

April 15, 1996  
File No. 10-3002-39

ST 110 5305

Ms. Susan Hugo  
Alameda County Department of  
Environmental Health  
1131 Harbor Bay Parkway  
Alameda, California 94502

**SUBJECT: Final Groundwater Sampling Report and Request for Closure, 3623 Adeline Street, Emeryville, California**

Dear Ms. Hugo:

Kleinfelder, Inc., (Kleinfelder) is pleased to submit this request for closure on behalf of the Owens Financial Group for their property located at 3623 Adeline Street, Emeryville, California (Plate 1). This letter report also presents results of groundwater sampling requested by the Alameda County Department of Environmental Health (ACDEH) in our meeting on February 29, 1996.

### BACKGROUND

A Preliminary Site Assessment (PSA) was performed at the site by Converse Environmental, dated July 29, 1994. Based on information provided by the Sanborn Fire Insurance Maps of the site for years 1906 and 1912, included with the PSA, an underground storage tank (UST) was installed sometime between 1906 and 1912. Based on the age of this UST (approximately 85 to 90 years) and of the known historical site uses, it is likely that the UST was used to store fuel, possibly ranging in composition from kerosene to diesel. The UST was removed in September 1995 by Owens at the request of the ACDEH.

It was observed, at the time of tank removal, that a pipe leading from the base of the UST had been sheared. No water or product was observed emanating from the pipe. This pipe was assumed at the time to be either a fill or a supply line. The pipe was capped as directed by Susan Hugo of ACDEH.

Before tank removal, liquids from the tank were pumped out. During tank removal, a small amount of residual fuel oil was released into the excavation; this product also was pumped out and impacted soil excavated. A total of 54 tons of soil was excavated. Additional excavation was deemed not to be feasible due to site conditions and engineering constraints, and the excavation was backfilled upon approval by ACDEH.

In November 1995, Kleinfelder was retained to conduct a soil and groundwater investigation, based on a proposal/workplan dated September 29, 1995. Six soil borings were installed, and soil and groundwater samples were collected from these six borings. Based on field observations and apparent hydrocarbon impact near the former UST, one 6-inch diameter monitoring well (EW-1) was installed within ten feet of the former UST in the inferred downgradient direction. The newly installed well was developed and sampled in December of 1995. Results of soil and groundwater investigation were presented in Kleinfelder's report (submitted to ACDEH), dated January 29, 1996.

Following ACDEH review of the January 29, 1996 report, Alan Gibbs and Dan Carroll of Kleinfelder met with Ms. Susan Hugo of the ACDEH on February 29, 1996 to discuss the most cost-effective route to closure for the site. In that meeting, Kleinfelder agreed to sample monitoring well EW-1 to confirm the December 1995 analytical results, and to analyze one groundwater sample for polynuclear aromatic hydrocarbons (PAH's).

## **GROUNDWATER SAMPLING**

On March 8, 1996, monitoring well EW-1 was purged and sampled. Data collected from this final sampling event was intended to fulfill three objectives, based on the February 29, 1996 meeting: (1) to verify previous analytical results regarding the quality of groundwater underlying the site; (2) to collect additional data requested by ACDEH to assess the toxicity of diesel-range hydrocarbons in groundwater and separate phase petroleum hydrocarbons; and (3) to facilitate closure as a low-risk groundwater case. The location of the monitoring well is shown on Plate 2.

Prior to purging, a disposable bailer was lowered slowly into the well to check for separate phase petroleum hydrocarbons. No separate phase was observed. Monitoring well EW-1 was then purged using a dedicated 12-volt electric purge pump. (See Appendix A for the purge log.) A total of 45 gallons of groundwater was purged from the well, after which the well was dewatered. During purging, several small globules of oil were observed in purge water, but no sheen or separate phase petroleum product were observed. During recovery (prior to sampling), frequent depth-to-water measurements were recorded to document the low recharge rate of the six-inch diameter well. Results from the recovery test (March 8, 1996) are tabulated below.

**EW-1 RECOVERY TEST  
MARCH 8, 1996**

| <b>Time (minutes)</b> | <b>Depth to Water</b> |
|-----------------------|-----------------------|
| 0                     | 19.52                 |
| 3                     | 19.27                 |
| 7                     | 18.91                 |
| 11                    | 18.50                 |
| 20                    | 17.87                 |
| 33                    | 16.98                 |
| 48                    | 16.15                 |
| 55                    | 15.76                 |

Following purging and a minimum of 80% recovery, the groundwater was sampled using a disposable bailer. A purge log is enclosed as Appendix A. Kleinfelder's groundwater sampling protocol is included as Appendix B. One groundwater sample was collected and submitted to AEN laboratory for the following analyses: Total petroleum hydrocarbons quantified as gasoline (TPH-g) and benzene, toluene, ethylbenzene, and total xylenes (BTEX; EPA methods 8015 and 8020/5030); TPH quantified as kerosene, diesel, and motor oil (TPH-k/d/mo; EPA method 3510); and Polynuclear Aromatic Hydrocarbons (PAH's; EPA method 3520/8270).

Samples of drummed soil from previous investigation activities also were collected and submitted to AEN for analyses required by the soil/water recycling facility (REMCO), to comply with their waste receiving requirements. REMCO is the same facility that previously had received hydrocarbon-impacted soils excavated as part of source removal activities. Waste profiling samples were analyzed for pH (EPA method 9045); for Ignitability; and for five metals (cadmium, chromium, lead, nickel and zinc, EPA method 3050/6010), as required.

AEN laboratory is certified by the State of California for the soil and water analyses requested above.

### **ANALYTICAL RESULTS**

Analytical results from this event are tabulated in Table 1 along with historical groundwater sampling analytical results. Detected concentrations of the various hydrocarbon fractions in groundwater generally were consistent with previous analytical results. PAH's were not detected in the March 8, 1996 groundwater sample. Benzene also was not detected in the most recently collected sample. Benzene was detected in the December '95 groundwater sample from monitoring well EW-1 at a concentration of 0.7 micrograms per liter ( $\mu\text{g/L}$ ), slightly above the 0.5  $\mu\text{g/L}$  reporting limit.

Laboratory analytical reports for the first quarter 1996 sampling event along with chain-of-custody documentation are included as Appendix C.

Results from soil sample analysis are summarized in Table 2, along with historical soil analytical results from investigation activities. These analytical results were forwarded to REMCO. The investigation derived wastes have been approved by REMCO for Class II non-hazardous recycling.

## **CONCLUSION AND REQUEST FOR CLOSURE**

It is Kleinfelder's opinion that this site meets the criteria for a "low-risk groundwater" site based on the analytical results from the March 8, 1996 sampling of EW-1, and historical analytical results for soil and groundwater sampling conducted at the site. These low-risk site criteria were issued in January 1996 by the San Francisco Bay Regional Water Quality Control Board (RWQCB). In the RWQCB guidance, a low-risk groundwater site is defined as a site that meets six criteria. We will address each of these six criteria in the proceeding paragraphs.

**Number 1: The leak has been stopped and ongoing sources, including free product, have been removed or remediated.**

A UST apparently was installed at the site between 1906 and 1912, based on Sanborn Fire Insurance maps (Preliminary Site Assessment, Converse Environmental, July 29, 1994). The UST was removed in September 1995 by Owens at the request of ACDEH. After tank removal and prior to backfilling, a total of 54 tons of soil was excavated and transported to REMCO for treatment. Additional source removal was deemed not to be feasible due to site conditions and engineering constraints. These activities were overseen by ACDEH, and documented in a tank removal report previously submitted to ACDEH (Tank Removal Activity Report, SEMCO, October 1995). Monitoring well EW-1 is located within 10 feet of the former UST in the inferred downgradient direction. This well did not contain separate phase petroleum product during development, and product was not present in either the December '95 or March '96 sampling event. Kleinfelder believes that the source area and ongoing sources have been removed to the extent feasible.

**Number 2: The site has been adequately characterized.**

Kleinfelder conducted a soil and groundwater investigation at the site in 1995, as described earlier. Results were presented in Kleinfelder's January 29, 1996 Subsurface Investigation Report. The site characterization work conducted to date has not delineated soil and groundwater to non-detectable levels. However, the site now is adequately characterized to the extent necessary to determine if the site poses a threat to human health, the environment, or sensitive receptors nearby. No soil samples were found to contain petroleum hydrocarbons above 100 milligrams per kilogram (mg/kg), and only 2 of the 15 soil samples contained benzene, at concentrations of 0.0085 and 0.027 mg/kg.

A 36-inch diameter sewer main lies under the sidewalk at a depth of approximately 10 to 14 feet below ground surface (bgs), approximately 65 feet downgradient of the former UST. This underground feature apparently has acted historically as a groundwater cutoff, preventing hydrocarbon impacted shallow groundwater from migrating across 36th Street to the southwest.

**Number 3: The dissolved hydrocarbon plume is not migrating.**

The former UST at the site was estimated to be 85 to 90 years old. Given the age of the tank, it is likely that the petroleum release from this tank occurred decades ago. Since that time, hydrocarbons in subsurface soils and groundwater have been undergoing passive bioremediation. The "dissolved hydrocarbon plume" has had many years to stabilize and attenuate. Since source removal has been accomplished in association with tank removal, we now expect further attenuation.

**Number 4: No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted.**

Subsurface soils underlying the site and in close proximity to the former UST are low to medium plasticity clays and silty clays with interbedded fine sands and trace gravels. Recovery test data from the March 8, 1996 sampling event shows that groundwater production in first encountered groundwater at the site is very poor. First encountered water at the site is brackish (typical of sites near San Francisco Bay and in bay mud). First encountered water does not meet the criteria of an aquifer. Upgradient site uses are residential; downgradient site uses are industrial and freeway easement. Kleinfelder contacted Mr. Andreas Godfrey of the Alameda County Public Works Agency to conduct a well survey within one quarter mile of the subject site. The results are attached as Appendix D. These results indicate that 30 wells are recorded within one quarter mile. All of these wells are installed on UST leak sites.

Based on this information, and the absence of benzene and PAH's in source area groundwater, it is unlikely that hydrocarbons in groundwater from this site could have a significant adverse impact on a sensitive off-site receptor.

**Number 5: The site presents no significant risk to human health.**

Following tank removal, source area soils were sampled. One tank closure sample contained 21,000 mg/kg of TPH-d, prompting ACDEH to require the subsurface investigation conducted previously. Please note that the sample of concern did not contain detectable benzene. Following installation and development of monitoring well EW-1, a groundwater sample from the well was found to contain 0.7 µg/L of benzene (December 21, 1995). In the March 8, 1996 sample from the same well, benzene was not detected. Also in the March 8, 1996 sample, PAH's were not detected.

Human health risk at petroleum UST sites is associated primarily with benzene and PAH's. Benzene was detected in only 2 of 15 soil samples submitted for analysis (boring B-6 at 15 feet deep at 0.0085 mg/kg and boring EW-1 at 15 feet at 0.027 mg/kg). Although no formal

assessment of human health risk or exposure pathways has been conducted, it is apparent that toxic hydrocarbon constituents are not present beneath the site at concentrations that might pose a significant risk to human health.

**Number 6: The site presents no significant risk to the environment.**

The UST was removed from inside of the building on-site. Surrounding land uses are primarily residential in the upgradient direction, and commercial/light industrial to the west and south. The right-of-way to Interstate 580 is located across 36th street downgradient of the site. The UST release poses little risk to surface water, wetlands, or other sensitive receptors. Kleinfelder recommends that the existing monitoring well be abandoned in accordance with ACDEH and Water District requirements after site closure, following their approval.

In conclusion, Kleinfelder recommends no further investigation work at the site. We recommend closure of this site as a low-risk groundwater case, and proper abandonment of monitoring well EW-1.

## **LIMITATIONS**

This report was prepared in general accordance with the accepted standard of practice which exists in Northern California at the time the investigation was performed. It should be recognized that definition and evaluation of environmental conditions is a difficult and inexact art. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the conditions present. More extensive studies, including additional environmental investigations, can tend to reduce the inherent uncertainties associated with such studies. If the Client wishes to reduce the uncertainty beyond the level associated with this study, Kleinfelder should be notified for additional consultation.

Our firm has prepared this report for the Client's exclusive use for this particular project and in accordance with generally accepted engineering practices within the area at the time of our investigation. No other representations, expressed or implied, and no warranty or guarantee is included or intended.

This report may be used only by the client and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both onsite and offsite) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.

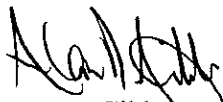
If you have any questions regarding this report or require additional information, please contact the undersigned at (510) 484-1700.

Sincerely,

**KLEINFELDER, INC.**



Daniel S. Carroll, P.E.  
Project Manager



Alan D. Gibbs, R.G., C.H.G.  
Environmental Manager

DSC:ADG:ks

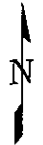
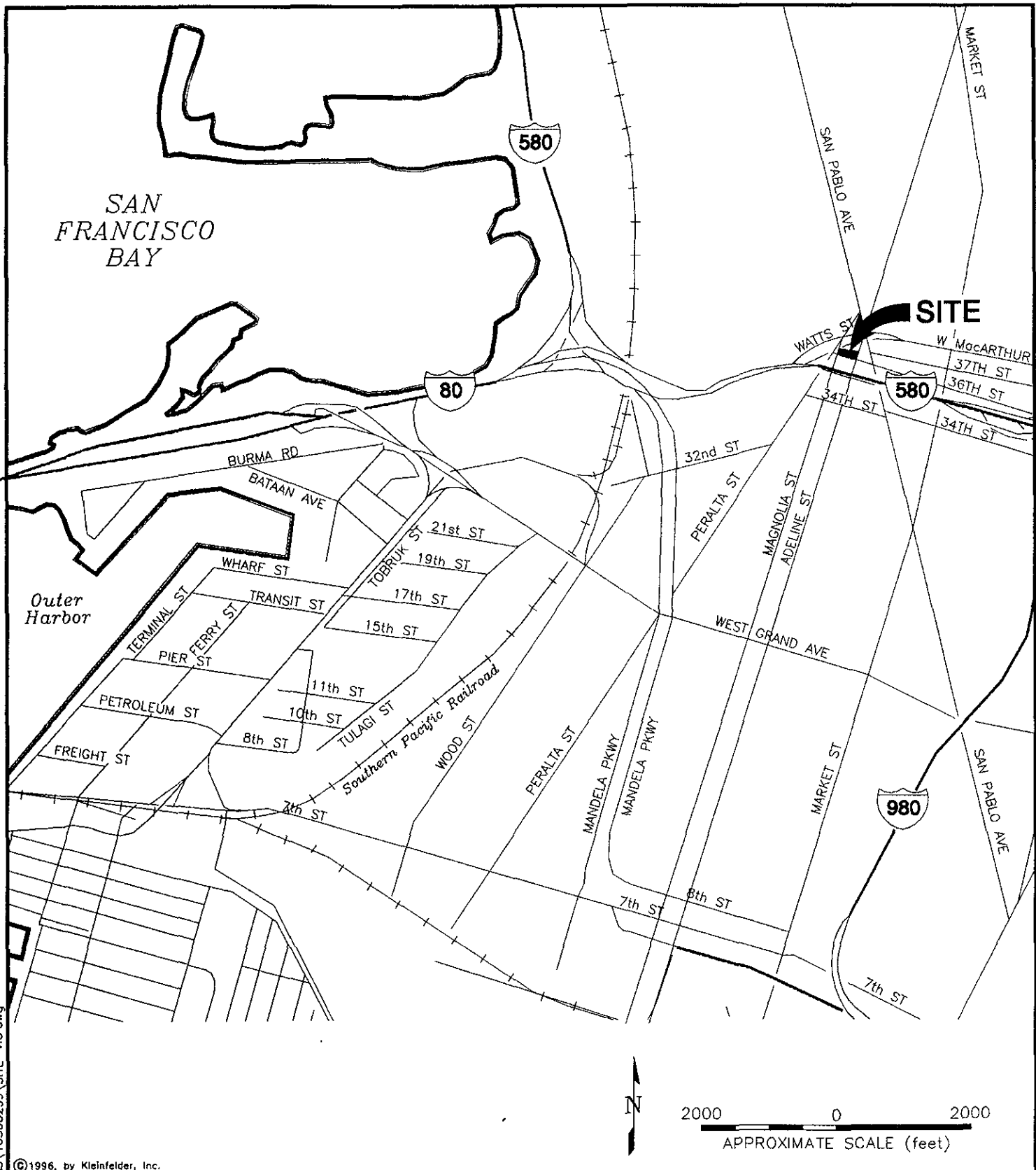
Attachments

cc: Mr. Scott Barde, Owens Financial Group

## PLATES

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2000 0 2000  
 APPROXIMATE SCALE (feet)

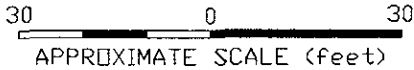
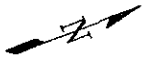
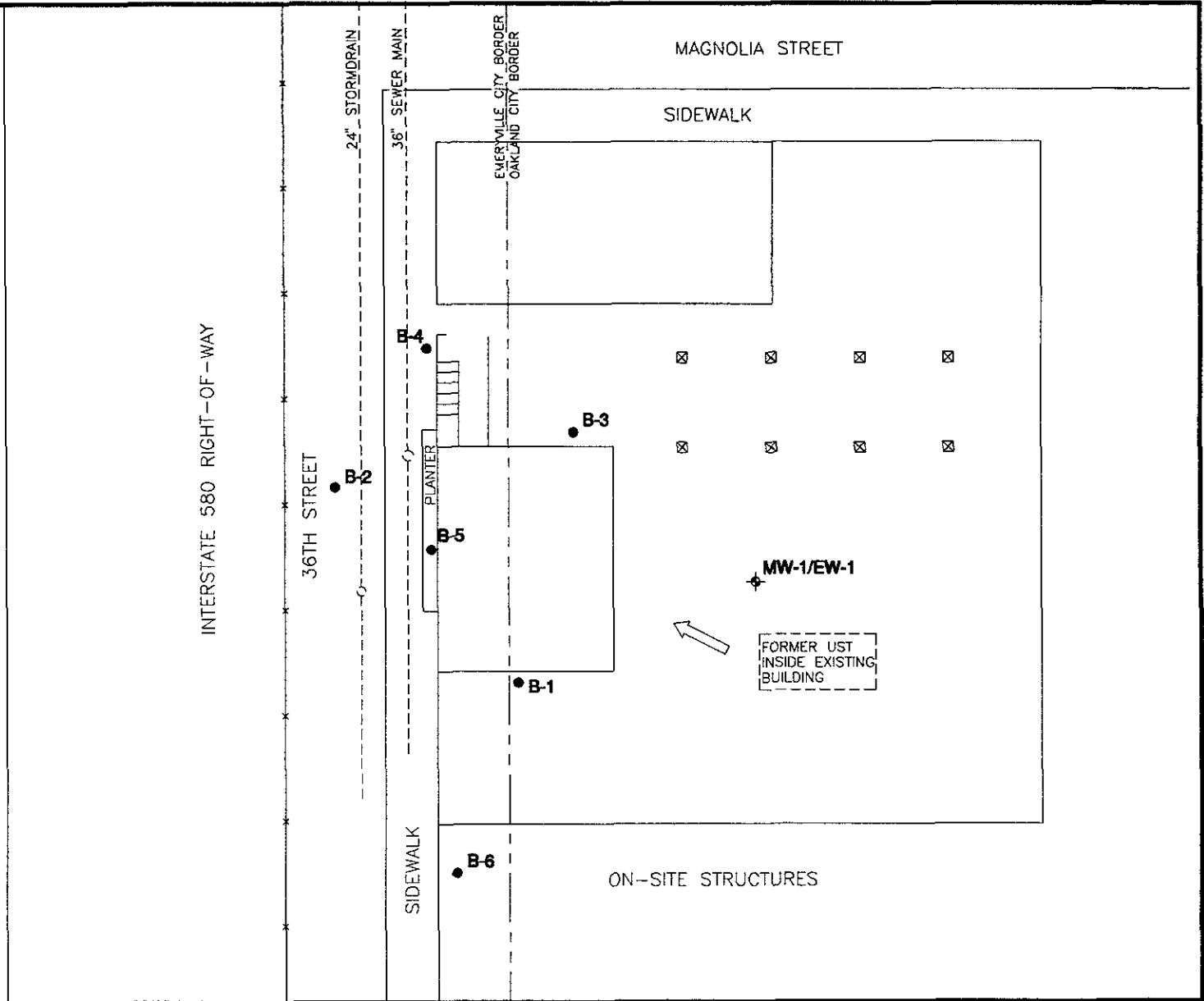
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CAD FILE: D:\-KA\_PROV\PLEAS\10300239\SITE-VIC.dwg

|   |               |  |  |          |
|---|---------------|--|--|----------|
|  |               | <b>SITE LOCATION MAP</b>   |  | PLATE    |
|   |               | OWENS FINANCIAL<br>3623 ADELINE STREET<br>EMERYVILLE, CALIFORNIA |  | <b>1</b> |
| DRAFTED BY: L. Sue  | DATE: 1-10-96 | PROJECT NO. 10-300239-001  |  |          |
| CHECKED BY: A. Gibbs  | DATE: 1-24-96 |  |  |          |

**LEGEND**

- \*— FENCE
- ☒ SUPPORT BEAM
- ☐ UNDERGROUND STORAGE TANK EXCAVATION
- ⊕ MONITORING WELL (approximate)
- SOIL BORING (approximate)
- ↙ ASSUMED GROUNDWATER GRADIENT



**SITE PLAN**

OWENS FINANCIAL  
 3623 ADELIN STREET  
 EMERYVILLE, CALIFORNIA

DRAFTED BY: L. Sue      DATE: 1-10-96

CHECKED BY: A. Gibbs      DATE: 1-29-96

PROJECT NO. 10-300239-001

PLATE

**2**

## TABLES

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**TABLE 1**  
**SUMMARY OF SOIL ANALYTICAL RESULTS**  
 3623 Adeline Street/1168 36th Street, Emeryville, California

| Boring No. | Sample Depth<br>(ft bgs) | Sample Date | Petroleum Hydrocarbons (8015M) |                  | Volatile Organics (8020) |                    |                         |                          | Metals (3050)      |                     |                 |                   |                 | RCI |
|------------|--------------------------|-------------|--------------------------------|------------------|--------------------------|--------------------|-------------------------|--------------------------|--------------------|---------------------|-----------------|-------------------|-----------------|-----|
|            |                          |             | TPH-d<br>(mg/kg)               | TPH-o<br>(mg/kg) | Benzene<br>(µg/kg)       | Toluene<br>(µg/kg) | Ethylbenzene<br>(µg/kg) | Total Xylenes<br>(µg/kg) | Cadmium<br>(mg/kg) | Chromium<br>(mg/kg) | Lead<br>(mg/kg) | Nickel<br>(mg/kg) | Zinc<br>(mg/kg) |     |
| EW-1       | 5.0                      | 11/14/95    | ND                             | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
|            | 9.5                      | 11/14/95    | 29                             | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
|            | 15.0                     | 11/14/95    | 56 <sup>a</sup>                | 55               | 27                       | 400                | 360                     | 1300                     | —                  | —                   | —               | —                 | —               | —   |
| B-1        | 5.0                      | 12/6/95     | ND                             | 16               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
|            | 10.0                     | 12/6/95     | 1.1 <sup>b</sup>               | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
|            | 15.0                     | 12/6/95     | 1.5 <sup>c</sup>               | ND               | 8.5                      | 22                 | 36                      | 91                       | —                  | —                   | —               | —                 | —               | —   |
| B-2        | 15.0                     | 12/6/95     | ND                             | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
| B-3        | 15.0                     | 12/6/95     | 1.4 <sup>d</sup>               | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
| B-4        | 5.0                      | 12/6/95     | ND                             | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
|            | 10.0                     | 12/6/95     | ND                             | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
|            | 15.0                     | 12/6/95     | 1.9                            | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
| B-5        | 5.0                      | 12/6/95     | ND                             | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
|            | 10.0                     | 12/6/95     | 1.1                            | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
|            | 15.0                     | 12/6/95     | 3.2                            | ND               | ND                       | ND                 | ND                      | ND                       | —                  | —                   | —               | —                 | —               | —   |
| B-6        | 15.0                     | 12/6/95     | 34 <sup>c</sup>                | ND               | ND                       | 30                 | 49                      | 88                       | —                  | —                   | —               | —                 | —               | —   |
| Drums      | —                        | 3/8/96      | —                              | —                | —                        | —                  | —                       | —                        | ND                 | 36                  | 10              | 45                | 8               | ND  |

**EXPLANATION**

ft bgs feet below ground surface.  
 mg/kg milligrams per kilogram ~ parts per million.  
 µg/kg micrograms per kilogram ~ parts per billion.  
 — not tested.  
 ND target analytes were not detected at or above the laboratory method reporting limit. See laboratory report for detection limits by analyte.  
 TPH total petroleum hydrocarbons quantified as noted below.  
 d = quantified as diesel  
 o = quantified as bunker oil                      k = quantified as kerosene  
 RCI reactivity, corrosivity, ignitability

**NOTES**

- a The sample appears to be a mixture of components which are both lighter and heavier than diesel. The hydrocarbon pattern representing the heavier fraction exhibits characteristics which are peculiar to fuel oil.
- b The result for the diesel range hydrocarbons is an unknown hydrocarbon consisting of a single peak.
- c The positive result appears to be a lighter hydrocarbon than diesel.
- d Laboratory reported the positive result as having an atypical pattern for diesel analysis



## APPENDIX A

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# KA KLEINFELDER

## WELL DEVELOPMENT & SAMPLING LOG

WELL NO. \_\_\_\_\_

Date: 3/8/96 Weather: COOL Sheet 1 of 1  
 Project: CWENS Submitted By: B. DETZ Date: \_\_\_\_\_  
 Project No.: 10-3002-39 Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Purpose of Log  Development  Sampling

|                             |                         |              |                          |              |                  |                       |           |           |
|-----------------------------|-------------------------|--------------|--------------------------|--------------|------------------|-----------------------|-----------|-----------|
| Equipment & Decontamination | Purging Equipment       | Bailer       | Disposable Bailer        | Suction Pump | Submersible Pump | <u>Dedicated Pump</u> | Other:    |           |
|                             | Sampling Equipment      | Bailer       | <u>Disposable Bailer</u> | Suction Pump | Submersible Pump | Dedicated Pump        | Other:    |           |
|                             | Test Equipment          | Water Level  |                          | pH           |                  | Conductivity          |           | Turbidity |
|                             | Meter No.               | <u>12185</u> |                          |              |                  |                       |           |           |
|                             | Calibration Date/Time   | NA           |                          |              |                  |                       |           |           |
|                             | Decontamination Methods | Wash         |                          | Rinse I      |                  | Rinse II              |           | Rinse III |
|                             | TSP                     | DI Tap       | Steam Hot                | DI Tap       | Steam Hot        | DI Tap                | Steam Hot | DI Tap    |
|                             | Alconox                 | Other        | Cool                     | Other        | Cool             | Other                 | Cool      | Other     |
|                             | Other:                  |              |                          |              |                  |                       |           |           |
|                             | Vol. (gal):             |              |                          |              |                  |                       |           |           |
| Source:                     |                         |              |                          |              |                  |                       |           |           |
| Decon. Notes:               | <u>N/A DISPOSAL</u>     |              |                          |              |                  |                       |           |           |

|   |                 |              |                   |                 |                                      |              |      |         |                 |    |
|---|-----------------|--------------|-------------------|-----------------|--------------------------------------|--------------|------|---------|-----------------|----|
| Well Security:  | good            | fair         | poor              | Well Integrity: | good                                 | fair         | poor | Locked: | yes             | no |
| Purge Volume (CV)   | T.D.            | -            | DTW               | x               | Factor                               | x            | 1 CV | =       | gal             |    |
| Well Diam.: <input type="checkbox"/> 2" <input type="checkbox"/> 4" | <u>25.35ft.</u> | -            | <u>10.38 ft.</u>  | x               | <u>2"= 0.175</u><br><u>4"= 0.663</u> | x            |      | =       | gal             |    |
| Free Product?: <u>odor</u>  | no              | <u>yes</u>   | Floating Product: | none            | <u>sheen</u>                         | film         |      |         | feet thick      |    |
| Time (24-hr)  | <u>1114</u>     | <u>1120</u>  | <u>1123</u>       | <u>1125</u>     | <u>1132</u>                          | <u>1140</u>  |      |         | Replicate Goals |    |
| Gallons Purged  | 0               | 10           | 18                | 25              | 35                                   | 45           |      |         | Goals           |    |
| Surged (minutes)  | ↑               |              | <u>16:10</u>      | <u>13:00</u>    | <u>22:00</u>                         |              |      |         | (dev. only)     |    |
| pH  | S               | <u>6.83</u>  | <u>6.76</u>       | <u>6.75</u>     | <u>6.72</u>                          | <u>6.72</u>  |      |         | ±0.10           |    |
| Temperature (°C)  | T               | <u>15°C</u>  | <u>15°C</u>       | <u>15°C</u>     | <u>15°C</u>                          | <u>15°C</u>  |      |         | ±1°C            |    |
| Cond. (µmhos/cm)  | A               | <u>1400</u>  | <u>1375</u>       | <u>1375</u>     | <u>1375</u>                          | <u>1375</u>  |      |         | ±10%            |    |
| Salinity (‰)  | R               | <u>.01%</u>  | <u>.01%</u>       | <u>.01%</u>     | <u>.01%</u>                          | <u>.01%</u>  |      |         | ±10%            |    |
| Turbidity (NTU's)   | T               |              |                   |                 |                                      |              |      |         | <50 NTUs        |    |
| Color   | ↓               | <u>DECLR</u> | <u>DECLR</u>      | <u>DECLR</u>    | <u>DECLR</u>                         | <u>DECLR</u> |      |         | Colorless       |    |
| Depth to Water  | <u>10.38</u>    |              |                   |                 |                                      |              |      |         | ±0.01'          |    |
| Reference Point:  | <u>ROC</u>      | Other:       |                   |                 |                                      |              |      |         |                 |    |

| Sample Log | Sample #    | Time        | Quantity | Volume   | Type       | Preserv.   | Filtration | Analysis    | Lab |
|------------|-------------|-------------|----------|----------|------------|------------|------------|-------------|-----|
|            | <u>3801</u> | <u>1306</u> | <u>1</u> | <u>2</u> | <u>AMB</u> | <u>HCL</u> |            | <u>TPAK</u> |     |
|            |             |             | <u>1</u> | <u>2</u> | <u>AMB</u> |            |            | <u>TPAD</u> |     |
|            |             |             | <u>1</u> | <u>2</u> |            |            |            |             |     |
|            |             |             |          |          |            |            |            |             |     |
|            |             |             |          |          |            |            |            |             |     |

Misc Other Observations: STRONG ODOR, FREE PRODUCT OBSERVED

Final Check: VOAs free of bubbles? (yes) / no / NA Well Locked? (yes) / no / NA

## **APPENDIX B**

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**APPENDIX B**  
**GROUNDWATER MEASURING AND SAMPLING PROTOCOL**

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**1. GROUNDWATER MONITORING**

**A. Water Level Measurements**

Groundwater levels are measured in each well prior to purging and sampling. Measurement protocol is as follows:

1. The wells are opened and allowed to equilibrate with the atmosphere.
2. If floating product is suspected, an interface probe or disposable bailer is used to detect the floating product. If present, the thickness is measured with the interface probe.
3. The water level probe is rinsed with distilled water prior to use in each well to reduce the risk of cross contamination.
4. Water level measurements are made using a conductivity-based water-level meter. Depth-to-water is generally measured from a surveyed mark on the north rim of the PVC well casing.

**B. Groundwater Sampling**

Groundwater samples are collected from the monitoring wells at the site. The sampling protocol for each well is as follows:

1. Down-well equipment (pumps, bailers, etc.) is decontaminated by steam cleaning, or by scrubbing in an Alconox wash, followed by a distilled water rinse, prior to use in each well. Bailer cord is replaced prior to use in each well.
2. The depth-to-water is measured using a conductivity-based water-level meter.
3. The volume of water standing in the well is calculated by subtracting the depth-to-water measurement from the depth of the well and multiplying by the appropriate conversion factor.
4. A minimum of four well volumes of water are purged from each well using a submersible pump or Teflon bailer unless a well dewater. Should a well dewater, it is allowed to recharge to at least 80% of the original well volume before sampling.

5. Physical parameters pH, specific conductivity, and temperature are monitored for stability during purging. The physical parameter measurements are recorded on purge-and-sample logs, along with the time and volume of water purged at each measurement. Purge water is contained in 55-gallon drums pending analytical results. The water is then disposed of appropriately under manifest control.
6. Samples are collected with a disposable bailer into appropriately prepared bottles provided by the analytical laboratory.
7. Samples are immediately labeled and placed in an iced sample container. Samples are delivered to the analytical laboratory under chain-of-custody control.

## **APPENDIX C**

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# American Environmental Network

## Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

KLEINFELDER, INC.  
7133 KOLL CENTER PARKWAY,  
SUITE 100  
PLEASANTON, CA 94566

ATTN: DAN CARROLL  
CLIENT PROJ. ID: 10-3002-39  
CLIENT PROJ. NAME: OWENS FINANC.  
C.O.C. NUMBER: 795  
P.O. NUMBER: R3392

REPORT DATE: 03/21/96

DATE(S) SAMPLED: 03/08/96

DATE RECEIVED: 03/08/96

AEN WORK ORDER: 9603124

### PROJECT SUMMARY:

On March 8, 1996, this laboratory received 2 (1 water & 1 soil) sample(s).

Client requested sample(s) be analyzed for chemical parameters. Portion for reactivity was subcontracted to a DOHS certified laboratory; subcontract report is included. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

  
Larry Klein  
Laboratory Director

## KLEINFELDER, INC.

SAMPLE ID: 3801  
 AEN LAB NO: 9603124-01  
 AEN WORK ORDER: 9603124  
 CLIENT PROJ. ID: 10-3002-39

DATE SAMPLED: 03/08/96  
 DATE RECEIVED: 03/08/96  
 REPORT DATE: 03/21/96

| ANALYTE                   | METHOD/<br>CAS# | RESULT | REPORTING<br>LIMIT | UNITS      | DATE<br>ANALYZED |
|---------------------------|-----------------|--------|--------------------|------------|------------------|
| BTEX & Gasoline HCs       | EPA 8020        |        |                    |            |                  |
| Benzene                   | 71-43-2         | ND     | 0.5                | ug/L       | 03/15/96         |
| Toluene                   | 108-88-3        | 7.2 *  | 0.5                | ug/L       | 03/15/96         |
| Ethylbenzene              | 100-41-4        | 0.6 *  | 0.5                | ug/L       | 03/15/96         |
| Xylenes, Total            | 1330-20-7       | 2.4 *  | 0.5                | ug/L       | 03/15/96         |
| Purgeable HCs as Gasoline | 5030/GCFID      | 1.0 *  | 0.05               | mg/L       | 03/15/96         |
| #Extraction for TPH       | EPA 3510        | -      |                    | Extrn Date | 03/14/96         |
| TPH as Diesel             | GC-FID          | 2.8 *  | 0.05               | mg/L       | 03/16/96         |
| TPH as Kerosene           | GC-FID          | 1.0 *  | 0.05               | mg/L       | 03/16/96         |
| TPH as Oil                | GC-FID          | 0.6 *  | 0.2                | mg/L       | 03/16/96         |
| #Extraction for PNAs      | EPA 3520        | -      |                    | Extrn Date | 03/11/96         |
| PNAs by EPA 8270          | EPA 8270        |        |                    |            |                  |
| Acenaphthene              | 83-32-9         | ND     | 10                 | ug/L       | 03/15/96         |
| Acenaphthylene            | 208-96-8        | ND     | 10                 | ug/L       | 03/15/96         |
| Anthracene                | 120-12-7        | ND     | 10                 | ug/L       | 03/15/96         |
| Benzo(a)anthracene        | 56-55-3         | ND     | 10                 | ug/L       | 03/15/96         |
| Benzo(b)fluoranthene      | 205-99-2        | ND     | 10                 | ug/L       | 03/15/96         |
| Benzo(k)fluoranthene      | 207-08-9        | ND     | 10                 | ug/L       | 03/15/96         |
| Benzo(g, h, i)perylene    | 191-24-2        | ND     | 10                 | ug/L       | 03/15/96         |
| Benzo(a)pyrene            | 50-32-8         | ND     | 10                 | ug/L       | 03/15/96         |
| Chrysene                  | 218-01-9        | ND     | 10                 | ug/L       | 03/15/96         |
| Dibenzo(a, h)anthracene   | 53-70-3         | ND     | 10                 | ug/L       | 03/15/96         |
| Fluoranthene              | 206-44-0        | ND     | 10                 | ug/L       | 03/15/96         |
| Fluorene                  | 86-73-7         | ND     | 10                 | ug/L       | 03/15/96         |
| Indeno(1,2,3-cd)pyrene    | 193-39-5        | ND     | 10                 | ug/L       | 03/15/96         |
| Naphthalene               | 91-20-3         | ND     | 10                 | ug/L       | 03/15/96         |
| Phenanthrene              | 85-01-8         | ND     | 10                 | ug/L       | 03/15/96         |
| Pyrene                    | 129-00-0        | ND     | 10                 | ug/L       | 03/15/96         |

ND = Not detected at or above the reporting limit

\* = Value at or above reporting limit

## KLEINFELDER, INC.

SAMPLE ID: 3802  
 AEN LAB NO: 9603124-02  
 AEN WORK ORDER: 9603124  
 CLIENT PROJ. ID: 10-3002-39

DATE SAMPLED: 03/08/96  
 DATE RECEIVED: 03/08/96  
 REPORT DATE: 03/21/96

| ANALYTE                   | METHOD/<br>CAS# | RESULT   | REPORTING<br>LIMIT | UNITS     | DATE<br>ANALYZED |
|---------------------------|-----------------|----------|--------------------|-----------|------------------|
| Corrosivity in soil (pH)  | EPA 9045        | 8.3      |                    | S.U.      | 03/18/96         |
| Ignitability in solid     | AEN             | NEGATIVE |                    | @         | 03/18/96         |
| #Digestion, Metals AA/ICP | EPA 3050        | -        |                    | Prep Date | 03/14/96         |
| Cadmium                   | EPA 6010        | ND       | 0.2 mg/kg          |           | 03/18/96         |
| Chromium                  | EPA 6010        | 36 *     | 0.5 mg/kg          |           | 03/18/96         |
| Lead                      | EPA 6010        | 10 *     | 1 mg/kg            |           | 03/18/96         |
| Nickel                    | EPA 6010        | 45 *     | 1 mg/kg            |           | 03/18/96         |
| Zinc                      | EPA 6010        | 8 *      | 1 mg/kg            |           | 03/18/96         |

Sample did not ignite or burn persistently when exposed to an open flame at atmospheric temperature and pressure.

ND = Not detected at or above the reporting limit

\* = Value at or above reporting limit

AEN (CALIFORNIA)  
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9603124

CLIENT PROJECT ID: 10-3002-39

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

0: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9603124  
 DATE EXTRACTED: 03/14/96  
 INSTRUMENT: C  
 MATRIX: WATER

Surrogate Standard Recovery Summary

| Date Analyzed | Client Id. | Lab Id. | Percent Recovery<br>n-Pentacosane |
|---------------|------------|---------|-----------------------------------|
| 03/16/96      | 3801       | 01      | 113                               |
| QC Limits:    |            |         | 59-118                            |

DATE EXTRACTED: 03/14/96  
 DATE ANALYZED: 03/14/96  
 SAMPLE SPIKED: 9602283-01  
 INSTRUMENT: A

Matrix Spike Recovery Summary

| Analyte | Spike Added<br>(mg/L) | Average Percent<br>Recovery | RPD | QC Limits        |     |
|---------|-----------------------|-----------------------------|-----|------------------|-----|
|         |                       |                             |     | Percent Recovery | RPD |
| Diesel  | 4.18                  | 83                          | 1   | 58-107           | 15  |

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.



QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9603124  
 INSTRUMENT: H  
 MATRIX: WATER

Surrogate Standard Recovery Summary

| Date Analyzed | Client Id. | Lab Id. | Percent Recovery Fluorobenzene |
|---------------|------------|---------|--------------------------------|
| 03/15/96      | 3801       | 01      | 98                             |
| QC Limits:    |            |         | 70-130                         |

DATE ANALYZED: 03/17/96  
 SAMPLE SPIKED: 9603134-04  
 INSTRUMENT: H

Matrix Spike Recovery Summary

| Analyte                  | Spike Added (ug/L) | Average Percent Recovery | RPD | QC Limits        |     |
|--------------------------|--------------------|--------------------------|-----|------------------|-----|
|                          |                    |                          |     | Percent Recovery | RPD |
| Benzene                  | 22.2               | 94                       | 5   | 85-109           | 17  |
| Toluene                  | 73.9               | 88                       | 4   | 87-111           | 16  |
| Hydrocarbons as Gasoline | 500                | 106                      | 2   | 66-117           | 19  |

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

## QUALITY CONTROL DATA

METHOD: EPA 8270

AEN JOB NO: 9603124  
 DATE EXTRACTED: 03/11/96  
 INSTRUMENT: 11  
 MATRIX: WATER

## Surrogate Standard Recovery Summary

| Date Analyzed | Client Id. | Lab Id. | Percent Recovery |                       |                              |                   |                       |                           |
|---------------|------------|---------|------------------|-----------------------|------------------------------|-------------------|-----------------------|---------------------------|
|               |            |         | 2-Fluoro-phenol  | Phenol-d <sub>5</sub> | Nitro-benzene-d <sub>5</sub> | 2-Fluoro-biphenyl | 2,4,6-Tri-bromophenol | Terphenyl-d <sub>14</sub> |
| 03/15/96      | 3801       | 01      | 78               | 86                    | 86                           | 72                | 103                   | 72                        |
| QC Limits:    |            |         | 21-100           | 10-94                 | 35-114                       | 43-116            | 10-123                | 33-141                    |

DATE EXTRACTED: 03/11/96  
 DATE ANALYZED: 03/16/96  
 SAMPLE SPIKED: LCS  
 INSTRUMENT: 11

## Laboratory Control Sample Recovery

| Analyte                   | Spike Added (ug/L) | Percent Recovery | QC Limits        |
|---------------------------|--------------------|------------------|------------------|
|                           |                    |                  | Percent Recovery |
| Phenol                    | 220                | 100              | 5-112            |
| 2-Chlorophenol            | 209                | 100              | 23-134           |
| 1,4-Dichlorobenzene       | 208                | 92               | 20-124           |
| N-Nitrosodi-n-propylamine | 212                | 106              | 0-230            |
| 1,2,4-Trichlorobenzene    | 209                | 92               | 44-142           |
| 4-Chloro-3-methylphenol   | 205                | 107              | 22-147           |
| Acenaphthene              | 202                | 109              | 47-145           |
| 4-Nitrophenol             | 216                | 112              | 0-132            |
| 2,4-Dinitrotoluene        | 211                | 100              | 0-112            |
| Pentachlorophenol         | 210                | 115              | 14-176           |
| Pyrene                    | 217                | 86               | 52-115           |

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

## QUALITY CONTROL DATA

AEN JOB NO: 9603124  
SAMPLE SPIKED: DI WATER  
DATE ANALYZED: 03/18/96  
MATRIX: WATER

## Method Spike Recovery Summary

| Analyte      | Inst./<br>Method | Spike<br>Added<br>(mg/L) | Average<br>Percent<br>Recovery | RPD | QC Limits           |     |
|--------------|------------------|--------------------------|--------------------------------|-----|---------------------|-----|
|              |                  |                          |                                |     | Percent<br>Recovery | RPD |
| Cd, Cadmium  | ICP/6010         | 10.0                     | 101                            | 1   | 83-109              | 10  |
| Cr, Chromium | ICP/6010         | 50.0                     | 104                            | 1   | 85-110              | 10  |
| Ni, Nickel   | ICP/6010         | 50.0                     | 103                            | <1  | 83-115              | 10  |
| Pb, Lead     | ICP/6010         | 50.0                     | 102                            | <1  | 80-116              | 10  |
| Zn, Zinc     | ICP/6010         | 50.0                     | 99                             | <1  | 81-109              | 10  |

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

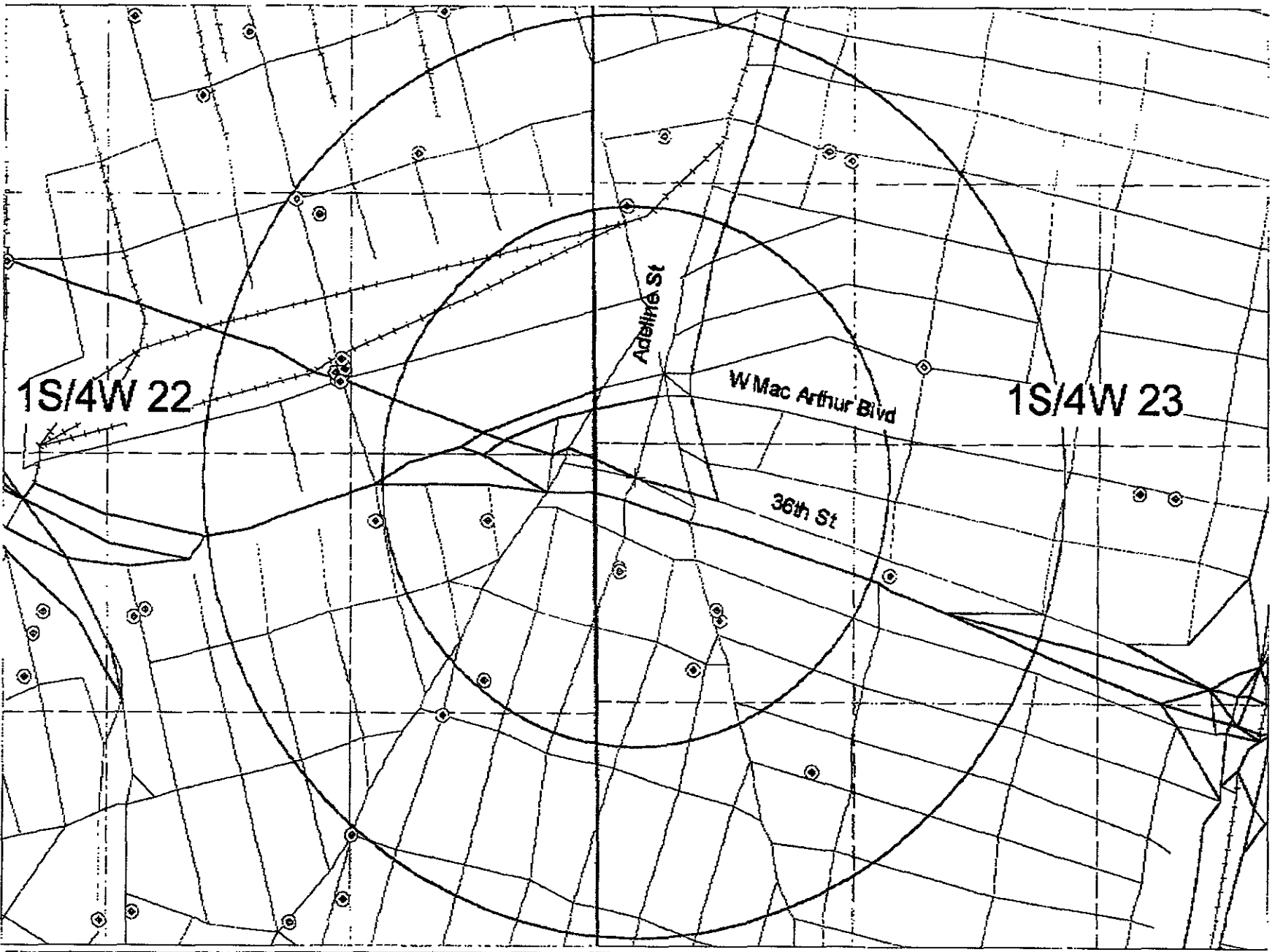
\*\*\* END OF REPORT \*\*\*

| PROJ NO<br>10.302-39                             |  | PROJECT NAME<br>OWENS FINAUCIAL                  |      | NO<br>OF<br>CON<br>TAINERS | ANALYSIS<br>TPHG + BTX<br>Cd, Cr, Pb, Zn, Ni (total)<br>TPHE<br>R.C.I.<br>TPHD<br>Cadmium<br>TPHMD<br>DNALS |                                 |             |   |   |   |   |  | REMARKS<br>R-3, S-3<br>R-5, S-D |
|--|--|--|------|----------------------------|---|---------------------------------|-------------|---|---|---|---|--|---------------------------------|
| LP NO<br>P.O. NO.<br>R-3592                      |  | SAMPLERS: (Signature/Number)<br>S. T. Kelly 2856 |      |                            | DATE<br>MM DD YY  | SAMPLE I D.<br>TIME<br>HH MM SS | SAMPLE I D. |   |   |   |   |  |                                 |
|  |  | 3/8/96   | 1306 | 3801                       | 01A-F   | 6                               | X           | X | X | X | X |  | STD T/A                         |
|  |  | ↓  | 1220 | 3802                       | 02A   | 4                               | X           | X | X |   |   |  | (SOIL) COMPOSIT 4X              |
| Run STLC only if totals are higher than 10X STLC |  |  |      |                            |   |                                 |             |   |   |   |   |  |                                 |

|  |                           |  |                             |   |
|--|---------------------------|--|-----------------------------|---|
| Relinquished by: (Signature)<br><i>S. T. Kelly</i> | Date/Time<br>3/8/96 11:39 | Received by: (Signature)<br><i>[Signature]</i> | Remarks<br>THANK YOU<br>AEN | Send Results To<br>D. CARROLL<br>KLEINFELDER<br>7133 KOLL CENTER PARKWAY<br>SUITE 100<br>PLEASANTON, CA 94566<br>(510) 484-1700 |
| Relinquished by: (Signature)                       | Date/Time                 | Received by: (Signature)                       |                             |   |
| Relinquished by: (Signature)                       | Date/Time                 | Received for Laboratory by (Signature)         |                             |   |

## **APPENDIX D**

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**1/4 MILE RADIUS**  
**04/11/1996**

| WELL #      | CITY | ADDRESS                | OWNER                | PHONE USE | DR. DATE | DIAM | TOT. DEPTH | DTW | ST. ELEV | WA. ELEV | YIELD | LOG | WQ | WL | DATA ORGN | MARGIN |
|-------------|------|------------------------|----------------------|-----------|----------|------|------------|-----|----------|----------|-------|-----|----|----|-----------|--------|
| 1S/4W 22J 1 | OAK  | 3423 HARLAN ST         | E. K. COSTOLLO       | 0 ABN     | /29      | 10   | 163        | 16  | 0        | 0        | 0 ?   | 0 2 |    |    |           | L      |
| 1S/4W 22J2  | OAK  | 3315 Magnolia St       | Clawson School       | 0 MON     | 6/91     | 2    | 21         | 10  | 98       | 88       | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 22J3  | OAK  | 3315 Magnolia St       | Clawson School       | 0 MON     | 6/91     | 2    | 22         | 12  | 98       | 0        | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 22J4  | OAK  | 3315 Magnolia St       | Clawson School       | 0 MON     | 6/91     | 2    | 21         | 12  | 100      | 0        | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 23N 1 | OAK  | 3516 ADELINE ST        | FRANK CHAMPION       | 0 LND     | /36      | 0    | 37         | 13  | 0        | 0        | 0 ?   | 0 2 |    |    |           | L      |
| 1S/4W 23N 2 | OAK  | 3400 SAN PABLO AVE     | ARCO PETROLEUM       | 0 TES     | 07/86    | 2    | 25         | 10  | 0        | 0        | 0 D   | 0 0 |    |    |           | L      |
| 1S/4W 23N 3 | OAK  | 3400 SAN PABLO AVE     | ARCO PETROLEUM       | 0 TES     | 07/86    | 2    | 25         | 10  | 0        | 0        | 0 D   | 0 0 |    |    |           | L      |
| 1S/4W 23N 4 | OAK  | 3400 SAN PABLO AVE     | ARCO PETROLEUM       | 0 TES     | 07/86    | 2    | 25         | 10  | 0        | 0        | 0 D   | 0 0 |    |    |           | L      |
| 1S/4W 23N 5 | OAK  | 3400 SAN PABLO AVE     | THRIFTY OIL          | 0 MON     | 11/86    | 4    | 15         | 6   | 0        | 0        | 0 G   | 0 0 |    |    |           | L      |
| 1S/4W 23N 6 | OAK  | 3400 SAN PABLO AVE     | THRIFTY OIL          | 0 MON     | 11/86    | 2    | 15         | 8   | 0        | 0        | 0 G   | 0 0 |    |    |           | L      |
| 1S/4W 23N 7 | OAK  | 3400 SAN PABLO AVE     | THRIFTY OIL          | 0 MON     | 11/86    | 2    | 15         | 9   | 0        | 0        | 0 G   | 0 0 |    |    |           | L      |
| 1S/4W 23N 8 | OAK  | 3400 SAN PABLO AVE     | THRIFTY OIL          | 0 MON     | 11/86    | 4    | 15         | 8   | 0        | 0        | 0 G   | 0 0 |    |    |           | L      |
| 1S/4W 23N 9 | OAK  | 3420 SAN PABLO AVE     | SHELL OIL CO.        | 0 MON     | 04/89    | 4    | 25         | 6   | 0        | 0        | 0 G   | 0 0 |    |    |           | L      |
| 1S/4W 23N10 | OAK  | 3420 SAN PABLO AVE     | SHELL OIL CO.        | 0 MON     | 04/89    | 4    | 19         | 6   | 0        | 0        | 0 G   | 0 0 |    |    |           | L      |
| 1S/4W 23N11 | OAK  | 3420 SAN PABLO AVE     | SHELL OIL CO.        | 0 MON     | 04/89    | 4    | 27         | 6   | 0        | 0        | 0 G   | 0 0 |    |    |           | L      |
| 1S/4W 23N12 | OAK  | 3420 SAN PABLO AVE     | SHELL OIL CO.        | 0 MON     | 04/89    | 4    | 25         | 6   | 0        | 0        | 0 G   | 0 0 |    |    |           | L      |
| 1S/4W 23N13 | OAK  | 3420 San Pablo Avenue  | Shell Oil Company    | 0 MON     | 1/90     | 4    | 25         | 8   | 21       | 13       | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 23N14 | OAK  | 3420 San Pablo Avenue  | Shell Oil Company    | 0 MON     | 1/90     | 4    | 20         | 8   | 22       | 14       | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 23N15 | OAK  | 3420 San Pablo Avenue  | Shell Oil Company    | 0 MON     | 1/90     | 4    | 20         | 9   | 21       | 12       | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 23N16 | OAK  | 3420 San Pablo Avenue  | Shell Oil Company    | 0 MON     | 1/90     | 4    | 20         | 7   | 21       | 14       | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 23N17 | OAK  | 34200 San Pablo Avenue | Shell Oil Company    | 0 MON     | 1/90     | 4    | 20         | 9   | 21       | 12       | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 23N18 | OAK  | 3400 San Pablo Avenue  | Thrifty Oil Company  | 0 MON     | 10/89    | 6    | 25         | 9   | 0        | 0        | 0 D   | 0 0 |    |    |           | D      |
| 1S/4W 23N19 | OAK  | 3420 San Pablo Ave     | Shell Oil Co.        | 0 TES     | 10/91    | 4    | 19         | 9   | 0        | 0        | 0 D   | 0 0 |    |    |           | D      |
| 1S/4W 23N20 | OAK  | 3420 San Pablo Ave     | Shell Oil Co.        | 0 TES     | 10/91    | 4    | 22         | 14  | 0        | 0        | 0 D   | 0 0 |    |    |           | D      |
| 1S/4W 23N21 | OAK  | 34th St. & Linden St.  | Dougco Metal Finish. | 0 MON     | 4/93     | 4    | 14         | 0   | 0        | 0        | 0 E   | 0 0 |    |    |           | D      |
| 1S/4W 23N22 | OAK  | 34th St. & Linden St.  | Dougco Metal Finish. | 0 MON     | 4/93     | 4    | 15         | 0   | 0        | 0        | 0 E   | 0 0 |    |    |           | D      |
| 1S/4W 23N23 | OAK  | 34th St. & Linden St.  | Dougco Metal Finish. | 0 MON     | 4/93     | 4    | 14         | 0   | 0        | 0        | 0 E   | 0 0 |    |    |           | D      |
| 1S/4W 23N24 | OAK  | 3516 Adeline St.       | Champion Estate      | 0 MON     | 10/92    | 2    | 30         | 14  | 0        | 0        | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 23N25 | OAK  | 3516 Adeline St.       | Champion Estate      | 0 MON     | 10/92    | 2    | 30         | 13  | 0        | 0        | 0 G   | 0 0 |    |    |           | D      |
| 1S/4W 23N26 | OAK  | 3516 Adeline St.       | Champion Estate      | 0 MON     | 10/92    | 2    | 30         | 14  | 0        | 0        | 0 G   | 0 0 |    |    |           | D      |

## WELL INVENTORY FILE

Definitions and abbreviations for items listed in the well inventory file are as follows:

**[WELLNO]** Well number - Wells are numbered according to their location in the rectangular system of the Public Land Survey. The part of the number preceding the slash indicates the township; the part following the slash indicates the range and section number; the letter following the section number indicates the 40-acre subdivision; and the final digit is a serial number for wells in each 40-acre subdivision.

**[DAT]** Date - The month and year when drilling or boring was completed.

**[ELEV]** Surface elevation - The surface elevation of the well, if known, in feet above mean sea level. A zero designates an unknown elevation.

**[TD]** Total depth - The depth of the well. This usually designates the completed well depth. If the well has a well log available on file, then the total drilled depth of the well is given. The inventory does not show total depth data for geotechnical borings. This is because only one state well number is assigned to one boring at a site, and there are usually several borings of different depth.

**[DTW]** Depth to water - This category usually indicates the standing groundwater level in the well on the date of completion. The "depth to first water encountered" is recorded in the inventory when it is the only water level data reported on the well driller's report.

**[USE]** Use - The well use (or in the case of cathodic protection wells and geotechnical borings, the reason for the excavation) as indicated in the well driller's report or data sheets. A plus sign (+) after the well use indicates a well in the current ACFC & WCD monitoring network.

**[ABN]** Abandoned well - A well whose use has been permanently discontinued or which is in such a state of disrepair that no water can be produced. In the inventory, this may include wells which are covered or capped but not properly destroyed.

**[CAT]** Cathodic protection well - Any artificial excavation constructed by any method for the purpose of installing equipment or facilities for the protection from corrosion by electrochemical methods of metallic equipment (usually piping) in contact with the ground; commonly referred to as cathodic protection.

**[DES]** Destroyed well - A well that has been properly filled so that it cannot produce water nor act as a vertical conduit for the movement of groundwater.

**[DOM]** Domestic well - A water well which is used to supply water for the domestic needs of an individual residence or systems of four or less service connections or "hookups".



**[EXT]** Extraction well - generally used in site remediation to extract contaminated water for treatment.

**[GEO]** Geotechnical boring - A temporary boring made to determine certain engineering properties of soils. An asterisk (\*) indicates that the state well number assigned to the boring represents more than one boring at a particular site.

**[INA]** Inactive well - A well not routinely operating but capable of being made operable with a minimum of effort. Also called a "standby well".

**[IND]** Industrial well - A well used to supply water for industrial use

**[INJ]** Injection well - reintroduces water into the aquifer for recharge

**[IRR]** Irrigation well - A water well used to supply water only for irrigation or other agricultural purposes. In the inventory, this category includes large capacity wells as well as small capacity wells for lawn irrigation.

**[MON]** Monitoring or observation well - Wells constructed for the purpose of observing or monitoring groundwater conditions. (see piezometer).

**[MUN]** Municipal well - A water well used to supply water for domestic purposes in systems subject to Chapter 7, Part 1, Division 5 of the California Health and Safety Code. Included are wells supplying public water systems classified by the Department of Health Services. (Also referred to as community water supply wells).

**[PIE]** Piezometer - A piezometer is a well specifically designated to measure the hydraulic head within a zone small enough to be considered a point as contrasted with a well that reflects the average head of the aquifer for the screened interval.

**[REC]** Recovery well - same as extraction well

**[STO]** Stock - A water well used primarily for livestock.

**[TES]** Test well and test hole - A test well is constructed for the purpose of obtaining the information needed to design a well prior to its construction. Such wells are not to be confused with "test holes" which are temporary in nature (i.e., uncased excavations whose purpose is the immediate determination of existing geologic and hydrologic conditions). Test wells are cased and can be converted to observation or monitoring wells, and under certain circumstances, to production wells. In the inventory, "TES" includes both test wells and test holes.

**[?]** Unidentified use - This indicates water wells whose use could not be ascertained from the available well data.

**[LOG]** Log - This category indicates whether a geologic record, or log, for the well or boring is available in the Agency's files. Abbreviations are as follows:

- D - well driller's log
- G - geotechnical boring log
- E - electric (resistivity) log or other subsurface geophysical logs.

**[WQ]** Water quality data available - This category indicates which wells have water quality data available in ACFC & WCD files. The numbers 1 through 9 signify the number of sets of water quality measurements available for that well. A plus sign (+) indicates that 10 or more sets of data are available. A "0" indicates that no data is available.

**[WL]** Water level data available - This category indicates which wells have water level data other than the data reported on the well driller's logs. The numbers 1 through 9 signify the number of water level measurements available. A plus sign (+) indicates that 10 or more measurements are available for that well. A "0" indicates that no data is available.

**[YLD]** Yield - The maximum pumping rate in gallons per minute that can be supplied by a well without lowering the water level in the well below the pump intake. This data is taken from pump test data recorded in the driller's records. Some of the yield data reflects current production rates and does not reflect maximum yield values determined in a capacity test.

**[DIA]** Diameter - The diameter in inches of the main casing in a well. May also indicate the diameter of a hand-dug well. Diameter data is not recorded for geotechnical borings.

