ENSR
Consulting • Engineering • Remediation

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http://www.ensr.com

October 18, 2000
Project: 6908-112.310

#1049

Will need to do a receptor survey prior to closure.

Mr. Barney Chan
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California, 94502

Subject: **Second Quarter 2000 Groundwater Monitoring Report**
Oakland International Airport
United Airlines Building M-110
1100 Airport Drive, Oakland, California
StID # 1049

Dear Mr. Chan:

ENSR Corporation (ENSR), on behalf of United Airlines, is pleased to provide this report documenting the results of quarterly groundwater monitoring conducted at the Oakland International Airport, United Airlines Building M-110 (site), 1100 Airport Drive, Oakland, California **(Figure 1 – Site Location Map)** on June 15, 2000. The monitoring event included the collection of depth to groundwater measurements and groundwater samples from monitoring wells MW-1, MW-2, and MW-3 **(Figure 2 – Site Map).**

## BACKGROUND

On January 15, 1999, one 10,000-gallon diesel fuel underground storage tank (UST) and one 10,000-gallon unleaded gasoline UST were removed from the Site, along with a dispenser island and associated piping. Approximately 758 cubic-yards of soil were removed and properly disposed of during over-excavation activities. The results of the UST removal activities are documented in ENSR's report titled, "*Underground Storage Tanks Closure Report*", dated March 1999.

On July 21, 1999, three 4-inch-diameter groundwater monitoring wells (MW-1, MW-2, and MW-3) were completed to a depth of approximately 25 feet below ground surface (bgs), and developed per the guidelines stipulated by the California Code of Regulations, Title 23, Subchapter 16, Article 4, Sections 2647 and 2648. The results of the well installations documented in ENSR's report titled, "*Results Report: Installation of Groundwater Monitoring Wells*", dated September 1999.

## SITE DESCRIPTION

The San Francisco Bay Area lies within the Coast Ranges geomorphic province, which is characterized by a series of nearly parallel mountain ranges that trend obliquely to the coast in a northwesterly direction. Generally, the bedrock underlying San Francisco Bay is composed of sandstone, siltstone, chert and greenstone of the Franciscan Formation. Sediments within the

Bay consist of "older bay mud", overlain by either a sand unit or "younger bay mud". Younger Bay Mud consists of a soft, uniform, gray, silty clay containing silt, minor fine sand and fragments of shells (Geology of San Francisco Bay, California Division of Mines and Geology).

The subject area is located on the northwest side of United Airlines Building M-110, which is used for airplane maintenance. The surrounding surface area is a graded, relatively flat area paved with asphalt concrete. The site exists at an approximate elevation of five feet above mean sea level. The nearest body of water is the San Francisco Bay located approximately 0.5 miles south of the Site (U.S.G.S. San Leandro Quadrangle, Photo-revised 1980).

Soils encountered during well installation consisted of sand (SP) to depths of approximately 13-feet bgs, clay (CL) to depths of 13 to 18 feet bgs; and clayey sand (SC) to depths of 25 feet bgs. A copy of the well logs is presented in **Appendix A.**

## GROUNDWATER MONITORING

### Groundwater Levels

On June 15, 2000, depth to groundwater measurements were collected from monitoring wells MW-1, MW-2, and MW-3 prior to purging and sampling. The measurements were recorded to the nearest 0.01-foot from the referenced (top-of-casing) elevations.

The inferred groundwater flow direction was toward the east at a hydraulic gradient of approximately 0.003 ft/ft. **Figure 3** is a potentiometric surface map generated from the groundwater data collected.

The groundwater monitoring wells were surveyed by Tronoff Associates of Emeryville, California, a California licensed land surveyor. A copy of the well survey is presented in **Appendix A**, and groundwater level data is summarized in **Table 1.**

### Sampling Activities

On June 15, 2000 groundwater samples were collected from monitoring wells MW-1, MW-2, and MW-3. Prior to sampling, each monitoring well was purged of approximately two to three well casing volumes using a submersible pump. Physical properties, including temperature, pH, and conductivity, were monitored during purging activities. The groundwater samples were collected after these parameters showed relative stability (e.g., less than 10% change), and the water level in each well recharged 80% of the depth measured prior to purging.

Generated purge water and wash water was containerized onsite in 55-gallon drums. A total of three drums of water were generated. Based on analytical groundwater results, the water in these drums will be disposed of at an appropriate facility.

Groundwater samples were collected using a new disposable bailer for each well. The groundwater samples were transferred to the appropriate sample containers and stored in a cooler containing ice for preservation. The samples were delivered under chain-of-custody to McCampbell Analytical, Inc. of Pacheco, California, a California certified laboratory. Field documentation forms and ENSR's standard operating procedures (SOPs) are presented in **Appendix B.**

Groundwater samples were submitted for the following chemical analysis:

- Total Petroleum Hydrocarbons as diesel (TPH-d) fuel by DHS Luft;
- Total Petroleum Hydrocarbons as gasoline (TPH-g) by DHS Luft;
- Benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA Method 8020; and
- Oxygenates including Methyl tert-butyl ether (MTBE), Di-isopropyl Ether (DIPE), Ethyl tert-Butyl Ether (ETBE), tert-Amyl Methyl Ether (TAME), and tert-butanol by EPA Method 8260.

One groundwater sample (from MW-1) was also submitted for the following water quality analysis:

- General Mineral by EPA 6000/7000 Series Method; and
- Total Dissolved Solids (TDS) by EPA Method 160.1.

**Laboratory Results**

The chemical analytical results of groundwater samples collected from monitoring wells MW-1, MW-2, and MW-3 are summarized in **Table 2.** Copies of the laboratory data sheets are included in **Appendix C.**

The following is a summary of the analytical results:

- TPH-d was detected in groundwater samples MW-2 at 73 micrograms per Liter (µg/L) and MW-3 at 78 µg/L;
- Benzene was detected in groundwater sample MW-2 at 0.57 µg/L; and
- MTBE was detected in groundwater samples MW-2 at 17 µg/L, and MW-3 at 280 µg/L.

Water quality analyses were performed on a groundwater sample collected from monitoring well MW-1. The results are summarized in **Table 3** and the laboratory data sheets are presented in **Attachment 3**. The analytical results indicated the following:

- TDS for groundwater sample MW-1 was 5,300 milligrams per Liter (mg/L);
- Total Hardness/CaCO3 for groundwater sample MW-1 was 714 mg/L;
- Total Alkalinity for groundwater sample MW-1 was 750 mg/L; and
- Sodium for groundwater sample MW-1 was 1,700 mg/L.

**CONCLUSIONS/RECOMMENDATIONS**

Based on the change in groundwater flow direction in this and previous monitoring events, it appears that the groundwater flow direction is being influenced by tidal fluctuations.

Groundwater samples collected from monitoring well MW-1 have not indicated the presence of any petroleum hydrocarbon constituents of concern in any of the sampling events.

Groundwater samples collected from monitoring well MW-2 indicated a slight increase in concentrations of TPH-d and benzene from the previous sampling event. Concentrations of MTBE declined significantly from the previous sampling event.

Groundwater samples collected from monitoring well MW-3, have not indicated the presence of TPH-g in any of the sampling events, and did not detect the presence of benzene for this sampling event. Concentrations of TPH-d declined from the previous sampling event, and concentrations of MTBE increased.

This site appears to be excluded from the California State Water Board "Sources of Drinking Water" policy, based on the relatively high levels of total dissolved solids (greater than 3,000 mg/L). This sampling event represents the third of four quarterly groundwater monitoring events (one year) required by the Alameda County Department of Environmental Health.

If you have any questions or comments regarding this report, please call Mr. Alan Klein at (916) 362-7100.

Sincerely,

**ENSR**

Alan J. Klein, R.E.A.
Senior Environmental Scientist

Peter G. Minkel, R.G.
Project Geologist

AJK:PGM:em

Attachments:

cc: Mr. Dennis Moulton, United Air Lines, Inc.
Mr. Steve Sulgit, United Air Lines, Inc.
Mr. Ted Wells, United Air Lines, Inc.
Mr. Dan Klettke, Port of Oakland Environmental Compliance
Mr. Brian Finnell, ENSR – Acton, MA.

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## TABLES



## FIGURES



## APPENDICES

**TABLE 1**
**GROUNDWATER LEVEL DATA**
**Oakland International Airport**
**United Airlines Building M-110**

| Well | Date | Reference Level (feet) | Depth to Groundwater (feet) | Groundwater Elevation (feet) |
|---|---|---|---|---|
| MW-1 | 7/28/99 | 10.91 | 6.12 | 4.79 |
| | 12/27/99 | | 6.37 | 4.54 |
| | 3/14/00 | | 5.48 | 5.43 |
| | 06/15/00 | | 5.85 | 5.06 |
| MW-2 | 7/28/99 | 12.30 | 7.47 | 4.83 |
| | 12/27/99 | | 7.83 | 4.47 |
| | 3/14/00 | | 7.05 | 5.25 |
| | 06/15/00 | | 7.26 | 5.04 |
| MW-3 | 7/28/99 | 12.51 | 7.67 | 4.84 |
| | 12/27/99 | | 8.05 | 4.46 |
| | 3/14/00 | | 7.30 | 5.21 |
| | 06/15/00 | | 7.59 | 4.92 |

**TABLE 2**

**ANALYTICAL RESULTS – GROUNDWATER**

**Oakland International Airport**

**United Airlines Building M-110**

| Sample ID | Date Collected | Total Petroleum Hydrocarbons | | MTBE | Volatile Organic Compounds | | | |
|---|---|---|---|---|---|---|---|---|
| | | Diesel (µg/L) | Gasoline (µg/L) | (µg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethylbenzene (µg/L) | Xylenes (µg/L) |
| MW-1 | 7/28/99 | ND | ND | ND | ND | ND | ND | ND |
| | 12/27/99 | ND | ND | ND | ND | ND | ND | ND |
| | 3/14/00 | ND | ND | ND | ND | ND | ND | ND |
| | 6/15/00 | ND | ND | ND | ND | ND | ND | ND |
| MW-2 | 7/28/99 | 160 | ND | 190 | ND | ND | ND | ND |
| | 12/27/99 | 180 | 110 | 110 | 43 | ND | ND | ND |
| | 3/14/00 | 63 | ND | 350 | ND | ND | ND | ND |
| | 6/15/00 | 73 | ND | 17 | 0.57 | ND | ND | ND |
| MW-3 | 7/28/99 | ND | ND | 270 | ND | ND | ND | ND |
| | 12/27/99 | 90 | ND | 270 | ND | ND | 0.54 | ND |
| | 3/14/00 | 120 | ND | 72 | 7.1 | ND | ND | ND |
| | 6/15/00 | 78 | ND | (8260) 280 | ND | ND | ND | ND |
| Reporting Limit | | 50 | 50 | 1.0 | 0.5 | 0.5 | 0.5 | 0.5 |

Notes:

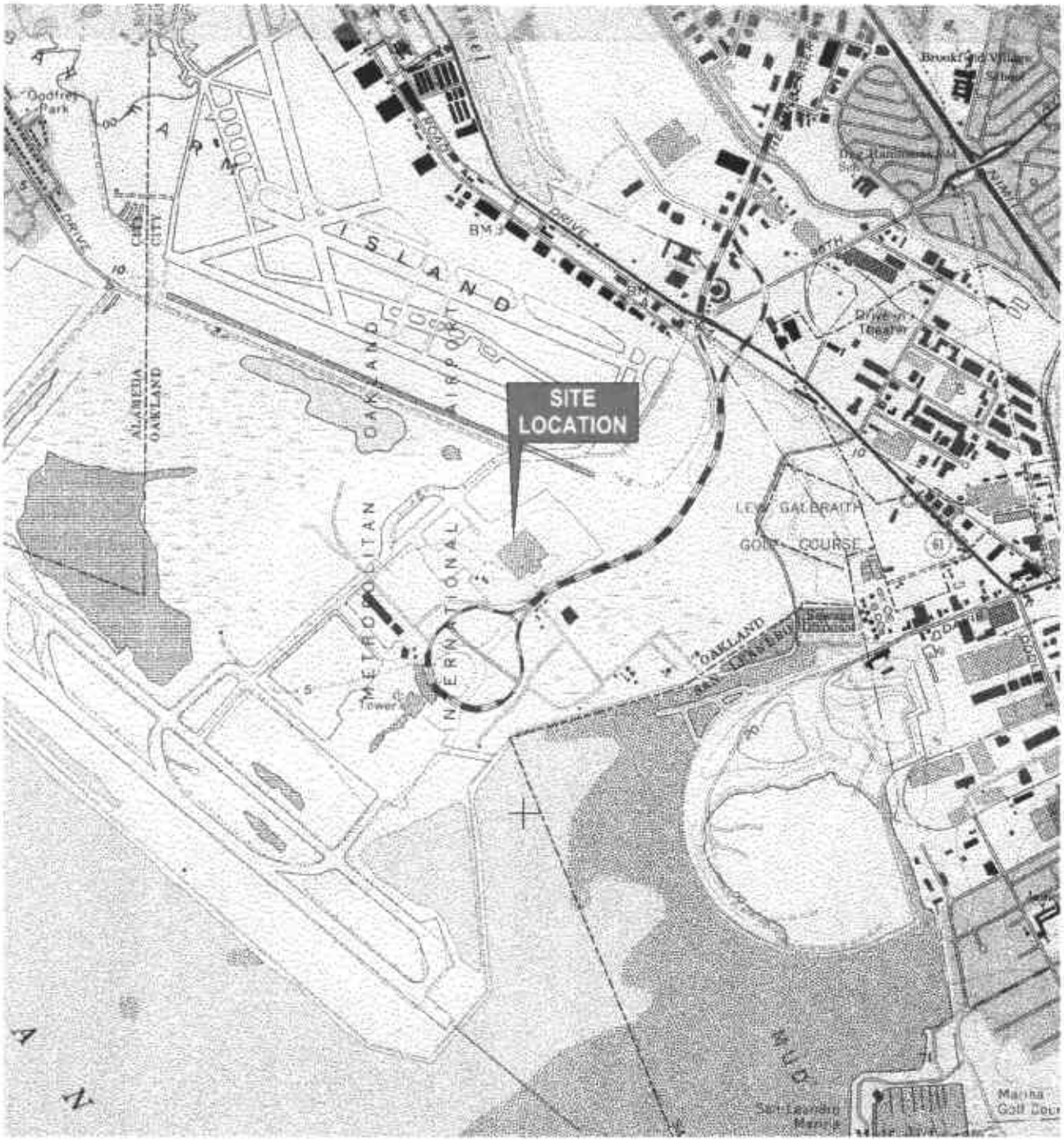
MTBE Methyl tert-Butyl Ether by EPA 8260
ND Not detected above laboratory reporting limits
µg/L micrograms per Liter

# TABLE 3
## ANALYTICAL RESULTS - GROUNDWATER QUALITY
## Oakland International Airport
## United Airlines Building M-110

| Sample ID | Date Collected | Total Dissolved Solids (mg/L) | Total Hardness/ CaCO3 (mg/L) | Total Alkalinity (mg/L) | Bicarbonate (mg/L) | Magnesium (mg/L) | Sodium (mg/L) | Potassium (mg/L) | Calcium (mg/L) | Manganese (mg/L) | Iron (mg/L) | Copper (mg/L) | Zinc (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 7/28/99 | 6,600 | NA | NA | NA | 210 | 2,300 | 81 | 180 | 2.4 | 55 | 0.066 | 103 |
| | 12/27/99 | 6,130 | 935 | 800 | 800 | 140 | 1,780 | 52 | 144 | 1.75 | 9.3 | < 0.05 | < 0.05 |
| | 3/14/00 | 6,350 | 775 | 700 | 684 | 140 | 1,780 | 65 | 80 | 0.09 | < 0.1 | < 0.05 | < 0.05 |
| | 6/15/00 | 5,300 | 714 | 750 | 750 | 109 | 1,700 | 61 | 107 | 1.5 | 1.2 | <0.05 | <0.05 |
| Reporting Limit | --- | 10 | 1 | 10 | 10 | 1.0 | 1.0 | 1.0 | 1.0 | 0.01 | 0.1 | 0.05 | 0.05 |

Notes:

mg/L milligrams per Liter
NA Not analyzed




USGS 7.5 MINUTE
SAN LEANDRO, CA QUADRANGLE
1959, PHOTOREVISED 1980

NORTH

0 1000 2000

FEET

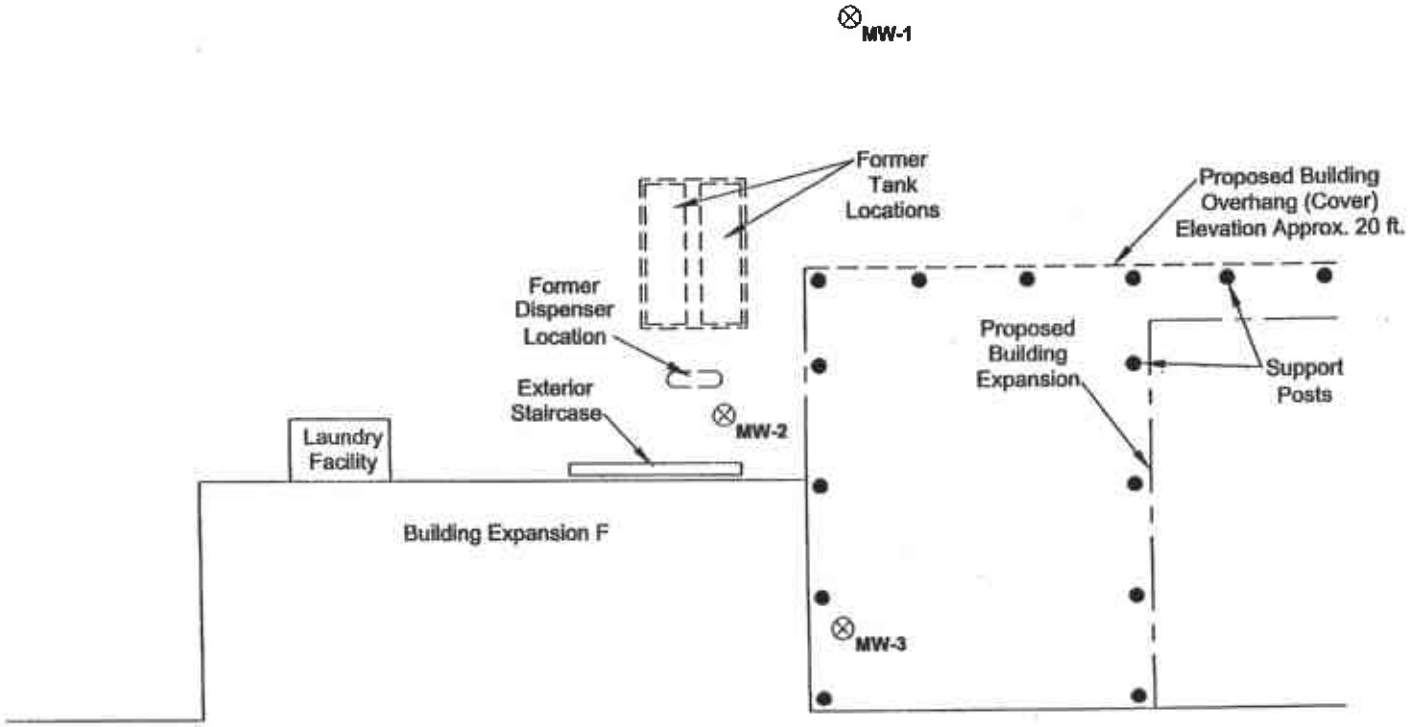
ENSR.

FIGURE 1

**SITE LOCATION MAP**

United Airlines
Oakland International Airport
Oakland, CA

| DRAWN: J. Glerek | DATE: 9/22/98 | PROJECT NO: 6908-112-310 | REV. |
|---|---|---|---|
| FILE: | | | |




LEGEND

⊗ MW-1 Monitoring Well

NORTH

0 20 40

APPROX. SCALE IN FEET

ENSR.

FIGURE 2

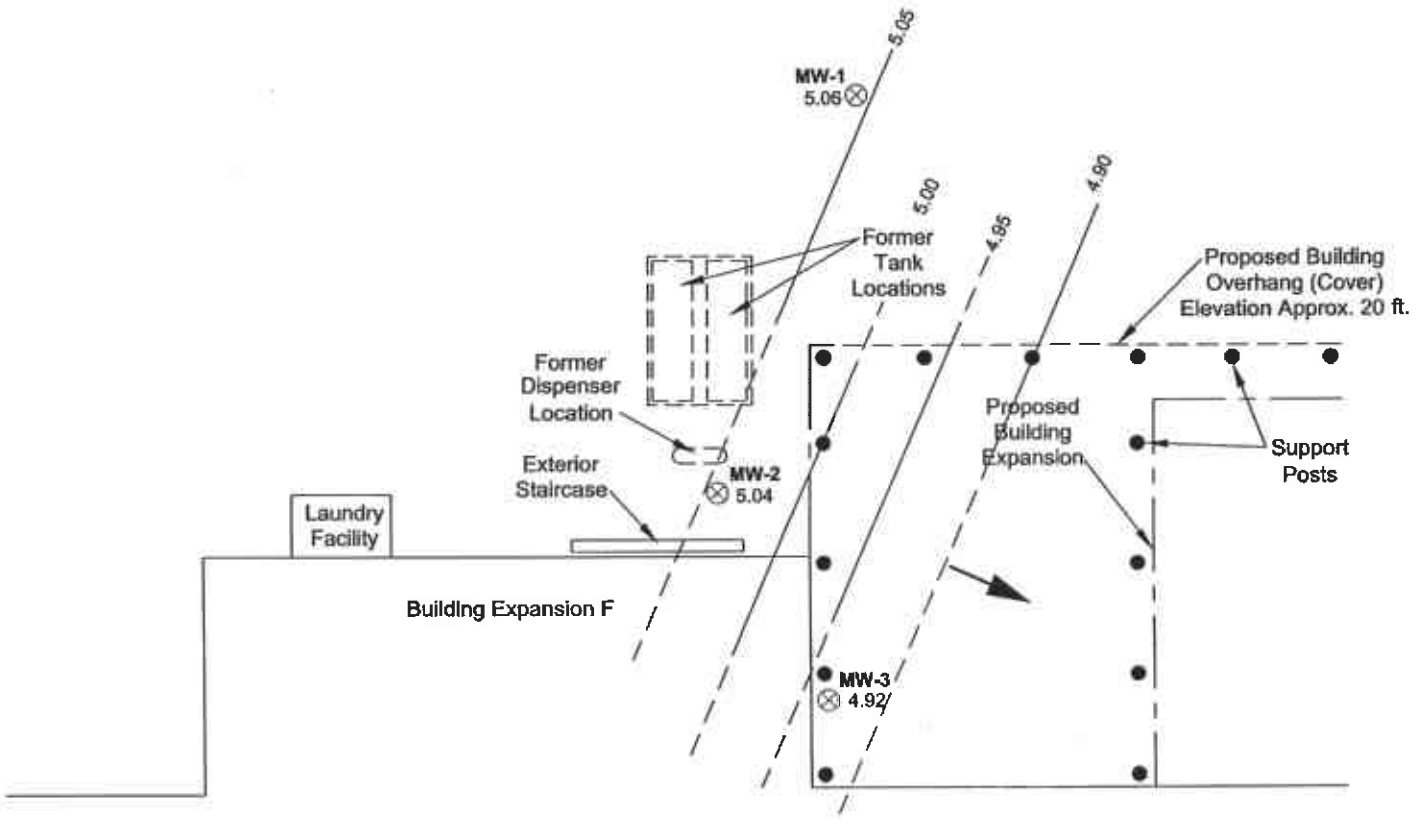
SITE MAP

United Airlines

Oakland International Airport

Oakland, CA

| DRAWN: J. Gierek | DATE: 1/25/00 | PROJECT NO: 6908-050-200 | REV. |
|---|---|---|---|
| FILE: Ensr\6908\050\Proposed40a.dwg | | | |




LEGEND

| | |
|---|---|
| ⊗ MW-1 5.06 | Monitoring Well / Groundwater Elevation in feet |
| | Potentiometric Surface Contour Line |
| → | Implied Groundwater Flow Direction |

Contour interval = 0.05 ft.
Hydraulic gradient = 0.003 ft/ft

NORTH

0 20 40
APPROX. SCALE IN FEET

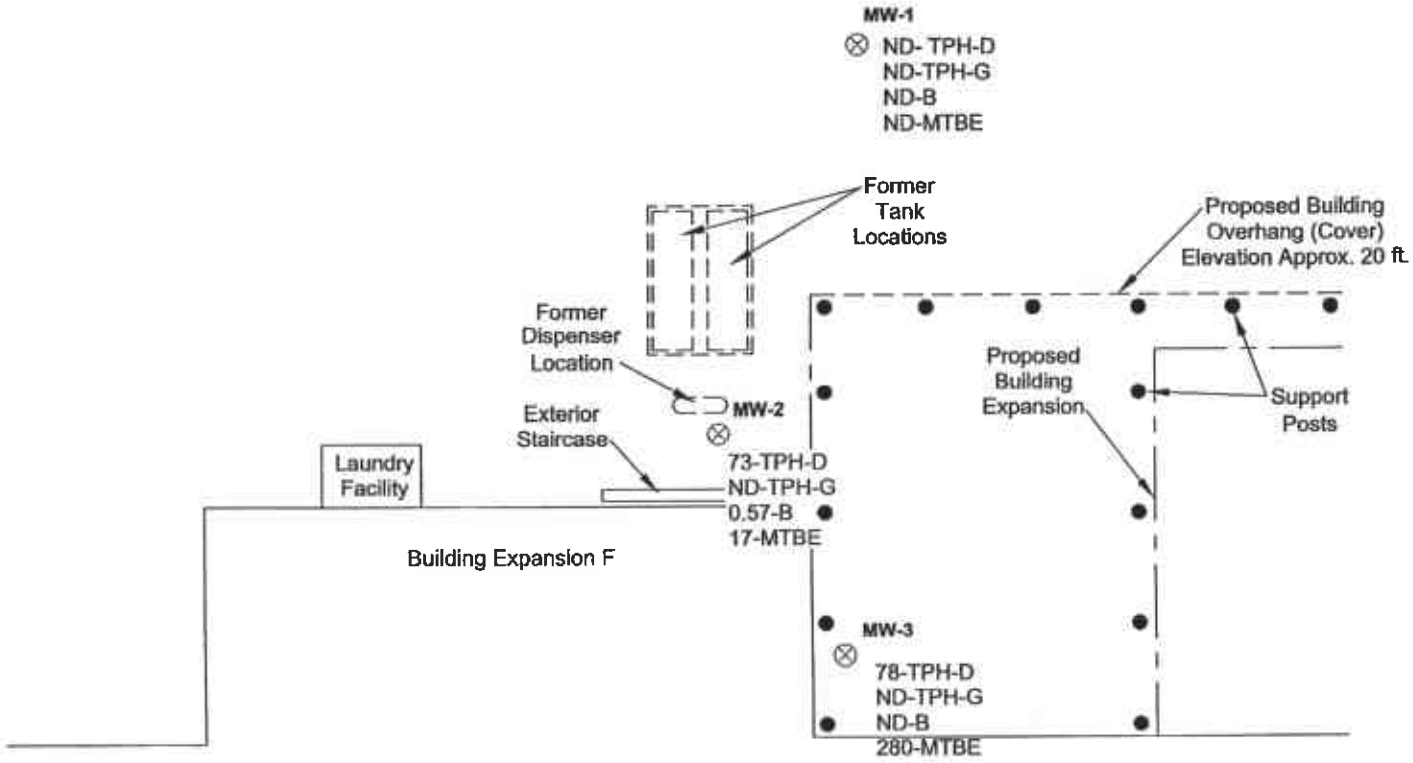
ENSR.

**FIGURE 3**

# POTENTIOMETRIC SURFACE MAP

June 15, 2000
United Airlines
Oakland International Airport
Oakland, CA

| | | | |
|---|---|---|---|
| DRAWN: J.Hopeck | DATE: 3/14/00 | PROJECT NO: 6908-112-310 | REV. |
| FILE: Ensr\6908\112/3108g3 | | | |




LEGEND

| | | | |
|---|---|---|---|
| ⊗ MW-2 | = | Monitoring Well | |
| TPH-D | = | TPH as Diesel | (ug/L) |
| TPH-G | = | TPH as Gasoline | (ug/L) |
| B | = | Benzene | (ug/L) |
| MTBE | = | Methyl tert-Butyl Ether | (ug/L) |
| ND | = | Non-detect | |

NOTE: All measurements in parts per billion.

NORTH

0 20 40

APPROX. SCALE IN FEET

ENSR.

**FIGURE 4**

# DISTRIBUTION OF TPH-D, TPH-G, BENZENE, & MTBE IN GROUNDWATER

**June 15, 2000**

United Airlines

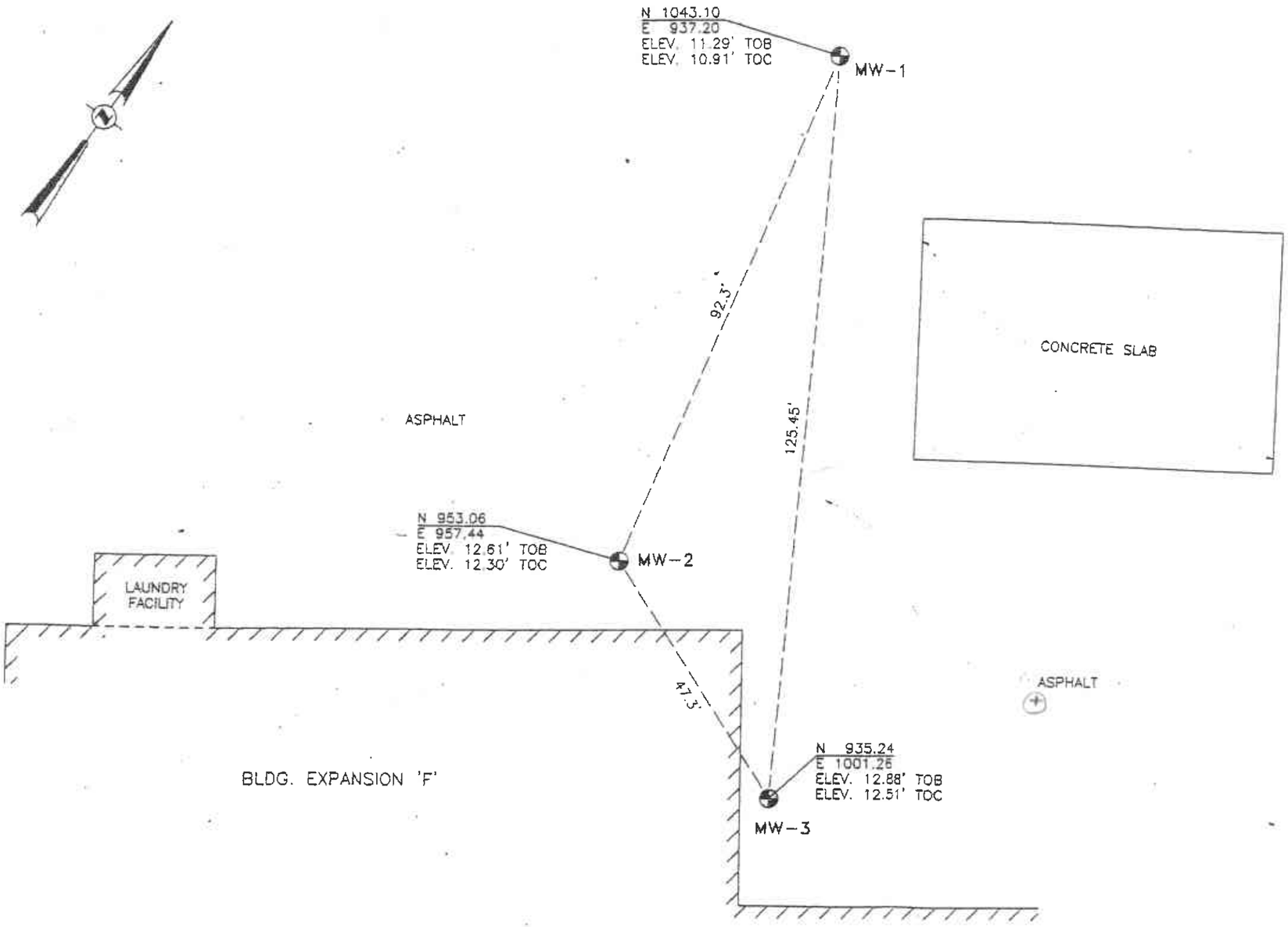
Oakland International Airport

Oakland, CA

| DRAWN: J.Hopeck | DATE: 4/26/00 | PROJECT NO: 6908-112-310 | REV. |
|---|---|---|---|
| FILE: Ensr\6908\112\310 | | | |

# APPENDIX A

# WELL LOGS AND WELL SURVEY DATA




## NOTES

1. VERTICAL DATUM: ASSUMED TO BE CITY OF OAKLAND PER GRADING PLAN DRAWING SP-20, PORT FILE AA-1285, 10/16/77.
2. COORDINATE BASIS: LOCAL
3. TOB = SET PUNCH MARK N'LY SIDE WELL BOX.
4. TOC = MARK N'LY SIDE TOP 4" PVC CASING.

# GROUNDWATER MONITORING WELL SURVEY
## UNITED AIRLINES FACILITY
## OAKLAND INTERNATIONAL AIRPORT

ALAMEDA COUNTY, CALIFORNIA

PREPARED FOR

**ENSR**

BY

*TRONOFF ASSOCIATES - LAND SURVEYORS*

5850 SHELLMOUND WAY, SUITE 300 EMERYVILLE, CA.

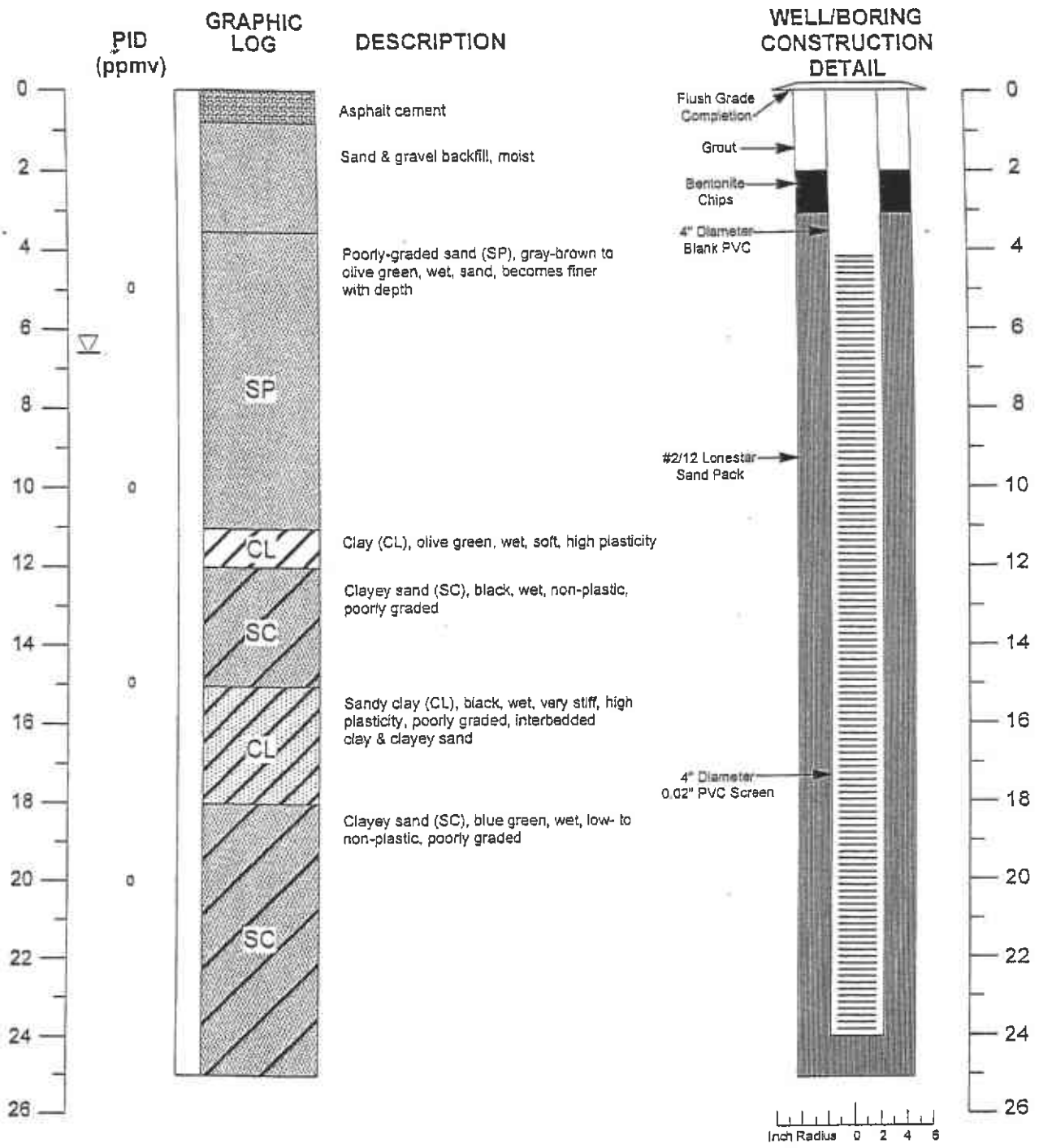
(510) 428-1515

SCALE 1"= 20' AUGUST 23, 1999

SURVEY NO. 4194

LICENSED LAND SURVEYOR BRUCE T. TRONOFF NO. 6415 STATE OF CALIFORNIA

BRUCE T. TRONOFF, LAND SURVEYOR NO. 6415 (RENEWAL DATE 12/31/02)




| | | | | | |
|---|---|---|---|---|---|
| Driller: | Gregg Drilling | End Date: | 7/21/99 | Type of Sampler: | Split spoon |
| Drilling Method: | Hollow Stem Auger | Groundwater: | 6.5 ft. bgs | TD (Total Depth): | 25 ft. bgs |
| Start Date: | 7/21/99 | Sampler: | Jeff Wendt | | |

Legend

- Water level in completed well
- First water found during drilling
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Contact: Solid where certain
- Contact: Dotted where approximate
- Contact: Dashed where uncertain

# Monitoring Well MW-1

United Airlines
1100 Airport Drive
Oakland, CA

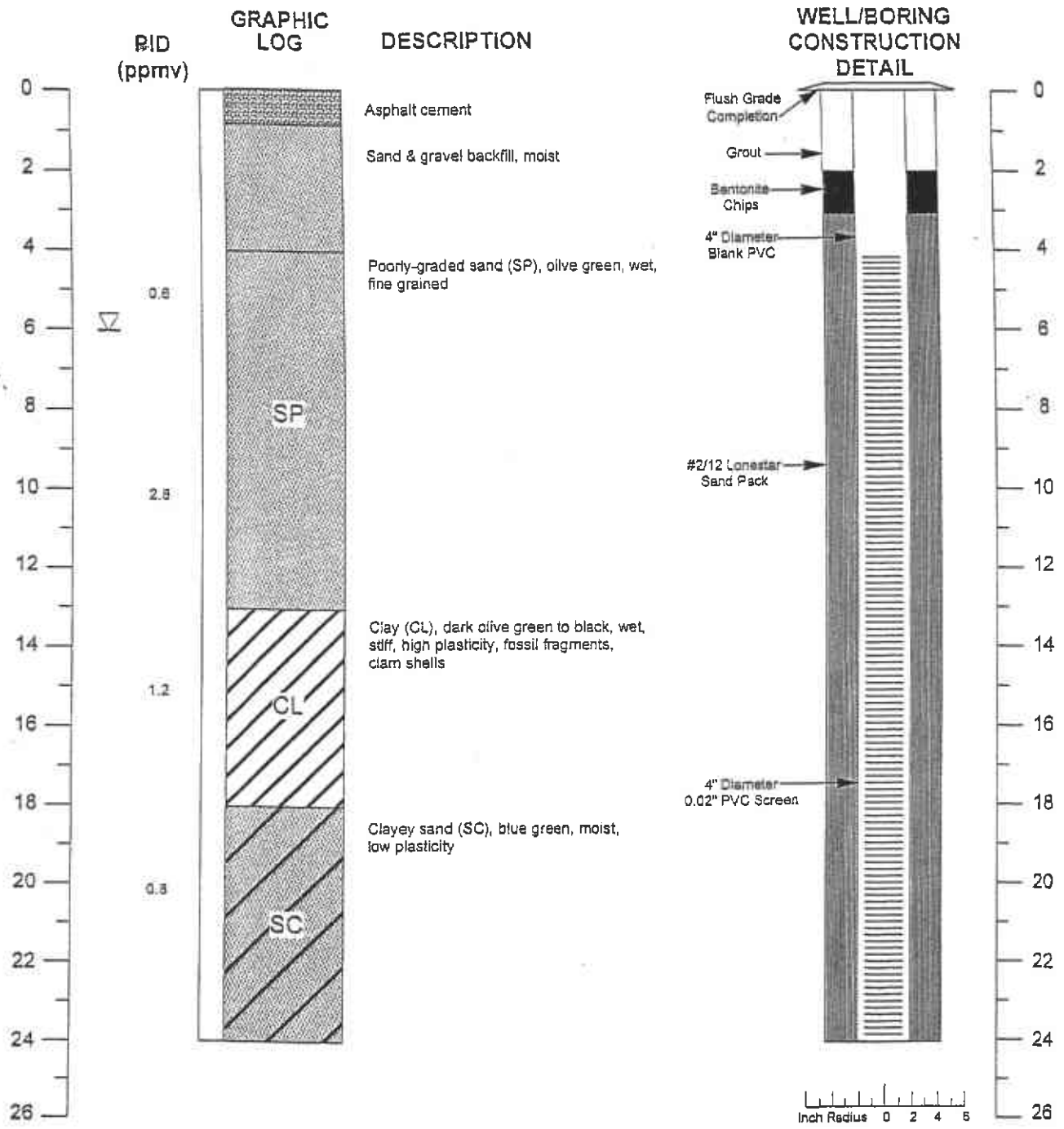
ENSR®

Page: 1 of 1

| | | | |
|---|---|---|---|
| Drawn By: | J. Gierak | Date: | 7/26/99 |
| Revised By: | J. Gierak | Date: | 8/10/99 |

Job Number: 6908-050

Ensr\6908050\borings.dsf




| | | | | | |
|---|---|---|---|---|---|
| Driller: | Gregg Drilling | End Date: | 7/21/99 | Type of Sampler: | Split spoon |
| Drilling Method: | Hollow Stem Auger | Groundwater: | 6 ft. bgs | TD (Total Depth): | 24 ft. bgs |
| Start Date: | 7/21/99 | Sampler: | Jeff Wendt | | |

Legend

- Water level in completed well
- First water found during drilling
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Contact: Solid where certain
- Contact: Dotted where approximate
- Contact: Dashed where uncertain

Ensr\6908\050\borings.daf

# Monitoring Well MW-2

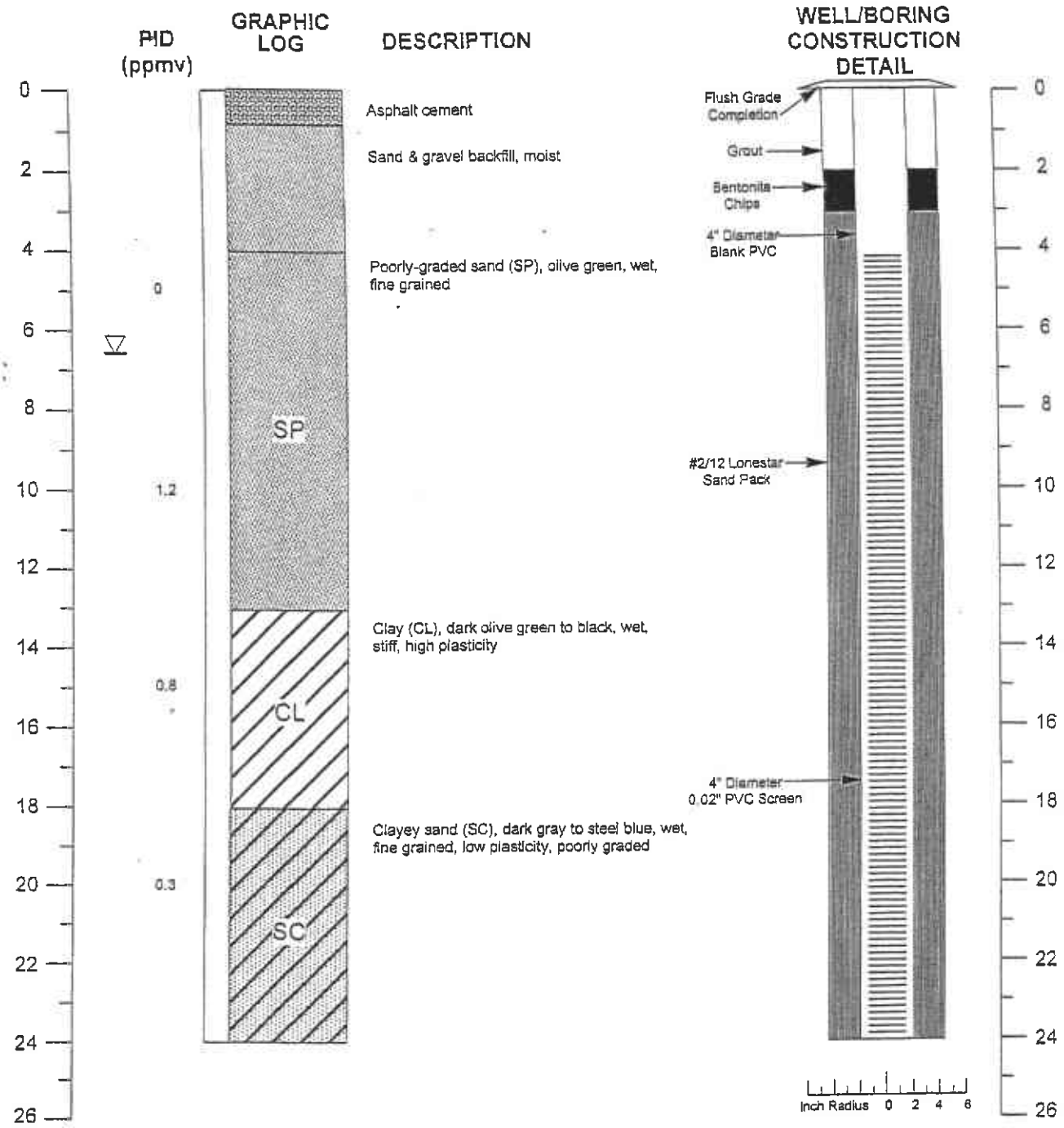
United Airlines
1100 Airport Drive
Oakland, CA

ENSR®

Page: 1 of 1

| | | | |
|---|---|---|---|
| Drawn By: | J. Gierek | Date: | 7/26/99 |
| Revised By: | J. Gierek | Date: | 8/10/99 |

Job Number: 6908-050




| | | | | | |
|---|---|---|---|---|---|
| Driller: | Gregg Drilling | End Date: | 7/21/99 | Type of Sampler: | Split spoon |
| Drilling Method: | Hollow Stem Auger | Groundwater: | 6.5 ft. bgs | TD (Total Depth): | 24 ft. bgs |
| Start Date: | 7/21/99 | Sampler: | Jeff Wendt | | |

Legend

- Water level in completed well
- First water found during drilling
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Contact: Solid where certain
- Contact: Dotted where approximate
- Contact: Dashed where uncertain

# Monitoring Well MW-3

United Airlines
1100 Airport Drive
Oakland, CA

ENSR®

Page: 1 of 1

| | | | |
|---|---|---|---|
| Drawn By: | J. Gierek | Date: | 7/28/99 |
| Revised By: | J. Gierek | Date: | 8/10/99 |

Job Number: 6908-050

Ensr6908\050borings.dsf

# APPENDIX B

# FIELD SHEETS AND ENSR SOPS

cc: AK, TR, CF

ENSR

## REPORT OF FIELD OBSERVATIONS

| | |
|---|---|
| Job No: 6908-112.310 | Date: 6/15/00 (M T W X F S S) |
| Client: UAL | Project: BLDG 110 GM |
| Location: 1100 AIRPORT DR. OAKLAND, CA. | Weather: |
| Observer: T. RANKIN | Observation Period: SITE 0530-0900 |

Description: TRVL TO SITE (0330-0530) OPEN WELLS, OBTAIN WATER LEVELS. PURGE & SAMPLE MW'S 1, 3 & 2 (IN THAT ORDER). LABEL NAMS GENERATED TODAY & INVENTORIED OTHER NAMS. 3 FULL FROM PREVIOUS EVENTS FOR A TOTAL OF 6 NAMS.

LEAVE @ 0900, TRAVEL TO McCAMPBELL LABS TO DROP SAMPLES & RETURN TO OFFICE @ 1100

Mileage: miles

Copy Sent To Client: Y N | Continued on Next Page | Page of

**ENSR**
**GROUNDWATER/LIQUID LEVEL DATA**
**(measurements in feet)**

**Project Address:** 1100 Airport Drive Bldg-110,Oakland,CA. **Date:** 6/15/00
**Recorded by:** T. RAPKIN **Project No.:** 6908-112.310

| Well No. | Time | Well Elev | Measured Total Depth | Depth to Gr. Water | Depth to Product | Product Thickness | Comments (TOC/TOB) (product skimmer in well) |
|---|---|---|---|---|---|---|---|
| MW-1 | 0550 | | 23.30 | 5.85 | N/A | N/A | |
| MW-2 | 0555 | | 22.05 | 7.26 | N/A | N/A | |
| MW-3 | 0553 | | 22.70 | 7.59 | N/A | N/A | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Notes:**

# MONITORING WELL SAMPLING INFORMATION SHEET

ENSR

Client: UNITED AIRLINES — Project No: 6908-112.310

Site: 1110 AIRPORT DR BLDG 110, OAKLAND, CA — Well Designation: MW-1

Is setup of traffic control devices required?: (NO) YES — Setup & Takedown time: _____ hours

Is there standing water in well box?: NO (YES) — (Above TOC) (Below TOC)

Is Top of Casing cut level?: NO (YES) — (If NO please explain in remarks)

Is well cap sealed and locked?: NO (YES) — (If NO please explain in remarks)

Height of Well Casing Riser (in inches): 45

General condition of Wellhead assembly: (Excellent) Good Fair Poor (Explain in remarks)

Purging Equipment: _____ 2" Disposable bailer — X Submersible pump

_____ 2" PVC bailer — _____ Dedicated bailer

_____ 4" PVC bailer

Sampled with: Disposable bailer: X Teflon bailer: _____

| Well diameter: | 2"___ | 3"___ | 4" X | 6"___ | 8"___ |
|---|---|---|---|---|---|
| Purge Vol. Multiplier: | 0.163 | 0.367 | 0.653 | 1.47 | 2.61 gal/ft. |

Initial Measurement

Time: 0550

Depth of well: 23.30

Depth to water: 5.85

Recharge Measurement

Time: 0741

Depth to water: 6.03

Calculated purge: 34

Actual purge: 34

Start purge: 0604 — Sampling time: 0745 — Sampling Date: 6/15/00

| Time | Temp (F) | E.C. | pH | Turbidity | 0 (ppm) | Volume (Gal.) |
|---|---|---|---|---|---|---|
| 0610 | 71.6 | 6.58mS | 7.02 | | | 11 |
| 0616 | 70.4 | 10.2 | 7.22 | | | 22 |
| 0621 | 67.8 | 10.0 | 7.24 | | | 34 |
| | | | | | | |
| | | | | | | |

Sample appearance: CLEAR / SEMI CLEAR

QC samples collected at his well: NONE — Lock: DOLPHIN

Equipment replaced: (Check all that apply) Note condition of replaced item.

2" Locking Cap: — Lock #2357: — Lock #0909:

3" Locking Cap: — Lock #3753: — Lock-Dolphin:

4" Locking Cap: — Chevron Lock:

Remarks: HAVE TO PUMP SLOW TO GET FULL FORCE

Signature: JR — Review: _____

# MONITORING WELL SAMPLING INFORMATION SHEET

ENSR

Client: UNITED AIRLINES — Project No: 6908-112.310

Site: 1110 AIRPORT DR. BLDG 110, OAKLAND, CA — Well Designation: MW-2

Is setup of traffic control devices required?: (NO) YES — Setup & Takedown time: _____ hours

Is there standing water in well box?: (NO) YES — (Above TOC Below TOC)

Is Top of Casing cut level?: NO (YES) — (If NO please explain in remarks)

Is well cap sealed and locked?: NO (YES) — (If NO please explain in remarks)

Height of Well Casing Riser (in inches): 6-8

General condition of Wellhead assembly: (Excellent) Good Fair Poor (Explain in remarks)

Purging Equipment: _____ 2" Disposable bailer — X Submersible pump

_____ 2" PVC bailer — _____ Dedicated bailer

_____ 4" PVC bailer

Sampled with: Disposable bailer: X Teflon bailer: _____

| Well diameter: | 2"___ | 3"___ | 4" X | 6"___ | 8"___ |
|---|---|---|---|---|---|
| Purge Vol. Multiplier: | 0.163 | 0.367 | 0.653 | 1.47 | 2.61 gal/ft. |

Initial Measurement

Time: 0555

Depth of well: 22.05

Depth to water: 7.26

Recharge Measurement

Time: 0759

Depth to water: 9.47

Calculated purge: 30

Actual purge: 22

Start purge: 0718 — Sampling time: 0805 — Sampling Date: 6/15/00

| Time | Temp (F) | E.C. | pH | Turbidity | 0 (ppm) | Volume (Gal.) |
|---|---|---|---|---|---|---|
| 0723 | 67.7 | 5.26mS | 7.03 | | | 10 |
| 0729 | 67.3 | 6.69mS | 7.04 | | | 20 |
| 0431 | 66.5 | 6.31 | 7.13 | | | 22 |
| | | | | | | |
| | | | | | | |

Sample appearance: SEMI-CLEAR

QC samples collected at his well: NONE — Lock: DOLPHIN

Equipment replaced: (Check all that apply) Note condition of replaced item.

2" Locking Cap: — Lock #2357: — Lock #0909:

3" Locking Cap: — Lock #3753: — Lock-Dolphin:

4" Locking Cap: — Chevron Lock:

Remarks: DAT @ 22 GALS

Signature: JR — Review: _____

# MONITORING WELL SAMPLING INFORMATION SHEET

ENSR

Client: UNITED AIRLINES  Project No: 6908-112.310

Site: 1110 AIRPORT DR. BLDG 110  Well Designation: MW-3

OAKLAND, CA

Is setup of traffic control devices required?: (NO) YES  Setup & Takedown time: _____ hours

Is there standing water in well box?: (NO) YES  (Above TOC  Below TOC)

Is Top of Casing cut level?: NO (YES)  (If NO please explain in remarks)

Is well cap sealed and locked?: NO (YES)  (If NO please explain in remarks)

Height of Well Casing Riser (in inches): 12.44

General condition of Wellhead assembly: (Excellent) Good Fair Poor (Explain in remarks)

Purging Equipment: _____ 2" Disposable bailer  X Submersible pump

_____ 2" PVC bailer  _____ Dedicated bailer

_____ 4" PVC bailer

Sampled with: Disposable bailer: X  Teflon bailer: _____

| Well diameter: | 2" | 3" | 4" | 6" | 8" |
|---|---|---|---|---|---|
| | ____ | ____ | X | ____ | ____ |
| Purge Vol. Multiplier: | 0.163 | 0.367 | 0.653 | 1.47 | 2.61 gal/ft. |

22.7
7.6
15.1 x .653
≈ 10 gal/well
x3

Initial Measurement

Time: 0553

Depth of well: 22.70

Depth to water: 7.59

Recharge Measurement

Time: 0723

Depth to water: 10.84

Calculated purge: 30

Actual purge: _____

Start purge: 0649  Sampling time: 0725  Sampling Date: 6/15/00

| Time | Temp (F) | E.C. | pH | Turbidity | 0 (ppm) | Volume (Gal.) |
|---|---|---|---|---|---|---|
| 0654 | 66.2 | 5.19 mS | 7.28 | | | 10 |
| 0658 | 65.3 | 6.96 | 7.29 | | | 20 |
| 0707 | 65.3 | 6.90 | 7.34 | | | 30 |
| | | | | | | |
| | | | | | | |

Sample appearance: SEMI-CLEAR

QC samples collected at his well: NONE  Lock: DOLPHIN

Equipment replaced: (Check all that apply) Note condition of replaced item.

2" Locking Cap:  Lock #2357:  Lock #0909:

3" Locking Cap:  Lock #3753:  Lock-Dolphin:

4" Locking Cap:  Chevron Lock:

Remarks: _____

Signature: JR  Review: _____

M901376

# ENSR — CHAIN OF CUSTODY RECORD

Page 1 of 1

| | |
|---|---|
| Client/Project Name: VAL/BLDG 110 QM | Project Location: 110 ALAMEDA AVE BLDG 110 OAKLAND, CA. 94621 |
| Project Number: 4004-112.310 | Field Logbook No.: |
| Sampler: (Print Name) /Affiliation: TRACE RANKIN/ENSR | Chain of Custody Tape No.: |
| Signature: | Send Results/Report to: ADAM KLEIN 10324 PARKER LN #200 SACTO, CA. 95827 PH (916) 362-7100/FAX (916) 362-8100 |

Analysis Requested

| Field Sample No./ Identification | Date | Time | Grab | Comp | Sample Container (Size/Mat'l) | Sample Type (Liquid, Sludge, Etc.) | Preservative | Field Filtered | TPH-DIESEL | TPH-G | BTEX EXCLUSIVE OF MTBE 8260 | TDS | Lab I.D. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW3 | 6/15/00 | 0725 | X | | 4X40mL VOA 1X1LGL AMB | $H_2O$ | ICE/HCL | N | X | X | X | | | STANDARD TAT |
| MW2 | 6/15/00 | 0805 | X | | 4X40mL VOA 1X1LGL AMB | $H_2O$ | ICE/HCL | N | ↓ | ↓ | ↓ | | | |
| MW1 | 6/15/00 | 0745 | X | | 4X40mL VOA 1X1LGL AMB 2X 250mL PLY | $H_2O$ | ICE/HCL | N | ↓ | ↓ | ↓ | X | X | 24HR MIN LAB TO FILTER |

| | | | | |
|---|---|---|---|---|
| Relinquished by: (Print Name) TRACE RANKIN/ENSR<br>Signature: | Date: 6/15/00<br>Time: 0942 | Received by: (Print Name)<br>Signature: | Date: 6/15/00<br>Time: 0942 | Analytical Laboratory (Destination): MCCAMPBELL ANALYTICAL 1102 QUE AVE SOUTH, #D7 PACHECO, CA. 94553 PH (925) 798-1620 FAX (925) 798-1622 |
| Relinquished by: (Print Name)<br>Signature: | Date:<br>Time: | Received by: (Print Name)<br>Signature: | Date:<br>Time: | |
| Relinquished by: (Print Name)<br>Signature: | Date:<br>Time: | Received by: (Print Name)<br>Signature: | Date:<br>Time: | Serial No. 29216 |

## SAMPLE IDENTIFICATION AND CHAIN-OF-CUSTODY PROCEDURES
**SOP-4**

Sample identification and chain-of-custody procedures ensure sample integrity, and document sample possession from the time of collection to its ultimate disposal. Each sample container submitted for analysis is labeled to identify the job number, date, time of sample collection, a sample number unique to the sample, any name(s) of on-site personnel and any other pertinent field observations also recorded on the field excavation or boring log.

Chain-of-custody forms are used to record possession of the sample from time of collection to its arrival at the laboratory. During shipment, the person with custody of the samples will relinquish them to the next person by signing the chain-of-custody form(s) and noting the date and time. The sample-control officer at the laboratory will verify sample integrity, correct preservation, confirm collection in the proper container(s), and ensure adequate volume for analysis.

If these conditions are met, the samples will be assigned unique laboratory log numbers for identification throughout analysis and reporting. The log numbers will be recorded on the chain-of-custody forms and in the legally-required log book maintained in the laboratory. The sample description, date received, client's name, and any other relevant information will also be recorded.

## LABORATORY ANALYTICAL QUALITY ASSURANCE AND CONTROL
**SOP-5**

In addition to routine instrument calibration, replicates, spikes, blanks, spiked blanks, and certified reference materials are routinely analyzed at method-specific frequencies to monitor precision and bias. Additional components of the laboratory Quality Assurance/Quality Control program include:

1. Participation in state and federal laboratory accreditation/certification programs;
2. Participation in both U.S. EPA Performance Evaluation studies (WS and WP studies) and inter-laboratory performance evaluation programs;
3. Standard operating procedures describing routine and periodic instrument maintenance;
4. "Out-of-Control"/Corrective Action documentation procedures; and,
5. Multi-level review of raw data and client reports.

## GROUNDWATER PURGING AND SAMPLING
**SOP-7**

Prior to water sampling, each well is purged by evacuating a minimum of three wetted well-casing volumes of groundwater. When required, purging will continue until either the discharge water temperature, conductivity, or pH stabilize to within 10% of previously measured values; and a maximum of ten wetted casing volumes of groundwater have been recovered, or the well is bailed dry. When practical, the groundwater sample should be collected when the water level in the well recovers to at least 80 percent of its static level. Field measurements, observations and procedures are noted.

The sampling equipment consists of a clean bailer, or stainless steel bladder pump with a "Teflon" bladder. If the sampling system is dedicated to the well, then the bailer is usually "Teflon," but the bladder pump may be PVC with a polypropylene bladder. Sample container type, preservation, and volume depends on the intended analyses.

The groundwater sample is decanted into each VOA vial in such a manner that there is no meniscus at the top of the vial. A cap is quickly secured to the top of the vial. The vial is then inverted and gently tapped to see if air bubbles are present. If none are present, the vial is labeled and refrigerated for delivery, under strict chain-of-custody, to the analytical laboratory. Label information should include a unique sample identification number, job identification number, date, time, and the sampler's initials.

For quality control purposes, a duplicate water sample may be collected from a well. When required, a trip blank is prepared at the laboratory and placed in the transport cooler. It is labeled similar to the well samples, remains in the cooler during transport, and is analyzed by the laboratory along with the groundwater samples. In addition, a field blank may be prepared in the field when sampling equipment is not dedicated. The field blank is prepared after a pump or bailer has been either steam cleaned or properly washed, prior to use in the next well, and is analyzed along with the other samples. The field blank analysis demonstrates the effectiveness of in-field cleaning procedures to prevent cross-contamination.

To minimize the potential for cross-contamination between wells, all well development and water sampling equipment not dedicated to a well is either steam cleaned or properly washed between use. As a second precautionary measure, wells are sampled in order of lowest to highest concentrations as established by available previous analytical data.

In the event the water samples cannot be submitted to the analytical laboratory on the same day they are collected (e.g., due to weekends or holidays), the samples are temporarily stored until the first opportunity for submittal either on ice in a cooler, such as when in the field, or in a refrigerator.

## MEASURING LIQUID LEVELS USING A WATER LEVEL INDICATOR OR INTERFACE PROBE
**SOP-12**

Field equipment used for liquid-level gauging typically includes the measuring probe (water level or interface) and a clean product bailer(s). The field kit also includes cleaning supplies (buckets, TSP, spray bottles, and deionized water) to be used in cleaning the equipment between wells.

Prior to measurement, the probe tip is lowered into the well until it touches bottom. Using the previously established top-of-casing or top-of-box (i.e., wellhead vault) point, the probe cord (or halyard) is marked and a measuring tape (graduated in hundredths of a foot) is used to determine the distance between the probe end and the marking on the cord. This measurement is then recorded on the liquid-level data sheet as the "Measured Total Depth" of the well.

When necessary in using the interface probe to measure liquid levels, the probe is first electrically grounded to either the metal stove pipe or another metal object nearby. When no ground is available, reproducible measurements can be obtained by clipping the ground lead to the handle of the interface probe case.

The probe tip is then lowered into the well and submerged in the groundwater. An oscillating (beeping) tone indicates the probe is in water. The probe is slowly raised until either the oscillating tone ceases or becomes a steady tone. In either case, this is the depth-to-water (DTW) indicator and the DTW measurement is made accordingly. The steady tone indicates floating hydrocarbons. In this case, the probe is slowly raised until the steady tone ceases. This is the depth-to-product (DTP) indicator and the measurement of DTP is recorded. A corrected depth to groundwater to account for floating hydrocarbons can be calculated by using the following formula:

CDTW = DTW - (SP.G x LHT).
CDTW = Corrected depth to groundwater.
DTW = Measured depth to groundwater.
SP.G = Specific gravity: unweathered gasoline = 0.75; diesel = 0.80
LHT = Measured liquid hydrocarbon thickness.

The corresponding groundwater elevation is the difference between a previously determined well reference elevation and either the depth to groundwater or the corrected depth to groundwater.

The process of lowering and raising the probe must be repeated several times to ensure accurate measurements. The DTW and DTP measurements are recorded on the liquid-level data sheet. When floating product is indicated by the probe's response, a product bailer is lowered partially through the product-water interface to confirm the product on the water surface, and as further indication of product thickness, particularly in cases where the product layer is quite thin. Either this measurement or the difference between DTW and DTP is recorded on the data sheet as "product thickness."

In order to avoid cross-contamination of wells during the liquid-level measurement process, wells are measured in the order of "clean" to "dirty" (where such information is available). In addition, all measurement equipment is cleaned with TSP or similar solution and thoroughly rinsed with deionized water before use, between measurements in respective wells, and at the completion of the day's activities.

# APPENDIX C

# LABORATORY ANALYTICAL REPORT AND CHAIN OF CUSTODY DOCUMENTATION

McCAMPBELL ANALYTICAL INC.
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http://www.mccampbell.com E-mail: main@mccampbell.com

| | | |
|---|---|---|
| ENSR<br>10324 Placer Lane, #200<br>Sacramento, CA 95827 | Client Project ID: #6908-112.310; UAL/Bldg 110 QM | Date Sampled: 06/15/00 |
| | | Date Received: 06/15/00 |
| | Client Contact: Alan Klein | Date Extracted: 06/15/00 |
| | Client P.O: | Date Analyzed: 06/15/00 |

07/01/2000

Dear Alan:

Enclosed are:

1). the results of **3** samples from your **#6908-112.310; UAL/Bldg 110 QM** project,

2). a QC report for the above samples

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Edward Hamilton, Lab Director

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| | | |
|---|---|---|
| ENSR<br>10324 Placer Lane, #200<br>Sacramento, CA 95827 | Client Project ID: #6908-112.310; UAL/Bldg 110 QM | Date Sampled: 06/15/00 |
| | | Date Received: 06/15/00 |
| | Client Contact: Alan Klein | Date Extracted: 06/15-06/16/00 |
| | Client P.O: | Date Analyzed: 06/15-06/16/00 |

**Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX***

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

| Lab ID | Client ID | Matrix | TPH(g)+ | MTBE | Benzene | Toluene | Ethylben-zene | Xylenes | % Recovery Surrogate |
|---|---|---|---|---|---|---|---|---|---|
| 40385 | MW-3 | W | ND | --- | ND | ND | ND | ND | 102 |
| 40386 | MW-2 | W | ND | --- | 0.57 | ND | ND | ND | 105 |
| 40387 | MW-1 | W | ND | --- | ND | ND | ND | ND | 103 |
| | | | | | | | | | |
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| | | | | | | | | | |
| Reporting Limit unless otherwise stated; ND means not detected above the reporting limit | | W | 50 ug/L | 5.0 | 0.5 | 0.5 | 0.5 | 0.5 | |
| | | S | 1.0 mg/kg | 0.05 | 0.005 | 0.005 | 0.005 | 0.005 | |

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

# cluttered chromatogram; sample peak coelutes with surrogate peak

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

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| | | |
|---|---|---|
| ENSR<br>10324 Placer Lane, #200<br>Sacramento, CA 95827 | Client Project ID: #6908-112.310; UAL/Bldg 110 QM | Date Sampled: 06/15/00 |
| | | Date Received: 06/15/00 |
| | Client Contact: Alan Klein | Date Extracted: 06/15/00 |
| | Client P.O: | Date Analyzed: 06/16-06/18/00 |

**Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel ***

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

| Lab ID | Client ID | Matrix | TPH(d)+ | % Recovery Surrogate |
|---|---|---|---|---|
| 40385 | MW-3 | W | 78,b | 98 |
| 40386 | MW-2 | W | 73,b | 115 |
| 40387 | MW-1 | W | ND | 118 |
| | | | | |
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| | | | | |
| | | | | |
| Reporting Limit unless otherwise stated; ND means not detected above the reporting limit | | W | 50 ug/L | |
| | | S | 1.0 mg/kg | |

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

# cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

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| | | |
|---|---|---|
| ENSR<br>10324 Placer Lane, #200<br>Sacramento, CA 95827 | Client Project ID: #6908-112.310; UAL/Bldg 110 QM | Date Sampled: 06/15/00 |
| | | Date Received: 06/15/00 |
| | Client Contact: Alan Klein | Date Extracted: 06/17-06/210/00 |
| | Client P.O: | Date Analyzed: 06/17-06/21/00 |

**Oxygenated Volatile Organics By GC/MS**

EPA method 8260 modified

| Lab ID | 40385 | 40386 | 40387 | Reporting Limit | |
|---|---|---|---|---|---|
| Client ID | MW-3 | MW-2 | MW-1 | | |
| Matrix | W | W | W | S | W |
| Compound | Concentration* | | | ug/kg | ug/L |
| Di-isopropyl Ether (DIPE) | ND<6.5 | ND | ND | 5.0 | 1.0 |
| Ethyl tert-Butyl Ether (ETBE) | ND<6.5 | ND | ND | 5.0 | 1.0 |
| Methyl-tert Butyl Ether (MTBE) | 280 | 17 | ND | 5.0 | 1.0 |
| tert-Amyl Methyl Ether (TAME) | ND<6.5 | ND | ND | 5.0 | 1.0 |
| tert-Butanol | ND<33 | ND | ND | 25 | 5.0 |
| **Surrogate Recoveries (%)** | | | | | |
| Dibromofluoromethane | 108 | 108 | 106 | | |
| **Comments:** | | | | | |

* water samples are reported in ug/L, soil and sludge samples in ug/kg, wipes in ug/wipe and all TCLP / STLC / SPLP extracts in ug/L

ND means not detected above the reporting limit; N/A means surrogate not applicable to this analysis

(h) lighter than water immiscible sheen is present; (i) liquid sample that contains greater than ~5 vol. % sediment; (j) sample diluted due to high organic content

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| | | |
|---|---|---|
| ENSR<br>10324 Placer Lane, #200<br>Sacramento, CA 95827 | Client Project ID: #6908-112.310; UAL/Bldg 110 QM | Date Sampled: 06/15/00 |
| | | Date Received: 06/15/00 |
| | Client Contact: Alan Klein | Date Extracted: 06/15/00 |
| | Client P.O: | Date Analyzed: 06/15-06/16/00 |

| Analytical methods | | | **Total Dissolved Solids** |
|---|---|---|---|
| | | | EPA160.1, SM2540C |
| Lab ID | Client ID | Matrix | TDS |
| 40387 | MW-1 | W | 5300 |
| | | | |
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| | | | |
| Reporting Limit or Method Accuracy unless otherwise stated; ND means not detected above the reporting limit; N/A means not applicable | | W | 10 mg/L |
| | | S | N/A |
| Reporting Units | | --- | mg/L |

DHS Certification No. 1644

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# QC REPORT

Date: 06/15/00 Matrix: Water

Extraction: N/A

| Compound | Concentration: ug/L | | | | %Recovery | | RPD |
|---|---|---|---|---|---|---|---|
| | Sample | MS | MSD | Amount Spiked | MS | MSD | |
| SampleID: 39534 | | | | Instrument: GC-3 | | | |
| Surrogate1 | 0.000 | 98.0 | 99.0 | 100.00 | 98 | 99 | 1.0 |
| Xylenes | 0.000 | 279.0 | 278.0 | 300.00 | 93 | 93 | 0.4 |
| Ethyl Benzene | 0.000 | 94.0 | 93.0 | 100.00 | 94 | 93 | 1.1 |
| Toluene | 0.000 | 96.0 | 95.0 | 100.00 | 96 | 95 | 1.0 |
| Benzene | 0.000 | 98.0 | 97.0 | 100.00 | 98 | 97 | 1.0 |
| MTBE | 0.000 | 106.0 | 104.0 | 100.00 | 106 | 104 | 1.9 |
| GAS | 0.000 | 932.7 | 928.6 | 1000.00 | 93 | 93 | 0.4 |
| SampleID: 61900 | | | | Instrument: GC-6 A | | | |
| Surrogate1 | 0.000 | 100.0 | 109.0 | 100.00 | 100 | 109 | 8.6 |
| TPH (diesel) | 0.000 | 330.0 | 337.0 | 300.00 | 110 | 112 | 2.1 |

$$\%\ \text{Re covery} = \frac{(MS - Sample)}{AmountSpiked} \cdot 100$$

$$\text{RPD} = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation

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# QC REPORT

## VOCs (EPA 8240/8260)

Date: 06/17/00 Matrix: Water

Extraction: N/A

| Compound | Concentration: ug/L | | | | %Recovery | | RPD |
|---|---|---|---|---|---|---|---|
| | Sample | MS | MSD | Amount Spiked | MS | MSD | |
| SampleID: 63000 | | | | Instrument: GC-4 | | | |
| Surrogate | 0.000 | 104.0 | 104.0 | 100.00 | 104 | 104 | 0.0 |
| Tolune | 0.000 | 96.0 | 94.0 | 100.00 | 96 | 94 | 2.1 |
| Benzene | 0.000 | 120.0 | 121.0 | 100.00 | 120 | 121 | 0.8 |
| Chlorobenzene | 0.000 | 106.0 | 103.0 | 100.00 | 106 | 103 | 2.9 |
| Trichloroethane | 0.000 | 90.0 | 83.0 | 100.00 | 90 | 83 | 8.1 |
| 1,1-Dichloroethene | 0.000 | 117.0 | 118.0 | 100.00 | 117 | 118 | 0.9 |
| Surrogate | 0.000 | 112.0 | 98.0 | 100.00 | 112 | 98 | 13.3 |
| tert-Amyl Methyl Ether | 0.000 | 105.0 | 100.0 | 100.00 | 105 | 100 | 4.9 |
| Methyl tert-Butyl Ether | 0.000 | 114.0 | 126.0 | 100.00 | 114 | 126 | 10.0 |
| Ethyl tert-Butyl Ether | 0.000 | 126.0 | 128.0 | 100.00 | 126 | 128 | 1.6 |
| Di-isopropyl Ether | 0.000 | 126.0 | 129.0 | 100.00 | 126 | 129 | 2.4 |

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{AmountSpiked} \cdot 100$$

$$\text{RPD} = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation

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# QC REPORT

## VOCs (EPA 8240/8260)

Date: 06/17/00-06/18/00 Matrix: Water

Extraction: N/A

SampleID: 63000 Instrument: GC-4

| Compound | Concentration: ug/L | | | | %Recovery | | RPD |
|---|---|---|---|---|---|---|---|
| | Sample | MS | MSD | Amount Spiked | MS | MSD | |
| Surrogate | 0.000 | 104.0 | 104.0 | 100.00 | 104 | 104 | 0.0 |
| Tolune | 0.000 | 96.0 | 94.0 | 100.00 | 96 | 94 | 2.1 |
| Benzene | 0.000 | 120.0 | 121.0 | 100.00 | 120 | 121 | 0.8 |
| Chlorobenzene | 0.000 | 106.0 | 103.0 | 100.00 | 106 | 103 | 2.9 |
| Trichloroethane | 0.000 | 90.0 | 83.0 | 100.00 | 90 | 83 | 8.1 |
| 1,1-Dichloroethene | 0.000 | 117.0 | 118.0 | 100.00 | 117 | 118 | 0.9 |
| Surrogate | 0.000 | 112.0 | 98.0 | 100.00 | 112 | 98 | 13.3 |
| tert-Amyl Methyl Ether | 0.000 | 105.0 | 100.0 | 100.00 | 105 | 100 | 4.9 |
| Methyl tert-Butyl Ether | 0.000 | 114.0 | 126.0 | 100.00 | 114 | 126 | 10.0 |
| Ethyl tert-Butyl Ether | 0.000 | 126.0 | 128.0 | 100.00 | 126 | 128 | 1.6 |
| Di-isopropyl Ether | 0.000 | 126.0 | 129.0 | 100.00 | 126 | 129 | 2.4 |

$$\%\ \text{Recovery} = \frac{(MS - Sample)}{AmountSpiked} \cdot 100$$

$$\text{RPD} = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2 \cdot 100$$

RPD means Relative Percent Deviation

# GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

## CERTIFICATE OF ANALYSIS

General Minerals

**Report # L168-11**

**Date:** 6/28/00

McCampbell Analytical
110 2nd Avenue South
Pacheco CA 94553

**Project:** 20657

PO#

**Date Rec'd:** 6/16/00
**Date Started:** 6/16/00
**Date Completed:** 6/27/00

**Date Sampled:** 6/15/00
**Time:**
**Sampler :**

**Sample ID:** MW1
**Lab ID:** L35310

| Method | RL | Analyte | Results | Units |
|---|---|---|---|---|
| 200.7 | 1.0 | Calcium | 107 | mg/L |
| 200.7 | 1.0 | Magnesium | 109 | mg/L |
| 200.7 | 1.0 | Sodium | 1700 | mg/L |
| 200.7 | 1.0 | Potassium | 61 | mg/L |
| SM2340B | 1.0 | Total Hardness/CaCO3 | 714 | mg/L |
| 2320B | 10 | Total Alkalinity | 750 | mg/L |
| 2320B | 10 | Carbonate | ND | mg/L |
| 2320B | 10 | Bicarbonate | 750 | mg/L |
| 2320B | 10 | Hydroxide Alkalinity | ND | mg/L |
| 300.0 | 1.0 | Sulfate | 440 | mg/L |
| 300.0 | 1.0 | Chloride | 1650 | mg/L |
| 5540C | 0.05 | MBAS | ND | mg/L |
| 200.7 | 0.1 | Iron | 1.2 | mg/L |
| 200.7 | 0.05 | Copper | ND | mg/L |
| 200.7 | 0.05 | Zinc | ND | mg/L |
| 200.7 | 0.01 | Manganese | 1.5 | mg/L |
| 160.1 | 10 | Total Dissolved Solids | 4260 | mg/L |
| 150.1 | NA | pH | 7.73 | Std.Units |
| 120.1 | 1.0 | Specific Conductance | 10600 | µmhos/cm |

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

# GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916


**Report#** L168-11

## QC REPORT

McCampbell Analytical
110 2nd Avenue South
Pacheco CA 94553

**Dates Analyzed** 6/16/00-6/27/00

| Analyte | Batch # | Method | Original | Duplicate | MS % Recovery | MSD % Recovery | RPD | RPD | Blank |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | I05084 | 200.7 | | | 79.2 | 78.7 | | 0.6 | ND |
| Magnesium | I05085 | 200.7 | | | 99.5 | 101.1 | | 1.6 | ND |
| Sodium | I05086 | 200.7 | | | 96.1 | 97.3 | | 1.3 | ND |
| Potassium | I05087 | 200.7 | | | 91.4 | 90.3 | | 1.3 | ND |
| Hardness | I05088 | SM2340B | | | 98.4 | 89.9 | | 9.0 | ND |
| Total Alkalinity | I05187 | 2320B | | | 99.5 | 99.8 | | 0.3 | ND |
| Carbonate | I05187 | 2320B | | | 99.5 | 99.8 | | 0.3 | ND |
| Bicarbonate | I05187 | 2320B | | | 99.5 | 99.8 | | 0.3 | ND |
| Hydroxide Alkalinity | I05187 | 2320B | | | 99.5 | 99.8 | | 0.3 | ND |
| Sulfate | I04980 | 300.0 | | | 91.2 | 92.2 | | 1.1 | ND |
| Chloride | I04978 | 300.0 | | | 120.0 | 120.0 | | 0.0 | ND |
| MBAS | I05011 | 5540C | | | 109.6 | 109.3 | | 0.3 | ND |
| Iron | I05091 | 200.7 | | | 104.0 | 100.0 | | 3.9 | ND |
| Copper | I05089 | 200.7 | | | 98.0 | 96.0 | | 2.1 | ND |
| Zinc | I05090 | 200.7 | | | 108.0 | 108.0 | | 0.0 | ND |
| Manganese | I05092 | 200.7 | | | 104.0 | 102.0 | | 1.9 | ND |
| TDS (Filterable Residue) | I03575 | 160.1 | 2870 | 2590 | | | 10.3 | | ND |
| pH | I05059 | 150.1 | 8.34 | 8.26 | | | 1.0 | | NA |
| Specific Conductance (EC) | I05061 | 120.1 | 200 | 200 | | | 0.0 | | NA |

Ramiro Salgado
Chemist

Certification # 1157

Donna Keller
Laboratory Director

GPO

L1168-11

# McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553-5560
Telephone: (925) 798-1620 Fax: (925) 798-1622

# CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY ☐ ROUTINE

Report To: ED HAMILTON Bill To: MAI

Project #: 20657 Project Name: ENSR

Project Location:

| SAMPLE ID | LOCATION | SAMPLING Date | SAMPLING Time | # Containers | Type Containers | MATRIX Water | MATRIX Soil | MATRIX Air | MATRIX Sludge | MATRIX Other | METHOD PRESERVED Ice | METHOD PRESERVED HCl | METHOD PRESERVED $HNO_3$ | METHOD PRESERVED Other | EPA 601/8010 | EPA 602/8020 | EPA 608/808 | EPA 608/8080-PCB's only | EPA 624/8240/8260 | EPA 625/8270 | CAM – 17 Metals | EPA – Priority Pollutant Metals | LUFT Metals | LEAD (7240/7421/239.2/6010) | ORGANIC LEAD | RCI | OTHER General Minerals | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW1 | | 6/15 | | 1 | P | X | | | | | | | | | | | | | | | | | | | | | X | L35310 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Relinquished By: | Date: | Time: | Received By: |
|---|---|---|---|
| Yen Cao | 6/15/00 | | Cal Overnight |
| Cal overnight | 6/16 | 915 | Priya Sahota |
| | | | |

Remarks: 40387

Please Fax Results When Done. Thanks

M901376

20657 Z ENS46.doc

# ENSR — CHAIN OF CUSTODY RECORD

Page 1 of 1

| | |
|---|---|
| Client/Project Name: UAL / BLDG 110 QM | Project Location: 1100 MIDDLE DR. BLDG 110 OAKLAND, CA. 94621 |
| Project Number: 6908-112.310 | Field Logbook No.: |
| Sampler: (Print Name) /Affiliation: TRACE RANKIN / ENSR | Chain of Custody Tape No.: |
| Signature: | Send Results/Report to: ALAN KLEIN, 10324 PLACER LN #200 SACTO, CA. 95827, PH(916) 362-7100 / FAX (916) 362-8100 |

Analysis Requested: STANDARD TAT

| Field Sample No./ Identification | Date | Time | Grab | Comp | Sample Container (Size/Mat'l) | Sample Type (Liquid, Sludge, Etc.) | Preservative | Field Filtered | TPHg BTEX | TPHd | Fuel Oxygenates 8260 | CAM17MW SPA 6010/7000 | TDS EPA 160.1 | Lab I.D. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW 3 | 6/15/00 | 0725 | X | | 4X40mL VOA 1X1LGL AM | $H_2O$ | ICE/HCL | N | X | X | X | | | | |
| MW 2 | 6/15/00 | 0805 | X | | 4X40mL VOA 1X1LGL AM | $H_2O$ | ICE/HCL | N | ↓ | ↓ | ↓ | | | | |
| MW 1 | 6/15/00 | 0745 | X | | 4X40mL VOA 1X1LGL AM 2X500mL POLY | $H_2O$ | ICE/HCL | N | ↓ | ↓ | ↓ | X | X | | *FIELD MIN LAB TO FILTER |
| | | | | | | | | | | | | | | 40385 | |
| | | | | | | | | | | | | | | 40386 | |
| | | | | | | | | | | | | | | 40387 | |

| | | | | |
|---|---|---|---|---|
| Relinquished by: (Print Name) TRACE RANKIN / ENSR<br>Signature: | Date: 6/15/00<br>Time: 0942 | Received by: (Print Name) Yen Cao<br>Signature: | Date: 6/15/00<br>Time: 0942 | Analytical Laboratory (Destination):<br>MCCAMPBELL ANALYTICAL<br>1102 2ND AVE SOUTH, #D7<br>PACHECO, CA. 94553<br>PH(925) 798-1620<br>FAX(925) 798-1622 |
| Relinquished by: (Print Name)<br>Signature: | Date:<br>Time: | Received by: (Print Name)<br>Signature: | Date:<br>Time: | |
| Relinquished by: (Print Name)<br>Signature: | Date:<br>Time: | Received by: (Print Name)<br>Signature: | Date:<br>Time: | |

ICE/@ — PRESERVATION GOOD CONDITION — APPROPRIATE — HEAD SPACE ABSENT — CONTAINERS

Serial No. 29216

TB:SU