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Environmental Contracting and Consulting

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922/RO234

January 18, 2002

Project No. 3628
StID #922/RO0000234

Mr. Barney Chan
Alameda County Health Care Services
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

JAN 24 2002

Subject: **Oakland Truck Stop**
1107 Fifth Street
Oakland, California

Dear Mr. Chan:

Enclosed is the most recent Quarterly Monitoring Report for the subject site. This sampling event is the fifteenth sampling event since site investigation activities were initiated in November of 1996. At present, we are negotiating site access agreements with adjacent property owners prior to installing two offsite-monitoring wells. We still need your concurrence on the proposed preliminary active remediation goals (PARGs). Please contact me at your earliest convenience to provide your comment on the proposed PARGs. You can reach me at (707) 693-2929.

Sincerely,

W.A. Craig, Inc.,

Tim Cook, PE
Principal Engineer

cc: Reed Rinehart, Rinehart Distributing, Inc.

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QUARTERLY MONITORING REPORT
NOVEMBER 2001

SITE LOCATION:
Oakland Truck Stop
1107 Fifth Street
Oakland, California

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

SUBMITTED TO:
Mr. Barney Chan
Alameda County Department of Environmental Health Services
Division of Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577
(510) 567-6774
fax (510) 337-9335

W. A. CRAIG, INC. PROJECT # 3628

January 18, 2001

PROFESSIONAL CERTIFICATION

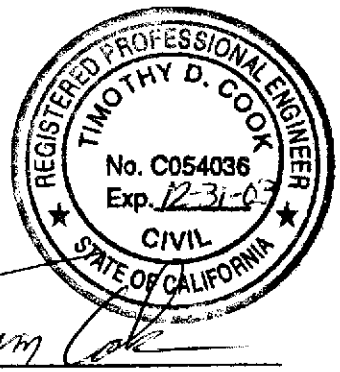
Quarterly Monitoring Report
November 2001

Oakland Truck Stop
1107 5th Street
Oakland, California

Job No. 3628
January 18, 2002

This document 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 site descriptions contained in this document are based upon our current understanding of site conditions. These conditions are subject to change as W.A. Craig, Inc. evaluates additional information.

Opinions or conclusions presented in this document are professional opinions based solely upon a review of existing environmental data. We recognize that the limited scope of services performed in execution of this investigation 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 is at the sole risk of the user.



Tim D. Cook, P.E.
Principal Engineer

INTRODUCTION

Site Location and Description

The Oakland Truck Stop located at 1107 5th Street in Oakland, California ("the Site") is owned by Mr. Tony Muir. Rino Pacific, Inc. and Rinehart Distribution, Inc. lease the property from the owner. The Site is in a commercial and industrial district at the intersection of Adeline and 5th Streets **(Figure 1)**. A service station building, two underground storage tanks, four pump dispenser islands, a truck scale and scale house currently occupy the Site.

The Site topography is flat and is bounded on the north by Fifth Street, on the west by Adeline Street, on the south by a restaurant and parking lot and on the east by Chestnut Street. The nearest surface water is the Oakland Estuary located approximately 2,400 feet south of the Site.

Background

The Site was developed as a truck stop approximately 40 years ago and has been in operation throughout this period. Three 10,000-gallon underground storage tanks (USTs) and one 8,000-gallon UST were formerly maintained at the Site. All four USTs were constructed of single-wall steel. Of the 10,000-gallon USTs, two contained diesel fuel and one contained mid-grade unleaded gasoline. The 8,000-gallon UST contained regular unleaded gasoline. Prior to the recent remodel of the Site, fuel product lines were constructed of single-wall fiberglass.

In mid-1995 an unauthorized release of fuel occurred as a result of a leak in a product line. Product lines associated with this release were replaced as soon as the leak was discovered. Interim cleanup of the spill was performed by installing and operating two product recovery sumps in the vicinity of the release. The sumps recovered approximately 6.3 gallons of gasoline using a skimmer device and reduced the floating product thickness to a sheen on the water in the recovery wells. The sumps were removed during recent leaseholder improvements at the Site. The water table fluctuates seasonally between 10 inches and 4 feet below grade.

In March 1999, the four single-walled USTs were replaced with two 15,000-gallon double-walled fiberglass USTs. An interim remedial action was performed during UST replacement activities to remove the grossly contaminated soil and groundwater.

The following is a summary of interim remedial activities performed at the Site by Trinity Excavating and Engineering, Inc. of Santa Rosa, California. The work was performed between February 8, 1999 and May 5, 1999.

2/8 through 2/10, 1999	Excavated to tops of tanks and rinsed three gasoline and one diesel underground fuel tanks
2/11/1999	Removed tanks and disposed offsite (observed by Fire Inspector)
3/3 &3/4, 1999	Removed approximately 2,100 tons of contaminated soil from excavation bottom and sides before sampling as directed by Fire

	Inspector. Collected excavation and stockpile samples. Removed water from pit as needed. Stored approximately 33,000 gallons of contaminated water in temporary storage tanks.
2/24 through 5/19, 1999	Loaded, manifested and disposed of 2,000.5 tons of contaminated soil at the Forward non-hazardous disposal facility near Stockton, California.
2/1 through 5/6, 1999	Provided and placed approximately 1,700 tons of backfill.
5/3 through 5/5, 1999	Disposed of contaminated water at Seaport Environmental.

The lateral extent of hydrocarbon contamination has not yet determined. Quarterly groundwater monitoring is being conducted. The direction of groundwater flow has varied from southwest to north. Interpretation of the groundwater gradient is suspect and could be affected by tidal fluctuation, improper monitoring well construction or by very localized recharge (i.e., leaking water or sewer lines). not likely

The shallow aquifer beneath the Site has no beneficial use as a potential drinking water resource due to its high total dissolved solids concentration (>3,000 mg/l). Proposed Groundwater Amendments to the Water Quality Control Plan (Basin Plan), dated April 2000, specifically states that shallow groundwater to a depth of about 100 feet in portions of the East Bay Plain is often brackish due to naturally-occurring saltwater intrusion. However, well yields may be sufficient for industrial or irrigation uses.

This same document states that cleanup in areas that have no beneficial use as a drinking water resource, should be protective of ecological receptors, human health and probable non-potable uses (e.g., irrigation or industrial process supply). Pursuant to State Board Resolution No. 92-49, pollution sites will continue to be required to demonstrate that 1) reasonably adequate source removal has occurred, 2) the plume has been reasonably defined both laterally and vertically and 3) a long-term monitoring program is established to verify that the plume is stable and will not impact ecological receptors or human health (e.g., from volatilization into trenches and buildings). In the East Bay Plain there are deep aquifers that will continue to be designated as potential drinking water resources. In such a setting, the deep aquifers (defined as aquifers below the Yerba Buena Mud) are subject to protection as potential drinking water resources.

In a letter to Rinehart Distributing Inc. dated July 27, 2001, Alameda County Health Care Services (ACHCS) requested that additional investigation be performed to delineate the extent of petroleum hydrocarbons both on-site and off-site. Specifically, they requested monitoring wells to the south or adjacent to the main building. A *Site Investigation Work Plan* dated October 22, 2001 has been submitted and approved by the ACHCS. At present, we are negotiating site access agreements with offsite property owners prior to installing additional monitoring wells.

SCOPE OF WORK

The scope of work conducted by W.A. Craig, Inc (WAC) during this period included the following:

- Measure dissolved oxygen concentrations and static water levels in eight on-site monitoring wells;
- Purge and sample groundwater from these wells;
- Analyze 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
- Prepare this Quarterly Monitoring Report.

GROUNDWATER SAMPLING AND ANALYSIS

Groundwater Elevations

WAC measured water levels in the eight monitoring wells on November 4, 2001 using an electronic water-level indicator. The wells are located as shown on **Figure 2**. Well construction details are summarized in **Table 1**. The wells were exposed to atmospheric conditions for approximately 30 minutes to stabilize static water levels. The depths to static water level measurements were subtracted from the top of casings to obtain static water elevations. Due to the unusual distribution of groundwater elevations, the groundwater gradient and flow direction could not be determined from the data collected. Groundwater elevations for this and previous monitoring events are presented on **Table 2**. If the groundwater elevations in wells MW-3 and MW-7 are ignored, it appears the groundwater gradient is to the north. This is counterintuitive since the Inner Oakland Harbor is located to the south of the Site.

Groundwater Sampling

On November 4, 2001, the wells were purged prior to collecting groundwater samples to ensure that formation water was sampled. The dissolved oxygen concentration was measured prior to sampling. Dissolved oxygen concentrations and temperature are summarized in **Table 3**.

Three well volumes were purged from each well prior to sampling to ensure that water samples were representative of the ambient groundwater quality. Groundwater sampling logs are included in **Attachment A**.

Groundwater samples were collected using disposable polyethylene bailers. The samples were collected in laboratory cleaned sample bottles appropriate for each analysis. 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

MtBE concentrations exceed the proposed preliminary active remediation goal (PARG) for this constituent in wells MW-7 and MW-8. MtBE and all other petroleum constituents continue to have the highest in concentrations in well MW-7. Hydrocarbons in the vicinity of MW-7 may have originated from the former UST excavation, a leak from the former product piping or a leak from the pump dispenser located east of well MW-7. The distribution of MtBE in groundwater samples is presented on **Figure 3**.

Concentrations of most hydrocarbon constituents decreased when compared with the last sampling event in August 2001. Notable exceptions are the increase in TPH-d in well MW-7 from 520 ug/L to 6,500 and the increase in MtBE in well MW-6 from 8,800 ug/L to 17,000 ug/L. The concentration of MtBE in well MW-7 has decreased considerably since it was first sampled on November 6, 2000. The concentration has decreased from 920,000 ug/L to 180,000 ug/L in this most recent sampling. MtBE concentrations versus time for all monitoring wells are presented on **Figure 4**. TPH-g concentrations versus time are presented on **Figure 5**. TPH-d concentrations versus time are presented on **Figure 6**.

MtBE is the principal constituent of concern (COC). TPH-g and BTEX constituents are present in many wells but at lower concentrations. Remediation of MtBE will also remove the other COCs. The hydrocarbon plume appears to be centered about wells MW-4, MW-5, MW-6, MW-7 and MW-8. This area includes the former UST pit, and dispenser islands to the west and east of the former UST pit. This area will be the focus of the remedial action. The next quarterly sampling event will be in February 2002.

Recommendations

We recommend abandoning well MW-3, due to incompatible well screening with the other seven monitoring wells and replacing it with well MW-3A. Well MW-3A will have a screened interval similar to the most recently installed wells. We also recommend installing two additional monitoring wells on two adjacent properties south of the Site to determine the groundwater flow direction. Details of this proposed investigation are presented in the *Site Investigation Work Plan (Revision 1)*, dated October 22, 2001. At present, we are negotiating site access with the owners of these adjacent properties.

already approved

After the direction of groundwater flow has been determined, we recommend the installation of offsite temporary borings to determine the lateral extent of the contaminant plume.

We further recommend active remediation in the vicinity of well MW-7 to remove a portion of the hydrocarbon mass present in the shallow groundwater. To this end, we propose Preliminary Active Remediation Goals (PARGs). The purpose of the PARGs is to establish remediation cleanup goals that are achievable and that will remove a large mass of the contaminant plume.

We recommend that this Site be included in the pilot study Pay for Performance Program (PFP) administered by the State Water Resources Control Board, UST Cleanup Fund. The purpose of this pilot PFP is to demonstrate expedited site cleanups using PARGs and payment of the consultant based on performance (i.e., attainment of clean up milestones). We propose establish PARGs and a timeline that are mutually agreeable to the owner, the environmental consultant, ACHCS and the California UST Cleanup Fund. We recommend establishing PARGs and a timeline at a meeting with the stakeholders.

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	9-20	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	11-17	9-11	1-9
MW-4	08/16/00	2	20.5	5-20	4-20	3-4	1-3
MW-5	08/16/00	2	20.5	5-20	4-20	7-13	1-3
MW-6	08/16/00	2	20.5	5-20	4-20	3-4	1-3
MW-7	08/17/00	2	20.5	5-20	4-20	3-4	1-3
MW-8	08/16/00	2	20.5	5-20	4-20	3-4	1-3
MW-9	08/23/00	2	20.5	5-20	4-20	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
	05/07/01		2.94	4.66
	08/22/01		3.70	3.90
	11/04/01		3.89	3.71
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
	05/07/01		6.30	1.49
	08/22/01		5.21	2.58
	11/04/01		5.47	2.32
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
	05/07/01		2.66	5.08
	08/22/01		4.13	3.61
	11/04/01		4.53	3.21

Table 2
Groundwater Elevations
Oakland Truck Stop

Well Number	Date	Top of Casing (ft)	Depth Below TOC (ft)	Elevation Above MSL (ft)
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
	05/07/01		2.73	4.80
	08/22/01		3.88	3.65
	11/04/01		3.95	3.58
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
	05/07/01		3.08	4.81
	08/22/01		3.77	4.12
	11/04/01		4.33	3.56
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
	05/07/01		6.35	2.61
	08/22/01		6.86	2.10
	11/04/01		6.66	2.30
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
	05/07/01		2.76	4.56
	08/22/01		3.56	3.76
	11/04/01		3.76	3.56
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
	05/07/01		2.75	4.55
	08/22/01		3.80	3.50
	11/04/01		3.61	3.69

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	3.2%
	11/06/00	0.24	21.8	2.7%
	02/22/01	0.76	15.7	7.6%
	05/07/01	0.79	20.3	8.6%
	08/27/01	0.20	23.9	2.4%
	11/04/01	0.60	22.5	6.9%
MW-3	08/30/00	0.35	26.4	4.4%
	11/06/00	0.23	22.7	2.6%
	02/22/01	0.97	15.3	9.6%
	05/07/01	NS	NS	NS
	08/27/01	0.40	23.9	4.7%
	11/04/01	NS	NS	NS
MW-4	08/30/00	0.16	27.4	2.0%
	11/06/00	0.30	23.9	3.5%
	02/22/01	0.85	16.3	8.6%
	05/07/01	0.95	20.5	10.4%
	08/27/01	0.20	26.1	2.5%
	11/04/01	0.30	23.7	3.5%
MW-5	08/30/00	0.28	27.0	3.6%
	11/06/00	0.24	22.6	2.8%
	02/22/01	0.77	14.7	7.5%
	05/07/01	0.99	19.8	10.7%
	08/27/01	0.20	26.4	2.5%
	11/04/01	0.60	23.1	7.0%
MW-6	08/30/00	0.42	27.7	5.4%
	11/06/00	0.23	23.0	2.7%
	02/22/01	1.01	15.3	10.0%
	05/07/01	0.89	21.0	9.9%
	08/27/01	0.15	26.5	1.9%
	11/04/01	0.50	23.0	5.8%
MW-7	08/30/00	0.17	26.8	2.1%
	11/06/00	0.25	23.5	2.9%
	02/22/01	0.66	17.1	6.8%
	05/07/01	0.56	21.0	6.2%
	08/27/01	0.40	25.4	4.9%
	11/04/01	0.42	24.0	5.0%
MW-8	08/30/00	0.18	26.4	2.3%
	11/06/00	0.25	23.7	2.9%
	02/22/01	0.69	17.1	7.1%
	05/07/01	0.96	21.1	10.7%
	08/27/01	0.15	26.1	1.9%
	11/04/01	0.3	24.2	3.6%
MW-9	08/30/00	0.30	22.8	3.5%
	11/06/00	0.31	21.7	3.5%
	02/22/01	0.71	16.2	7.2%
	05/07/01	0.97	18.8	10.3%
	08/27/01	0.2	23.0	2.3%
	11/04/01	0.3	22.1	3.4%

Notes: NS = not sampled

(8ppm - 10ppm) @24° @15°

Table 4
Groundwater Analytical Results
Oakland Truck Stop

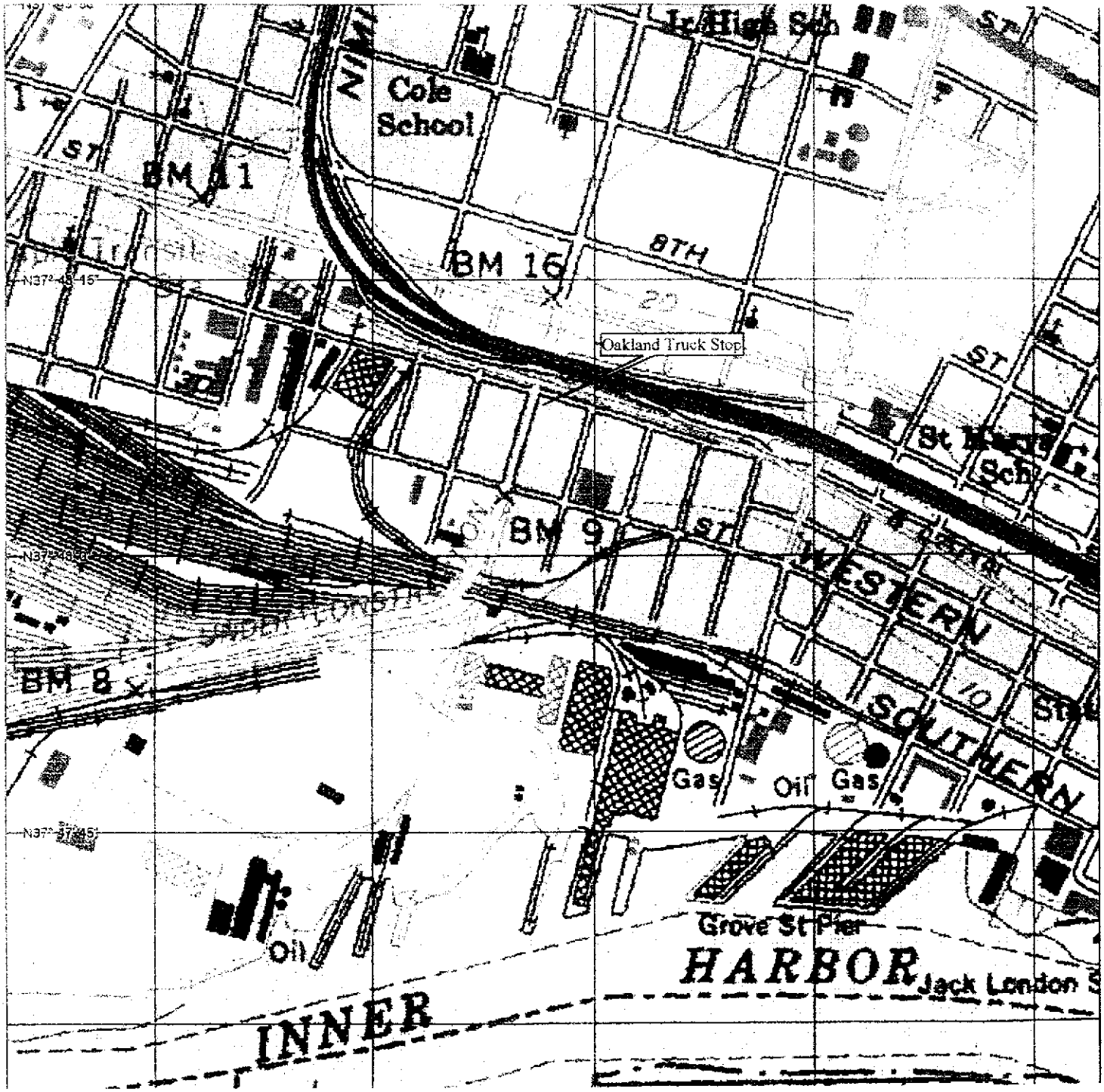
Well Number	Date	TPH-g	TPH-d	MtBE	MtBE 8260	benzene	toluene	ethyl-benzene	xylenes
MW-5	08/30/00	1,000	**450**	**52,000**	NS	ND	ND	ND	ND
	11/06/00	ND<1,000	**520**	44,000	42,000	ND<1.0	ND<1.0	ND<1.0	ND<1.0
	02/22/01	ND<1,000	270	30,000	39,000	ND<1.0	ND<1.0	ND<1.0	ND<1.0
	05/07/01	ND<1,800	**470**	**48,000**	**59,000**	ND<5.0	ND<2.0	ND<2.0	ND<2.0
	08/22/01	ND<2,200	**780**	**63,000**	**70,000**	ND<3.0	ND<3.0	ND<3.0	ND<3.0
	11/04/01	ND<1,700	**670**	44,000	37,000	ND<2.0	ND<2.0	ND<2.0	ND<2.0
MW-6	08/30/00	1,300	**1,300**	23,000	NS	55	ND	16	27
	11/06/00	ND<630	**1,100**	26,000	27,000	7	8.1	ND<3	5.2
	02/22/01	ND<200	**420**	6,500	8,000	ND	ND	ND	ND
	05/07/01	ND<1000	**900**	37,000	40,000	ND<2.0	ND<2.0	ND<1.0	ND<1.0
	08/22/01	ND<350	**520**	8,600	8,800	ND<2.0	ND<1.0	ND	ND
	11/04/01	ND<500	**420**	12,000	17,000	ND<2.0	ND<2.0	ND	ND
MW-7	08/30/00	**160,000**	**2,600**	**800,000**	NS	**28,000**	**15,000**	**1,200**	**5,900**
	11/06/00	**80,000**	**1,700**	**540,000**	**920,000**	**23,000**	**12,000**	**1,200**	**5,000**
	02/22/01	**80,000**	**2,000**	**440,000**	**460,000**	**19,000**	**12,000**	**1,100**	**3,200**
	05/07/01	**100,000**	**7,600**	**460,000**	**520,000**	**25,000**	**16,000**	**1,700**	**6,600**
	08/22/01	**110,000**	**520**	**240,000**	**250,000**	**18,000**	**12,000**	**2,000**	**9,400**
	11/04/01	**85,000**	**6,500**	**150,000**	**180,000**	**17,000**	**2,700**	**2,100**	**9,700**
MW-7D duplicate	02/22/01	**84,000**	**2,400**	**400,000**	**500,000**	**20,000**	**13,000**	**1,200**	**3,400**
	05/07/01	**100,000**	**8,200**	**530,000**	**500,000**	**25,000**	**17,000**	**1,700**	**6,700**
MW-8	08/30/00	ND	**690**	28,000	NS	ND	ND	ND	ND
	11/06/00	ND<3,300	**810**	**120,000**	**76,000**	ND<8	ND<5	ND<3	ND<7
	02/22/01	ND<2,500	**1,100**	**99,000**	**130,000**	ND<3	ND<3	ND<3	ND<3
	05/07/01	ND<5,000	**1,300**	**110,000**	**120,000**	32	ND<10	ND<5.0	ND<5.0
	08/22/01	ND<4,000	**1,200**	**76,000**	**86,000**	ND<5.0	ND<5.0	ND<5.0	16
	11/04/01	590	**1,100**	**60,000**	**49,000**	6.9	ND	ND	ND
MW-9	08/30/00	ND	**770**	97	NS	ND	ND	ND	ND
	11/06/00	ND	**390**	190	220	ND	ND	ND	ND
	02/22/01	ND	240	120	160	ND	ND	ND	ND
	05/07/01	ND	190	120	150	ND	ND	ND	ND
	08/22/01	ND	120	120	120	ND	ND	ND	ND
	11/04/01	ND	160	ND	120	ND	ND	ND	ND
Proposed PARG		20,000	380	48,000	48,000	3,600	2,400	700	1,880

Notes:
units are micrograms per liter (ug/L)
ND = Not detected
NS = Not sampled
PARG = Preliminary Active Remediation Goal
Concentrations in excess of the proposed PARGs are in bold
MW-2 was destroyed during excavation of contaminated soil
MW-4 through MW-9 were constructed in August 2000
The following petroleum hydrocarbon constituents have not been detected to date DIPE, ETBE, TAME, TBA, methanol, ethanol, EDB and 1,2-DCA

80% Reduction from highest conc.

Table 4
Groundwater Analytical Results
Oakland Truck Stop

Well Number	Date Sampled	TPH-g	TPH-d	MtBE	MtBE 8260	benzene	toluene	ethyl-benzene	xylenes
MW-1	11/04/96	ND	220	ND	NA	ND	ND	ND	ND
	03/05/97	ND	230	ND	NA	ND	ND	ND	ND
	06/12/97	ND	290	ND	NA	ND	ND	ND	ND
	09/09/97	ND	180	ND	NA	ND	ND	ND	ND
	02/13/98	ND	**590**	9.4	NA	ND	ND	ND	ND
	07/07/98	ND	**1,400**	ND	2.7	ND	ND	ND	ND
	10/01/98	ND	**1,100**	ND	1.8	ND	ND	ND	ND
	12/30/98	ND	**1,700**	ND	2.3	ND	ND	ND	ND
	03/21/00	220	**3,100**	3,800	4,800	11	ND	ND	ND
	08/30/00	140	**1,600**	2,900	NS	5.3	ND	ND	ND
	11/06/00	51	**1,500**	1,700	2,100	1.0	ND	ND	ND
	02/22/01	140	**3,000**	1,000	1,100	ND	ND	ND	ND
	05/07/01	ND	**3,800**	780	1,100	ND	ND	ND	ND
	08/22/01	ND<110	**1,800**	1,900	1,600	ND	ND	ND	ND
	11/04/01	ND	**1,300**	1,600	1,500	ND	ND	ND	ND
MW-2	11/04/96	910	**2,700**	**470,000**	NA	120	23	3.5	51
	03/05/97	4,400	**2,300**	**760,000**	NA	1,500	51	24	100
	06/12/97	3,600	**2,400**	**840,000**	NA	1,200	14	12	40
	09/09/97	3,700	**970**	**470,000**	NA	570	31	19	60
	02/13/98	6,500	**2,200**	**750,000**	NA	2,400	31	ND	ND
	07/07/98	5,200	**2,700**	**950,000**	**1,000,000**	2,800	ND	ND	ND
	10/01/98	1,200	**1,200**	**420,000**	**360,000**	330	12	8.8	11
Well Destroyed	12/30/98	1,000	**1,900**	**370,000**	**360,000**	96	ND	ND	ND
MW-3	11/04/96	ND	310	1,000	NA	ND	ND	ND	ND
	03/05/97	ND	210	13	NA	ND	ND	ND	ND
	06/12/97	ND	94	17	NA	ND	ND	ND	ND
	09/09/97	ND	**2,300**	12	NA	ND	ND	ND	ND
	02/13/98	ND	**570**	14	NA	ND	ND	ND	ND
	07/07/98	ND	**1,100**	7.8	6.6	ND	ND	ND	ND
	10/01/98	ND	**390**	9.2	4.8	ND	ND	ND	ND
	12/30/98	ND	64	6.9	4.5	ND	ND	ND	ND
	03/21/00	ND	**2,800**	6.7	4.8	ND	ND	ND	ND
	08/30/00	ND	260	12	NS	1.3	ND	ND	ND
	11/06/00	ND	**940**	25	12	ND	ND	ND	ND
	02/22/01	ND	340	18	26	1.2	1.5	ND	0.74
	05/07/01	140	**460**	25	33	0.76	4.7	2.2	14.0
	08/22/01	ND	130	41	44	ND	ND	ND	ND
	11/04/01	ND	190	36	43	ND	ND	ND	ND
MW-4	08/30/00	1,300	**390**	**210,000**	NS	64	63	9.7	110
	11/06/00	ND<3,300	170	**130,000**	**120,000**	80	ND<4.0	ND<5.0	ND<3.0
	02/22/01	ND<3,300	120	**120,000**	**150,000**	30	ND<3.0	ND<3.0	ND<3.0
	05/07/01	ND<4,200	240	**150,000**	**200,000**	ND<20	ND<10	ND<5.0	ND<5.0
	08/22/01	ND<5,400	300	**160,000**	**190,000**	ND<5.0	ND<5.0	ND<5.0	ND<5.0
	11/04/01	ND<5,000	210	**130,000**	**170,000**	ND<5.0	ND<5.0	ND<5.0	ND<5.0



Project No: 3628

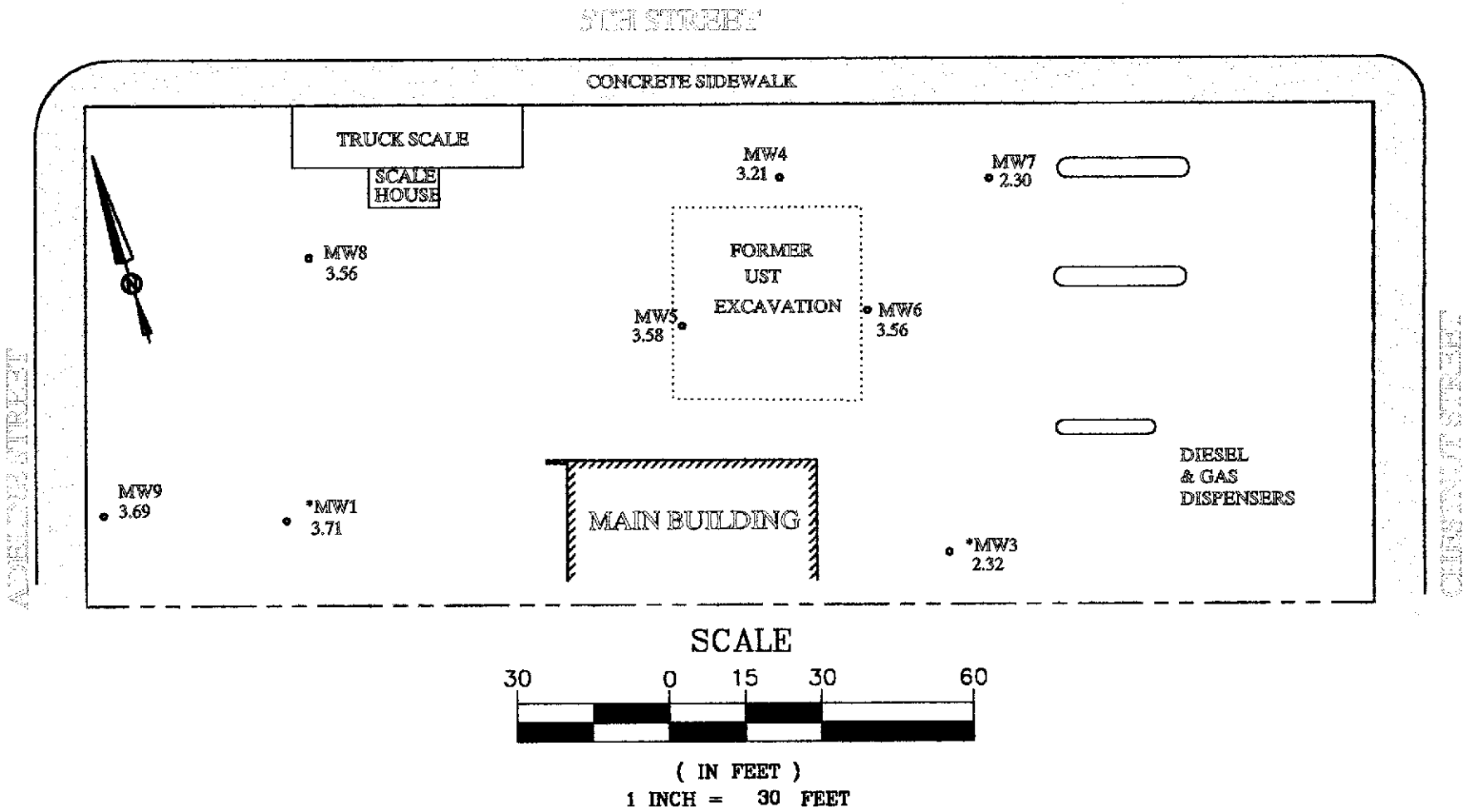
September 2000

Site Location Map
Oakland Truck Stop
1107 5th Street
Oakland, California

Figure 1

N

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)

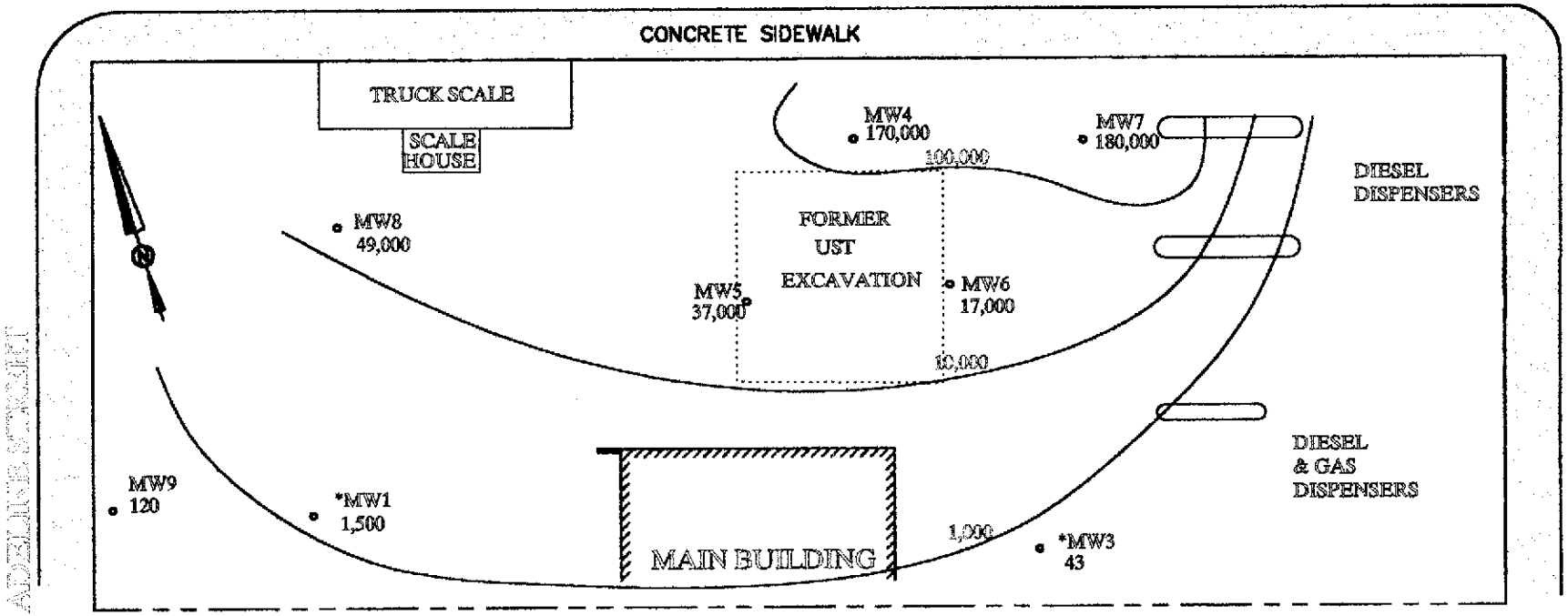
1 INCH = 30 FEET

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: 11/04/01	



SCALE

30 0 15 30 60

(IN FEET)

1 INCH = 30 FEET

Note: MtBE analyzed by EPA Method 8260

W.A. Craig, Inc.
6940 Tremont Road LIC# 455752
Dixon, California 95620-9603
PH# (707) 693-2929 Fax# (707) 693-2922

MtBE Concentrations in Groundwater

OAKLAND TRUCK STOP
1107 FIFTH STREET
OAKLAND, CA

Project #: 3628	Figure: 3
Date: 11/04/01	

Figure 4. MtBE Concentrations vs. Time

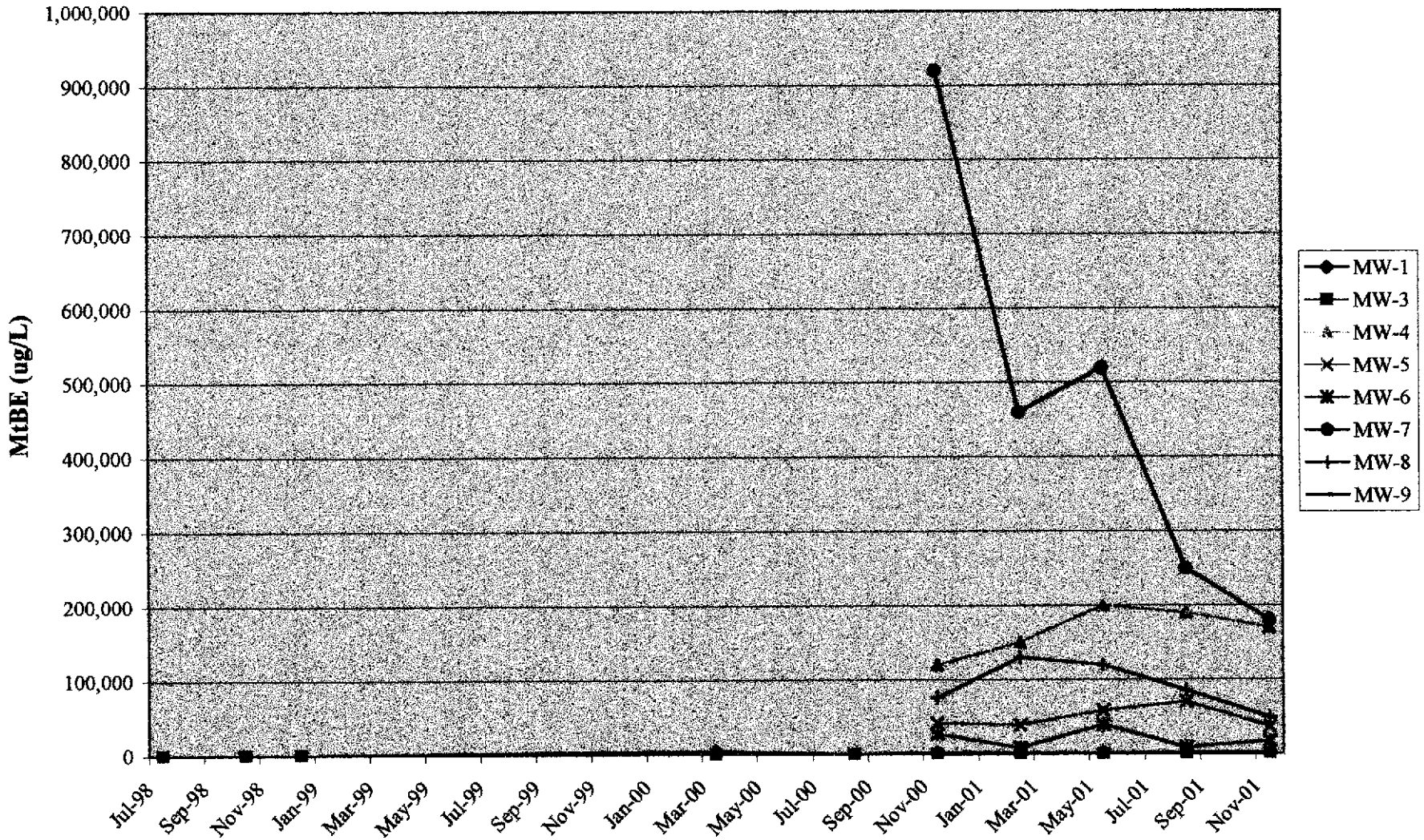


Figure 5. TPH-g Concentrations vs. Time

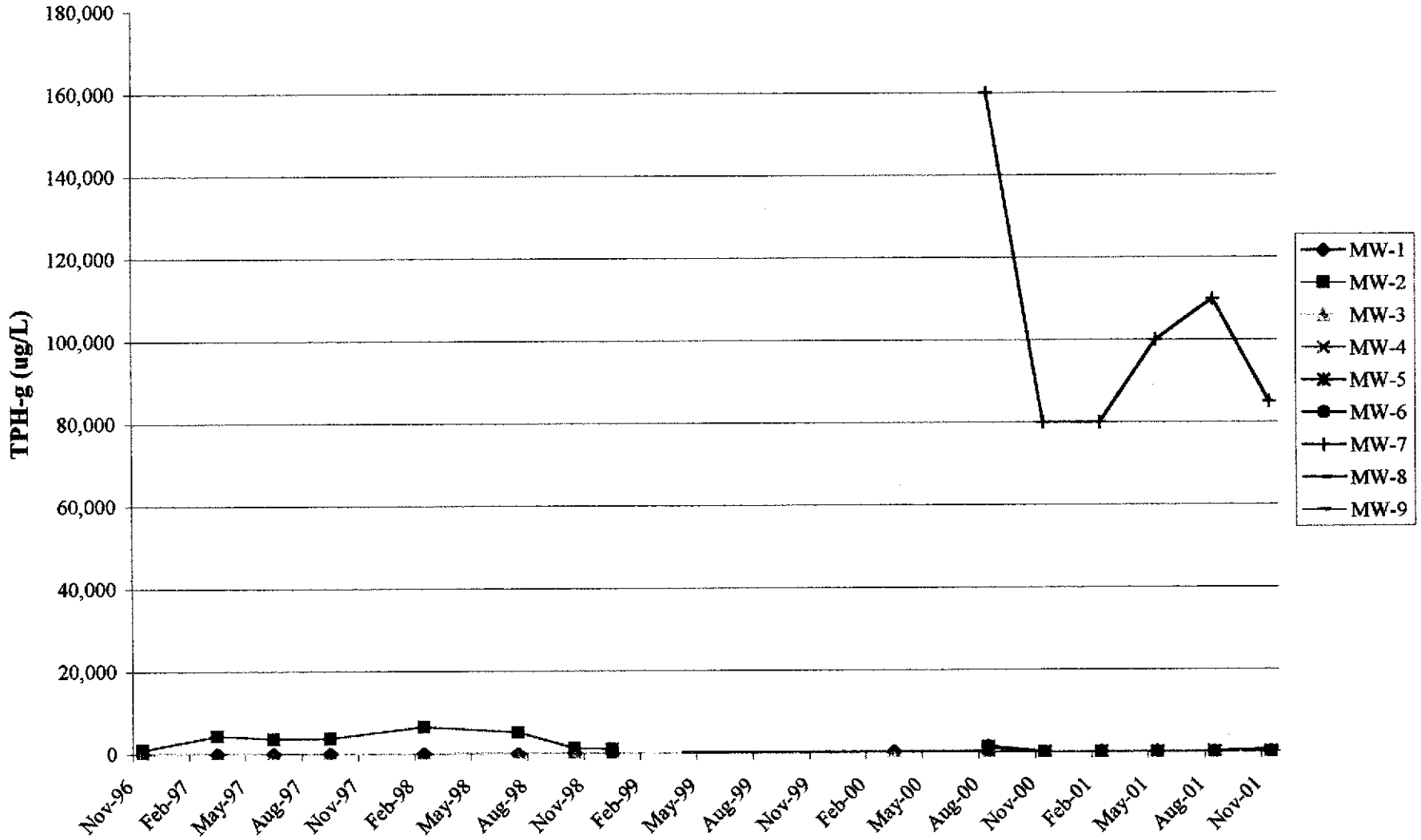
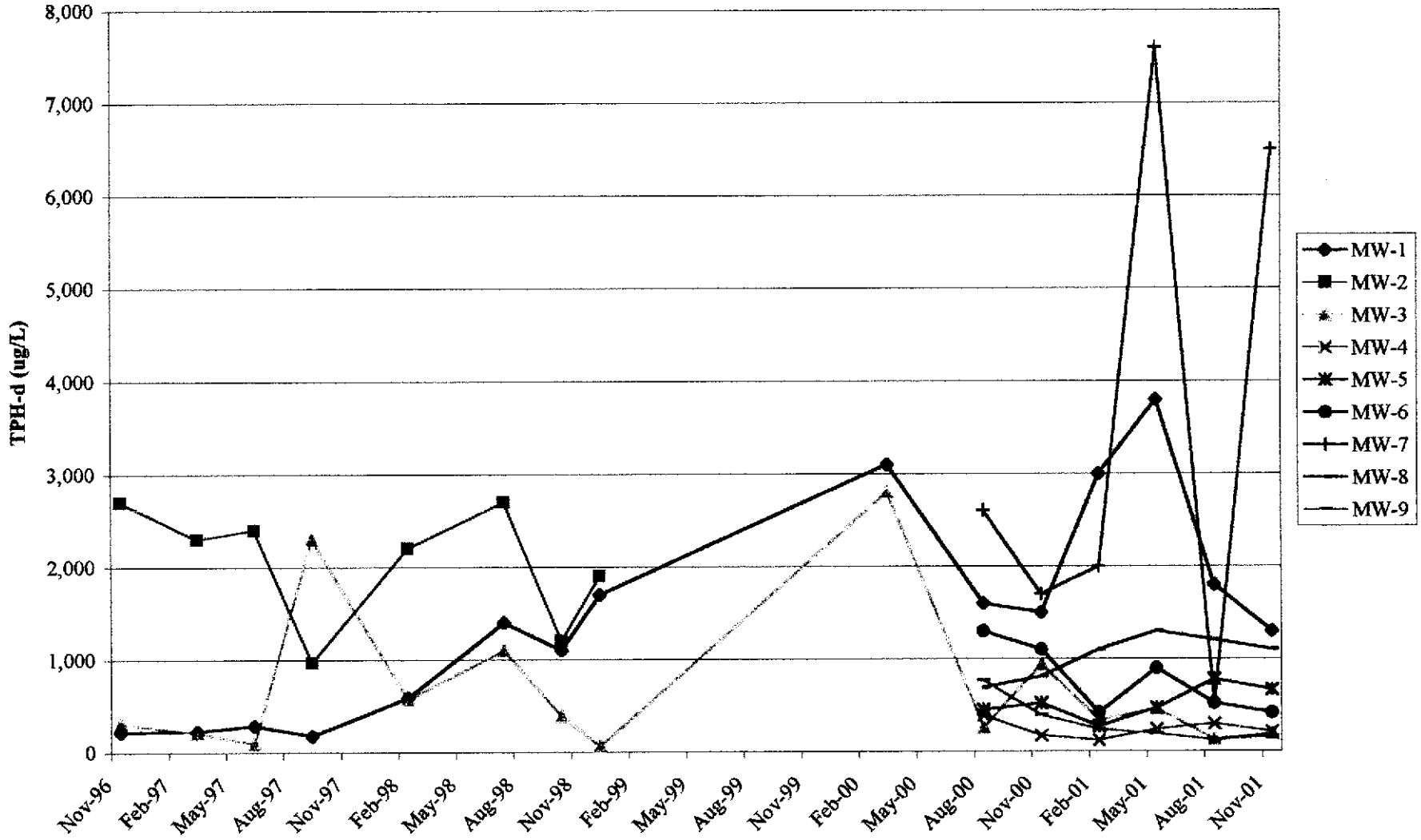


Figure 6. TPH-d Concentrations vs. Time



APPENDIX A

GROUNDWATER SAMPLING LOGS

WELL DEVELOPMENT AND SAMPLING LOG

Project Name Rinehart Job No. 3628 Date 11-4-01 Weather sunny/warm

ler J. Davis

Well Data **Well Number MW1**

Total Depth of Well 20' Casing Elevation _____ Depth to Water 3.89 Groundwater Elevation _____

Method of Purging Well _____ Method of Sampling Well _____

Casing Volume 2.7 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 2.7x3 = 8.0 gall. (only purged 6 gall)

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
1553	Begin purging well					
1600			3999*			yellowish tan, no odor
1603			3999*			no sheen
1605			3990*			
1608			3999*			
1612			3999*			
						DO = 0.6 @ 22.5°

Comments:

*maxed out the meter

Well Data **Well Number [redacted] MW9**

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 3.61' Groundwater Elevation _____

Method of Purging Well _____ Method of Sampling Well _____

Casing Volume 2.8 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 2.8x3 = 8.4 gall.

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
1627	Begin purging well					
1640			3999*			light yellowish olive green
						slight odor, no sheen
						DO = 0.3 @ 22.1°

Comments:

*maxed out the meter

WELL DEVELOPMENT AND SAMPLING LOG

Project Name Rinehart Job No. 3628 Date 11-4-01 Weather sunny/warm
ler T. Davis

Well Data **Well Number MW3**

Total Depth of Well 20' Casing Elevation _____ Depth to Water 5.47 Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.4 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 2.4x3 = 7.2 gall. only purged 2.5 gall

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
1657	Begin purging well					
1700			2354			yellowish green yellow PPT odor, no sheen
1710						

Comments:

Well Data **Well Number MW4**

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 4.53' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.7 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 2.7x3 = 8.0 gall.

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
1440	Begin purging well					
45			3158			greyish, olive green, odor
48			3203			sheen
55			3836			
						DO = 8.3 @ 23.7°

Comments:

WELL DEVELOPMENT AND SAMPLING LOG

Project Name Rinehart Job No. 3628 Date 11-4-01 Weather sunny/warm
ler T. Davis

Well Data **Well Number** MW5

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 3.95' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.7 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 2.7 x 3 = 8.2 gall.

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
1509	Begin purging well					
13			1884			greyish brown, odor, slight sheen
15			1883			
17			1812			
19			1816			
20			1807			
						DO = 0.6 @ 23.1°

Comments:

Well Data **Well Number** MW6

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 4.33' Groundwater Elevation _____
Method of Purging Well _____ Method of Sampling Well _____
Casing Volume 2.7 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 2.7 X3 = 8.1 gall.

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
1419	Begin purging well					
15			1285			gray, odor, sheen
17			1264			
20			1243			
22			1162			
25			1165			
						DO = 0.5 @ 23.0°

Comments:

WELL DEVELOPMENT AND SAMPLING LOG

Project Name Rinehart Job No. 3628 Date 11-4-01 Weather sunny/warm

ler T. Davis

Well Data **Well Number MW7**

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 6.66' Groundwater Elevation _____

Method of Purging Well _____ Method of Sampling Well _____

Casing Volume 2.3 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 2.3 x 3 = 6.9 gall.

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
1352	Begin purging well					
55			1461			[illegible] odor, sheen
59			1409			
1402			1506			
						DO = 0.42 @ 24.0°

Comments:

Well Data **Well Number MW8**

Total Depth of Well 20.5' Casing Elevation _____ Depth to Water 3.76 Groundwater Elevation _____

Method of Purging Well _____ Method of Sampling Well _____

Casing Volume 2.8 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 2.8 x 3 = 8.3 gall.

Field Parameters

Time	Volume (gal)	Temperature	SP	pH	Turbidity	Comments (color/odor/sheen/product etc.)
1533	Begin purging well					
36			2417			dramatic greenish green
38			2518			[illegible] odor, slight sheen
40			2963			
45			3126			
						DO = ~~0.5 @ 24.0°~~ 0.3 @ 24.2°

Comments: bubbles in VOA's due to "carbonated" effect.

Acid preservative + CO_3 → CO_2↑

APPENDIX B

LABORATORY ANALYTICAL REPORTS

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
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: 11/04/01
		Date Received: 11/05/01
	Client Contact: Tim Cook	Date Extracted: 11/05/01
	Client P.O:	Date Analyzed: 11/05/01

11/12/01

Dear Tim:

Enclosed are:

1). the results of **8** 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

McCAMPBELL ANALYTICAL INC.
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Telephone : 925-798-1620 Fax : 925-798-1622
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: 11/04/01
		Date Received: 11/05/01
	Client Contact: Tim Cook	Date Extracted: 11/06-11/09/01
	Client P.O:	Date Analyzed: 11/06-11/13/01

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
82720	MW1	W	ND	1600	ND	ND	ND	ND	103
82721	MW3	W	ND	36	ND	ND	ND	ND	106
82722	MW4	W	ND<5000	130,000	ND<5.0	ND<5.0	ND<5.0	ND<5.0	105
82723	MW5	W	ND<1700	44,000	ND<2.0	ND<2.0	ND<2.0	ND<2.0	107
82724	MW6	W	ND<500	12,000	ND<2.0	ND<2.0	ND	ND	102
82725	MW7	W	85,000,a	150,000	17,000	2700	2100	9700	113
82726	MW8	W	590,f	60,000	6.9	ND	ND	ND	107
82727	MW9	W	ND	130	ND	ND	ND	ND	105
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

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
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: 11/04/01
		Date Received: 11/05/01
	Client Contact: Tim Cook	Date Extracted: 11/05/01
	Client P.O:	Date Analyzed: 11/06-11/14/01

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
82720	MW1	W	1300,a	94
82721	MW3	W	190,b,g	92
82722	MW4	W	210,c	93
82723	MW5	W	670,c	97
82724	MW6	W	420,c	100
82725	MW7	W	6500,d	91
82726	MW8	W	1100,c	95
82727	MW9	W	160,c	96
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	
		S	1.0 mg/kg	

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

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

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

DHS Certification No. 1644

Edward Hamilton, Lab Director

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W. A. Craig, Inc. 6940 Tremont Road Dixon, CA 95620-9603	Client Project ID: #3628; Rinehart	Date Sampled: 11/04/01
		Date Received: 11/05/01
	Client Contact: Tim Cook	Date Extracted: 11/08-11/13/01
	Client P.O:	Date Analyzed: 11/08-11/13/01

Oxygenated Volatile Organics By GC/MS

EPA method 8260 modified

Lab ID	82720	82721	82722	82723	Reporting Limit	
Client ID	MW1	MW3	MW4	MW5		
Matrix	W	W	W	W	S	W
Compound	Concentration*				ug/kg	ug/L
Di-isopropyl Ether (DIPE)	ND<50	ND	ND<2500	ND<1000	5.0	1.0
Ethyl tert-Butyl Ether (ETBE)	ND<50	ND	ND<2500	ND<1000	5.0	1.0
Methyl-tert Butyl Ether (MTBE)	1500	43	170,000	37,000	5.0	1.0
tert-Amyl Methyl Ether (TAME)	ND<50	ND	ND<2500	ND<1000	5.0	1.0
tert-Butanol	ND<250	ND	ND<13,000	ND<5000	25	5.0
Surrogate Recoveries (%)						
Dibromofluoromethane	117	88	102	87		
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

DHS Certification No. 1644

Edward Hamilton, Lab Director

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W. A. Craig, Inc. 6940 Tremont Road Dixon, CA 95620-9603	Client Project ID: #3628; Rinehart	Date Sampled: 11/04/01
		Date Received: 11/05/01
	Client Contact: Tim Cook	Date Extracted: 11/08/01
	Client P.O:	Date Analyzed: 11/08/01

Oxygenated Volatile Organics By GC/MS

EPA method 8260 modified

Lab ID	82724	82725	82726	82727	Reporting Limit	
Client ID	MW6	MW7	MW8	MW9		
Matrix	W	W	W	W	S	W
Compound	Concentration*				ug/kg	ug/L
Di-isopropyl Ether (DIPE)	ND<250	ND<2500	ND<2500	ND<5.0	5.0	1.0
Ethyl tert-Butyl Ether (ETBE)	ND<250	ND<2500	ND<2500	ND<5.0	5.0	1.0
Methyl-tert Butyl Ether (MTBE)	17,000	180,000	49,000	120	5.0	1.0
tert-Amyl Methyl Ether (TAME)	ND<250	ND<2500	ND<2500	ND<5.0	5.0	1.0
tert-Butanol	ND<1300	ND<13,000	ND<13,000	ND<25	25	5.0
Surrogate Recoveries (%)						
Dibromofluoromethane	81	102	88	107		
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

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
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: 11/04/01
		Date Received: 11/05/01
	Client Contact: Tim Cook	Date Extracted: 11/08-11/13/01
	Client P.O:	Date Analyzed: 11/08-11/13/01

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
82720	MW1	W	ND<50,j	ND<50	117
82721	MW3	W	ND	ND	88
82722	MW4	W	ND<2500,j	ND<2500	102
82723	MW5	W	ND<1000,j	ND<1000	87
82724	MW6	W	ND<250,j	ND<250	81
82725	MW7	W	ND<2500,j	ND<2500	102
82726	MW8	W	ND<2500,j	ND<2500	88
82727	MW9	W	ND<5.0,j	ND<5.0	107
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	1.0 ug/L	1.0	
		S	5.0 ug/kg	5.0	

* 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

EPA 8015m + 8020

Date: 11/06/01 **Matrix:** Water

Compound	Concentration: ug/L			%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 110701	Extraction: EPA 5030				Instrument: GC-7		
Surrogate1	ND	107.0	106.0	100.00	107	106	0.9
Xylenes	ND	32.1	32.3	30.00	107	108	0.6
Ethylbenzene	ND	10.8	10.8	10.00	108	108	0.0
Toluene	ND	10.8	10.8	10.00	108	108	0.0
Benzene	ND	9.9	10.8	10.00	99	108	8.7
MTBE	ND	9.0	9.3	10.00	90	93	3.3
TPH (gas)	ND	102.2	101.0	100.00	102	101	1.2
SampleID: 100601	Extraction: EPA 3510				Instrument: GC-11 A		
Surrogate1	ND	82.0	83.0	100.00	82	83	1.2
TPH (diesel)	ND	8600.0	8600.0	7500.00	115	115	0.0

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

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 200$$

RPD means Relative Percent Deviation

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QC REPORT

VOCs (EPA 8240/8260)

Date: 11/08/01 **Extraction:** N/A **Matrix:** Water

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 110701					Instrument:	GC-10	
Surrogate	ND	100.0	100.0	100.00	100	100	0.0
tert-Amyl Methyl Ether	ND	9.8	9.9	10.00	98	99	1.0
Methyl tert-Butyl Ether	ND	9.4	9.5	10.00	94	95	1.1
Ethyl tert-Butyl Ether	ND	10.2	10.4	10.00	102	104	1.9
Di-isopropyl Ether	ND	9.9	9.9	10.00	99	99	0.0
Toluene	ND	10.0	10.0	10.00	100	100	0.0
Benzene	ND	10.6	10.6	10.00	106	106	0.0
Chlorobenzene	ND	10.6	10.4	10.00	106	104	1.9
Trichloroethene	ND	8.8	8.8	10.00	88	88	0.0
1,1-Dichloroethene	ND	10.3	10.3	10.00	103	103	0.0

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

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 200$$

RPD means Relative Percent Deviation

28591 ZWAC603

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CHAIN OF CUSTODY RECORD

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

Report To: T. Cook Bill To:
Company: W. A. Craig
6940 Tremont Road
Dixon, CA 95620-9603
Tele: (707) 693-2929 Fax: (707) 693-2922
Project #: 3628 Project Name: Rinehart
Project Location: 1107 5th St, Oakland, CA
Sampler Signature: [signature]

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) fuel oxys Lead Scav	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	Oakland	11-4	16:13	5	*	X					X	X			X	X							X								*3-40mL (HCl)
MW3	↓	↓	17:11	↓	↓	X					X	X			X	X							X								2-1Liter Ambers
MW4			14:56			X					X	X			X	X							X								(no HCl)
MW5			15:21			X					X	X			X	X							X								
MW6			14:26			X					X	X			X	X							X								
MW7			14:03			X					X	X			X	X							X								
MW8			15:46			X					X	X			X	X							X								
MW9	↓	↓	16:41	↓	↓	X					X	X			X	X							X								

Comments (stamped): 82720, 82721, 82722, 82723, 82724, 82725, 82726, 82727

Relinquished By:	Date:	Time:	Received By:
[signature]	11/5	8am	[signature]
[signature]	11/5	7pm	Anne A. Butler

Remarks:

ICE/t° ✓
GOOD CONDITION ✓
HEAD SPACE ABSENT ✓

	VOAS	O&G	METALS	OTHER
PRESERVATION	✓			

APPROPRIATE CONTAINERS ✓