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***SUBSURFACE INVESTIGATION  
REPORT***

1107 5th Street  
Oakland, California

Prepared for:  
Mr. Reed Rinehart  
Rino Pacific  
P.O. Box 725  
Ukiah, California 95482

W.A. Craig, Inc.  
Project No. 3628  
January 17, 1997

ENVIRONMENTAL  
PROTECTION  
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**W. A. CRAIG, INC.**

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January 17, 1997

Mr. Reed Rinehart  
Rino Pacific  
P.O.Box 725  
Ukiah, California 95482

Project No. 3628.2

**Subject: REPORT - Subsurface Investigation**  
**1107 5th Street**  
**Oakland, California**

Dear Mr. Rinehart:

W.A. Craig, Inc., is pleased to submit this subsurface investigation report for the site located at 1107 5th Street in Oakland, California. This report summarizes the work performed to characterize soil and groundwater quality at the site.

We appreciate this opportunity to be of service to you on this project. If we can provide any further assistance, please don't hesitate to give us a call.

Respectfully,

W.A. Craig, Inc.

*William A. Craig, II*  
*For W.A. Craig, Inc.*

William A. Craig, II  
Principal

WAC:gaf

A:\SSIREPORT\CVRLTR.WPD

# PROFESSIONAL CERTIFICATION

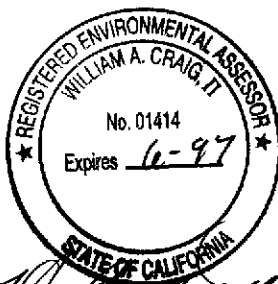
## *Subsurface Investigation Report*


1107 5th Street  
Oakland, California

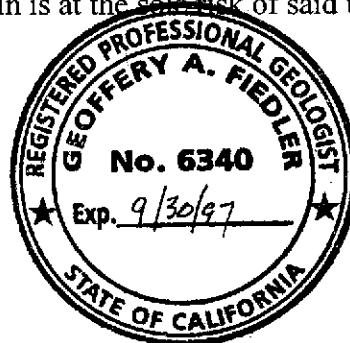
W.A. Craig, Inc.  
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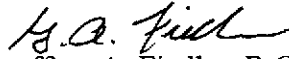
This report has been prepared by the staff of W. A. Craig, Inc., under the professional supervision of the persons whose seals and signatures appear hereon. No warranty, either expressed or implied, is made as to the professional advice presented herein. The analysis, conclusions and recommendations contained in this report are based upon site conditions as they existed at the time and location of the investigation and they are subject to change.

The conclusions presented in this report are professional opinions based solely upon visual observations of the site and vicinity, and interpretation of available information as described in this report. W.A. Craig, Inc., recognizes that the limited scope of services performed in execution of this investigation may not be appropriate to satisfy the needs, or requirements of state agencies, or of other users. Any use or reuse of this document or its findings, conclusions or recommendations presented herein is at the sole risk of said user.



  
W. A. Craig, II, REA  
Owner



  
Geoffery A. Fiedler, R.G.  
Geologist

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## EXECUTIVE SUMMARY

Soil samples collected during this investigation were analyzed for the presence of gasoline, diesel, BTEX, and MTBE. Diesel and gasoline have been detected in soil and groundwater samples although, gasoline is less prevalent in the southern portions of the site. The fuel dispensing islands and the UST areas are generally indicated as having elevated petroleum hydrocarbon concentrations and free product. Interbedded clay and an apparent low groundwater recovery in wells may retard the horizontal and vertical migration of the petroleum hydrocarbon constituents. Tidal influences may have caused short term changes in groundwater elevations, but did not greatly affect the direction of groundwater flow.

Groundwater depths were measured by WAC at depths of approximately 3 to 8 fbg. Petroleum product released from the fuel dispenser area, UST area, or product lines would potentially intercept shallow sandy soil, perched water, and groundwater in this depth interval.

MTBE was detected in some soil and groundwater samples at unusually high concentrations. In some locations MTBE was identified where no gasoline constituents were identified. WAC anticipates that gasoline constituents will eventually begin to appear or increase in concentration in these locations. Diesel has been detected in downgradient monitoring wells MW-1 and MW-3. The concentrations of diesel are at relatively low concentrations, however the downgradient extent of the diesel-impacted groundwater has not been assessed.

WAC recommends performing free product recovery from the existing recovery sumps at the site. The sumps appear to be adequately constructed to intercept product that may reside in product line trenches and the UST excavation area.

Additional investigation is recommended to assess soil and groundwater quality in offsite areas south and east of the site. The investigation of these areas should include adequate sampling locations and analyses to perform risk-based corrective action evaluations in accordance with recent Regional Water Quality Control Board guidance for the investigation and remediation of petroleum fuel release sites. The monitoring wells at the site should be monitored on a quarterly basis.

The sump located near monitoring well MW-3 should be closed. The material in the sump should be appropriately contained, characterized, and disposed. Groundwater stored in an on-site baker tank and stockpiled soil should be characterized and disposed.

## 1.0 INTRODUCTION

This report describes the work performed by W.A. Craig, Inc. (WAC), to assess soil and groundwater quality at 1107 5th Street, Oakland, California (site). The site location is shown on **Figure 1**. This investigation was performed in response to the request by Rino Pacific, Inc. for a soil and groundwater investigation. The scope of work described herein was performed to assess the site soil and groundwater quality with respect to the release of petroleum hydrocarbons from the underground storage tank system at the site. This investigation included ~~the drilling of seven exploratory soil borings, the installation and sampling of three groundwater monitoring wells,~~ the analyses of soil and groundwater samples, and the preparation of this report detailing the methods used and the findings of the investigation.

## 2.0 SITE HISTORY

### 2.1 Site Location and Description

The site is located on the southeast corner of Adeline and 5th Streets in Oakland, California (see **Figure 1**, Site Location Map). The site is currently operated as a tire service station, public scale, and a dispensing station for diesel and gasoline fuel. The site is paved with asphalt and concrete. The areas surrounding the site are commercially and industrially developed. The site topography is relatively flat with a slight slope to the south. The regional slope is toward the west. The site layout is shown on the site plan, **Figure 2**.

### 2.2 Background

The site was built approximately ~~40 years ago~~ and has been in operation throughout this period. The water table is reported to fluctuate between 10 inches and 4 feet below grade depending on the tides. The tanks were believed to have been replaced approximately 15 years ago. The current configuration of tanks is as follows: (1) 8,000 gal. regular unleaded tank (single wall steel), (1) 10,000 gal. Midgrade Unleaded tank (single wall steel), (2) 12,000 gal Diesel tanks manifolded (single wall steel). ~~The product lines are believed to be single wall steel. It is not known if the lines have been replaced since the original construction date.~~

All of the tanks were tightness tested in March of 1996, and passed. However, several disruptions in the UST system may have resulted in releases into the environment. ~~In mid 1995 an unauthorized release of gasoline occurred as a result of a leak in a fuel product line. The USTs associated with the release were removed from service. Interim cleanup of the spill was performed by pumping water and product from two product recovery trenches (Figure 2). WAC inspected the interior of the product recovery sumps associated with the trenches and noted the presence of approximately 1/4 inch of floating fuel product. It is WAC's~~

understanding that there have been no previous investigations of the site subsurface conditions.

### **2.3 Scope of Work**

This investigation was performed in accordance with WAC's work plan, dated September 16, 1996. WAC directed the drilling of seven exploratory soil borings and the installation of three groundwater monitoring wells on October 10, 1996. Details of the drilling, sampling, well installations, and the analysis of the groundwater samples are presented herein. The scope of work for this investigation included the following:

- Preparation of a site-specific health and safety plan for submittal to the Alameda County Health Services Agency;
- Obtaining appropriate permits and notifications prior to drilling the proposed, seven, boreholes and installing three monitoring wells;
- Collecting three soil samples per borehole for laboratory analysis;
- Constructing groundwater monitoring wells in three of the seven boreholes;
- Developing and sampling the monitoring wells;
- Analysis of soil and groundwater samples for total petroleum hydrocarbons as diesel (TPH-d) using EPA Method 8015 (modified); total petroleum hydrocarbons as gasoline (TPH-g) using EPA Method 8015 (modified); and benzene, toluene, ethylbenzene, xylenes (BTEX) and methyl tert-butyl ether (MTBE) using EPA Method 8020;
- Preparation of this soil and groundwater quality investigation report.

## **3.0 SUBSURFACE INVESTIGATION**

### **3.1 Drilling and Soil Sampling**

Seven exploratory soil borings were drilled on October 10, 1996, at the approximate locations shown on **Figure 2**. The soil borings were drilled to a depth of approximately 13.5 to 21-feet below grade (fbg) using a truck-mounted drill rig equipped with eight-inch outside diameter hollow-stem augers. The soil borings were drilled in the vicinity of the UST's and dispenser islands in an attempt to identify hydrocarbon impact on soil and groundwater at the site. The boreholes were logged in the field by a registered geologist. The soil boring logs are presented in **Appendix A**. The soil cuttings were added to an existing stockpile at the site and encapsulated in plastic. **Approximately 37 cubic yards (cy) of soil is stockpiled at the site.**

Soil samples were collected using a two-inch, inside-diameter, California Modified sampler. Undisturbed soil samples were collected in brass liners placed inside the sampler. Prior to the collection of each soil sample, all sampling equipment was washed with a laboratory

grade detergent solution and rinsed with tap water to reduce the potential for cross-contamination.

Soil samples were collected at approximate depth intervals of every 5 feet or based on noted changes in the subsurface such as the capillary fringe, soil type, stratigraphy, or where petroleum hydrocarbons were suspected. Soil samples collected for laboratory analysis were contained in brass liners and sealed with Teflon<sup>®</sup>-lined polyethylene end-caps. The soil samples were labeled, placed inside a sealed plastic bag, and immediately stored on ice inside a portable insulated container. The samples were submitted to McCampbell Analytical, Inc. (MAI), of Pacheco, California, under chain-of-custody control. MAI is certified by the State of California to perform the required analyses.

### **3.2 Subsurface Conditions**

The shallow soil below the site consists of thin beds of interbedded sand, silt, and clay. The contacts between these soils is generally sharp, but there is considerable lateral variation. In general, the western portion of the site is characterized by clay soils with interbedded sandy soils. The eastern portion of the site is characterized by sandy soils (see EB-5 and EB-7 logs). The clayey soils have a high organic material content, are generally highly plastic, and have a moderate hydrogen sulfide odor. The clay is relatively homogeneous with varying amounts of peat. Peat was encountered in soil at a depth of approximately 7 to 12 feet below grade (fbg) in soil boring EB-6.

The exploratory borehole locations and a cross-section of the site are shown on **Figures 2 and 3**. Cross-Section A-A' (**Figure 3**) was prepared to generally depict the subsurface soil layers encountered at the site. ~~The reader should note that cross-section A-A' is vertically exaggerated (approximately 8X) and, therefore, the soil layers appear disproportionately thick.~~ Detailed descriptions of the subsurface conditions are presented on the soil boring logs in **Appendix A**.

~~Perched water was encountered in sandy soils at depth of approximately 5 fbg in borings EB-1, EB-3, EB-4, and EB-6. This soil was generally noted as having a moderate to strong petroleum hydrocarbon odor.~~ *→ see logs*

### **3.3 Monitoring Well Installation and Sampling**

#### **3.3.1 Monitoring Well Construction**

Three exploratory boreholes (EB-1, EB-4, and EB-6) were converted to groundwater monitoring wells MW-1, MW-2, and MW-3, respectively. The well construction details are



presented on the logs of the soil borings in **Appendix A**. The monitoring wells were constructed of two-inch, 0.020-inch machine slotted, flush threaded, Schedule 40 polyvinyl chloride (PVC) well screen. All three of the well casings were constructed through the hollow-stem augers, with materials placed from the bottom of the borehole to the ground surface. Groundwater monitoring wells MW-1, MW-2 and MW-3 were constructed to depths of 20, 13, and 17 fbg, respectively. Ten feet of slotted well screen was used in the construction of MW-1. Monitoring wells MW-2 and MW-3 were constructed with 5 feet of well screen. The screened intervals were selected to isolate the first encountered water bearing unit from the shallow perched water. Blank PVC casing completed the wells from the top of the screened interval to surface grade. The screened section annulus was packed with clean graded sand (#3 Monterey) to a level approximately one-foot above the screened interval. A sanitary seal, consisting of approximately 18-inches of hydrated bentonite pellets, was placed above the sand pack. The remaining annulus was sealed from the bentonite seal to the ground surface using a portland cement/bentonite grout mixture. The wells were completed slightly above surface grade, with a protective-casing cover set in concrete to prevent surface water runoff from entering the monitoring wells.

### 3.3.2 Well Development

Monitoring wells MW-1, MW-2 and MW-3 were developed by WAC technical staff on October 21, 1996. Well development was accomplished by intermittent surging of the well casing and purging or bailing of groundwater. Prior to purging the wells, static groundwater levels were measured and recorded. Field parameters including odor, temperature, conductivity, pH, and turbidity were intermittently monitored during the development of the wells. Purged water was stored on-site in a labeled, sealed, DOT approved, steel drum. The field parameters measured during the well development were recorded on monitoring well development and sampling logs. Copies of the well development and sampling logs are included in **Appendix B**.

### 3.3.3 Groundwater Sample Collection - Monitoring Well Water Samples

Groundwater samples were collected after the development of the three wells on November 4, 1996. Generally, a minimum of three well casing volumes are purged from each monitoring well prior to collecting groundwater samples. However, due to slow groundwater recharge in MW-1 and MW-2 fewer than three well volumes were purged prior to sampling. Water levels and field parameters including odor, temperature, conductivity, pH, and turbidity were intermittently monitored and recorded on monitoring well sampling logs during purging of the wells. Copies of the logs are included in **Appendix C**.

Groundwater samples were collected using disposable polyethylene bailers. The bailers are pre-cleaned by the manufacturer and sealed in plastic. A clean bailer was lowered into each

well casing to extract groundwater samples. The water drawn from the well is decanted into laboratory supplied containers approved for the analyses required. The groundwater samples and trip-blank were immediately placed inside a portable insulated container, placed under refrigeration, and delivered to MAI under chain-of-custody control.

### 3.3.4 Groundwater Flow Conditions

On October 21, 1996, WAC technical staff measured water levels in the three monitoring wells, prior to developing the wells, using an electronic water level indicator. The monitoring well elevations were surveyed by a State-Licensed surveyor on October 31, 1996. A copy of the surveyor's report is included in **Appendix B**. The well elevations were surveyed relative to a City of Oakland datum located at the intersection of 3rd and Magnolia Streets. Water levels were also measured on the date of sampling, November 4, 1996.

The surveyed well elevations and field water level measurements were used to interpret the groundwater elevations at the site. The groundwater elevations indicate groundwater flow is ~~southeast (10/21/96) to south (11/4/96)~~ at gradients of 0.03ft/ft. and 0.01ft/ft, respectively. Groundwater elevation contour maps for these events are presented on **Figures 4 and 5**.

~~Groundwater was encountered during drilling at depths of approximately 8 to 12 fbg.~~ Static groundwater depths were measured in the monitoring wells during this investigation. The first measurement was made prior to development and the second was made prior to sampling. ~~The depth to groundwater varied from approximately 3 to 8 fbg.~~ Groundwater elevations measured in monitoring wells MW-1 and MW-3 on 10/21/96 were approximately 2 fbg lower than were measured on 11/4/96. The groundwater elevations measured in monitoring well MW-2 showed a comparatively slight change, 0.06 feet lower. ~~Monitoring wells MW-1 and MW-3 were noted as having slow groundwater recovery times.~~ Groundwater elevations for these monitoring events are presented in **Table 1**.

## **4.0 LABORATORY ANALYTICAL RESULTS**

Soil and groundwater samples were analyzed by McCampbell Analytical, Inc. (MAI), laboratory of Pacheco, California. MAI is certified by the State of California to perform the required analyses. The soil samples collected were analyzed for total TPH-d and TPH-g using EPA Method 8015 (modified), purgeable aromatic hydrocarbons (BTEX) and MTBE using EPA Method 8020. The groundwater samples collected from each of the wells were analyzed for all of the constituents above. The results of the laboratory analysis of the soil and groundwater samples collected during this investigation is presented in **Tables 2 and 3**, respectively.

#### **4.1 Soil Sample Analytical Results**

Three soil samples were collected from each of the seven borings. TPH-g and MTBE were not detected above the laboratory limits of detection in soil samples collected from borings EB-1 and EB-3. Samples from borings EB-2, EB-4, EB-5, EB-6 and EB-7 indicate elevated concentrations of TPH-g in the depth interval from 5 to 9 fbg. TPH-g concentrations in this interval ranged from below the limit of detection to 1,400 milligrams per kilogram (mg/kg). The soil samples analyzed from below 9 fbg are consistently one to two orders of magnitude lower in TPH-g concentration.

Elevated concentrations of TPH-d are present in similar distribution as previously described for TPH-g. TPH-d concentrations in the 5 to 9 fbg interval range from below detection limits to 28,000 mg/kg. The highest concentrations of TPH-g and TPH-d were reported for soil samples collected from borings EB-2, EB-4, and EB-5. Free petroleum fuel product was observed on the soil at a depth of approximately 5 fbg in soil boring EB-5.

MTBE was not detected in soil samples collected from borings EB-1, EB-2, and EB-3. The gasoline additive MTBE was detected in several soil samples (EB-4, EB-6, and EB-7) at concentrations that appear high in proportion to the respective TPH-g concentrations. Conversely, MTBE was not detected in samples from borings EB-5 and EB-2, where TPH-g was detected.

BTEX constituents were present at elevated concentrations and were similarly distributed as were the TPH-g and TPH-d. Benzene was not detected in soil samples collected from borings EB-1 and EB-2. Benzene was detected at relatively high concentrations in soil samples from borings EB-4, EB-5, and EB-7 (12 mg/kg, 3.5 mg/kg, and 1.5 mg/kg, respectively).

The soil sample analytical results are summarized in **Table 2**. The laboratory analytical reports and chain-of-custody forms are included in **Appendix D**.

#### **4.2 Groundwater Sample Analytical Results**

Groundwater samples were collected from each of the three monitoring wells at the site on November 4, 1996. TPH-g and BTEX were not detected above the laboratory limits in the groundwater samples collected from MW-1 and MW-3. TPH-g (910 ug/l), benzene (120 ug/l), toluene (23 ug/l), ethylbenzene (3.5 ug/l), and xylenes (51 ug/l) were detected in the groundwater samples from monitoring well MW-2. TPH-d was detected at concentrations of 220 and 310 micrograms per liter (ug/l) in groundwater samples from MW-1 and MW-3, respectively. TPH-d was reported at a concentration of 2,700 ug/l in the groundwater sample from MW-2. MTBE was not detected in the groundwater sample from MW-1. Groundwater

samples from monitoring well MW-2 and MW-3 were reported to contain MTBE at concentrations of 470,000 and 1,000 ug/l, respectively (both concentrations exceed the reported concentration of TPH-g reported at these locations [910 ug/l and not detected]).

The groundwater sample analytical results for the samples collected during this investigation are summarized in **Table 3**. The laboratory analytical reports and chain-of-custody forms are included in **Appendix D**. TPH-g, benzene, MTBE, and TPH-d concentrations in groundwater samples from each of the monitoring wells is shown on **Figure 2**.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Conclusions**

Petroleum fuel product from the UST system has been released to the shallow soil and groundwater. Diesel and gasoline have been detected in soil and groundwater samples although, gasoline is less prevalent in the southern portions of the site. The fuel dispensing islands and the UST areas are generally indicated as having elevated petroleum hydrocarbon concentrations and free product. The vertical migration of constituents appears to be limited to relatively shallow depths, less than 10 feet below grade. This condition appears to be the result of interbedded or interlaminated clay soils which generally retard the downward migration of the petroleum fuel constituents.

The wells at the site are slow to recover after pumping, suggesting the lateral migration of constituents in groundwater may be relatively slow. Water level fluctuations of approximately two feet have been observed in the southern portion of the site during this investigation. Water levels measured from monitoring well MW-2 were relatively unchanged between measurements. Tidal influences are suspected as having caused these fluctuations, although under the conditions observed during this investigation the direction of flow was relatively unchanged.

Groundwater depths were measured by WAC at depths of approximately 3 to 8 fbg. Petroleum product released from the fuel dispenser, UST area, or product lines would potentially intercept the shallow sandy soil, perched water, and groundwater in this depth interval.

~~The concentrations of MTBE are, in our experience, unusually high.~~ In our experience MTBE concentrations do not commonly exceed TPH-g concentrations to the degree observed in groundwater samples from this site. MTBE is a gasoline additive with chemical characteristics that have been reported to result in a higher mobility in soil and groundwater than gasoline or BTEX. ~~The MTBE concentrations reported in groundwater samples from monitoring wells~~

MW-2 and MW-3 greatly exceed Federal and State drinking water quality standards. WAC anticipates that TPH-g and BTEX constituents will eventually migrate to areas where the more mobile MTBE has been detected. MTBE has been detected in the downgradient monitoring well MW-3 although TPH-g has not been detected. The lack of MTBE may indicate the release of a TPH-g product that did not contain MTBE.

Diesel has been detected in downgradient monitoring wells MW-1 and MW-3. The concentrations of diesel are at relatively low concentrations, however the downgradient extent of the diesel-impacted groundwater has not been assessed.

## 5.2 Recommendations

WAC recommends performing free product recovery from the existing recovery sumps at the site. The sumps appear to be adequately constructed to intercept product that may reside in product line trenches and the UST excavation area. In our opinion, the soil and groundwater conditions at the site appear to be favorable for effective product recovery. The site conditions indicate relatively slow or restricted vertical and horizontal migration of the petroleum constituents. The shallow sandy soil in the perched water zone, and the product line and UST backfill materials are potential preferential flow pathways for the collection of free product.

Additional investigation is recommended to assess soil and groundwater quality in offsite areas south and east of the site. The investigation of these areas should include adequate sampling locations and analyses to perform risk-based corrective action evaluations in accordance with recent Regional Water Quality Control Board guidance for the investigation and remediation of petroleum fuel release sites. The monitoring wells at the site should be monitored on a quarterly basis.

The sump located near monitoring well MW-3 should be closed. The purpose of the sump is not apparent and the uncovered sump has collected an oily substance resembling motor oil. The material in the sump should be appropriately contained, characterized, and disposed. Groundwater stored in an on-site baker tank and stockpiled soil should be characterized and disposed.

**TABLE 1**  
**Groundwater Elevations**  
**1107 5th Street, Oakland, CA**

Well Number	Date	Top of Casing*	Depth to Water	Static Water Elevation
MW-1	10-21-96	3.84	5.08	-1.24
	11-04-96	3.84	3.02	0.82
MW-2	10-21-96	4.48	4.66	-0.18
	11-04-96	4.48	4.60	-0.12
MW-3	10-21-96	4.81	7.66	-2.85
	11-04-96	4.81	5.70	-0.89

**Notes:**      \* Elevations are based upon the City of Oakland Datum #16NW15.  
All elevations/depths measured in feet.

*~2' Δ in water levels  
in MW # 3 from Oct to Nov.*

**TABLE 2**  
**Soil Sample Analytical Results**  
**1107 5th Street, Oakland, California**  
**Analytical Results in milligrams per kilogram**

Soil Samples	Depth in feet	DTW Date	ANALYTES						
			Diesel	TPH-g	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes
EB-1	9	10-10-96	ND	ND	ND	ND	ND	ND	ND
EB-1	13	5'	ND	ND	ND	ND	ND	ND	ND
EB-1	19.5		3.4	ND	ND	ND	ND	ND	ND
EB-2	5		1,600	200	ND	ND	ND	ND	0.2
EB-2	9	9'	ND	ND	ND	ND	ND	ND	ND
EB-2	13		14	1.5	ND	ND	0.009	ND	0.007
EB-3	9.5	5'	1.8	ND	ND	0.018	0.038	0.007	0.027
EB-3	13		ND	ND	ND	0.017	0.052	0.009	0.038
EB-3	16		1.9	ND	ND	0.012	0.042	0.009	0.041
EB-4	5	5' stable 1st gw	2.1	6.1	83	0.97	0.94	0.1	0.44
EB-4	9		1,100	470	100	12	47	12	63
EB-4	12.5		5.9	1.7	0.34	0.035	0.14	0.03	0.15
EB-5	4.5	8'	28,000	1,400	ND	3.5	12	9.4	25
EB-5	8.5		5,000	610	ND	1.2	1.4	5	2.2
EB-5	12.5		15	ND	0.2	0.03	0.007	0.011	0.008
EB-6	4.5	8' stable 1st gw	390	7.8	1.9	0.13	ND	ND	0.027
EB-6	9		2	ND	ND	ND	ND	ND	ND
EB-6	12.5		ND	ND	ND	ND	ND	ND	ND
EB-7	4.5	13'	3.7	1.6	0.13	0.18	0.018	0.03	0.063
EB-7	8.5		3.9	18	2.3	1.5	1.7	0.27	1.3
EB-7	12.5		ND	1	0.15	0.12	0.075	0.027	0.11

ND = Not detected at the laboratory limit of detection.

at 6' PP in soil  
 See lab rpt for footnotes  
 max

**TABLE 3**  
**Groundwater Sample Analytical Results**  
**1107 5th Street, Oakland, California**  
**Analytical Results in micrograms per liter**

Sample	Date	ANALYTES						
		Diesel	TPH-g	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes
MW-1	11-04-96	220	ND	ND	ND	ND	ND	ND
MW-2		2,700	910	470,000	120	23	3.5	51
MW-3		310	ND	1,000	ND	ND	ND	ND
California MCL		None Listed	None Listed	0.040*	0.001	0.15	0.68	1.75

**Notes:**

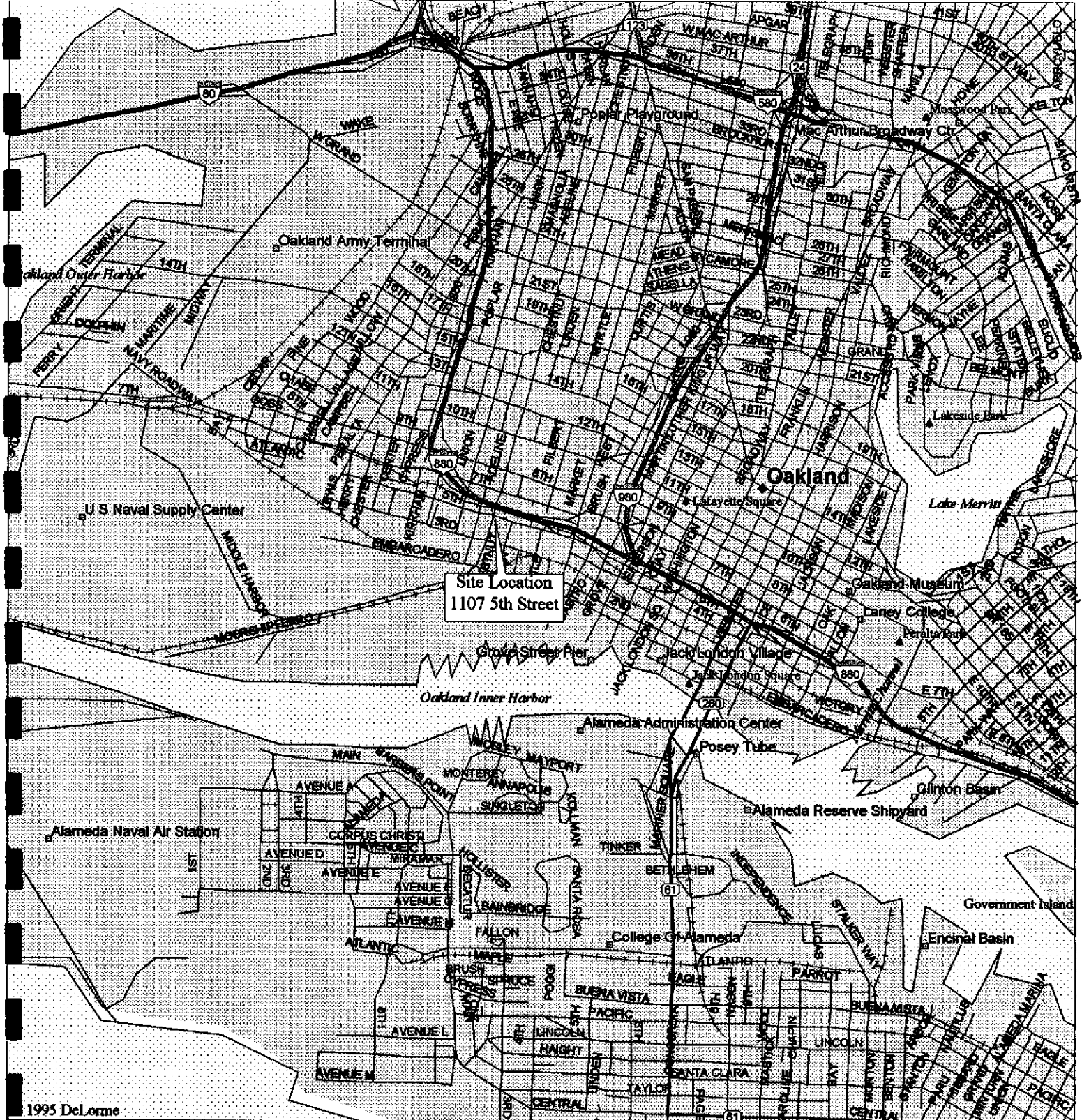
ND = Not detected at the laboratory reported limit of detection.

MW = Sample collected from monitoring well.

MCL = Maximum Contaminant Level, Drinking Water Standards and Health Advisories  
EPA document dated August, 1995.

\*California Water Quality Goals-Organic Constituents, Human Health and Welfare, Mars  
September 1991.





1995 DeLorme

Mag 14.00  
 Date Nov 26 16:02 1996

Scale 1:31,250 (at center)  
 2000 Feet



Checked by: CAT 1/15/97

Project No. 3628  
 January 1997

**SITE LOCATION MAP**  
 Rino Pacific  
 1007 5th Street  
 Oakland, California

Figure 1



**W. A. CRAIG, INC.**  
 Environmental Contracting and Consulting

P.O. Box 448  
 Napa, California 94559-0448  
 Cal License #455752

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 FAX (707) 252-3385



5th Street

Adeline Street

Sidewalk

Scale

EB-2

EB-4  
2,700  
910/120  
470,000

EB-5

Diesel/Gas  
Dispensers

Diesel Dispenser

Diesel Dispenser

EB-3

Recovery Wells

EB-1  
220  
ND/ND  
ND

Container

Container

Container

Fire Sales Building

Sump

Container

Baker Tank

EB-7

Accessible Lane

Olivers Hof Brau  
360 Adeline

EB-6  
310  
ND/ND  
1,000

Soil Stockpiles (approx. 35 cy)

Parking lot

**EXPLANATION**

--- Location of UST's

⊙ EB -1 Exploratory Boreholes

⊙ Monitoring Wells

Results of Groundwater Sample Analyses

~~ND/ND~~

~~ND/ND~~

MTBE = 1,000

(Concentrations Reported in Micrograms Per Liter)



Approximate Scale: 1 inch = 30 Feet

Checked by: GAF 1/15/97



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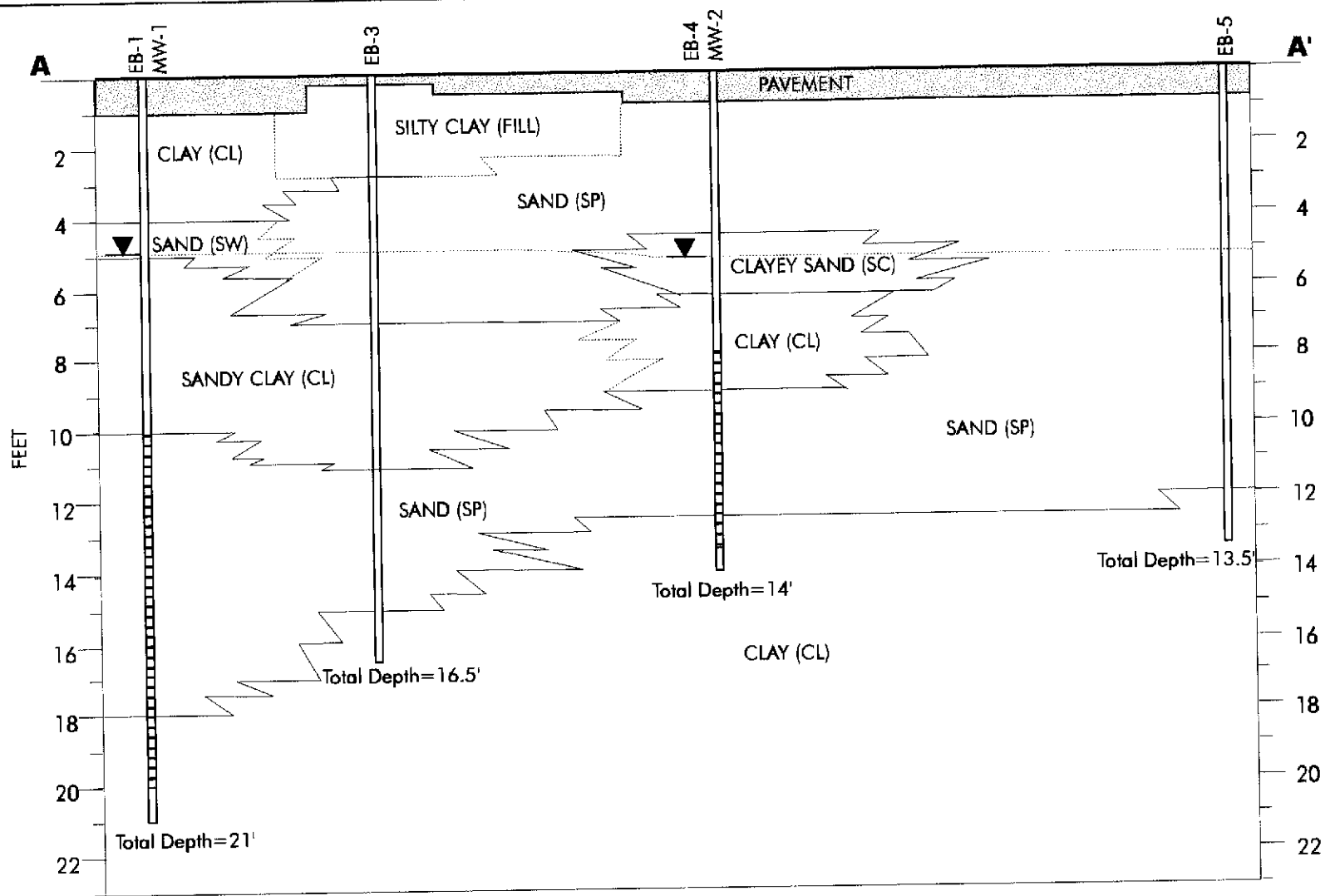
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Project No. 3628.2  
January 1997

**SITE PLAN**  
Rino Pacific  
1107 5th Street  
Oakland, CA

**Figure 2**



**EXPLANATION**

- Contact Between Soil Types (Dashed where Inferred)
- Screened Interval of Well
- Static Water Level Measured in Well



Horizontal Scale: 1 inch = 30 Feet  
(Approximately 8x Vertical Exaggeration)

Checked by: GAF 1/15/97

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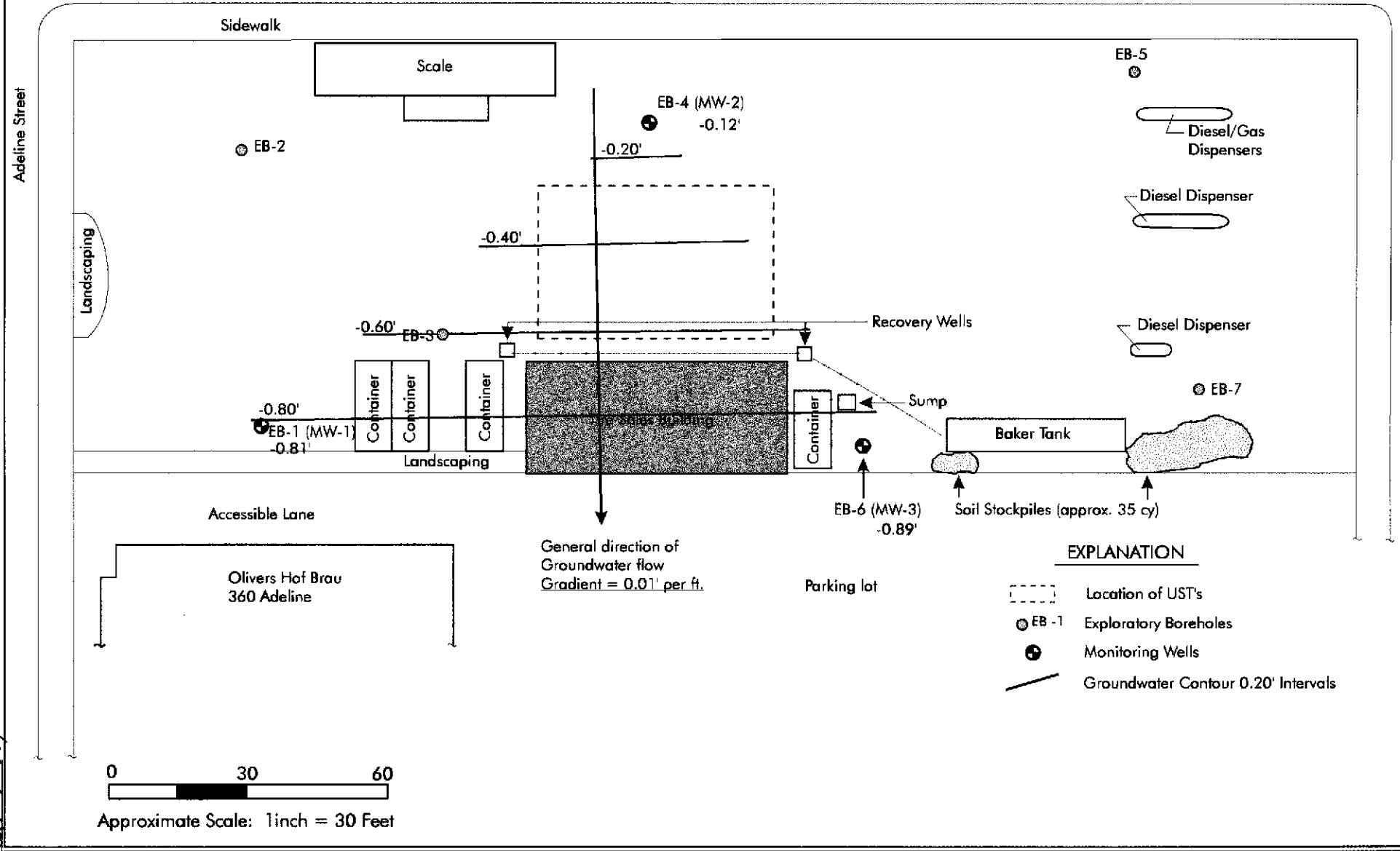
Project No. 3628.2  
January 1997

**CROSS SECTION A - A'**  
Rino Pacific  
1107 5th Street  
Oakland, CA

**FIGURE 3**



5th Street



Checked by: C.A.F. 1/15/97

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**Groundwater Contour 11/4/96**  
Rino Pacific  
1107 5th Street  
Oakland, CA

Project No. 3628.2  
January 1997

**Figure 5**

**APPENDIX A**  
**SOIL BORING LOGS**



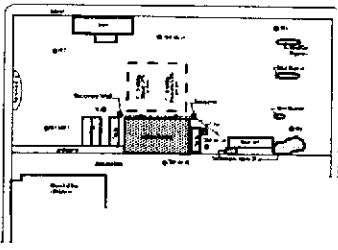
# DRILLING LOG



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Environmental Contracting and Consulting

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 Cal License #455752 FAX (707) 252-3385



<b>PROJECT:</b> Rinehart 1107 5th Street, Oakland, CA		<b>PROJECT NO.</b> 3628.2	<b>BORING NO:</b> EB-2
<b>DRILLING CONTRACTOR:</b> V&W, Inc.		<b>START TIME:</b>	<b>DATE:</b> 10/10/96
<b>DRILLING METHOD:</b> Hollow Stem Auger - 8 inch		<b>TOTAL DEPTH:</b> 13.5'	<b>DEPTH TO WATER:</b> Encountered ~9'
<b>SAMPLER:</b> 2 inch Calif. Modified		<b>SCREEN INT.:</b>	<b>CASING:</b>
<b>HAMMER WEIGHT:</b> 140 lb. <b>DROP:</b> 30 inches		<b>FIELD GEOLOGIST:</b> Jeff Fiedler	

DEPTH	SAMPLE NO	SAMPLE BLOWS/ 0.5 FOOT	PID (ppm)	Recovery	BORING/ WELL CONST.	LITHOLOGIC LOG	USCS DESCRIPTION Classification, Color, Density, Moisture
5	EB-2 @5'	4 85	60	10'			<b>Concrete</b> <b>Clay (CL)</b> , greenish gray, high plasticity, soft, homogeneous, damp, slight hydrocarbon odor Refusal at 18" below grade, possibly concrete fill
10	EB-2 @9'	2 48	5	18'			<b>Sandy Clay (CL)</b> , mottled olive gray to dark gray, stiff, moderate plasticity, moist
15	EB-2 @13'	4 61	2	18'			<b>Grades olive gray</b> <b>Sand (SP)</b> , olive gray, loose, fine grained, homogeneous, wet
20							
25							
30							
35							
40							

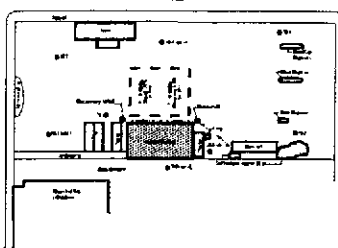
# DRILLING LOG



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Environmental Contracting and Consulting

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 Napa, California 94559-0448 (707) 252-3353  
 Cal License #455752 FAX (707) 252-3385



<b>PROJECT:</b> Rinehart 1107 5th Street, Oakland, CA	<b>PROJECT NO.</b> 3628.2	<b>BORING NO:</b> EB-3
<b>DRILLING CONTRACTOR:</b> V&W, Inc.	<b>START TIME:</b>	<b>DATE:</b> 10/10/96
<b>DRILLING METHOD:</b> Hollow Stem Auger - 8 inch	<b>TOTAL DEPTH:</b> 16.5'	<b>DEPTH TO WATER:</b> Encountered ~11'
<b>SAMPLER:</b> 2 inch Calif. Modified	<b>SCREEN INT.:</b>	<b>CASING:</b>
<b>HAMMER WEIGHT:</b> 140 lb. <b>DROP:</b> 30 inches	<b>FIELD GEOLOGIST:</b> Jeff Fiedler	

DEPTH	SAMPLE No	SAMPLE	BLOWS/ 0.5 FOOT	PID [ppm]	Recovery	BORING/ WELL CONST.	LITHOLOGIC LOG	USCS DESCRIPTION Classification, Color, Density, Moisture
5			8		0		*	<b>Asphalt</b> Fill Silty Sand (SM), greenish black, loose, fine grained, damp, fibrous wood fragments, diesel odor
			8				.	Sand (SP), olive black, loose, moist, diesel odor
10	EB-3 @9.5'		4		18"	▽ 10/10	/	Sandy Clay (CL), olive gray, stiff, moderate plasticity, some interlaminated sand (SP), moist-wet
			8				.	Sand (SP), olive gray, loose fine grained, wet, trace diesel odor
15	EB-3 @13'		9		18"		*	
			1		20"		.	
			2		18"		/	Clay (CL), bay mud dark greenish gray, soft, high plasticity, moist, grasses and rootlets, moderate H2S odor
	EB-3 @16'		5				*	
			6		0		.	
20							.	
25							.	
30							.	
35							.	
40							.	







# DRILLING LOG

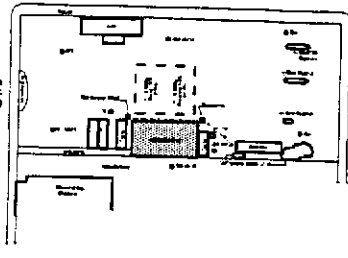


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**PROJECT:** Rinehart  
1107 5th Street, Oakland, CA

**PROJECT NO.** 3628.2

**BORING NO:** EB-6 (MW-3)

**DRILLING CONTRACTOR:** V&W, Inc.

**START TIME:**  
**FINISH TIME:**

**DATE:** 10/10/96

**DRILLING METHOD:** Hollow Stem Auger - 8 inch

**TOTAL DEPTH:** 17'

**DEPTH TO WATER:** Encountered ~12'

**SAMPLER:** 2 inch Calif. Modified

**SCREEN INT.:** 12-17ft 0.020" slot

**CASING:** SCH 40 PVC - 2"

**HAMMER WEIGHT:** 140 lb. **DROP:** 30 inches

**FIELD GEOLOGIST:** Jeff Fiedler

DEPTH	SAMPLE NO	SAMPLE BLOWS/ 0.5 FOOT	PID [ppm]	Recovery	BORING/ WELL CONST.	LITHOLOGIC LOG	USCS DESCRIPTION Classification, Color, Density, Moisture
							Asphalt
							Sand (SP) with silt, dusky brown, loose, fine grained, moist, diesel odor
5	EB-6 @4.5'	0	18'				Sand (SP) with silt, olive gray, loose, fine grained, damp-moist, trace diesel odor
					10/21		Peat with bay mud, moderate brown, soft, damp, H2S odor
10	EB-6 @9'	10	18'				
					10/10		Silty Sand (SM), dark gray, loose, fine grained, homogeneous, wet, rootlets, slight H2S odor
15	EB-6 @12.5'	0	18'				
							Sandy Clay (CL), mottled olive gray, stiff, high plasticity, homogeneous, damp, trace rootlets
20							
25							
30							
35							
40							

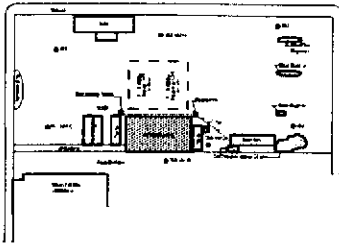
# DRILLING LOG



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<b>PROJECT:</b> Rinehart 1107 5th Street, Oakland, CA		<b>PROJECT NO.</b> 3628.2	<b>BORING NO:</b> EB-7
<b>DRILLING CONTRACTOR:</b> V&W, Inc.		<b>START TIME:</b>	<b>DATE:</b> 10/10/96
<b>DRILLING METHOD:</b> Hollow Stem Auger - 8 inch		<b>TOTAL DEPTH:</b> 13.5'	<b>DEPTH TO WATER:</b> Encountered ~12.5'
<b>SAMPLER:</b> 2 inch Calif. Modified		<b>SCREEN INT.:</b>	<b>CASING:</b>
<b>HAMMER WEIGHT:</b> 140 lb. <b>DROP:</b> 30 inches		<b>FIELD GEOLOGIST:</b> Jeff Fiedler	

DEPTH	SAMPLE No	SAMPLE	BLOWS/ 0.5 FOOT	PID (ppm)	Recovery	BORING/ WELL CONST.	LITHOLOGIC LOG	USCS DESCRIPTION <small>Classification, Color, Density, Moisture</small>	
5	EB-7 @4.5		4 6 14	120	18"			<b>Concrete</b> <b>Silty Sand (SM)</b> , grayish black, loose, fine grained, damp, moderate diesel odor  <b>Silty Sand (SM)</b> , trace clay, olive gray, trace light greenish gray stringers, medium dense, fine grained, damp, moderate gasoline odor	
10	EB-7 @8.5		6 11 19	60	18"				<b>Clay (CL)</b> , bay mud dark greenish gray, soft, high plasticity, moist, grasses and rootlets, moderate diesel odor
15	EB-7 @12.5		16 22 20	0	18"				
10/10									

**APPENDIX B**

**SURVEYOR'S REPORT**

# SAMUEL KUSHNER

LICENSED LAND SURVEYOR

21 Diaz Place  
Oakland, CA 94611  
(510) 339-1728

October 31, 1996

W. A. Craig, Inc.  
P.O. Box 448  
Napa, CA 94559-0448

Attn: David Orr

Re: Rinehart Oil, Inc., 1107 - 5th Street, Oakland  
Your No. 3628.2

Dear Sirs,

Below are listed the locations and elevations for the monitoring wells and borings at the above referenced site as determined by our field visit of October 31, 1996.

The horizontal relationship is the distance easterly along the back of sidewalk line of 5th St., starting at Adeline St. and offset right or southerly from that line. Points 2013 and 2014 are the front corners of the concrete block building on the site.

## BSW Line, 5th St.

From BSW Adeline

Pt	Distance	Offset
eb1	39.7	81.7 R
eb2	33.4	24.3 R
eb3	74.9	59.8 R
eb4	122.8	16.3 R
eb5	212.5	7.0 R
eb6	170.2	88.2 R
eb7	234.9	72.5 R
2013	91.1	69.9 R
2014	144.3	69.9 R

The elevations are based upon the City of Oakland Datum.

Bench Mark is pin monument #16NW15 at the intersection of 3rd and Magnolia Streets.

ELEVATION = 3.19

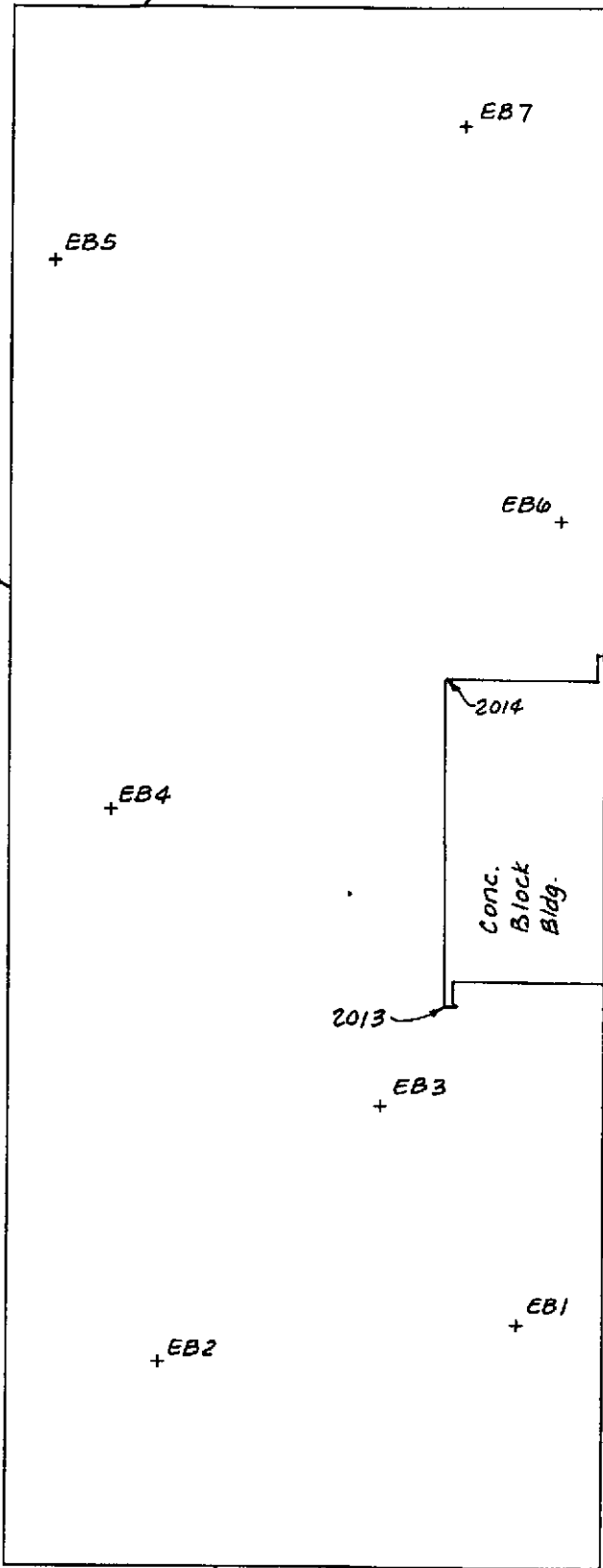
Location	Casing Elev.	Rim or Plug Elev.
MW-1 = EB - 1	3.84	4.5
EB - 2		4.6
EB - 3		4.7
MW-2 = EB - 4	4.48	5.0
EB - 5		6.4
MW-3 = EB - 6	4.81	5.5
EB - 7		6.3

CHESNUT ST.

Back of Sidewalk

Back of Sidewalk

5TH STREET



+ EB7

+ EB5

EB6 +

+ EB4

2014

Conc.  
Block  
Bldg.

2013

+ EB3

+ EB2

+ EB1

Back of Sidewalk

ADELINE ST.



SCALE: 1" = 30'

BSW Line, 5th St.  
From BSW Adeline

Pt	Distance	Offset
eb1	39.7	81.7 R
eb2	33.4	24.3 R
eb3	74.9	59.8 R
eb4	122.8	16.3 R
eb5	212.5	7.0 R
eb6	170.2	88.2 R
eb7	234.9	72.5 R
2013	91.1	69.9 R
2014	144.3	69.9 R

**APPENDIX C**

**MONITORING WELL DEVELOPMENT  
AND SAMPLING LOGS**



**GROUNDWATER SAMPLING  
WELL DEVELOPMENT LOG**

WELL NUMBER: MW-1 FIELD PERSON(S): Russell Gentry  
 DATE STARTED: 10/21/96  
 TIME STARTED: 12:00 JOB NUMBER: 3629.2  
 DATE COMPLETED: \_\_\_\_\_ JOB NAME: \_\_\_\_\_  
 TIME COMPLETED: 15:09

DEPTH TO BOTTOM OF CASING LENGTH				WELL INSIDE DIAMETER		
DEPTH TO WATER	5.09'	Δ (FT)	14.92'	VOLUME FACTOR V.F. = GAL/FT	1"=0.041 1-1/2"=0.092 2"=0.163 3"=0.367 4"=0.653 6"=1.469 8"=2.611 12"=5.875	
1 (FT)	14.92	X (V.F.) =	0.163	WELL CASING VOLUME (GAL)	2.93	
DATE PURGED:	_____				WELL DEWATERED	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
PURGE METHOD:	<u>Submersible pump</u>				DATE SAMPLED:	<u>N/A</u>
DEPTH TO WATER:	<u>2.25' when well opened</u>				TIME SAMPLED:	<u>N/A</u>
TOTAL VOLUME REMOVED (GAL):	<u>17</u>				SAMPLING METHOD:	<u>N/A</u>
SINGLE VOLUMES REMOVED:	<u>10+</u>				WEATHER CONDITIONS:	<u>Sun, warm, breeze</u>
PURGE RATE (GPM):	<u>≈ 2</u>				PURGES/SAMPLED BY:	<u>RL</u>
DEPTH TO WATER AFTER RECOVERY _____ (FT) = _____ % RECOVERED PRIOR TO SAMPLING						

**FIELD PARAMETERS:**

TIME (24 HOUR CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	X 1000 ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)
12:38	3	72.2	9.43	7.04	Med/Light
12:41	6	69.8	10.44	6.84	"
13:16	9	68.4	9.96	7.09	Slight
15:00	12	69.1	7.23	7.17	Med/Slight
15:04	14.5	70.2	7.80	7.23	"
15:08	17	69.6	7.91	6.93	

DW = 16.10  
 8.70  
 14.43  
 DW 15.09

COMMENTS: Note: No bolts to hold down lid.  
Hydrocarbon odor when lid removed.  
No hydrocarbon odor from water

**GROUNDWATER SAMPLING  
WELL DEVELOPMENT LOG**

WELL-NUMBER: MW-2 FIELD PERSON(S): Russell Gentry  
 DATE STARTED: 10/21/96  
 TIME STARTED: 14:15 JOB NUMBER: 3629.2  
 DATE COMPLETED: \_\_\_\_\_ JOB NAME: Rhinehart  
 TIME COMPLETED: 15:38

DEPTH TO BOTTOM OF CASING LENGTH				WELL INSIDE DIAMETER	
DEPTH TO BOTTOM	<u>12.86</u>	DEPTH TO WATER	<u>4.66</u>	$\Delta$ (FT)	<u>8.20'</u>
$\Delta$ H (FT)	<u>8.20</u>	X (V.F.)	<u>0.163</u>	WELL CASING VOLUME (GAL)	<u>1.33</u>
				VOLUME FACTOR	1"=0.041      4"=0.653 1-1/2"=0.092      6"=1.469 2"=0.163      8"=2.611 3"=0.367      12"=5.875
DATE PURGED: _____				WELL DEWATERED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
PURGE METHOD: <u>Submersible</u>				DATE SAMPLED: <u>N/A</u>	
INITIAL DEPTH TO WATER: <u>6.30 @ 12:00</u>				TIME SAMPLED: _____	
TOTAL VOLUME REMOVED (GAL): <u>8.0</u>				SAMPLING METHOD: <u>✓</u>	
CASING VOLUMES REMOVED: <u>10'</u>				WEATHER CONDITIONS: <u>Sun. Warm</u>	
PURGE RATE (GPM): <u>~ 2</u>				PURGES/SAMPLED BY: <u>R/G</u>	
DEPTH TO WATER AFTER RECOVERY _____ (FT) = _____ % RECOVERED PRIOR TO SAMPLING					

**FIELD PARAMETERS:**

TIME (24 HOUR CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)
<u>16:16</u>	<u>1.5</u>	<u>74.9</u>	<u>3.88</u>	<u>6.72</u>	<u>Medium</u>
<u>17:36</u>	<u>3.0</u>	<u>75.2</u>	<u>4.03</u>	<u>6.61</u>	<u>"</u>
<u>14:37</u>	<u>4.5</u>	<u>76.1</u>	<u>3.92</u>	<u>6.57</u>	<u>"</u>
<u>14:38</u>	<u>5.5</u>	<u>79.4</u>	<u>4.17</u>	<u>6.54</u>	<u>"</u>
<u>15:37</u>	<u>7.0</u>	<u>75.2</u>	<u>3.13</u>	<u>6.70</u>	<u>Heavy</u>
<u>15:37</u>	<u>8.0</u>	<u>78.7</u>	<u>3.63</u>	<u>6.25</u>	<u>"</u>

DW  
12.00'  
9:00'  
15:27  
@ 15.3

COMMENTS: Sulfur/organic odor in well, no hydrogen sulfide  
odor detected

# GROUNDWATER SAMPLING WELL DEVELOPMENT LOG

WELL NUMBER: MW-3 FIELD PERSON(S): Russell Gentry  
 DATE STARTED: 10/21/96  
 TIME STARTED: 12:10 JOB NUMBER: 3620.2  
 DATE COMPLETED: \_\_\_\_\_ JOB NAME: \_\_\_\_\_  
 TIME COMPLETED: 15:17

DEPTH TO WATER	WELL INSIDE DIAMETER	VOLUME FACTOR
DEPTH TO WATER: <u>14.72'</u> DEPTH TO WATER: <u>7.66'</u> - Δ(FIT) <u>2.06'</u> VOLUME FACTOR: <u>2.06'</u> X (V.F.) = <u>0.167</u> - VOLUME (GAL) <u>1.15</u>	1"=0.041 1-1/2"=0.092 2"=0.163 3"=0.367 4"=0.653 6"=1.469 8"=2.611 12"=5.875	
WELLS DEPLETED: _____ PUMP USED: <u>Submersible pump</u> DEPTH TO WATER: <u>8.82'</u> @ <u>12:10</u> VOLUME REMOVED (GAL): <u>1.5</u> VOLUME REMOVED: <u>T</u>	WELL DEWATERED: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO DATE SAMPLED: <u>N/A</u> TIME SAMPLED: <u>"</u> SAMPLING METHOD: <u>"</u> WEATHER CONDITIONS: <u>Sun, warm Breeze</u> PURGES/SAMPLED BY: <u>RG</u>	
DEPTH TO WATER AFTER RECOVERY _____ (FT) = _____ % RECOVERED PRIOR TO SAMPLING		

TIME (24 HRS CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	X1000 ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)
<u>13:50</u>	<u>1.5</u>	<u>71.6</u>	<u>2.02</u>	<u>6.75</u>	<u>Heavy</u>

DW  
 13.81  
 @ 1:5  
 13.72  
 @ 14:02  
 13.26  
 @ 15:17

REMARKS: Slight Sulfur odor. No hydrocarbon odor detected.

**GROUNDWATER SAMPLING  
WELL DEVELOPMENT LOG**

WELL NUMBER: MW-1 FIELD PERSON(S): Russell Gentry  
 DATE STARTED: 11/4/96  
 TIME STARTED: 11:00 JOB NUMBER: 3628.2  
 DATE COMPLETED: 11/4/96 JOB NAME: Rinehart  
 TIME COMPLETED: 4:35

DEPTH TO BOTTOM OR CASING LENGTH				WELL INSIDE DIAMETER	
DEPTH TO BOTTOM	<u>19.10'</u>	DEPTH TO WATER	<u>3.02'</u>	$\Delta$ (FT)	<u>16.08</u>
WELL VOLUME	<u>16.08</u>	X (V.F.)	<u>0.163</u>	WELL CASING VOLUME (GAL)	<u>2.62</u>
WELL PURGED:				WELL DEWATERED	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
SAMPLING METHOD: <u>Dip Bailer</u>				DATE SAMPLED:	<u>11/4/96</u>
DEPTH TO WATER: <u>3.02'</u>				TIME SAMPLED:	<u>4:30</u>
WELL VOLUME REMOVED (GAL): <u>7.00</u>				SAMPLING METHOD:	<u>Bailer</u>
CASING VOLUMES REMOVED: <u>2+</u>				WEATHER CONDITIONS:	<u>Overcast, cool</u>
FLOW RATE (GPM):				PURGES/SAMPLED BY:	<u>RJ</u>
RECOVERY: <u>80% = 6.24'</u> DEPTH TO WATER AFTER RECOVERY <u>3.06</u> (FT) = <u>@ 4:36</u> <u>11:34 @ 11:32</u> % RECOVERED PRIOR TO SAMPLING					

**FIELD PARAMETERS:**

TIME (CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	X 1000 ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)
<u>11:15</u>	<u>2.50</u>	<u>71.7</u>	<u>10.23</u>	<u>7.09</u>	<u>Medium</u>
<u>11:20</u>	<u>5.00</u>	<u>70.0</u>	<u>11.19</u>	<u>6.92</u>	<u>Medium/Heavy</u>
<u>11:28</u>	<u>7.00</u>	<u>68.7</u>	<u>12.12</u>	<u>6.73</u>	<u>Heavy</u>

REMARKS: No sheen or odor detected, water had a yellow tint initially then turned yellowish brown.

# GROUNDWATER SAMPLING WELL DEVELOPMENT LOG

WELL NUMBER: MW-2 FIELD PERSON(S): Russell Gentry  
 DATE STARTED: 11/4/96  
 TIME STARTED: 11:50 JOB NUMBER: 3628.2  
 DATE COMPLETED: 11/4/96 JOB NAME: Rinchant  
 TIME COMPLETED: 4:45

DEPTH TO BOTTOM OR CASING LENGTH		WELL INSIDE DIAMETER	
DEPTH TO WATER	DEPTH TO CASING	VOLUME FACTOR V.F. = GAL/FT	
<u>12.86'</u>	<u>4.60'</u> - Δ(FT)	1"=0.041	4"=0.653
		1-1/2"=0.092	6"=1.469
		2"=0.163	8"=2.611
		3"=0.367	12"=5.875
	WELL CASING VOLUME (GAL)		
<u>8.26'</u>	X (V.F.) = <u>0.163</u>	<u>1.35</u>	
WELL PURGED:		WELL DEWATERED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
METHOD: <u>Disp Bailer</u>		DATE SAMPLED: <u>11/4/96</u>	
TIME TO WATER: <u>6:30'</u>		TIME SAMPLED: <u>4:40</u>	
VOLUME REMOVED (GAL): <u>4.25</u>		SAMPLING METHOD: <u>Bailer</u>	
NUMBER OF VOLUMES REMOVED: <u>3</u>		WEATHER CONDITIONS: <u>Overcast / cool</u>	
FLOW RATE (GPM): <u>—</u>		PURGES/SAMPLED BY: <u>RJ</u>	
RECOVERY TO WATER AFTER RECOVERY <u>28' @ 17:02</u>		30% = 6.25' <u>8.24</u> (FT) = <u>4:40</u> % RECOVERED PRIOR TO SAMPLING	

PARAMETERS:

TIME (HOUR)	VOLUME REMOVED (GAL)	TEMPERATURE	X1000 ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)
<u>17:00</u>	<u>1.25</u>	<u>73.0</u>	<u>3.76</u>	<u>6.62</u>	<u>Slight (yellow)</u>
<u>17:05</u>	<u>2.75</u>	<u>74.0</u>	<u>4.15</u>	<u>6.52</u>	<u>Med "</u>
<u>17:10</u>	<u>4.25</u>	<u>74.1</u>	<u>4.46</u>	<u>6.59</u>	<u>Heavy</u>

COMMENTS: No sheen or hydrocarbon odor present in bailer. When the well was initially opened some hydrocarbon odor was detected in the blow of pressure from the casing. A prevalent sulfur odor exists

**GROUNDWATER SAMPLING  
WELL DEVELOPMENT LOG**

WELL NUMBER: MW-3 FIELD PERSON(S): Russell Gentry  
 DATE STARTED: 11/4/96  
 TIME STARTED: 12:10 JOB NUMBER: 3628.2  
 DATE COMPLETED: 11/4/96 JOB NAME: Rinehart  
 TIME COMPLETED: 5:00

DEPTH TO BOTTOM OF CASING LENGTH		WELL INSIDE DIAMETER	
DEPTH TO BOTTOM	<u>14.72'</u>	DEPTH TO WATER	<u>5.70'</u>
- Δ (FT) = <u>9.02'</u>		VOLUME FACTOR V.F. = GAL/FT	
WELL CASING VOLUME (GAL)	<u>1.47</u>	1"=0.041	4"=0.653
X (V.F.) = <u>0.163</u>		1-1/2"=0.092	6"=1.469
		2"=0.163	8"=2.611
		3"=0.367	12"=5.875
WATER PURGED:		WELL DEWATERED	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
PURGE METHOD:	<u>Disp. Barter</u>	DATE SAMPLED:	<u>11/4/96</u>
DEPTH TO WATER:	<u>5.74'</u>	TIME SAMPLED:	<u>4:55</u>
TOTAL VOLUME REMOVED (GAL):	<u>2.56</u>	SAMPLING METHOD:	<u>Barter</u>
CASING VOLUMES REMOVED:	<u>1.5+</u>	WEATHER CONDITIONS:	<u>Overcast, cool</u>
PURGE RATE (GPM):		PURGES/SAMPLED BY:	<u>R.G.</u>
90% = <u>7.50'</u>			
DEPTH TO WATER AFTER RECOVERY	<u>11.84</u> (FT) = <u>90%</u>	% RECOVERED PRIOR TO SAMPLING	
<u>18.00'</u> @ <u>12:24</u>			

FIELD PARAMETERS:

TIME (24HR CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	X1000 ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)
<u>12:43</u>	<u>1.50</u>	<u>68.2</u>	<u>2.63</u>	<u>6.76</u>	<u>Slight (yellow)</u>
<u>12:48</u>	<u>2.50</u>	<u>68.1</u>	<u>2.65</u>	<u>6.73</u>	<u>Heavy</u>

COMMENTS: No sheen or odor detected.

**APPENDIX D**

**LABORATORY ANALYTICAL REPORT**

W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559-0448	Client Project ID: # 3628; Rino	Date Sampled: 10/10/96
		Date Received: 10/11/96
	Client Contact: Jeff Fiedler	Date Extracted: 10/14/96
	Client P.O:	Date Analyzed: 10/14-10/16/96

**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) <sup>+</sup>	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Rec. Surrogate
70139	EB-1 @ 9'	S	ND	ND	ND	ND	ND	ND	105
70140	EB-1 @ 13'	S	ND	ND	ND	ND	ND	ND	102
70141	EB-1 @ 19.5'	S	ND	ND	ND	ND	ND	ND	102
70142	EB-2 @ 5'	S	200,g	ND	ND	ND	ND	0.20	99
70143	EB-2 @ 9'	S	ND	ND	ND	ND	ND	ND	104
70144	EB-2 @ 13'	S	1.5,g	ND	ND	0.009	ND	0.007	105
70145	EB-3 @ 9.5'	S	ND	ND	0.018	0.038	0.007	0.027	104
70146	EB-3 @ 13'	S	ND	ND	0.017	0.052	0.009	0.038	105
70147	EB-3 @ 16'	S	ND	ND	0.012	0.042	0.009	0.041	104
70148	EB-4 @ 5'	S	6.1,a	83	0.97	0.94	0.10	0.44	105
70149	EB-4 @ 9'	S	470,a	100	12	47	12	63	106
70150	EB-4 @ 12.5'	S	1.7,a	0.34	0.035	0.14	0.030	0.15	103
70151	EB-6 @ 4.5'	S	7.8,g	1.9	0.13	ND< 0.01	ND< 0.01	0.027	104
70152	EB-6 @ 9'	S	ND	ND	ND	ND	ND	ND	97
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, soil and sludge samples in mg/kg, and all TCLP extracts in mg/L

# cluttered chromatogram; sample peak coelutes with surrogate peak

<sup>+</sup> 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.



W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559-0448	Client Project ID: # 3628; Rino	Date Sampled: 10/10/96
		Date Received: 10/11/96
	Client Contact: Jeff Fiedler	Date Extracted: 10/14/96
	Client P.O:	Date Analyzed: 10/14-10/16/96

**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) <sup>+</sup>	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Rec. Surrogate
70153	EB-6 @ 12.5'	S	ND	ND	ND	ND	ND	ND	109
70154	EB-5 @ 4.5, S	S	1400,g	ND < 4	3.5	12	9.4	25	102
70155	EB-5 @ 8.5, S	S	610,j,g	ND < 0.85	1.2	1.4	5.0	2.2	116 <sup>#</sup>
70156	EB-5 @ 12.5, S	S	ND	0.20	0.030	0.007	0.011	0.008	100
70157	EB-7 @ 4.5, S	S	1.6,g,a	0.13	0.18	0.018	0.030	0.063	100
70158	EB-7 @ 8.5, S	S	18,a	2.3	1.5	1.7	0.27	1.3	102
70159	EB-7 @ 12.5, S	S	1.0,a	0.15	0.12	0.075	0.027	0.11	96
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, soil and sludge samples in mg/kg, and all TCLP extracts in mg/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.

W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559-0448	Client Project ID: # 3628; Rino	Date Sampled: 10/10/96
		Date Received: 10/11/96
	Client Contact: Jeff Fiedler	Date Extracted: 10/14-10/16/96
	Client P.O.:	Date Analyzed: 10/14-10/16/96

**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) <sup>+</sup>	% Recovery Surrogate
70139	EB-1 @ 9'	S	ND ✓	98
70140	EB-1 @ 13'	S	ND ✓	98
70141	EB-1 @ 19.5'	S	3.4,g,b ✓	94
70142	EB-2 @ 5'	S	1600,a ✓	113
70143	EB-2 @ 9'	S	ND ✓	100
70144	EB-2 @ 13'	S	14,a ✓	105
70145	EB-3 @ 9.5'	S	1.8,b ✓	104
70146	EB-3 @ 13'	S	ND ✓	101
70147	EB-3 @ 16'	S	1.9,g,b ✓	108
70148	EB-4 @ 5'	S	2.1,b,d ✓	111
70149	EB-4 @ 9'	S	1100,d,a ✓	111 <sup>#</sup>
70150	EB-4 @ 12.5'	S	5.9,a ✓	110
70151	EB-6 @ 4.5'	S	390,a ✓	112
70152	EB-6 @ 9'	S	2.0,b ✓	110
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	
	S		1.0 mg/kg	

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

<sup>#</sup> 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.<sup>+</sup> 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.

W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559-0448	Client Project ID: # 3628; Rino	Date Sampled: 10/10/96
		Date Received: 10/11/96
	Client Contact: Jeff Fiedler	Date Extracted: 10/14-10/16/96
	Client P.O.:	Date Analyzed: 10/14-10/16/96

**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) <sup>+</sup>	% Recovery Surrogate
70153	EB-6 @ 12.5'	S	ND	111
70154	EB-5 @ 4.5, S	S	28,000,a ✓	107
70155	EB-5 @ 8.5, S	S	5000,a ✓	113
70156	EB-5 @ 12.5, S	S	15,a ✓	105
70157	EB-7 @ 4.5, S	S	3.7,a ✓	104
70158	EB-7 @ 8.5, S	S	3.9,a,d ✓	104
70159	EB-7 @ 12.5, S	S	ND ✓	102
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	
		S	1.0 mg/kg	

\* water samples are reported in ug/L, soil and sludge samples in mg/kg, and all TCLP and STLC extracts in mg/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.

## QC REPORT FOR HYDROCARBON ANALYSES

Date: 10/14/96

Matrix: Soil

Analyte	Concentration (mg/kg) Sample (#67147)			Amount Spiked	% Recovery		RPD
	MS	MSD			MS	MSD	
TPH (gas)	0.000	1.927	1.906	2.03	95	94	1.1
Benzene	0.000	0.190	0.206	0.2	95	103	8.1
Toluene	0.000	0.190	0.208	0.2	95	104	9.0
Ethylbenzene	0.000	0.186	0.200	0.2	93	100	7.3
Xylenes	0.000	0.554	0.588	0.6	92	98	6.0
TPH (diesel)	0	312	315	300	104	105	0.8
TRPH (oil and grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553  
Tele: 510-798-1620 Fax: 510-798-1622

## QC REPORT FOR HYDROCARBON ANALYSES

Date: 10/16/96

Matrix: Soil

Analyte	Concentration (mg/kg) Sample (#67146)			Amount Spiked	% Recovery		
	MS	MSD			MS	MSD	RPD
TPH (gas)	0.000	1.994	1.839	2.03	98	91	8.1
Benzene	0.000	0.192	0.190	0.2	96	95	1.0
Toluene	0.000	0.204	0.196	0.2	102	98	4.0
Ethylbenzene	0.000	0.200	0.194	0.2	100	97	3.0
Xylenes	0.000	0.616	0.592	0.6	103	99	4.0
TPH (diesel)	0	311	303	300	104	101	2.8
TRPH (oil and grease)	0.0	19.3	19.5	20.8	93	94	1.0

\* Rec. = (MS - Sample) / amount spiked x 100

RPD = (MS - MSD) / (MS + MSD) x 2 x 100

# W. A. CRAIG, INC.

# CHAIN-OF-CUSTODY RECORD

7395AWAC682

PROJECT NO. 3628		PROJECT NAME RINO		MATRIX: Soil, Water, Air, Sludge, Other	ANALYSIS							Preserved?	REMARKS	LABORATORY I. D. NUMBER
PURCHASE ORDER NO.		SIGNATURE OF SAMPLER A.A. Field			TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	TPHg & BTEX	MTBE					
DATE	TIME	W. A. CRAIG, INC.'S SAMPLE IDENTIFICATION												
6/6	0845	EB-1	9'			X	X	X					70139	
	0850	EB-1	13'			X	X	X					70140	
	0900	EB-1	19.5'			X	X	X					70141	
	0925	EB-2	5'			X	X	X					70142	
	0935	EB-2	9'			X	X	X					70143	
	0940	EB-2	13'			X	X	X					70144	
	1010	EB-3	9.5'			X	X	X					70145	
	1015	EB-3	13'			X	X	X					70146	
	1020	EB-3	16'			X	X	X					70147	
	1045	EB-4	5'			X	X	X					70148	
	1050	EB-4	9'			X	X	X					70149	
	1055	EB-4	12.5'			X	X	X					70150	
	1145	EB-6	9.5'			X	X	X					70151	
	1150	EB-6	9'			X	X	X					70152	
	1155	EB-6	12.5'			X	X	X					70153	

ICE ✓  
 GOOD CONDITION ✓  
 HEAD SPACE ABSENT ✓  
 PRESERVATIVE ✓  
 APPROPRIATE ✓  
 CONTAINERS ✓  
 VOAS ✓

RELINQUISHED BY (Signature):  
*A.A. Field*

DATE/TIME  
 7:55 10/11

RECEIVED BY (Signature):  
*Eunna Mahoney*

LABORATORY:  
 MAE

PLEASE SEND RESULTS TO:  
 W. A. CRAIG, I  
 P.O. BOX 448  
 NAPA, CA 94559-0448  
 (707) 252-3353  
 ATTN: G. FIEDEL

RELINQUISHED BY (Signature):

DATE/TIME

RECEIVED BY (Signature):

TURNAROUND  
 TIME:  
 5-DAY

RELINQUISHED BY (Signature):

DATE/TIME

RECEIVED BY (Signature):

7395AWAC 682

PROJECT NO. 3628		PROJECT NAME RIND		MATRIX: Soil, Water, Air, Sludge, Other	ANALYSIS							Preserved?	REMARKS	LABORATORY I. D. NUMBER	
PURCHASE ORDER NO.		SIGNATURE OF SAMPLER <i>M. Friel</i>			TPHgasoline (8015)	BTEX (602/8020)	TPHdiesel (8015)	TPHg & BTEX	MTBE						
DATE	TIME	W. A. CRAIG, INC.'S SAMPLE IDENTIFICATION													
10/10	1350	EB-5	4.5'			X	X	X							
↓	1355	EB-5	8.5'			X	X	X							70154
↓	1400	EB-5	12.5'			X	X	X							70155
10/10	1430	EB-7	4.5'			X	X	X							70156
↓	1435	EB-7	8.5'			X	X	X							70157
↓	1440	EB-7	12.5'			X	X	X							70158
															70159

CE/T\*  GOOD CONDITION  
 HEAD SPACE ABSENT  PRESERVATIVE  
 APPROPRIATE CONTAINERS

VOAS  O&G  METALS  OTHER

RELINQUISHED BY (Signature): <i>A.A. Friel</i>	DATE/TIME 7:55p 10/11	RECEIVED BY (Signature): <i>Erinn Mahoney</i>	LABORATORY: <b>MAI</b>	PLEASE SEND RESULTS TO: <b>W. A. CRAIG, INC. P.O. BOX 448 NAPA, CA 94559-0448 (707) 252-3353</b>	
RELINQUISHED BY (Signature):	DATE/TIME	RECEIVED BY (Signature):			TURNAROUND TIME: <b>5-DAY</b>
RELINQUISHED BY (Signature):	DATE/TIME	RECEIVED BY (Signature):			ATTN: <i>G. Figeo</i>

McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553  
Tele: 510-798-1620 Fax: 510-798-1622

11/15/96

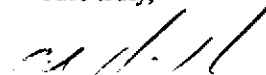
Dear Dave:

Enclosed are:

- 1). the results of 3 samples from your # 3628.2; Rinehart project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

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



W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559-0448	Client Project ID: # 3628.2; Rinehart	Date Sampled: 11/04/96
		Date Received: 11/06/96
	Client Contact: Dave Orr	Date Extracted: 11/08-11/12/96
	Client P.O:	Date Analyzed: 11/08-11/12/96

**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) <sup>+</sup>	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Rec. Surrogate
70939	MW-1	W	ND	ND	ND	ND	ND	ND	101
70940	MW-2	W	910,a	470,000	120	23	3.5	51	— <sup>#</sup>
70941	MW-3	W	ND	1000	ND	ND	ND	ND	108
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	0.5	
	S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	0.005	

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

<sup>#</sup> cluttered chromatogram; sample peak coelutes with surrogate peak

<sup>+</sup> 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.

W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559-0448	Client Project ID: # 3628.2; Rinehart	Date Sampled: 11/04/96
		Date Received: 11/06/96
	Client Contact: Dave Orr	Date Extracted: 11/08-11/12/96
	Client P.O:	Date Analyzed: 11/08-11/12/96

**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) <sup>+</sup>	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Rec. Surrogate
70939	MW-1	W	ND	---	ND	ND	ND	ND	101
70940	MW-2	W	910,a	---	120	23	3.5	51	--- <sup>#</sup>
70941	MW-3	W	ND	---	ND	ND	ND	ND	108
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, soil and sludge samples in mg/kg, and all TCLP extracts in mg/L

<sup>#</sup> cluttered chromatogram; sample peak coelutes with surrogate peak

<sup>+</sup> 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.

W.A. Craig, Inc. P.O. Box 448 Napa, CA 94559-0448	Client Project ID: # 3628.2; Rinehart	Date Sampled: 11/04/96
		Date Received: 11/06/96
	Client Contact: Dave Orr	Date Extracted: 11/06/96
	Client P.O.:	Date Analyzed: 11/06/96

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

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

Lab ID	Client ID	Matrix	TPH(d) <sup>+</sup>	% Recovery Surrogate
70939	MW-1	W	220,b	105
70940	MW-2	W	2700,a,d	106
70941	MW-3	W	310,a	104
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	
	S		1.0 mg/kg	

\* water samples are reported in ug/L, soil and sludge samples in mg/kg, and all TCLP and STLC extracts in mg/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.

McCAMPBELL ANALYTICAL INC.

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## QC REPORT FOR HYDROCARBON ANALYSES

Date: 11/08/96

Matrix: Water

Analyte	Concentration (ug/L) Sample (#69626)			Amount Spiked	% Recovery		RPD
	MS	MSD			MS	MSD	
TPH (gas)	0.0	91.3	95.9	100.0	91.3	95.9	5.0
Benzene	0.0	9.3	8.9	10.0	93.0	89.0	4.4
Toluene	0.0	9.5	9.1	10.0	95.0	91.0	4.3
Ethyl Benzene	0.0	10.1	9.5	10.0	101.0	95.0	6.1
Xylenes	0.0	30.2	28.4	30.0	100.7	94.7	6.1
TPH (diesel)	0	158	152	150	105	102	3.6
TRPH (oil & grease)	0	26000	26300	23700	110	111	1.1

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

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## QC REPORT FOR HYDROCARBON ANALYSES

Date: 11/06/96

Matrix: Water

Analyte	Concentration (ug/L) Sample (#70738)			Amount Spiked	% Recovery		RPD
	MS	MSD			MS	MSD	
TPH (gas)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ethyl Benzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Xylenes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TPH (diesel)	0	160	158	150	106	105	1.1
TRPH (oil & grease)	0	25400	26000	23700	107	110	2.3

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

# W. A. CRAIG, INC.

# CHAIN-OF-CUSTODY RECORD

*pd ck # 9769*

PROJECT NO. 3628.2		PROJECT NAME <i>Rinchart</i>		MATRIX: Soil, Water, Air, Sludge, Other	ANALYSIS							REMARKS <i>7562 AWAC 693</i>	LABORATORY I. D. NUMBER
PURCHASE ORDER NO.		SIGNATURE OF SAMPLER <i>Russell Gault</i>			TPHgasoline (8015)	BTEX (802/8020)	TPHdiesel (8015)	TPHg & BTEX			Preserved?		
DATE	TIME	W. A. CRAIG, INC.'S SAMPLE IDENTIFICATION											
<i>11/4</i>	<i>4:30</i>	<i>MW-1</i>		<i>W</i>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<i>ICE</i>	<i>70939</i>	
<i>↓</i>	<i>4:40</i>	<i>MW-2</i>		<i>↓</i>		<i>↓</i>	<i>↓</i>				<i>↓</i>	<i>70940</i>	
<i>↓</i>	<i>4:55</i>	<i>MW-3</i>		<i>↓</i>		<i>↓</i>	<i>↓</i>				<i>↓</i>	<i>70941</i>	
ICE/T <i>↓</i>		GOOD CONDITION <i>↓</i>		HEAD SPACE ABSENT <i>↓</i>		PRESERVATIVE APPROPRIATE CONTAINERS <i>↓</i>		VOAS <i>↓</i>	O&G <i>↓</i>	METALS <i>↓</i>	OTHER <i>↓</i>		

RELINQUISHED BY (Signature): <i>Russell Gault</i>	DATE/TIME: <i>11/6/96 5:07</i>	RECEIVED BY (Signature): <i>Nendi Pina</i>	LABORATORY: <i>McCarroll Analytical</i>	PLEASE SEND RESULTS TO: <b>W. A. CRAIG, INC.</b> <b>P.O. BOX 448</b> <b>NAPA, CA 94559-0448</b> <b>(707) 252-3353</b> <i>GAF</i>	
RELINQUISHED BY (Signature):	DATE/TIME:	RECEIVED BY (Signature):			TURNAROUND TIME: <i>5-day</i>
RELINQUISHED BY (Signature):	DATE/TIME:	RECEIVED BY (Signature):			ATTN:

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