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April 3, 2001 **Project No. 3628**

Mr. Reed Rinehart
Rinehart Distribution, Inc.
P.O. Box 725
Ukiah, California 94582

Groundwater Monitoring Report, February 2001
1107 Fifth Street
Oakland, California

Dear Mr. Rinehart:

W.A. Craig, Inc. (WAC) is pleased to submit this Groundwater Monitoring Report for sampling conducted on February 22, 2001 at the Rino Pacific service station, located at 1107 Fifth Street (site), Oakland, California (**Figure 1**). This work was performed in accordance with the scope of work presented in WAC's *Site Investigation Work Plan* dated September 16, 1996 and *Additional Site Investigation Work Plan* dated May 23, 2000.

This report includes groundwater analytical results, dissolved oxygen concentrations, groundwater elevation and well construction data (**Table 1**) for two monitoring wells installed at the site during October 1996 and six additional monitoring wells installed during August 2000. Descriptions of the previous site investigations are presented in the *Subsurface Investigation Report*; dated January 17, 1997 and the *Subsurface Investigation Report* dated September 15, 2000.

SCOPE OF WORK

The scope of work conducted by WAC during this period included the following:

- Measured dissolved oxygen concentrations and static water levels in eight monitoring wells;
- Purged and sampled groundwater from eight monitoring wells;
- Analyzed groundwater samples for total petroleum hydrocarbons as gasoline (TPH-g), total petroleum hydrocarbons as diesel (TPH-d), benzene, toluene, ethylbenzene, xylenes (BTEX), fuel oxygenates (MtBE, ETBE, TAME, DIPE, tert-Butanol, methanol, ethanol)

and lead scavengers (EDB and 1,2 DCA); and
- Prepared this Groundwater Monitoring Report.

GROUNDWATER SAMPLING AND ANALYSIS

Groundwater Elevations

WAC technical staff measured water levels in the eight monitoring wells on February 22, 2001 using an electronic water-level indicator. The wells were exposed to atmospheric conditions for approximately 30 minutes to stabilize static water levels. The top of casing elevations and the depth to static water level measurements obtained during this monitoring event were used to calculate the groundwater elevations. The groundwater gradient and flow direction for this sampling event is 0.048 ft/ft, northeast, respectively. Wells MW-1 and MW-3 were excluded from the groundwater calculations due to incompatible well screening. Groundwater elevations for this and previous monitoring events are presented on **Table 2**.

Groundwater Sampling

At least three well casing volumes were purged from each monitoring well prior to collecting groundwater samples. Dissolved oxygen concentration and turbidity were intermittently monitored during purging of the wells. Dissolved oxygen is a measure of the potential activity of aerobic bacteria available to bioremediate dissolved hydrocarbons in groundwater. Dissolved oxygen concentrations for this and previous sampling events are presented in **Table 3**. Groundwater samples were collected using disposable polyethylene bailers. The field groundwater sampling logs are included in **Attachment A**.

The samples were submitted under chain-of-custody control to McCampbell Analytical, Inc. (MAI), of Pacheco, California. The purged groundwater is currently stored on-site in labeled, DOT approved, 55-gallon, steel drums.

Groundwater Analytical Results

The groundwater samples were analyzed for TPH-g/TPH-d using EPA Method 8015 (modified), for purgeable aromatic hydrocarbons (BTEX) using EPA Method 8020 and for fuel oxygenates and lead scavengers using EPA Method 8260. MAI is certified by the State of California to perform these analyses. The results of the analyses are summarized in **Table 4.** A copy of the laboratory analytical report and chain-of-custody document are in **Attachment B**.

Conclusions

This is the second monitoring event since installation of the six monitoring wells in August 2000. During this event MtBE concentrations exceeded the primary maximum contaminant level for drinking water in all eight monitoring wells. MtBE concentrations were highest in well MW-7 at 460,000 ug/l, and lowest in well MW-9 at 160 ug/l (**Figure 3**). Hydrocarbon

constituents have been detected in well MW-7 since its installation in August 2000. This may be residual contamination from the former UST excavation or a leak from the product piping to the dispenser island located immediately east of well MW-7.

TPH-d concentrations in monitoring wells MW-1, MW-7 and MW-8 have increased since the previous sampling event, concentrations in the remaining wells have decreased slightly. Elevated groundwater levels during the rainy season appear to facilitate the migration of a TPH-d plume to the southwest corner of the Site. Increasing TPH-d concentrations have occurred in wells MW-1 and MW-8 since the August 2000 sampling event (**Figure 4**). TPH-g concentrations remain highest in monitoring well MW-7, at 80,000 ug/l. Concentrations of gasoline in the remaining wells fluctuated slightly over the previous sampling event.

Benzene ranged from 19,000 ug/l in monitoring well MW-7 to 1.2 ug/l in MW-3. Toluene, ethylbenzene or xylenes were detected in monitoring wells, MW-3, and MW-7. Fuel oxygenates and lead scavengers were below detection limits in the remaining wells.

Recommendations • Question the ... in MW5 + 6 ... excavation

WAC recommends abandonment of well MW-3, due to incompatible well screening with the other seven monitoring wells. WAC further recommends reinstallation of a well MW-3, with a screened interval similar to the most recently installed wells. The next groundwater sampling will be in May 2001.

Professional Certification

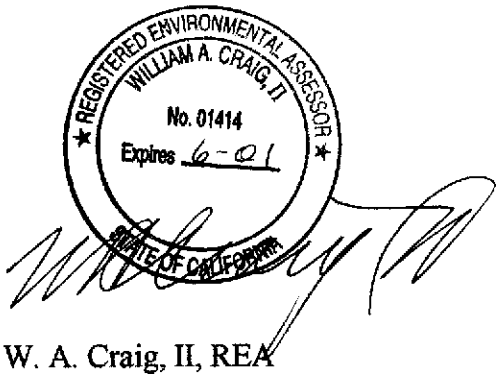
This report has been prepared by the staff of W. A. Craig, Inc., under the professional supervision of the persons whose seals and signatures appear hereon. No warranty, either expressed or implied, is made as to the professional advice presented herein. The analysis, conclusions and recommendations contained in this report are based upon site conditions as they existed at the time of quarterly monitoring and sampling 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 scope of work may not be appropriate to satisfy the needs, or requirements of other state agencies, or of other users. Any use or reuse of this document or its findings, conclusions or recommendations presented herein the sole risk of the user. There is no other warranty, either expressed or implied.

If you have any questions regarding this report please call Sean O'Grady at (707) 693-2929.

Sincerely,

W.A. Craig, Inc.,



Tim Cook, PE
Principal Engineer

W. A. Craig, II, REA
Principal

TC:sao

Attachments:

Table 1 – Well Construction Data
Table 2 – Groundwater Elevation Data
Table 3 – Dissolved Oxygen Concentrations
Table 4 – Groundwater Sample Analytical Results
Figure 1 – Site Location Map
Figure 2 – Groundwater Elevations
Figure 3 – MtBE Concentrations
Figure 4 – TPH-d Concentration Graph
A -Groundwater Sampling Logs and Graphs
B – Laboratory Analytical Reports

cc: Larry Seto, Alameda County Department of Environmental Health

Table 1
Well Construction Data
Oakland Truck Stop

Well Number	Date Installed	Casing Diameter (inches)	Borehole Depth (feet)	Screened Interval (feet)	Filter Pack Interval (feet)	Bentonite Interval (feet)	Grouting Interval (feet)
MW-1	10/10/96	2	20.5	10-20	9-10	7-9	1-7
MW-2	10/10/96	2	14.0	8-13	7-8	5-7	1-5
MW-3	10/10/96	2	17.0	12-17	11-12	9-11	1-9
MW-4	08/16/00	2	20.5	5-20	4-5	3-4	1-3
MW-5	08/16/00	2	20.5	5-20	4-5	3-4	1-3
MW-6	08/16/00	2	20.5	5-20	4-5	3-4	1-3
MW-7	08/17/00	2	20.5	5-20	4-5	3-4	1-3
MW-8	08/16/00	2	20.5	5-20	4-5	3-4	1-3
MW-9	08/23/00	2	20.5	5-20	4-5	3-4	1-3

Notes: MW-2 was abandoned during the UST excavation and removal in March 1999.

Table 2
Groundwater Elevations
Oakland Truck Stop

Well Number	Date	Top of Casing (ft)	Depth Below TOC (ft)	Elevation Above MSL (ft)
MW-1	10/21/96	7.60	5.08	2.52
	11/04/96		3.02	4.58
	03/04/97		2.28	5.32
	06/12/97		4.80	2.80
	07/14/97		2.66	4.94
	09/09/97		2.45	5.15
	09/19/97		2.60	5.00
	02/13/98		2.76	4.84
	07/07/98		2.15	5.45
	10/01/98		3.63	3.97
	12/30/98		4.40	3.20
	03/21/00		2.62	4.98
	08/30/00		3.21	4.39
	11/06/00		3.10	4.50
	02/22/01		3.50	4.10
MW-2	10/21/96	4.48	4.66	-0.18
	11/04/96		4.60	-0.12
	03/04/97		3.68	0.80
	06/12/97		3.70	0.78
	07/14/97		4.16	0.32
	09/09/97		3.88	0.60
	09/19/97		4.50	-0.02
	02/13/98		3.08	1.40
	07/07/98		3.74	0.74
	10/01/98		4.63	-0.15
	12/30/98		3.90	0.58
	03/21/00		Well Destroyed	
MW-3	10/21/96	7.79	7.66	0.13
	11/04/96		5.70	2.09
	03/04/97		11.38	-3.59
	06/12/97		5.18	2.61
	07/14/97		7.96	-0.17
	09/09/97		10.16	-2.37
	09/19/97		12.80	-5.01
	02/13/98		11.42	-3.63
	07/07/98		11.76	-3.97
	10/01/98		11.34	-3.55
	12/30/98		4.56	3.23
	03/21/00		10.92	-3.13
	08/30/00		5.12	2.67
	11/06/00		4.10	3.69
	02/22/01		6.60	1.19
MW-4	08/30/00	7.74	3.74	4.00
	11/06/00		3.85	3.89
	02/22/01		4.66	3.08
MW-5	08/30/00	7.53	3.01	4.52
	11/06/00		3.35	4.18
	02/22/01		3.00	4.53
MW-6	08/30/00	7.89	3.40	4.49
	11/06/00		3.72	4.17
	02/22/01		3.34	4.55
MW-7	08/30/00	8.96	6.72	2.24
	11/06/00		6.85	2.11
	02/22/01		6.00	2.96
MW-8	08/30/00	7.32	3.06	4.26
	11/06/00		2.98	4.34
	02/22/01		2.46	4.86
MW-9	08/30/00	7.30	2.81	4.49
	11/06/00		2.68	4.62
	02/22/01		2.20	5.10

Notes : Monitoring wells elevations are based on City of Oakland Datum # 16NW10 which lies 15 ft west of the centerline intersection of 3rd Street and Linden Street.: Elevation = 8.108 (City of Oakland Datum = 5.108 + 3.00 = 8.108). Elevations have been converted to U.S. Geodetic Datum by adding 3.00 feet.

Table 3
Dissolved Oxygen Concentrations
Oakland Truck Stop

Monitoring Well	Date	Dissolved Oxygen Concentration (mg/l)	Temperature (Celsius)	Dissolved Oxygen Percent of Saturation
MW-1	08/30/00	0.27	24.2	3.21%
	11/06/00	0.24	21.8	2.71%
	02/22/01	0.76	15.7	7.59%
MW-3	08/30/00	0.35	26.4	4.38%
	11/06/00	0.23	22.7	2.65%
	02/22/01	0.97	15.3	9.62%
MW-4	08/30/00	0.16	27.4	2.05%
	11/06/00	0.30	23.9	3.54%
	02/22/01	0.85	16.3	8.59%
MW-5	08/30/00	0.28	27.0	3.55%
	11/06/00	0.24	22.6	2.76%
	02/22/01	0.77	14.7	7.55%
MW-6	08/30/00	0.42	27.7	5.42%
	11/06/00	0.23	23.0	2.66%
	02/22/01	1.01	15.3	10.01%
MW-7	08/30/00	0.17	26.8	2.15%
	11/06/00	0.25	23.5	2.93%
	02/22/01	0.66	17.1	6.77%
MW-8	08/30/00	0.18	26.4	2.25%
	11/06/00	0.25	23.7	2.94%
	02/22/01	0.69	17.1	7.08%
MW-9	08/30/00	0.30	22.8	3.46%
	11/06/00	0.31	21.7	3.49%
	02/22/01	0.71	16.2	7.16%

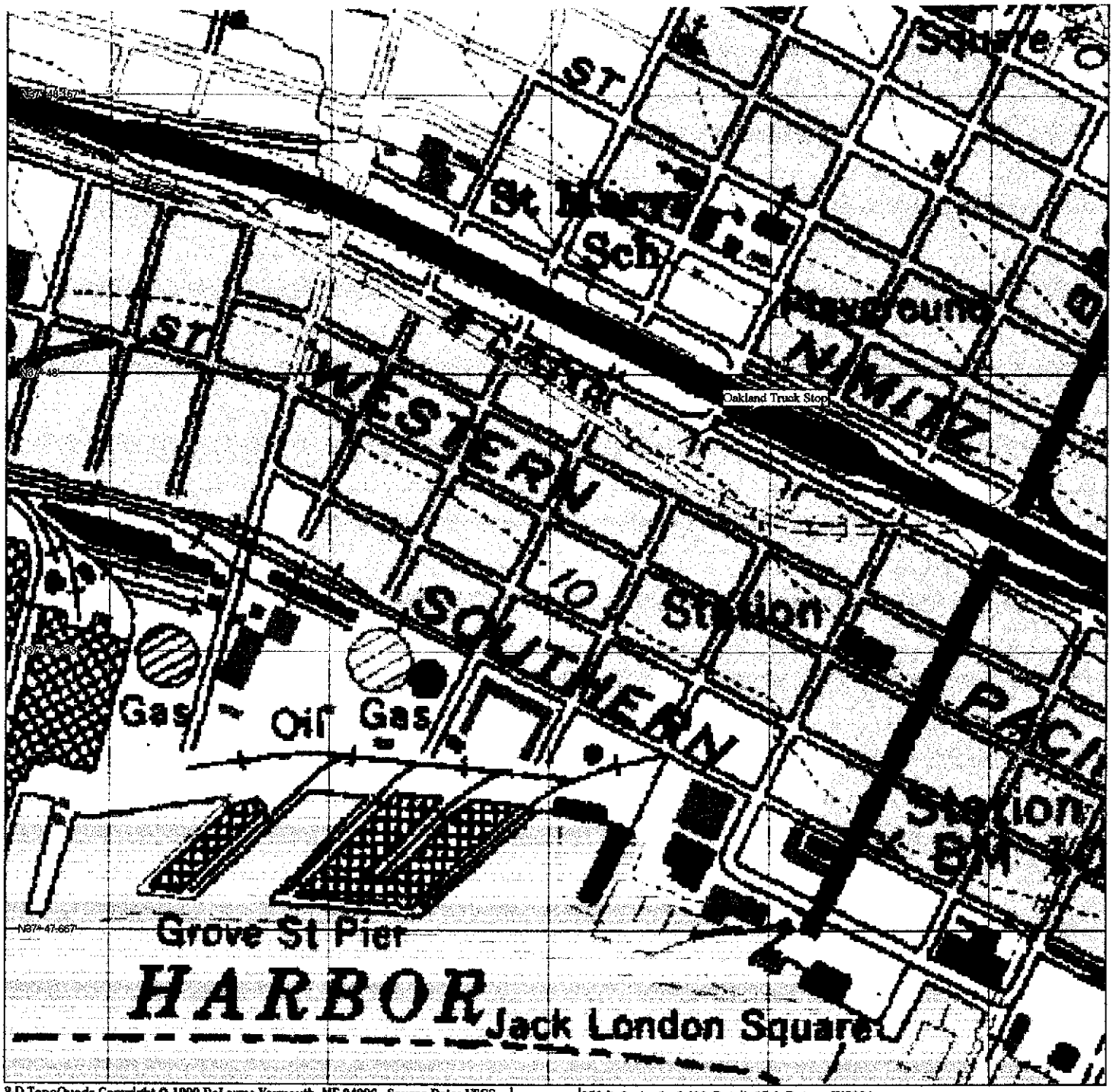
Table 4
Groundwater Sample Analytical Results
Oakland Truck Stop

Well Number	Date Sampled	TPH-g	TPH-d	MtBE	MtBE 8260	benzene	toluene	ethyl-benzene	xylenes	DIPE	ETBE	TAME	tert-Butanol	Methanol	Ethanol	EDB	1,2 DCA
MW-1	11/04/96	ND	220	ND	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	03/05/97	ND	230	ND	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	06/12/97	ND	290	ND	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	09/09/97	ND	180	ND	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	02/13/98	ND	590	9.4	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	07/07/98	ND	1,400	ND	2.7	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	10/01/98	ND	1,100	ND	1.8	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	12/30/98	ND	1,700	ND	2.3	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	03/21/00	220	3,100	**3,800**	**4,800**	**11**	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	08/30/00	140	1,600	**2,500**	NS	**5.3**	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	11/06/00	51	1,500	**1,700**	**2,100**	**1.0**	ND	ND	ND	ND<50	ND<50	ND<50	ND<250	NT	NT	ND<50	ND<50
	02/22/01	140	3,000	**1,000**	**1,100**	ND	ND	ND	ND	ND<20	ND<20	ND<20	ND<100	ND<4000	ND<1000	ND<20	ND<20
MW-2	11/04/96	910	2,700	**470,000**	NA	**120**	23	3.5	51	NT	NT	NT	NT	NT	NT	NT	NT
	03/05/97	4,400	2,300	**760,000**	NA	**1,500**	51	24	100	NT	NT	NT	NT	NT	NT	NT	NT
	06/12/97	3,600	2,400	**840,000**	NA	**1,200**	14	12	40	NT	NT	NT	NT	NT	NT	NT	NT
	09/09/97	3,700	970	**470,000**	NA	**570**	31	19	60	NT	NT	NT	NT	NT	NT	NT	NT
	02/13/98	6,500	2,200	**750,000**	NA	**2,400**	31	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	07/07/98	5,200	2,700	**950,000**	**1,000,000**	**2,800**	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	10/01/98	1,200	1,200	**420,000**	**360,000**	**330**	12	8.8	11	NT	NT	NT	NT	NT	NT	NT	NT
	12/30/98	1,000	1,900	**370,000**	**360,000**	**96**	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
Well Destroyed	03/21/00																
MW-3	11/04/96	ND	310	**1,000**	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	03/05/97	ND	210	13	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	06/12/97	ND	94	**17**	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	09/09/97	ND	2,300	12	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	02/13/98	ND	570	**14**	NA	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	07/07/98	ND	1,100	7.8	6.6	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	10/01/98	ND	390	9.2	4.8	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	12/30/98	ND	64	6.9	4.5	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	03/21/00	ND	2,800	6.7	4.8	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	08/30/00	ND	260	12	NS	**1.3**	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	11/06/00	ND	940	**25**	12.0	ND	ND	ND	ND	ND	ND	ND	ND	NT	NT	ND	ND
	02/22/01	ND	340	**18**	26.0	**1.2**	1.5	ND	0.74	ND	ND	ND	ND	ND	ND	ND	ND
MW-4	08/30/00	1,300	390	**210,000**	NS	**64**	63	9.7	110	NT	NT	NT	NT	NT	NT	NT	NT
	11/06/00	ND<3,300	170	**130,000**	**120,000**	**80**	ND<4	ND<5	ND<3	ND<2,500	ND<2,500	ND<2,500	ND<13,000	NT	NT	ND<2,500	ND<2,500
	02/22/01	ND<3,300	120	**120,000**	**150,000**	**30**	ND<3	ND<3	ND<3	ND<2,500	ND<2,500	ND<2,500	ND<13,000	ND<500,000	ND<130,000	ND<2,500	ND<2,500

Table 4
Groundwater Sample Analytical Results
Oakland Truck Stop

Well Number	Date	TPH-g	TPH-d	MtBE	MtBE 8260	benzene	toluene	ethyl-benzene	xylenes	DIPE	ETBE	TAME	tert-Butanol	Methanol	Ethanol	EDB	1,2 DCA
MW-5	08/30/00	1,000	450	**52,000**	NS	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	11/06/00	ND<1,000	520	**44,000**	**42,000**	ND<1	ND<1	ND<1	ND<1	ND<1,000	ND<1,000	ND<1,000	ND<5,000	NT	NT	ND<1,000	ND<1,000
	02/22/01	ND<1,000	270	**30,000**	**39,000**	ND<1	ND<1	ND<1	ND<1	ND<500	ND<500	ND<500	ND<2,500	ND<100,000	ND<25,000	ND<500	ND<500
MW-6	08/30/00	1,300	1,300	**23,000**	NS	55	ND	16	27	NT	NT	NT	NT	NT	NT	NT	NT
	11/06/00	ND<630	1,100	**26,000**	**27,000**	7	8.1	ND<3	5.2	ND<630	ND<630	ND<630	ND<3,200	NT	NT	ND<630	ND<630
	02/22/01	ND<200	420	**6,500**	**8,000**	ND	ND	ND	ND	ND<100	ND<100	ND<100	ND<500	ND<20,000	ND<5,000	ND<100	ND<100
MW-7	08/30/00	160,000	2,600	**800,000**	NS	**28,000**	**15,000**	**1,200**	**5,900**	NT	NT	NT	NT	NT	NT	NT	NT
	11/06/00	80,000	1,700	**540,000**	**920,000**	**23,000**	**12,000**	**1,200**	**5,000**	ND<13,000	ND<13,000	ND<13,000	ND<63,000	NT	NT	ND<13,000	ND<13,000
	02/22/01	80,000	2,000	**440,000**	**460,000**	**19,000**	**12,000**	**1,100**	**3,200**	ND<5,000	ND<5,000	ND<5,000	ND<25,000	ND<1,000,000	ND<250,000	ND<5,000	ND<5,000
MW_7D	02/22/01	84,000	2,400	**400,000**	**500,000**	**20,000**	**13,000**	**1,200**	**3,400**	ND<5,000	ND<5,000	ND<5,000	ND<25,000	ND<1,000,000	ND<250,000	ND<5,000	ND<5,000
MW-8	08/30/00	ND	690	**28,000**	NS	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	11/06/00	ND<3,300	810	**120,000**	**76,000**	ND<8	ND<5	ND<3	ND<7	ND<2,500	ND<2,500	ND<2,500	ND<13,000	NT	NT	ND<2,500	ND<2,500
	02/22/01	ND<2500	1,100	**99,000**	**130,000**	ND<3	ND<3	ND<3	ND<3	ND<2,000	ND<2,000	ND<2,000	ND<10,000	ND<400,000	ND<100,000	ND<5,000	ND<5,000
MW-9	08/30/00	ND	770	**97**	NS	ND	ND	ND	ND	NT	NT	NT	NT	NT	NT	NT	NT
	11/06/00	ND	390	**190**	**220**	ND	ND	ND	ND	ND<25	ND<25	ND<25	ND<125	NT	NT	ND<5.0	ND<5.0
	02/22/01	ND	240	**120**	**160**	ND	ND	ND	ND	ND<2.0	ND<2.0	ND<2.0	ND<10	ND<400	ND<100	ND<2.0	ND<2.0
MCL		NE	NE	**13**	**13**	**1**	**150**	**700**	**1,750**	NE	NE	NE	NE	NE	NE	**0.05**	**0.5**

units are micrograms per liter (ug/L)
ND = Not detected
NS = Not sampled
MCL= Primary Maximum Contaminant Level (California drinking water standard)
Concentrations in excess of the MCL are in bold
NE= no MCL is established
MW-2 was destroyed during excavation of contaminated soil
MW-4 through MW-9 were constructed in August 2000



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 250 ft Scale: 1 : 6,400 Detail: 15-0 Datum: WGS84

Project No:3628

February 2001

Site Location Map
Rinehart Distribution, Inc.
1107 Fifth St.
Oakland, CA.

Figure 1

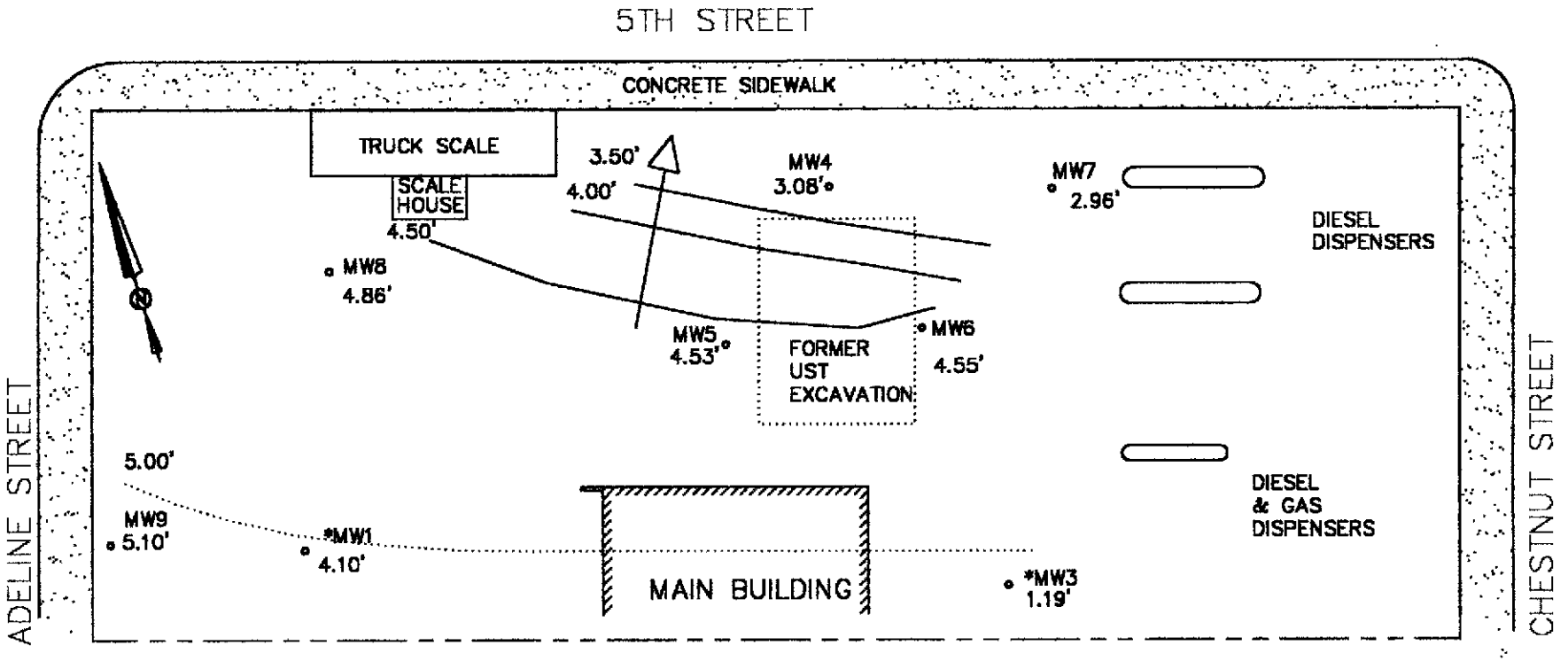
N

Checked by:

W. A. Craig, Inc.
Environmental Contracting and Consulting

6940 Tremont Road
Dixon, California 95620
Cal License #455752

(707) 693-2929
FAX (707) 693-2922



SCALE

30 0 15 30 60

(IN FEET)

1 INCH = 30 FEET

Explanation:

——— Groundwater Contours

——— Groundwater Flow Direction

* MW–1 & MW–3 were not used to calculate groundwater gradient

W.A. Craig, Inc.

6940 Tremont Road LIC# 455752

Dixon, California 95620-9603

PH# (707) 693-2929 Fax# (707) 693-2922

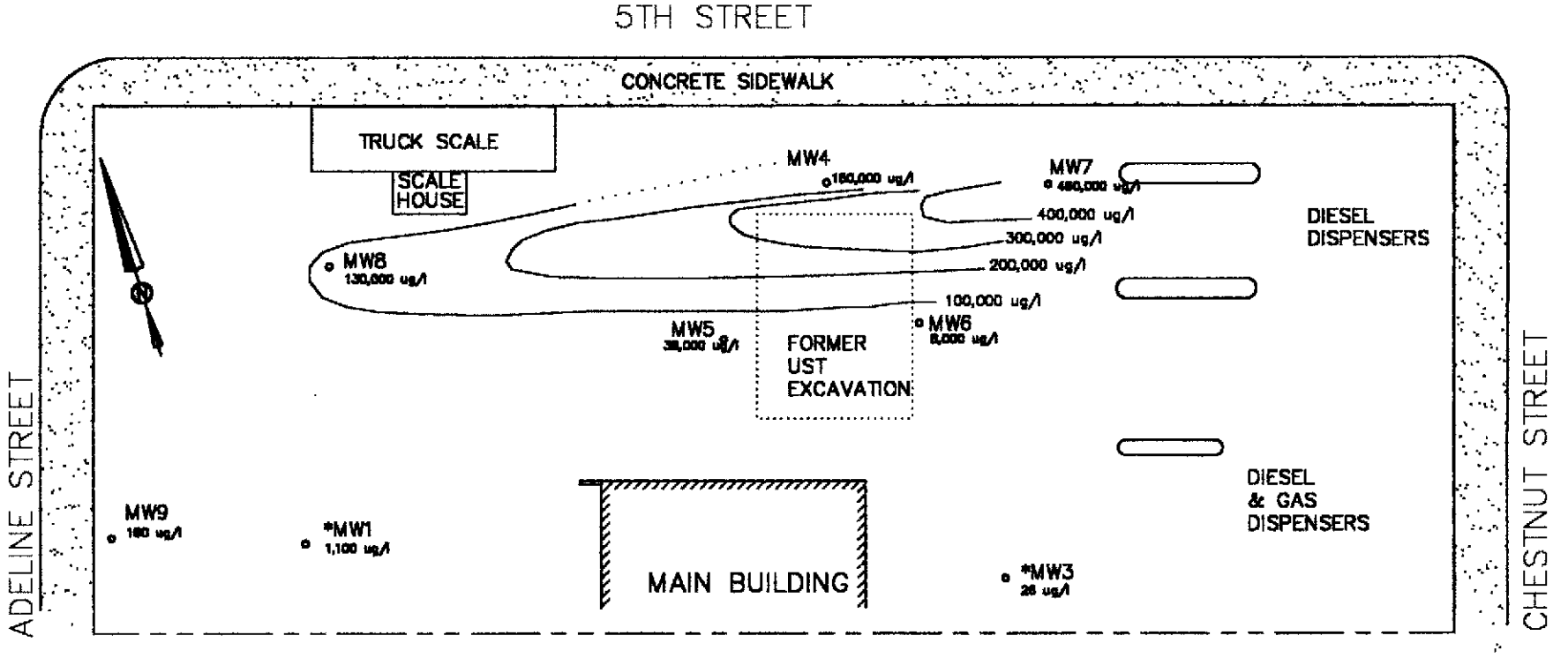
Groundwater Elevations

OAKLAND TRUCK STOP

1107 FIFTH STREET

OAKLAND, CA

Project #: 3628	Figure: 2
Date: 03/30/01	



SCALE

30 0 15 30 60

(IN FEET)

1 INCH = 30 FEET

Explanation:

MtBE Concentrations

MtBE Concentration Contours

W.A. Craig, Inc.

6940 Tremont Road LIC# 455752

Dixon, California 95620-9603

PH# (707) 693-2929 Fax# (707) 693-2922

MtBE Concentrations

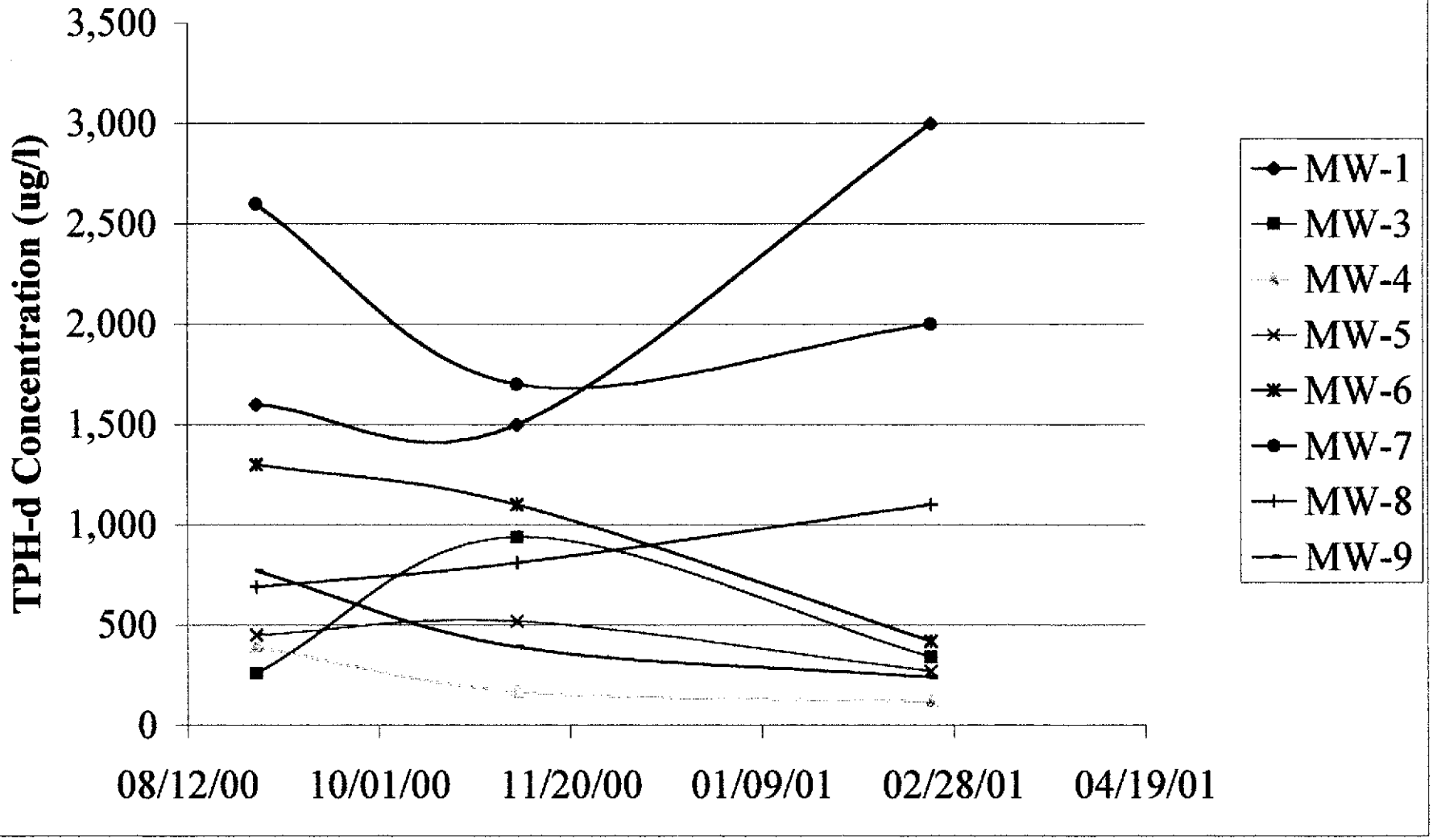
OAKLAND TRUCK STOP

1107 FIFTH STREET

OAKLAND, CA

Project #: 3628	Figure: 3
Date: 03/12/01	

Figure 4. TPH-d Concentrations



ATTACHMENT A
MONITORING WELL SAMPLING LOGS

WELL DEVELOPMENT AND SAMPLING LOG

Project Name Rinehart Job No. 3628 Date 02/22/01 Weather Partly Cloudy
Sampler O'Grady

Well Data **Well Number** MW-1

Total Depth of Well 20' Casing Elevation _____ Depth to Water 3.56' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.7 gallons Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft
Depth to Water Prior to Sampling 3 x 3 = 9.2 gallons D.O. 0.76 mg/l @ 15.7 C

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
12:36	3	65.2	—	7.39	MILD	REDDISH BRN NO ODOR / PRODUCT
12:46	6	65.7		7.33	MOD	GREY / GREEN " "
						INCREASED SEDIMENT SLOW RECHARGE
						SAMPLES EFFERVESCED SOME.

Comments: Purged 6.5 gallons Samples for TPH-G, TPH-D, BTEX, Fuel oxygenates, Lead scavengers

Well Data **Well Number** MW-3

Total Depth of Well 20' Casing Elevation _____ Depth to Water 6.20' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.2 gallons Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft
Depth to Water Prior to Sampling 7 x 3 = 6.6 gallons D.O. 0.97 mg/l @ [redacted] 15.3°C

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
3:18	1				MILD	Water is brown in color No O/P noticed
3:29	2				MILD	decreasing gravel in bottom of bailer
3:53	3				MILD	

Comments: Purged 3.0 gallons due to exceptionally slow recharge

WELL DEVELOPMENT AND SAMPLING LOG

Project Name RINEHART Job No. 3128 Date 02/22/01 Weather RAIN/CLOUDY
Sampler O'GRADY

Well Data **Well Number** MW-4

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 4.66' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.5 gallons x 3 = 7.5 gallons Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft
Depth to Water Prior to Sampling _____ D.O. 0.85 mg/l @ 16.3°C

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
1:27	2				MILD	SEDIMENT YIELD WAS LOW
1:32	4				MODERATE	COLORATION FROM SLIGHT GREEN TO
1:37	6				"	GREEN BROWN
1:41	8				"	PETROLEUM ODOR PRESENT BUT NO
						PRODUCT
						SAMPLES EFFERVESCED SLIGHTLY

Comments: Purged 8.0 gallons — Samples for TPH-g, TPH-D, BTEX, Dissolved oxygen/Lead scavengers

Due to RAIN PID METER WAS NOT EMPLOYED

Well Data **Well Number** MW-5

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 3.0' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.8 gallons x 3 = 8.5 gallons Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft
Depth to Water Prior to Sampling _____ D.O. 0.77 mg/l @ 14.7°C

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
1:53	2				MILD	SEDIMENT YIELD INCREASED BUT STILL
1:57	5				MODERATE	SIGNIFICANTLY LESS THAN MW1 OR MW3
2:02	8				MODERATE	COLORATION GREEN TO OPAQUE GREEN/BRN
						FAINT ODOR PRESENT/NO PRODUCT
						EXCELLENT RECHARGE

Comments: Purged 8.5 gallons

Due to RAIN PID METER NOT EMPLOYED

WELL DEVELOPMENT AND SAMPLING LOG

Project Name Rinehart Job No. 3628 Date 02/22/01 Weather Rain – Partly Cloudy
Sampler OGrady

Well Data **Well Number** MW-6

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 3.34' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.8 gallons Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft
Depth to Water Prior to Sampling 3 X 3 = 8.3 gallons D.O. 1.01 mg/l @ 15.3°C

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
2:17	2				MODERATE	SEDIMENT YIELD MODERATE
2:24	4					COLORATION TRANSLUCENT – OPAQUE BRN
2:30	6					FAINT ODOR / SLIGHT PRODUCT PRESENCE
2:37	8					

Comments: Purged 8.4 gallons
Due to Rain PID meter not employed
Sampling for TPH-g, TPH-D, BTEX, Pwl oxygenates / Lead scavengers

Well Data **Well Number** MW-7

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 6.07' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.3 gallons Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft
Depth to Water Prior to Sampling 3 X 3 = 7.0 gallons D.O. 0.44 mg/l @ 17.1°C

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
2:46	2				MOD	SEDIMENT YIELD MODERATE – HIGH
2:53	5				MOD-HIGH	COLORATION DARK GRAY – BLACK
2:59	7					STRONG PETROLEUM ODOR & PRODUCT PRESENCE
						SLIGHT EFFERVESCENCE

Comments: Purged 7.2 gallons
PID meter was not employed threat of rain

63.8 total purged gallons

WELL DEVELOPMENT AND SAMPLING LOG

Project Name Rinehart Job No. 3428 Date 02/22/01 Weather Mostly Cloudy
Sampler O'Grady

Well Data **Well Number** MW-8
Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 7.46' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.9 gallons Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft
Depth to Water Prior to Sampling 3 x 3 = 8.7 gallons D.O. 0.69 mg/l @ 17.1 °C

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
1:03	3	62.9	—	7.42	MODERATE	DARK GREEN/BRN STRONG ODOR/PRODUCT PRES
1:09	6	62.6	—	7.30	"	DARK BRN "
1:14	8.5	62.8	—	7.37	"	" "
						ODOR PERSISTED PRODUCT WAS EVIDENT IN
						WATER. SAMPLES EFFERVESCED SOME.

Comments: Purged 8.5 gallons Sampling for TPH-g, TPH-d, BTEX, fuel oxygenates/lead scavengers

Well Data **Well Number** MW-9
Total Depth of Well 20.6' Casing Elevation _____ Depth to Water 2.2' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 3.0 gallons Volume Factors: 2"=0.166g/ft; 4"=0.653g/ft; 6"=1.47g/ft; 8"=2.61g/ft; 12"=5.88g/ft
Depth to Water Prior to Sampling 3 x 3 = 8.9 gallons D.O. 0.71 mg/l @ 16.2 °C

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
	Begin purging well					
12:10	2	58.4	—	6.98	MILD	YELLOW/GREY FAINT ODOR/NO PRODUCT
12:15	5	58.2	—	6.94	"	GREY " "
12:18	8	60.0	—	6.97	MILD-MOD	" ODOR A LITTLE STRONGER "
12:26	9	61.5	—	7.00	MOD	" "
						SAMPLES EFFERVESCED SOME.

Comments: Purged 9.0 gallons

ATTACHMENT B
LABORATORY ANALYTICAL RESULTS

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

W. A. Craig, Inc. 6940 Tremont Road Dixon, CA 95620-9603	Client Project ID: #3628; Rinehart	Date Sampled: 02/22/01
		Date Received: 02/22/01
	Client Contact: Sean O'Grady	Date Extracted: 02/22/01
	Client P.O:	Date Analyzed: 02/22/01

03/01/01

Dear Sean:

Enclosed are:

1). the results of **9** samples from your **#3628; 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.

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

Yours truly,

Edward Hamilton, Lab Director

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6940 Tremont Road		Date Received: 02/22/01
Dixon, CA 95620-9603	Client Contact: Sean O'Grady	Date Extracted: 02/23-03/02/01
	Client P.O:	Date Analyzed: 02/23-03/02/01

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

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

Lab ID	Client ID	Matrix	TPH(g)+	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	% Recovery Surrogate
60746	MW-1	W	140,f	1000	ND	ND	ND	ND	101
60747	MW-3	W	ND	18	1.2	1.5	ND	0.74	105
60748	MW-4	W	ND<3300	120,000	30	ND<3.0	ND<3.0	ND<3.0	105
60749	MW-5	W	ND<1000	30,000	ND<1.0	ND<1.0	ND<1.0	ND<1.0	104
60750	MW-6	W	ND<200	6500	ND	ND	ND	ND	106
60751	MW-7	W	80,000,a	440,000	19,000	12,000	1100	3200	102
60752	MW-7D	W	84,000,a	400,000	20,000	13,000	1200	3400	105
60753	MW-8	W	ND<2500	99,000	53	ND<3.0	ND<3.0	ND<3.0	102
60755	MW-9	W	ND	120	ND	ND	ND	ND	103
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

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

cluttered chromatogram; sample peak coelutes with surrogate peak

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

DHS Certification No. 1644

Edward Hamilton, Lab Director

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		Date Received: 02/22/01
	Client Contact: Sean O'Grady	Date Extracted: 02/23-03/05/01
	Client P.O:	Date Analyzed: 02/23-03/05/01

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

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

Lab ID	Client ID	Matrix	TPH(d)+	% Recovery Surrogate
60746	MW-1	W	3000,a/e	93
60747	MW-3	W	340,g,b	93
60748	MW-4	W	120,a	114
60749	MW-5	W	270,b	95
60750	MW-6	W	420,a/e	96
60751	MW-7	W	2000,d,b	89
60752	MW-7D	W	2400,d,b	96
60753	MW-8	W	1100,c	95
60755	MW-9	W	240,a	100
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	
		S	1.0 mg/kg	

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

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

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (fuel oil?); 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.

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		Date Received: 02/22/01
	Client Contact: Sean O'Grady	Date Extracted: 02/26-03/01/01
	Client P.O:	Date Analyzed: 02/26-03/01/01

7 Oxygenated Volatile Organics By GC/MS

EPA method 8260 modified

Lab ID	60746	60747	60748	60749	Reporting Limit	
Client ID	MW-1	MW-3	MW-4	MW-5		
Matrix	W	W	W	W	S	W
Compound	Concentration*				ug/kg	ug/L
Di-isopropyl Ether (DIPE)	ND<20	ND	ND<2500	ND<500	5.0	1.0
Ethyl tert-Butyl Ether (ETBE)	ND<20	ND	ND<2500	ND<500	5.0	1.0
Methyl-tert Butyl Ether (MTBE)	1100	26	150,000	39,000	5.0	1.0
tert-Amyl Methyl Ether (TAME)	ND<20	ND	ND<2500	ND<500	5.0	1.0
tert-Butanol	ND<100	ND	ND<13,000	ND<2500	25	5.0
Methanol	ND<4000	ND	ND<500,000	ND<100,000	1000	200
Ethanol	ND<1000	ND	ND<130,000	ND<25,000	250	50
Surrogate Recoveries (%)						
Dibromofluoromethane	103	103	109	111		
Comments:						

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

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

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

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	Client P.O:	Date Analyzed: 02/26-03/01/01

7 Oxygenated Volatile Organics By GC/MS

EPA method 8260 modified

Lab ID	60750	60751	60752	60753	Reporting Limit	
Client ID	MW-6	MW-7	MW-7D	MW-8		
Matrix	W	W	W	W	S	W
Compound	Concentration*				ug/kg	ug/L
Di-isopropyl Ether (DIPE)	ND<100	ND<5000	ND<5000	ND<2000	5.0	1.0
Ethyl tert-Butyl Ether (ETBE)	ND<100	ND<5000	ND<5000	ND<2000	5.0	1.0
Methyl-tert Butyl Ether (MTBE)	8000	460,000	500,000	130,000	5.0	1.0
tert-Amyl Methyl Ether (TAME)	ND<100	ND<5000	ND<5000	ND<2000	5.0	1.0
tert-Butanol	ND<500	ND<25,000	ND<25,000	ND<10,000	25	5.0
Methanol	ND<20,000	ND<1000,000	ND<1000,000	ND<400,000	1000	200
Ethanol	ND<5000	ND<250,000	ND<250,000	ND<100,000	250	50
Surrogate Recoveries (%)						
Dibromofluoromethane	117	107	108	108		
Comments:						

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

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

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

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	Client P.O:	Date Analyzed: 02/26-03/01/01

7 Oxygenated Volatile Organics By GC/MS

EPA method 8260 modified

Lab ID	60754	60755			Reporting Limit	
Client ID	Trip Blk	MW-9				
Matrix	W	W			S	W
Compound	Concentration*				ug/kg	ug/L
Di-isopropyl Ether (DIPE)	ND	ND<2.0			5.0	1.0
Ethyl tert-Butyl Ether (ETBE)	ND	ND<2.0			5.0	1.0
Methyl-tert Butyl Ether (MTBE)	ND	160			5.0	1.0
tert-Amyl Methyl Ether (TAME)	ND	ND<2.0			5.0	1.0
tert-Butanol	ND	ND<10			25	5.0
Methanol	ND	ND<400			1000	200
Ethanol	ND	ND<100			250	50
Surrogate Recoveries (%)						
Dibromofluoromethane	119	120				
Comments:						

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

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

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

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	Client P.O:	Date Analyzed: 02/26-03/01/01

Ethylene Dibromide (1,2-Dibromoethane) and 1,2-Dichloroethane (1,2-DCA)

EPA method 8260

Lab ID	Client ID	Matrix	EDB*	1,2-DCA*	% Recovery Surrogate
60746	MW-1	W	ND<20,j	ND<20	103
60747	MW-3	W	ND	ND	103
60748	MW-4	W	ND<2500,j	ND<2500	109
60749	MW-5	W	ND<500,j	ND<500	111
60750	MW-6	W	ND<100,j	ND<100	117
60751	MW-7	W	ND<5000,j	ND<5000	107
60752	MW-7D	W	ND<5000,j	ND<5000	108
60753	MW-8	W	ND<2000,j	ND<2000	108
60754	Trip Blk	W	ND	ND	119
60755	MW-9	W	ND<2.0,j	ND<2.0	120
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	1.0 ug/L	1.0 ug/L	
		S	5.0 ug/kg	5.0 ug/kg	

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

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

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QC REPORT

Date: 03/04/01-03/05/01 Matrix: Water

Extraction: TTLC

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 22601					Instrument: GC-3		
Surrogate1	0.000	103.0	111.0	100.00	103	111	7.5
Xylenes	0.000	30.6	28.9	30.00	102	96	5.7
Ethyl Benzene	0.000	10.2	9.8	10.00	102	98	4.0
Toluene	0.000	10.4	10.2	10.00	104	102	1.9
Benzene	0.000	10.1	9.9	10.00	101	99	2.0
MTBE	0.000	9.5	9.6	10.00	95	96	1.0
GAS	0.000	82.8	79.9	100.00	83	80	3.6
SampleID: 22601					Instrument: GC-6 A		
Surrogate1	0.000	96.0	94.0	100.00	96	94	2.1
TPH (diesel)	0.000	8575.0	9225.0	7500.00	114	123	7.3

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

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

RPD means Relative Percent Deviation

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QC REPORT

VOCs (EPA 8240/8260)

Date: 02/26/01-02/27/01 Matrix: Water

Extraction: N/A

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 22601					Instrument: GC-4		
Surrogate	0.000	99.0	99.0	100.00	99	99	0.0
tert-Amyl Methyl Ether	0.000	112.0	118.0	100.00	112	118	5.2
Methyl tert-Butyl Ether	0.000	120.0	128.0	100.00	120	128	6.5
Ethyl tert-Butyl Ether	0.000	98.0	106.0	100.00	98	106	7.8
Di-isopropyl Ether	0.000	94.0	97.0	100.00	94	97	3.1
Toluene	0.000	98.0	105.0	100.00	98	105	6.9
Benzene	0.000	87.0	93.0	100.00	87	93	6.7
Chlorobenzene	0.000	92.0	94.0	100.00	92	94	2.2
Trichloroethane	0.000	91.0	98.0	100.00	91	98	7.4
1,1-Dichloroethene	0.000	86.0	90.0	100.00	86	90	4.5

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

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

RPD means Relative Percent Deviation

24614 WAC450.DOC

McCAMPBELL ANALYTICAL INC.

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

CHAIN OF CUSTODY RECORD

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

Report To: Sean O'Grady Bill To:
Company: W. A. Craig
6940 Tremont Road
Dixon, CA 95620-9603
Tele: (707) 693-2929 Fax: (707) 693-2922
Project #: 3128 Project Name: Pinehurst
Project Location: Oakland
Sampler Signature: Sean O'Grady

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX: Water	Soil	Air	Sludge	Other	METHOD PRESERVED: Ice	HCl	HNO_3	Other	BTEX & TPH as Gas (602/8020 + 8015) MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 (8260)	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other	Comments
MW1		2/22				X					X	X			X	X							X								60746
MW2						X					X	X			X	X							X								60747
MW3						X					X	X			X	X							X								60748
MW4						X					X	X			X	X							X								60749
MW5						X					X	X			X	X							X								60750
MW6						X					X	X			X	X							X								60751
MW7						X					X	X			X	X							X								60752
MW7D						X					X	X			X	X							X								60753
MW8						X					X	X			X	X							X								60754
TRIP BLK						X					X												X								60755
MW9						X									X	X							X								HOLD

Relinquished By:	Date:	Time:	Received By:
Sean O'Grady	2/22/09	5:22p	Tom Cole
Tom Cole	2/23/09	0805	Nima A Butler

Remarks:
* Sample not Received

TBSV