oakland.

2.0 SITE DESCRIPTION

The Test Cell Facility as shown in Figure 2-2 is built on artificial material adjacent to tidal wetlands at north of Old Earhart Road on MOIA property. It is surrounded by fencing and comprises an area of approximately 2.3 acres. The Test Cell Facility consists of six Engine Test Cells with auxiliary structures (sheds, pump house, waste water sumps, aboveground oil/water separator, control buildings, gas conditioning facility, air receivers, cooling towers, flare stack, and etc), one aboveground fuel tank for liquefied petroleum (LP) gas (30,000-gallons), and three underground storage tanks (USTs) for jet-A-fuel (one 10, 000-gallon) and two paired 8,000-gallon tanks.

An unlined ditch currently borders the southwestern side of the Test Cell Facility and receives stormwater and petroleum hydrocarbon contaminated runoffs from Test Cell numbers 1, 2, 3 and 4. Currently the runoff water is contained and treated. The unlined ditch drains southward through an underground pipe to a channel in the Airport property. A pumping station lifts water from the channel across the Earhart Road Levee to the tidal wetland east of the site where it flows to San Leadro Bay. A general description of the site detailing the vicinity and site maps, topography, geology and hydrology is presented below.

2.1 VICINITY MAP

A vicinity map showing the general area of the site and the surroundings is presented in Figure 2-1.

2.2 SITE MAP

A site map illustrating the on-site infrastructures, locations of the existing underground and aboveground storage tanks (USTs) existing monitoring wells, and previous soil borings is shown in Figure 2-2.

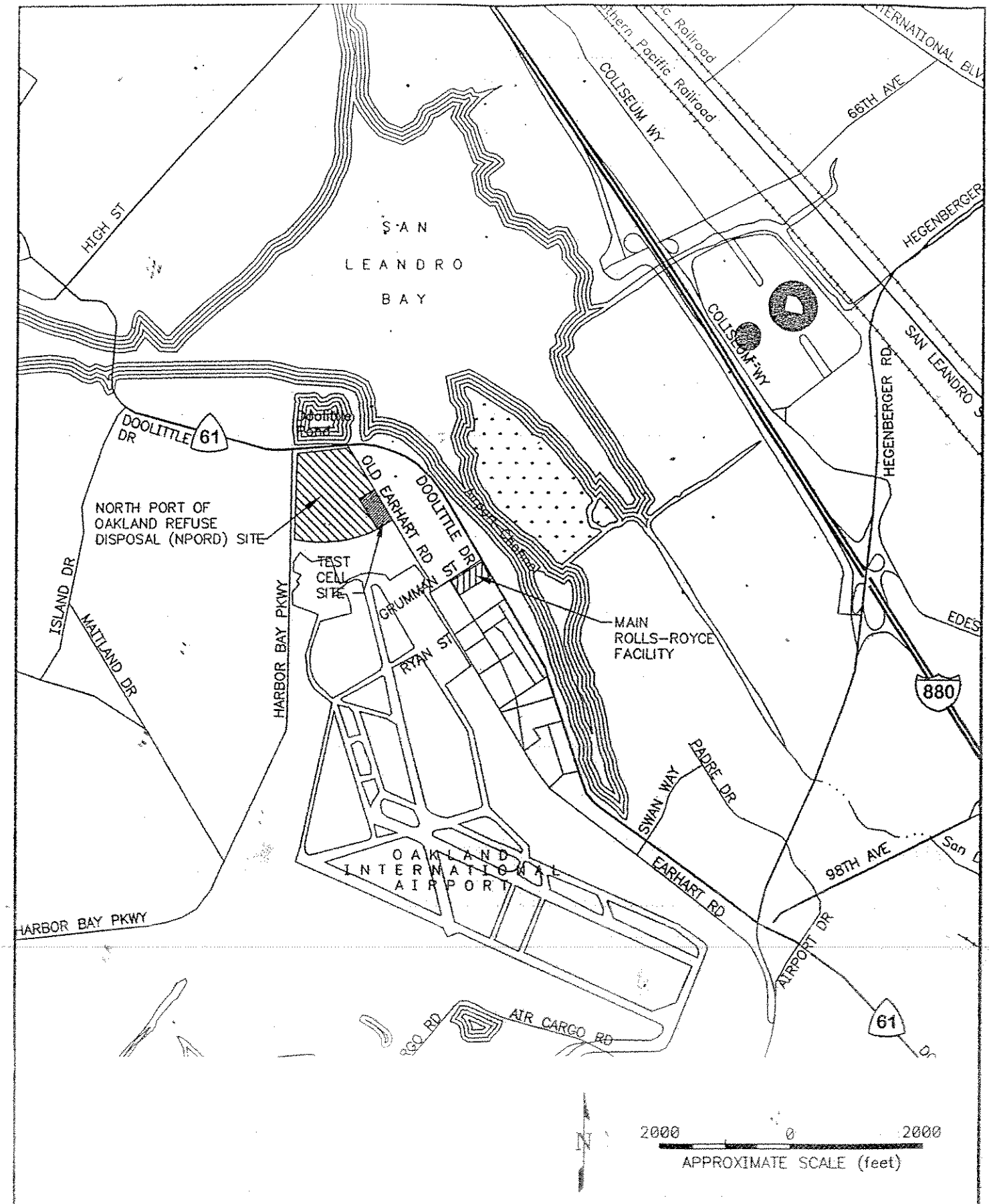


Figure 2-1: Vicinity Map
Rolls-Royce Test Cell Facility
6701 Old Earhart Road
Oakland, CA 94621

BASE MAP BY KLEINFELDER, INC.

TIDAL WETLAND

BERM

MW-1

EARHART ROAD

MW-2

NPORD MW-3

B-6

30,000-Gal AST (Liquefied Petroleum Gas)

B-7

Engine Prep Area

Low Speed Test Cell 5

Control Room

High Speed Test Cell 6

Treated Wastewater Sump

B-8

B-5

B-4

KB-4

8,000-Gal USTs (Jet Fuel)

KB-1

B-2

KB-2

B-1

B-3

UST 2

UST 3

KB-3

Pump House

LP Gas Facility

KB-20

KB-21

KB-22

Oil Stains from Gas Compressors

OB-1

KB-5

KB-23

KB-24

Cooling Water Pumps

Cooling Towers

KB-25

S-4

S-3

OB-3

S-2

Oil/Water Separator

KB-6

Air Receivers

Flare Stack

NORTH PORT OF OAKLAND REFUSE DISPOSAL AREA (NPORD)

Storage Shed

KB-13

OB-2

Swale

Office

Test Cell 1

TRENCH 3

Storage Shed

18,000-Gal UST (Jet Fuel)

KB-7

UST 1

KB-8

Control Station

TRENCH 1

TRENCH 2

Test Cell 2

KB-9

KB-12

RW-1

KB-11

KB-10

Concrete Drainage Channel

Test Cell 4

Test Cell 3

MW-3

Graywater Holding Tank

KB-19

NPORD MW-4

P-10

KB-14

KB-15

S-1

S-7

S-6

OB-5

OB-6

S-8

Depression

KB-16

Dense Brambles

KB-17

Drainage Ditch

KB-26

KB-18

OB-6

Outlet Pipe to Pumping Station and Tidal Wetland

S-9

SW-3

S-5

LEGEND

- FENCE
- TREE
- UST UNDERGROUND STORAGE TANK
- AST ABOVEGROUND STORAGE TANK
- PRODUCT RECOVERY WELL
- GROUNDWATER MONITORING WELL (by Environmetrix, 1996)
- PREVIOUS SAMPLING LOCATION (by Alameda County, 1994)
- PREVIOUS SAMPLING LOCATION (by Emcon, 1996)
- PIPELINE TRENCH (by Foss, 1998)
- NORTH PORT OF OAKLAND REFUSE DISPOSAL (NPORD) SITE GROUNDWATER MONITORING WELL
- NPORD PIEZOMETER
- SAMPLING LOCATION (by Kleinfelder, 2002)
- Surface Water Sampling Location

NOTE: Locations are approximate.

50 0 50

APPROXIMATE SCALE (feet)

BASE MAP BY KLEINFELDER, INC.

Figure 2-2: Site Map
Rolls-Royce Test Cell Facility
6701 Old Earhart Road
Oakland, CA 94621

2.3 SITE, GEOLOGY AND HYDROLOGY

According to EMC's report, the site is flat with elevation of approximately one to two feet above Mean Sea Level (MSL) (USGS, 1980). The site is located on an artificial rise separating the north end of Oakland Airport from tidal marsh

2.3.1 GEOLOGY

The site lies in the Eastern Franciscan Block of the Coast Range geomorphic province. The province is characterized by many elongate ranges and narrow valleys that trend generally northwest (Norris & Webb, 1990). The basement rock in the area is Franciscan subduction complex (Franciscan). The Franciscan is dominated by greenish-gray greywacke interbedded with dark shale and occasional limestone (Norris & Webb, 1990).

The surface rocks are Cenozoic shelf, slope and land deposits. These deposits consist mostly of sandstone and shale or mudstone of restricted aerial extent (Bailey, 1996). Locally, the site sits on a loose fill mixture of Pleistocene silts and clays. The clays, known as Bay Mud, are generally bluish gray. The site is approximately 5 miles west of the Hayward Fault and approximately 17 miles east of the San Andreas Fault. Both the Hayward and San Andreas are considered active faults.

2.3.2 HYDROLOGY

The site is approximately 1,000 feet from San Leandro Bay. Depth to water table is approximately between 3 feet to 5 feet below ground surface (bgs); however, tidal influences and irrigation may influence the depth and gradient locally.

3.0 WATER MONITORING AND SAMPLING PROCEDURES

This section describes the major groundwater monitoring and sampling procedures that ARCI utilized in conducting the quarterly groundwater monitoring and reporting activities during this first quarter. These procedures are presented in sections 3.1 through 3.3.

3.1 Groundwater Sampling Procedures

The depth to groundwater and the total depth of monitoring well MW-4 were measured by ETIC field personnel to the nearest 0.01 foot on March 28, 2006. The current and historical depths and total depth water elevation data are presented in Table 3-1. Table 3-2 represents monitoring well MW-4 well construction data. Prior to sampling, approximately three casing volumes of water were purged by ETIC field technician from monitoring well MW-4 using WaTerra inertial pump. Samples for TPH-g/BTE&X/MTBE were collected in two clean HCl preserved 40 mL clear glass vials using the WaTerra pump. Also the samples for TPH-d w/si-gel standard cleanup/TPH-jet-A-fuel/TPH-motor oil were also collected in two clean non-preserved 1-Liter Amber bottles using WaTerra pump.

Approximately 24 gallons of purged water were collected in six 5-gallon buckets using WaTerra pump and later placed in a labeled 55-gallon drum by ETIC personnel pending disposal by the Port's Hazardous Waste Contractor. The groundwater sampling data log sheet is included in Appendix B.

TABLE 3-1: SUMMARY OF GROUNDWATER MONITORING WELL (MW-4) ELEVATION DATA

Well ID	Date	DTW	CASING ELEVATION ELEVATION[1]	GROUNDWATER ELEVATION
		(feet BTOC)	(feet AMSL)	(feet AMSL)
MW-4	10/13/1989	3.06	6.9	3.84
MW-4	11/07/1989	3.03	6.9	3.87
MW-4	01/24/1990	2.95	6.9	3.95
MW-4	02/02/1990	3.05	6.9	3.85
MW-4	03/15/1990	2.53	6.9	4.37
MW-4	03/17/1990	2.65	6.9	4.25
MW-4	05/07/1990	2.38	6.9	4.52
MW-4	05/09/1990	2.36	6.9	4.54
MW-4	08/04/1995	2.15	6.9	4.75
MW-4	03/02/2005	1.43	6.87	5.44
MW-4	07/07/2005	1.97	6.87	4.90
MW-4	09/30/2005	2.25	6.87	4.62
MW-4	10/06/2005	2.30	6.87	4.57
MW-4	10/18/2005	2.10	6.87	4.77
MW-4	12/12/2005	2.13	6.87	4.74
MW-4	03/28/2006	1.34	6.87	5.53

DTW = Depth to water
BTOC = Below Top of Casing
AMSL = Above Mean Sea Level
1 = Data provided by Port of Oakland Survey Department, Port of Oakland datum

TABLE 3-2: WELL CONSTRUCTION DETAILS

Well ID	DATE	NORTHING[1]	EASTING[1]	TOC (feet amsl)	DEPTH OF BORING (feet bgs)	DEPTH OF WELL (feet btoc)	SCREENED INTERVAL (feet btoc)	SAND PACK INTERVAL (feet btoc)	WELL DIAMETER (inches)
MW-4	10/13/1989	2097741.7	6063565.8	6.9	15	12	4-12	3-12	4

TOC = Top of Casing
Amsl = Above Mean Sea Level
btoc = Below Top of Casing
1 = Data provided by Port of Oakland Survey Department, Port of Oakland datum

3.2 Surface Water Sampling Procedures

Grab water samples were collected on the NPORD site on March 28, 2006 from surface sampling location SW-3 located southwest of the Test Cell Facility (see Figure 2-2). Grab water samples for TPH-g/BTE&X/MTBE were collected from SW-3 in two clean HCl preserved 40 mL clear glass vials. The grab water samples for TPH-d w/si-gel standard cleanup/TPH-jet-A-fuel/TPH-motor oil were also collected in two non-preserved 1-Liter Amber bottles.

3.3 Water Sample Analysis

Groundwater and surface grab water samples were transported to Torrent Laboratory, Inc., Milpitas, California for chemical analyses. All the samples were analyzed by the certified laboratory for TPH-g as gasoline, TPH-jet-A-fuel, TPH-motor oil and TPH-d w/si-gel standard cleanup using EPA Method 8015B. The samples were also analyzed for benzene, toluene, ethyl benzene and total xylenes (BTE&X) and methyl tertiary ethyl ether (MTBE) using EPA Method 8260B.

4.0 GROUNDWATER MONITORING AND SAMPLING RESULTS

This section describes the groundwater monitoring and sampling results during the first quarter of 2006. These results are presented in sections 4.1 through 4.3.

4.1 Groundwater Elevations

Groundwater elevation in MW-4 this quarter was 5.53 feet above mean sea level (amsl), as presented in Table 3-1. Since the December 2005 groundwater monitoring event, groundwater elevations increased in approximately 0.79 feet in MW-4. The apparent groundwater differential water levels increases may reflect seasonal fluctuations in recharge, and local variations in hydrogeology, including variable release of water trapped in the refuse. Previous site investigations and data adjacent to the site indicate that groundwater flows toward the east according to ETIC (October 2, 2005).

4.2 Groundwater Analytical Results

The Total Petroleum hydrocarbons and their constituents' in the current groundwater analytical results in the groundwater samples collected from monitoring well MW-4 are summarized in Table 4-2a. The analytical result from the groundwater sample collected from MW-4 indicated that TPH-ag, TPH-g, TPH-jaf, benzene, toluene, ethyl benzene and total xylenes and MTBE level was each ND, not detected at or above detection limit. Also in MW-4, TPH-d and TPH-mo levels were 0.28 mg/L and 0.79 mg/L respectively. The historical groundwater analytical results in MW-4 are summarized in Table 4-1b. The groundwater analytical report with the chain-in-custody record (COC) is presented in Appendix C.

TABLE 4-1a: SUMMARY OF MW-4 CURRENT GROUNDWATER SAMPLES ANALYTICAL RESULTS

Well ID	Sample Date	TPH-g (mg/L)	TPH-d (mg/L)	TPH-jaf (mg/L)	TPH-ag (mg/L)	TPH-mo (mg/L)	MTBE (µg/L)	benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total xylenes (µg/L)
MW-4	3/28/06	ND	0.28	ND	ND	**0.79**	ND	ND	ND	ND	ND
ESL (µg/L)		500	640	-	-	640	1,800	46	130	290	100
MCL (µg/L)		-	-	-	-	-	-	1.0	150	300	1,750

Notes and abbreviations
mg/L = Milligram per Liter
µg/L = Micrograms per Liter
MTBE = Methyl tertiary butyl ether
TPH-g = Total Petroleum Hydrocarbons as gasoline
TPH-d = Total Petroleum Hydrocarbons as diesel
TPH-jaf = Total Petroleum Hydrocarbons as jet-a-fuel
TPH-mo = Total Petroleum Hydrocarbons as motor oil
TPH-ag = Total Petroleum Hydrocarbons as aviation gas

TABLE 4-1b: SUMMARY OF MW-4 HISTORICAL GROUNDWATER (MW-4) ANALYTICAL RESULTS

Well ID	Sample Date	TPH-g (µg/L)	TPH-d (µg/L)	TPH-jaf (µg/L)	TPH-ag (µg/L)	TPH-mo (µg/L)	MTBE (µg/L)	benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total xylenes (µg/L)
MW-4	Nov-89	-	-	-	-	-	-	<5.0	<5.0	<5.0	<5.0
MW-4	Jan-90	-	-	-	-	-	-	**7.8**	<5.0	<5.0	<5.0
MW-4	Mar 90	-	-	-	-	-	-	**.5.5**	<5.0	<5.0	<5.0
MW-4	May-90	-	-	-	-	-	-	<5.0	<5.0	<5.0	<5.0
MW-4	01/21/1994	180	**1,400**	NA	NA	-	-	<0.5	<0.5	<0.5	<0.5
MW-4	08/04/1995	-	-	NA	NA		ND	<5.0	<5.0	<5.0	ND
MW-4	02/18/2005	66 Q[1]	330 Q[2]	NA	NA	<500	<5.0	<0.5	<0.5	<0.5	<1.0
MW-4	07/07/2005	71 Q[1]	**1,200**	NA	NA	**740** Q[3]	<5.0	<1.0	<1.0	<1.0	<2.0
Groundwater ESL (µg/L)		500	640			640	1,800	46	130	290	100
CA Primary MCL (µg/L)							13	1.0	150	300	1,750

TABLE 4-1b: SUMMARY OF MW-4 HISTORICAL GROUNDWATER WATER (MW-4) ANALYTICAL RESULTS (cont')

Well ID	Sample Date	TPH-g (µg/L)	TPH-d (µg/L)	TPH-jaf (µg/L)	TPH-ag (µg/L)	TPH-mo (µg/L)	MTBE (µg/L)	benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total xylenes (µg/L)
MW-4	09/30/2005	94 a	**850a**	NA	NA	<500b	<5.0	<1.0	<1.0	<1.0	<2.0
MW-4	12/12/2005	100	**990**	NA	NA	510	<5.0	<1.0	<1.0	<1.0	<2.0
MW-4	03/28/2006	ND mg/L	0.28 mg/L	ND mg/L	ND mg/L	**0.81** mg/L	ND	ND	ND	ND	ND
Groundwater ESL (µg/L)		500	640			640	1,800	46	130	290	100
CA Primary MCL (µg/L)							13	1.0	150	300	1,750

Notes and Abbreviations:

Bold = Result above RWQCB (2005) Environmental Screening Levels for groundwater That is not a current or potential drinking water source (ESL) or above California Primary Maximum Contaminant Level (MCL).
a = The associated method blank contains the target analyte a reportable level.
b = Analyte concentration below reporting limits, estimated results presented in Appendix C of ETIC monitoring reports (March 08, 2006).
µg/L = Micrograms per Limit
MTBE = Methyl tertiary butyl ether
NA = Not Analyzed
ND = Below method detection limit
Q^1 = Quantity of unknown hydrocarbon (s) in sample based on gasoline
Q^2 = Quantity of unknown hydrocarbon (s) in sample based on diesel
Q^3 = Quantity of unknown hydrocarbon (s) in sample based on motor oil
TPH = Total Petroleum Hydrocarbons.
TPH-g = Total Petroleum Hydrocarbons as gasoline
TPH-d = Total Petroleum Hydrocarbons as diesel
TPH-jaf = Total Petroleum Hydrocarbons as jet-a-fuel
TPH-mo = Total Petroleum Hydrocarbons as motor oil
TPH-ag = Total Petroleum Hydrocarbons as aviation gas

4.3 Surface Grab Analytical Water Results

The Total Petroleum hydrocarbons and their constituents' in the groundwater samples collected from surface water sampling location SW-3 during this sampling period are summarized in Table 4-2a. The analytical results indicated that TPH-ag, TPH-g, TPH-jf, benzene, toluene, ethyl benzene and total xylenes and MTBE level was each ND, not detected at or above detection limit.

Also in SW-3, TPH-d and TPH-mo levels were 0.67 mg/L and 0.81 mg/L respectively. The historical groundwater analytical results in SW-3 are summarized in Table 4-2b. SW-3 grab water analytical report with the COC from the laboratory is also presented in Appendix C.

TABLE 4-2a: SUMMARY OF ANALYTICAL RESULTS FOR CURRENT SURFACE WATER PETROLEUM HYDROCARBON CONSTITUENTS NPORD SITE.

Well. ID	Sample Date	TPH-g (mg/L)	TPH-d (mg/L)	TPH-jaf (mg/L)	TPH-ag (mg/L)	TPH-mo (mg/L)	MTBE (µg/L)	benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total xylenes (µg/L)
SW-3	3/28/06	ND	**0.67**	ND	ND	**0.81**	ND	ND	ND	ND	ND
ESL (µg/L)		500	640	-	-	640	1,800	46	130	290	100
MCL (µg/L)		-	-	-	-	-	-	1.0	150	300	1,750

Notes and abbreviations
mg/L = Milligram per Liter
µg/L = Micrograms per Liter
MTBE = Methyl tertiary butyl ether
TPH-g = Total Petroleum Hydrocarbons as gasoline
TPH-d = Total Petroleum Hydrocarbons as diesel
TPH-jaf = Total Petroleum Hydrocarbons as jet-a-fuel
TPH-mo = Total Petroleum Hydrocarbons as motor oil
TPH-ag = Total Petroleum Hydrocarbons as aviation gas

TABLE 4-2b: SUMMARY OF SW-3 HISTORICAL SURFACE WATER ANALYTICAL RESULT

Well. ID	Sample Date	TPH-g (µg/L)	TPH-d (µg/L)	TPH-jaf (µg/L)	TPH-ag (µg/L)	TPH-mo (µg/L)	MTBE (µg/L)	benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total xylenes (µg/L)
SW-3	Nov-89		ND					<5	270	84	500
SW-3	Jan-90	ND	ND	-	-	-	-	-	-	-	-
SW-3	Mar-90	ND	ND	-	-	-	-	-	---	-	-
SW-3	May-90	ND	ND	-	-	-	-	-	-	-	-
Surface Water ESL (µg/L)		500	640	640	640	640	1,800	46	130	40	100
MCL (µg/L)		-	-	-	-	-	13	1.0	150	130	1,750

TABLE 4-2b: SUMMARY OF SW-3 HISTORICAL SURFACE WATER ANALYTICAL RESULT (cont')

Well ID	Sample Date	TPH-g (µg/L)	TPH-d (µg/L)	TPH-jaf (µg/L)	TPH-ag (µg/L)	TPH-mo (µg/L)	MTBE (µg/L)	benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total xylenes (µg/L)
SW-3	02/28/2005	**1,600**	**2,900**	-	-	**1,100**	16	<0.5	<0.5	<0.5	<1
SW-3	07/08/2005	**640 Q[1]**	**2,100**	-	-	**2,000 Q[3]**	<5.0	<1.0	<1.0	<1.0	<2.0b
SW-3**	09/30/2005	NS	NS	-	-	NS	NS	NS	NS	NS	NS
SW-3 **	12/12/2005	NS	NS	-	-	NS	NS	NS	NS	NS	NS
SW-3	03/28/2006	ND mg/L	**0.67** mg/L	ND mg/L	ND mg/L	**0.81** mg/L	ND	ND	ND	ND	ND
Surface Water ESL (µg/L)		500	640	640	640	640	1,800	46	130	40	100
MCL (µg/L)		-	-	-	-	-	13	1.0	150	130	1,750

Notes and Abbreviations

BOLD = Results above RWQCB (2005) Environmental Screening Levels for Surface water-estuary habitat (ESL)
µg/L = Micrograms per Liter
a = The associated method blank contains the target analyte at a reportable level at a reportable level
b = Analyte concentration below reporting limits; estimated results presented in Appendix B
MTBE = Methyl tertiary butyl ether
ND = Below method reporting limit
NS = Not Sampled
Q^1 = Quantity of unknown hydrocarbon (s) in sample based on gasoline
Q^3 = Quantity of unknown hydrocarbon (s) in sample based on motor oil
TPH = Total Petroleum Hydrocarbons.
TPH-g = Total Petroleum Hydrocarbons as gasoline
TPH-d = Total Petroleum Hydrocarbons as diesel
TPH-jaf = Total Petroleum Hydrocarbons as jet-a-fuel
TPH-ag = Total Petroleum Hydrocarbons as aviation gas
TPH-mo = Total Petroleum Hydrocarbons as motor oil
** = Surface water location was dry during the sampling event

5.0 DISCUSSION

Discussions on the evaluations of the groundwater and surface water grab water sample analytical results during this first quarter are presented in sections 5.1 and 5.2.

5.1 Groundwater Evaluation

The groundwater contaminant levels in this sampling period are evaluated relative to MCLs and ESLs for groundwater that is not a current or potential drinking water source. In March 2006, TPH-d concentration exceeded its respective ESL in NPORD monitoring well MW-4 (Table 4-1a, Table 4-1b and Figure 5-1). In March 2006, benzene, toluene, ethyl benzene, and total xylenes (BTE&X), methyl tertiary butyl ether (MTBE), TPH-ag, TPH-g, TPH-d (0.28 mg/L) and TPH-jaf concentrations (ND, not detected at or above detection limit) did not exceed their respective MCLs and ESLs in MW-4.

5.2 Surface Water Evaluation

The surface water levels in this sampling period are evaluated relative to ESLs for surface water in estuary habitats. In March 2006, TPH-d and TPH-mo levels exceeded their respective ESLs in surface water sampling location SW-3 (Table 4-1a, Table 4-1b and Figure 5-1). In March 2006 also, benzene, toluene, ethyl benzene and total xylenes (BTE&X), methyl tertiary butyl ether (MTBE), TPH-ag, TPH-g and TPH-jaf levels (ND, not detected at or above detection limit) did not exceed their respective ESLs and MCLs in SW-3.

6.0 PLANNED MONITORING ACTIVITIES

Quarterly groundwater and surface water sampling for NPORD monitoring well MW-4 and surface sampling location SW-3 is currently coordinated and conducted at the same time with ETIC Engineering, the consultant conducting Quarterly Groundwater Monitoring and Reporting on behalf of Port of Oakland for the Port of Oakland Refuse Disposal Site. It is anticipated that the second quarter 2006 groundwater monitoring and reporting for NPORD monitoring well MW-4 and surface water sampling location SW-3 will occur during second week of June 2006.

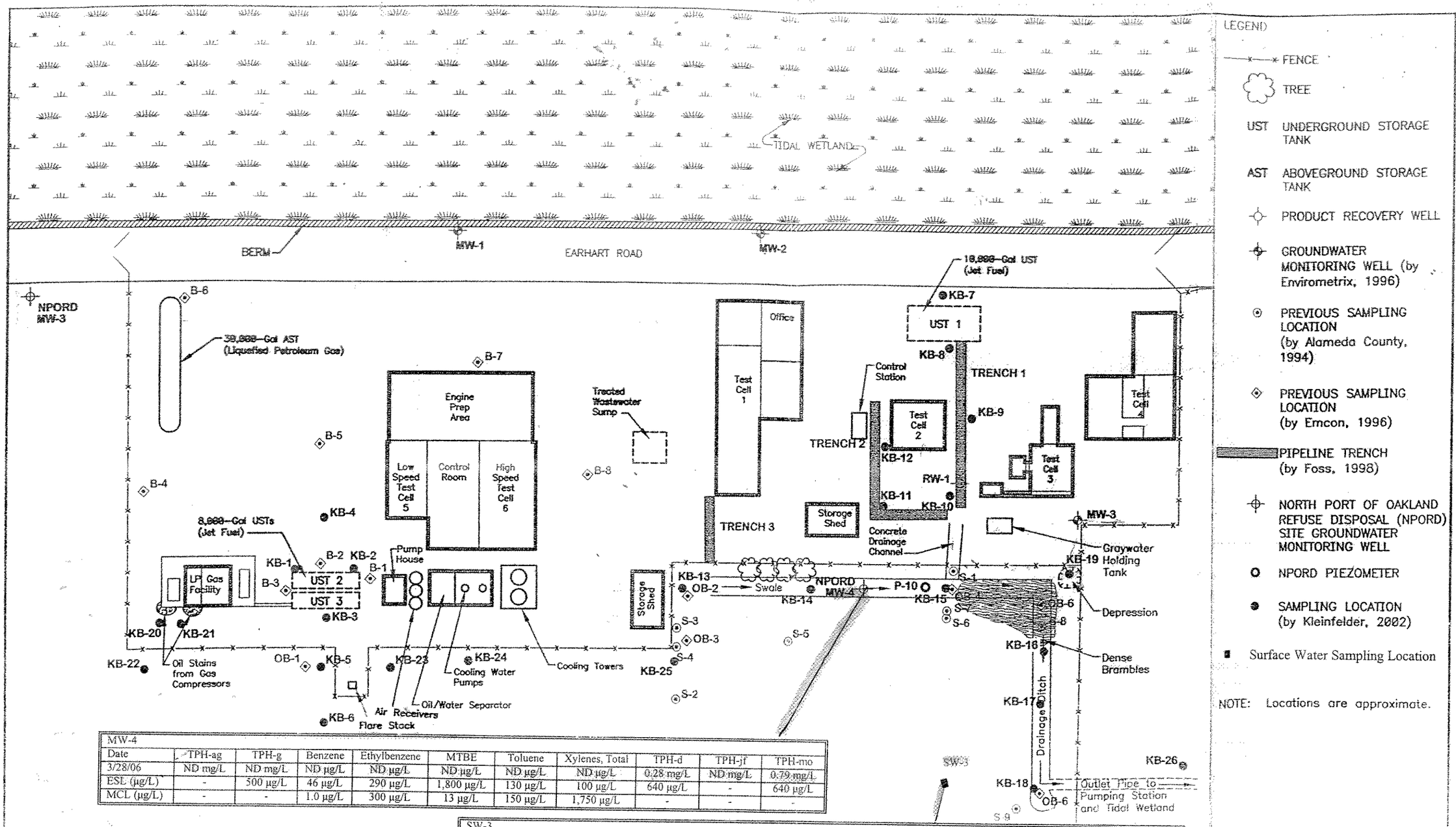
7.0 REFERENCES

Kleinfelder, Inc., August 23, 2002, "Report of Supplemental Site Investigation", Rolls-Royce Engine Services, Test Cell Facility, 6701 Earhart Road, Oakland, California 94621.

David D. Cooke, January 13, 2006, Allen Markins Leck Gamble & Mallory LLP, Attorney at Law, "Letter to Christine K. Noma, Esq., follow up letter on meeting on December 9, 2005 at Port of Oakland ("Port") Offices".

EMC, April 19, 1996, "Groundwater Investigation ", Test Cell Facility, 6701 Earhart Road, Oakland, California 94621.

Golder Associates Inc., June 27, 1990, "Final Report, Solid Waste Assessment" Test For Port of Oakland, Refuse Disposal Site.



MW-4										
Date	TPH-ag	TPH-g	Benzene	Ethylbenzene	MTBE	Toluene	Xylenes, Total	TPH-d	TPH-jf	TPH-mo
3/28/06	ND mg/L	ND mg/L	ND µg/L	ND µg/L	ND µg/L	ND µg/L	ND µg/L	0.28 mg/L	ND mg/L	0.79 mg/L
ESL (µg/L)	-	500 µg/L	46 µg/L	290 µg/L	1,800 µg/L	130 µg/L	100 µg/L	640 µg/L	-	640 µg/L
MCL (µg/L)	-	-	1.0 µg/L	300 µg/L	13 µg/L	150 µg/L	1,750 µg/L	-	-	-

SW-3										
Date	TPH-ag	TPH-g	Benzene	Ethylbenzene	MTBE	Toluene	Xylenes, Total	TPH-d	TPH-jf	TPH-mo
3/28/06	ND mg/L	ND mg/L	ND µg/L	ND µg/L	ND µg/L	ND µg/L	ND µg/L	0.67 mg/L	ND mg/L	0.81 mg/L
ESL (µg/L)	-	500 µg/L	46 µg/L	290 µg/L	1,800 µg/L	130 µg/L	100 µg/L	640 µg/L	-	640 µg/L
MCL (µg/L)	-	-	1.0 µg/L	300 µg/L	13 µg/L	150 µg/L	1,750 µg/L	-	-	-

TPH-ag = Total Petroleum Hydrocarbons as Aviation Gas
TPH-g = Total Petroleum Hydrocarbons as Gasoline
MTBE = Methyl tert-butyl ether
TPH-d = Total Petroleum Hydrocarbons as Diesel
TPH-jf = Total Petroleum Hydrocarbons as Jet Fuel
TPH-mo = Total Petroleum Hydrocarbons as Motor Oil

BASE MAP BY KLEINFELDER, INC.

LEGEND

- FENCE
- TREE
- UST UNDERGROUND STORAGE TANK
- AST ABOVEGROUND STORAGE TANK
- PRODUCT RECOVERY WELL
- GROUNDWATER MONITORING WELL (by Enviremetrix, 1996)
- PREVIOUS SAMPLING LOCATION (by Alameda County, 1994)
- PREVIOUS SAMPLING LOCATION (by Emcon, 1996)
- PIPELINE TRENCH (by Foss, 1998)
- NORTH PORT OF OAKLAND REFUSE DISPOSAL (NPORD) SITE GROUNDWATER MONITORING WELL
- NPORD PIEZOMETER
- SAMPLING LOCATION (by Kleinfelder, 2002)
- Surface Water Sampling Location

NOTE: Locations are approximate.

50 0 50
APPROXIMATE SCALE (feet)

Figure 5-1: Dissolved Petroleum Hydrocarbons Concentration In Groundwater And Surface Water Samples Rolls-Royce Test Cell Facility 6701 Old Earhart Road Oakland, CA 94621

ETIC Engineering, October 21, 2005, "Second Quarter 2005, Groundwater Monitoring Report", North Port of Oakland Refuse Disposal Site, Port of Oakland, 530 Water Street, Oakland, California 94607.

ETIC Engineering, December 30, 2005, "Third Quarter 2005, Groundwater Monitoring Report", North Port of Oakland Refuse Disposal Site, Port of Oakland, 530 Water Street, Oakland, California 94607.

ETIC Engineering, February 17, 2006, "Fourth Quarter 2005, Groundwater Monitoring Report", North Port of Oakland Refuse Disposal Site, Port of Oakland, 530 Water Street, Oakland, California 94607.

RWQCB, February 18, 2005, "Update to Environmental Screening Levels", Technical Document".

8.0 LIMITATIONS

ARCI warrants that its services are performed within the limits prescribed by its **CLIENTS**, with the usual thoroughness and competence of the engineering profession. No other warranty or representation, wither expressed or implied, is included in any of its work plans, reports, proposals or contracts.

ARCI will not be liable for damages or injury arising from damage to subterranean structures (pipes, tanks, telephones, cables and etc), which are not called to its attention and currently shown on the plans furnished to the company, in connection with the work that it performs.
ARCI is being engaged to render professional environmental consulting and construction related services involving hazardous materials. It will be compensated largely on the basis of time required in rendering these services not on the basis of potential legal liabilities created by risks associated with hazardous materials.

Several thousand chemicals, wastes and other materials have been designated as hazardous or toxic materials by several laws and regulations. If retained as in this case to perform quarterly groundwater monitoring and reporting with respect to such materials, ARCI will direct its efforts at locating the most significant sources, or potential sources, of such materials with potential from the most significant impact. For remediation, ARCI will continue a cleanup until the concentrations of contaminants of concern have reached levels that are acceptable to the local enforcement agency (LEA) in this case, ACDEH.

ARCI's liability to **CLIENT** for injury or damage to persons or property arising out of work performed for **CLIENT** and for which legal liability may be found to rest upon ARCI, other than for professional errors and omissions, will be limited to its general liability insurance coverage maximum limit.

For any damage on account of any error, omissions, or other professional and construction related negligence, ARCI's liability will be limited to a sum not to exceed its fees.

CLIENTS shall indemnify ARCI against any claims or costs, which exceed the limit on ARCI's liability provided in its insurance coverage, or results from acts of omissions of **CLIENTS**. This Work Plan for soil remediation and installation of additional groundwater monitoring wells was prepared in accordance with accepted professional standards and technical procedures as certified above.

FIELD PROTOCOLS FOR GROUNDWATER AND SURFACE WATER MONITORING

GROUNDWATER GAUGING

On March 28, 2006 monitoring well MW-4 was opened prior to gauging by first removing the steel well box and cover as well as the end cap with lock from the well and waiting for a minimum of thirty minutes after the well cover was opened before lowering the depth probe into the well. Depths to bottom, water and product of the well were immediately measured using a depth probe. The measurements were made from a permanent reference point at the top of MW-4 well casing. Normally if less than 1 foot of water is measured in a well, the water is bailed out, and if the well does not recover, the well is considered "dry". Had the well had any sheen or measurable liquid-phase hydrocarbons, it would not have been sampled.

Any free-floating product thickness prior to purging was measured and confirmed by observing a clear plastic bailer sample in the upper 1-foot of water from the well. No free-floating product was found in MW-4. A summary of the first quarter 2006 groundwater surface elevations is presented in Table 4-1a.

WELL PURGING

ETIC technician using Waterra pump purged monitoring well MW-4. Three (3) casing volumes of groundwater were purged from the well. Each casing volume of groundwater purged was collected in 5-gallon buckets and finally stored in 55-gallon open top DOT-17H was drum for proper disposal by Port of Oakland Waste Disposal Contractor. A total of approximately 24-gallons of purged contaminated groundwater were store in one 55-gallon open top DOT-17H waste drum.

SAMPLE COLLECTION PROCEDURES

Prior to sampling for chemical analysis, MW-4 was purged of three (3) casing volumes of groundwater using Waterra pump. The field parameters of Ph, temperature and electrical conductivity were measured after removal of each casing volume of groundwater. The groundwater samples for TPH-g/BTE&X/MTBE (VOCs) were collected in two (2) 40 mL clear glass vials using Waterra pump and preserved with HCl. The groundwater samples for TPH-d/TPH-jet-A-fuel/TPH-motor oil were also collected in two one (1) liter Amber bottles using Waterra pump.

SAMPLE COLLECTIONS

The groundwater samples from MW-4 for TPH-g/BTE&X/MTBE (VOCs) and diesel analyses were collected immediately after purging the last casing volume of water in two (2) 40 mL clear glass vials and two one (1) liter Amber bottles respectively using Waterra pump.

The groundwater samples for TPH-g/BTE&X/MTBE were preserved in HCl. The diesel samples were not preserved. All the sample containers were labeled with site name, project number, sample identification number, time and date sample is collected and type of analysis, recorded in a chain-of-custody (COC) record and wrapped in Ziploc bags. All the wrapped groundwater and grab water sample containers were kept in an ice chest at 4 ^{0}C and transported to Torrent Laboratory, Inc. in Milpitas, California under those conditions with the COC record.

SURFACE WATER SAMPLING

At surface water location SW-3, a clean plastic beaker was submerged into the water to collect adequate sample water for TPH-g/BTE&X/MTBE and TPH-d w/si-gel standard cleanup/TPH-jet-A-fuel/TPH-motor oil analyses. All the groundwater and grab water samples were collected in the appropriate clean and properly preserved sample containers.

EQUIPMENT DCONTAMINATION

After purging monitoring well MW-4 and sampling, the depth probe, bailer and rope, pH, and electrical conductivity and temperature meters that came into contact with the ground and surface water were decontaminated on-site using non-phosphate detergent and purified water. All the rinsate generated during the equpment decontamination was also stored in the same 55-gallon open top DOT-17H waste drum that was used to store the purged groundwater.

WASTE DISPOSAL

All the purged water and rinsate generated (24-gallons) during the purging and sampling activities were collected and stored in one 55-gallon open top DOT-17H waste drum for proper disposal by the Port's Hazardous Waste Disposal Contractor.

Applied Remediation Company

Environmental Services and Engineering

Telephone (408) 453-0188
Fax (408) 453-0757

Sampling Log Data Sheet

Site Location: NPORD MW-4

° Depth to Bottom: 13.24' ° Monitoring Well Number: MW-4

° Depth to Liquid: 1.34' ° Date: 3/28/06 Time: 9:18 A.M

° Thickness of Product: 0.00 ° Bailer Capacity: NA ° Casing Volume: 7.4 gallons

° Water Column 11.90'

° Well Diameter: 4.00" Number of Bails NA ° Total purged volume: 23.22 g

° Product Measurement Instrument: WATERRA PUMP. ° Multiplier gallons 0.65

Purging Data

° Time to start purging: 9:18 A.M Time to End Purging: 9:50 A.M

°Estimated Amount of Water to be purged: 23.22 **Gal. Gal.** (>10 Casing volumes)

° Sampling Procedures: Waterra pump

Field Parameters

Time	Case Volume (Gal.)	Temperature (°C)	pH	Turbidity	Conductivity (µS/cm)
9:18 A.M	8	16.0°C	6.8	Silty brown	781
9:37 A.M	8	15.6°C	6.8	Silty brown	704
9:33 A.M	8	15.2°C	6.8	clear	1,385

1376 N. 4th st #203 SJ, CA 95112

P.O. Box 612421, ~~1450 Koll Circle, Ste. 102A~~, San Jose CA 95161-2421

Applied Remediation Company

Environmental Services and Engineering

Telephone (408) 453-0188
Fax (408) 453-0757

Sampling Log Data Sheet

Site Location: NPORD SW-3

° Depth to Bottom: NA

° ~~Monitoring Well Number~~ Sampling Loc. SW-3

° Depth to Liquid: NA

° Date: 3/28/06 Time: 10:16 A.M

° Thickness of Product: NA

° Bailer Capacity: NA

° Well Diameter: NA

Number of Bails NA

° Product Measurement Instrument: Beaker/Cup

Purging Data

° Time to start purging: NA

Time to End Purging: NA

°Estimated Amount of Water to be purged: NA **Gal. Gal.** (>10 Casing volumes)

° Sampling Procedures: Beaker/Cup

° Slight sheen on surface water.

Field Parameters

Time	Case Volume (Gal.)	Temperature (^{0}C)	pH	Turbidity	Conductivity (µS/cm)

1376 N. 4th ST; ste 203, SJ, CA 95112

P.O. Box 612421, ~~1450 Koll Circle, Ste. 102A~~, San Jose, CA 95161-2421

TORRENT LABORATORY, INC.

483 Sinclair Frontage Rd. • Milpitas, CA 95035 • Ph: (408) 263-5258 • Fax: (408) 263-8293

www.torrentlab.com

April 11, 2006

Briggs Ogamba
Applied Remediation Company
1376 N. 4th. ST. STE.#203
SAN JOSE, CA 95112

TEL: (408) 453-0188
FAX (408) 453-0757

RE:

Order No.: 0603136

Dear Briggs Ogamba:

Torrent Laboratory, Inc. received 4 samples on 3/28/2006 for the analyses presented in the following report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc, is certified by the State of California, ELAP #1991. If you have any questions regarding these tests results, please feel free to contact the Project Management Team at (408)263-5258;ext: 204.

Sincerely,

Laboratory Director 4/11/06 Date

TORRENT LABORATORY, INC.

483 Sinclair Frontage Rd. • Milpitas, CA 95035 • Ph: (408) 263-5258 • Fax: (408) 263-8293

www.torrentlab.com

Torrent Laboratory, Inc. **Date:** *11-Apr-06*

CLIENT: Applied Remediation Company
Project:
Lab Order: 0603136

CASE NARRATIVE

Analytical Comments for METHOD TPHDOKJ_W, SAMPLE 0603136-002A: Note: x-Sample chromatogram does not resemble typical diesel or oil pattern. Hydrocarbons within the diesel range quantitated as diesel; hydrocarbons within the oil range quantitated as oil.

Analytical Comments for METHOD TPHDOKJ_W, SAMPLE 0603136-004A: Note: x- Sample chromatogram does not resemble typical diesel or oil pattern. Diesel result mainly a discrete unknown peak within the diesel range. Hydrocarbons within the diesel range quantitated as diesel; hydrocarbons within the oil range quantitated as oil.

TORRENT LABORATORY, INC.

483 Sinclair Frontage Road • Milpitas, CA • Phone: (408) 263-5258 • Fax: (408) 263-8293

Visit us at www.torrentlab.com email: analysis@torrentlab.com

Report prepared for: Briggs Ogamba
Applied Remediation Company

Date Received: 3/28/2006
Date Reported: 4/11/2006

Client Sample ID: MW-4
Sample Location: NORTHPORT OF OAKLAND
Sample Matrix: WATER
Date/Time Sampled 3/28/2006 9:50:00 AM

Lab Sample ID: 0603136-001
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
TPH (Aviation Gas)	SW8015B	3/29/2006	0.05	1	0.0500	ND	mg/L	R9029
TPH (Gasoline)	SW8015B	3/29/2006	0.05	1	0.0500	ND	mg/L	R9029
Surr: Trifluorotoluene	SW8015B	3/29/2006	0	1	65-135	75.1	%REC	R9029
Benzene	SW8260B	3/29/2006	1	1	1.0	ND	µg/L	R9028
Ethylbenzene	SW8260B	3/29/2006	1	1	1.0	ND	µg/L	R9028
Methyl tert-butyl ether (MTBE)	SW8260B	3/29/2006	3	1	3.0	ND	µg/L	R9028
Toluene	SW8260B	3/29/2006	1	1	1.0	ND	µg/L	R9028
Xylenes, Total	SW8260B	3/29/2006	2	1	2.0	ND	µg/L	R9028
Surr: 4-Bromofluorobenzene	SW8260B	3/29/2006	0	1	64.1-125	85.1	%REC	R9028
Surr: Dibromofluoromethane	SW8260B	3/29/2006	0	1	61.2-131	105	%REC	R9028
Surr: Toluene-d8	SW8260B	3/29/2006	0	1	75.1-127	98.3	%REC	R9028

Client Sample ID: MW-4
Sample Location: NORTHPORT OF OAKLAND
Sample Matrix: WATER
Date/Time Sampled 3/28/2006 9:55:00 AM

Lab Sample ID: 0603136-002
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
TPH (Diesel)	SW8015B	3/29/2006	0.1	1	0.100	0.28 x	mg/L	R9036
TPH (Jet Fuel)	SW8015B	3/29/2006	0	1	0	ND	mg/L	R9036
TPH (Oil)	SW8015B	3/29/2006	0.2	1	0.200	0.79 x	mg/L	R9036
Surr: Pentacosane	SW8015B	3/29/2006	0	1	53.3-124	102	%REC	R9036

Note: x-Sample chromatogram does not resemble typical diesel or oil pattern. Hydrocarbons within the diesel range quantitated as diesel; hydrocarbons within the oil range quantitated as oil.

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

CLIENT: Applied Remediation Company
Work Order: 0603136
Project:

ANALYTICAL QC SUMMARY REPORT

BatchID: R9029

Sample ID: **MB**	SampType: **MBLK**	TestCode: **TPHGAS_W**	Units: **mg/L**	Prep Date:	RunNo: **9029**
Client ID: **ZZZZZ**	Batch ID: **R9029**	TestNo: **SW8015B**		Analysis Date: **3/29/2006**	SeqNo: **134728**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH (Gasoline)	ND	0.0500									
Surr: Trifluorotoluene	0.1037	0	0.119	0	87.1	65	135				

Sample ID: **LCS**	SampType: **LCS**	TestCode: **TPHGAS_W**	Units: **mg/L**	Prep Date:	RunNo: **9029**
Client ID: **ZZZZZ**	Batch ID: **R9029**	TestNo: **SW8015B**		Analysis Date: **3/29/2006**	SeqNo: **134729**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH (Gasoline)	0.2092	0.0500	0.2381	0.0105	83.5	65	135				
Surr: Trifluorotoluene	0.09690	0	0.119	0	81.4	65	135				

Sample ID: **LCSD**	SampType: **LCSD**	TestCode: **TPHGAS_W**	Units: **mg/L**	Prep Date:	RunNo: **9029**
Client ID: **ZZZZZ**	Batch ID: **R9029**	TestNo: **SW8015B**		Analysis Date: **3/29/2006**	SeqNo: **134730**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH (Gasoline)	0.2157	0.0500	0.2381	0.0105	86.2	65	135	0.2092	3.06	20	
Surr: Trifluorotoluene	0.1095	0	0.119	0	92.0	65	135	0	0	20	

C-5

Qualifiers:

- E Value above quantitation range
- ND Not Detected at the Reporting Limit
- H Holding times for preparation or analysis exceeded
- R RPD outside accepted recovery limits
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits

CLIENT: Applied Remediation Company
Work Order: 0603136
Project:

ANALYTICAL QC SUMMARY REPORT

BatchID: R9036

Sample ID: **MBLK**	SampType: **MBLK**	TestCode: **TPHDOKJ_W**	Units: **mg/L**	Prep Date: **3/29/2006**	RunNo: **9036**
Client ID: **ZZZZZ**	Batch ID: **R9036**	TestNo: **SW8015B**		Analysis Date: **3/29/2006**	SeqNo: **135670**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH (Diesel)	ND	0.100									
TPH (Jet Fuel)	ND	0									
TPH (Oil)	ND	0.200									
Surr: Pentacosane	0.09800	0	0.1	0	98.0	53.3	124				

Sample ID: **LCS**	SampType: **LCS**	TestCode: **TPHDOKJ_W**	Units: **mg/L**	Prep Date: **3/29/2006**	RunNo: **9036**
Client ID: **ZZZZZ**	Batch ID: **R9036**	TestNo: **SW8015B**		Analysis Date: **3/29/2006**	SeqNo: **135668**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH (Diesel)	0.9160	0.100	1	0	91.6	40	120				
Surr: Pentacosane	0.09500	0	0.1	0	95.0	53.3	124				

Sample ID: **LCSD**	SampType: **LCSD**	TestCode: **TPHDOKJ_W**	Units: **mg/L**	Prep Date: **3/29/2006**	RunNo: **9036**
Client ID: **ZZZZZ**	Batch ID: **R9036**	TestNo: **SW8015B**		Analysis Date: **3/29/2006**	SeqNo: **135669**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH (Diesel)	1.006	0.100	1	0	101	40	120	0.916	9.37	30	
Surr: Pentacosane	0.1040	0	0.1	0	104	53.3	124	0	0	0	

C-6

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

Torrent Laboratory, Inc.

Date: *11-Apr-06*

CLIENT: Applied Remediation Company
Work Order: 0603136
Project:

ANALYTICAL QC SUMMARY REPORT

BatchID: R9028

Sample ID: **MB**	SampType: **MBLK**	TestCode: **8260B_W**	Units: **µg/L**	Prep Date: **3/29/2006**	RunNo: **9028**
Client ID: **ZZZZZ**	Batch ID: **R9028**	TestNo: **SW8260B**		Analysis Date: **3/29/2006**	SeqNo: **134723**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	1.00									
Ethylbenzene	ND	1.00									
Methyl tert-butyl ether (MTBE)	ND	3.00									
Toluene	ND	1.00									
Xylenes, Total	ND	2.00									
Surr: Dibromofluoromethane	12.36	0	11.9	0	104	61.2	131				
Surr: 4-Bromofluorobenzene	10.71	0	11.9	0	90.0	64.1	125				
Surr: Toluene-d8	11.25	0	11.9	0	94.5	75.1	127				

Sample ID: **LCS**	SampType: **LCS**	TestCode: **8260B_W**	Units: **µg/L**	Prep Date: **3/29/2006**	RunNo: **9028**
Client ID: **ZZZZZ**	Batch ID: **R9028**	TestNo: **SW8260B**		Analysis Date: **3/29/2006**	SeqNo: **134724**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	16.61	1.00	17.86	0	93.0	66.9	140				
Toluene	18.05	1.00	17.86	0	101	76.6	123				
Surr: Dibromofluoromethane	13.36	0	11.9	0	112	61.2	131				
Surr: 4-Bromofluorobenzene	9.630	0	11.9	0	80.9	64.1	125				
Surr: Toluene-d8	11.87	0	11.9	0	99.7	75.1	127				

Sample ID: **LCSD**	SampType: **LCSD**	TestCode: **8260B_W**	Units: **µg/L**	Prep Date: **3/29/2006**	RunNo: **9028**
Client ID: **ZZZZZ**	Batch ID: **R9028**	TestNo: **SW8260B**		Analysis Date: **3/29/2006**	SeqNo: **134725**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	16.15	1.00	17.86	0	90.4	66.9	140	16.61	2.81	20	
Toluene	19.58	1.00	17.86	0	110	76.6	123	18.05	8.13	20	
Surr: Dibromofluoromethane	12.31	0	11.9	0	103	61.2	131	0	0	0	
Surr: 4-Bromofluorobenzene	10.14	0	11.9	0	85.2	64.1	125	0	0	0	
Surr: Toluene-d8	12.71	0	11.9	0	107	75.1	127	0	0	0	

Qualifiers:
E Value above quantitation range
ND Not Detected at the Reporting Limit
H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits
J Analyte detected below quantitation limits
S Spike Recovery outside accepted recovery limits

Report prepared for: Briggs Ogamba
Applied Remediation Company

Date Received: 3/28/2006
Date Reported: 4/11/2006

Client Sample ID: SW-3
Sample Location: NORTHPORT OF OAKLAND
Sample Matrix: WATER
Date/Time Sampled 3/28/2006 10:17:00 AM

Lab Sample ID: 0603136-003
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
TPH (Aviation Gas)	SW8015B	3/29/2006	0.05	1	0.0500	ND	mg/L	R9029
TPH (Gasoline)	SW8015B	3/29/2006	0.05	1	0.0500	ND	mg/L	R9029
Surr: Trifluorotoluene	SW8015B	3/29/2006	0	1	65-135	98.1	%REC	R9029
Benzene	SW8260B	3/29/2006	1	1	1.0	ND	µg/L	R9028
Ethylbenzene	SW8260B	3/29/2006	1	1	1.0	ND	µg/L	R9028
Methyl tert-butyl ether (MTBE)	SW8260B	3/29/2006	3	1	3.0	ND	µg/L	R9028
Toluene	SW8260B	3/29/2006	1	1	1.0	ND	µg/L	R9028
Xylenes, Total	SW8260B	3/29/2006	2	1	2.0	ND	µg/L	R9028
Surr: 4-Bromofluorobenzene	SW8260B	3/29/2006	0	1	64.1-125	83.0	%REC	R9028
Surr: Dibromofluoromethane	SW8260B	3/29/2006	0	1	61.2-131	110	%REC	R9028
Surr: Toluene-d8	SW8260B	3/29/2006	0	1	75.1-127	101	%REC	R9028

Client Sample ID: SW-3
Sample Location: NORTHPORT OF OAKLAND
Sample Matrix: WATER
Date/Time Sampled 3/28/2006 10:22:00 AM

Lab Sample ID: 0603136-004
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
TPH (Diesel)	SW8015B	3/29/2006	0.1	1	0.100	0.67 x	mg/L	R9036
TPH (Jet Fuel)	SW8015B	3/29/2006	0	1	0	ND	mg/L	R9036
TPH (Oil)	SW8015B	3/29/2006	0.2	1	0.200	0.81 x	mg/L	R9036
Surr: Pentacosane	SW8015B	3/29/2006	0	1	53.3-124	80.0	%REC	R9036

Note:x- Sample chromatogram does not resemble typical diesel or oil pattern. Diesel result mainly a discrete unknown peak within the diesel range. Hydrocarbons within the diesel range quantitated as diesel; hydrocarbons within the oil range quantitated as oil.

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Definitions, legends and Notes

Note	Description
ug/kg	Microgram per kilogram (ppb, part per billion).
ug/L	Microgram per liter (ppb, part per billion).
mg/kg	Milligram per kilogram (ppm, part per million).
mg/L	Milligram per liter (ppm, part per million).
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate.
MDL	Method detection limit.
MRL	Modified reporting limit. When sample is subject to dilution, reporting limit times dilution factor yields MRL.
MS/MSD	Matrix spike/matrix spike duplicate.
N/A	Not applicable.
ND	Not detected at or above detection limit.
NR	Not reported.
QC	Quality Control.
RL	Reporting limit.
% RPD	Percent relative difference.
a	pH was measured immediately upon the receipt of the sample, but it was still done outside the holding time.
sub	Analyzed by subcontracting laboratory, Lab Certificate #

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

TORRENT LABORATORY, INC.
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CHAIN OF CUSTODY

LAB WORK ORDER NO: 0603136

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

Company Name: Rolls-Royce Engine Services Oakland Inc
Address: 6701 Old Earhart Road
City: Oakland State: CA Zip Code: 94621
Telephone: FAX:
REPORT TO: Applied Remediation Services Inc. SAMPLER: Briggs Obanna

Location of Sampling: North Part of Oakland Refuse Disposal
Purpose: Quarterly Groundwater Sampling
Special Instructions / Comments:
P.O. #: EMAIL: appliedrsco@aol.com

TURNAROUND TIME: [x] 10 Working Days [ ] 3 Working Days [ ] 2 - 8 Hours [ ] 7 Working Days [ ] 2 Working Days [ ] Other [ ] 5 Working Days [ ] 24 Hours

SAMPLE TYPE: [ ] Storm Water [ ] Other [ ] Waste Water [ ] Ground Water [ ] Soil

REPORT FORMAT: [ ] QC Level II [ ] EDF [ ] Excel / EDD

ANALYSIS REQUESTED

	CLIENT'S SAMPLE I.D.	DATE/TIME SAMPLED	SAMPLE TYPE	# OF CONT	CONT TYPE	TPH-g/BTEX	MTBE	TPH-d	TPH-jet fuel	TPH-motor oil				TORRENT'S SAMPLE I.D.
1.	MW-4	3/28/06 9:50 AM	Water	2	Vials	X	X							001A
2.	MW-4	3/28/06 9:55 AM	Water	2	Bottles			X	X	X				002A
3.	SW-3	3/28/06 10:17 AM	Water	2	Vials	X	X							003A
4.	SW-3	3/28/06 10:22 AM	Water	2	Bottles			X	X	X				004A
5.														
6.														
7.														
8.														
9.														
10.														

	Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:
1	[signature]	Briggs Obanna	3/28/06	12:22 PM	[signature]		3/28/06	2pm
2								

Were Samples Received in Good Condition? [x] Yes [ ] NO Samples on Ice? [ ] Yes [ ] NO Method of Shipment ______ Sample seals intact? [ ] Yes [ ] NO

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made. Page ___ of 1

Log In By: ______ Date: ______ Log In Reviewed By: ______ Date: 3/28/06

CLIENT