

**SEMI-ANNUAL GROUNDWATER
MONITORING REPORT**

**ARROW RENTALS
LIVERMORE, CALIFORNIA**

APRIL 2001

COPY

Prepared for: Don-Sul Inc.
187 North L Street
Livermore, California 94607

Date Prepared: June 15, 2001

By: Environmental Sampling Services
and Aquifer Sciences, Inc.

June 4, 2001
971275

Rita Sullins
Don-Sul, Inc.
187 North L Street
Livermore, CA 94550

Subject: Semi-Annual Groundwater Monitoring, April 2001
187 North L Street, Livermore, California

Dear Ms. Sullins:

Groundwater monitoring was conducted in April 2001 at the Arrow Rentals site, located at 187 North L Street in Livermore, California. This report presents the groundwater measurement and sampling procedures, evaluation of hydrogeologic data, and the results of laboratory analyses.

MEASUREMENT AND SAMPLING PROCEDURES

On April 18, 2001, groundwater monitoring was performed at the site by Environmental Sampling Services of Martinez, California. The locations of the groundwater monitoring wells are illustrated on Figure 1. Sampling procedures and measurements are described in the field activity report, included in Appendix A.

Prior to sampling, the depth of static groundwater was measured in all four wells (W-1s, W-3s, W-Bs, and W-Es) to the nearest 0.01 foot using an electrical water level recorder. The interface probe was washed using a Liqui-Nox® detergent solution, rinsed with potable water, and rinsed with distilled water. Groundwater elevation data for each well are listed in Table 1. The potentiometric surface corresponding to groundwater elevations measured on April 18, 2001, is shown on Figure 2.

Three of the wells (W-1s, W-3s, and W-Bs) were purged and sampled after static water level measurements were recorded. At least three casing volumes of groundwater were removed from each well prior to sampling. Each well was purged using a submersible pump with new tubing. Purge water from the monitoring wells was stored in 55-gallon drums, pending the analytical results.

Water quality parameters (pH, specific conductance, temperature, turbidity, color, and odor) were recorded at regular intervals during well purging. Water quality parameters for the three

wells were recorded in the sampling logs. Copies of the well sampling logs are included in Appendix A.

Groundwater samples were collected from each well using the submersible pump set to the minimum possible pump rate. Groundwater samples were collected in clean bottles supplied by the analytical laboratory, labeled, stored on ice in a cooler, and transported under chain-of-custody protocol within 24 hours of collection to McCampbell Analytical Laboratories, a California-certified laboratory located in Pacheco, California. A travel blank was prepared by the laboratory and accompanied the groundwater samples for quality assurance purposes.

The groundwater samples were analyzed for total petroleum hydrocarbons quantified as gasoline (TPH-gasoline) by EPA Method 8015 Modified; total petroleum hydrocarbons quantified as diesel (TPH-diesel) by EPA Method 8015 Modified; benzene, toluene, ethylbenzene, xylenes (BTEX) by EPA Method 8020; and methyl tertiary butyl ether (MTBE) by EPA Method 8020 Modified. The travel blank was analyzed for gasoline by EPA Method 8015 Modified, BTEX by EPA Method 8020, and MTBE by EPA Method 8020 Modified.

HYDROGEOLOGIC DATA EVALUATION

Groundwater elevations in the four monitoring wells ranged from 442.63 feet in well W-Es to 447.80 feet in well W-1s. Based upon measurements recorded on April 18, 2001, groundwater generally flows to the northwest as shown on Figure 2. The hydraulic gradient is approximately 0.019 ft/ft.

RESULTS OF LABORATORY ANALYSES

Results of laboratory analyses for groundwater samples collected in April 2001 are summarized in Tables 2 and 3. The laboratory report and chain-of-custody documentation are included in Appendix B.

Gasoline was detected in the groundwater samples collected from wells W-3s, W-Bs, W-1s, at concentrations ranging from 2,300 to 54,000 µg/L. TPH-diesel was detected at concentrations ranging from 1,600 to 6,800 µg/L. However, the laboratory indicated that non-diesel petroleum hydrocarbons were also present in all samples. Benzene was detected at concentrations ranging from 320 to 5,200 µg/L. The Maximum Contaminant Level (MCL) for benzene is 1 µg/L. Toluene (up to 1,800 µg/L), ethylbenzene (up to 1,500 µg/L), and xylenes (up to 7,000 µg/L) were also detected in the samples collected from all three wells. The concentrations of toluene, ethylbenzene, and xylenes in wells W-1s and W-Bs exceeded MCLs. MTBE was not detected in any of the groundwater samples.

SUMMARY AND CONCLUSIONS

Table 4 presents a summary of the analytical data for groundwater at the three wells since March 1996. High levels of gasoline, diesel, BTEX, and MTBE have been consistently detected in groundwater samples collected from wells W-1s and W-Bs. Lower levels of gasoline, diesel, BTEX, and MTBE have also been detected in samples collected from well W-3s (and W-Es when sampled). Fluctuations in the concentrations of gasoline, diesel, and BTEX may be related to seasonal variations in groundwater elevations and the groundwater flow direction. In April 2001, the direction of groundwater flow beneath the site was northwest.

Please call us if you have any questions concerning this report.

Respectfully yours,



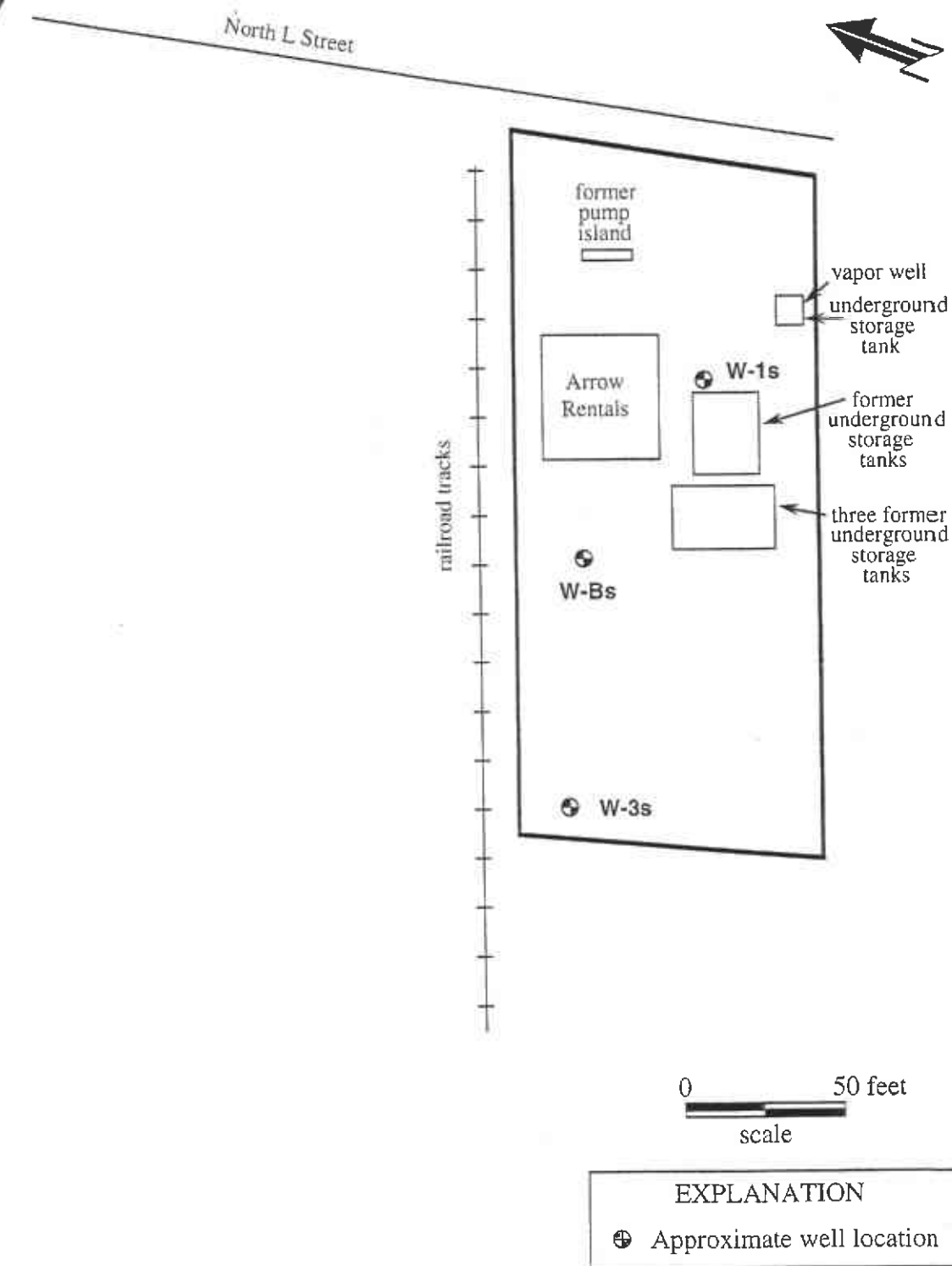
Richard P. Salopek
Hydrogeologist

Attachments



Rebecca A. Sterbentz, RG, CHG, REA
President





W-Es
⊕

Figure 1. SITE MAP
187 North L Street, Livermore, California

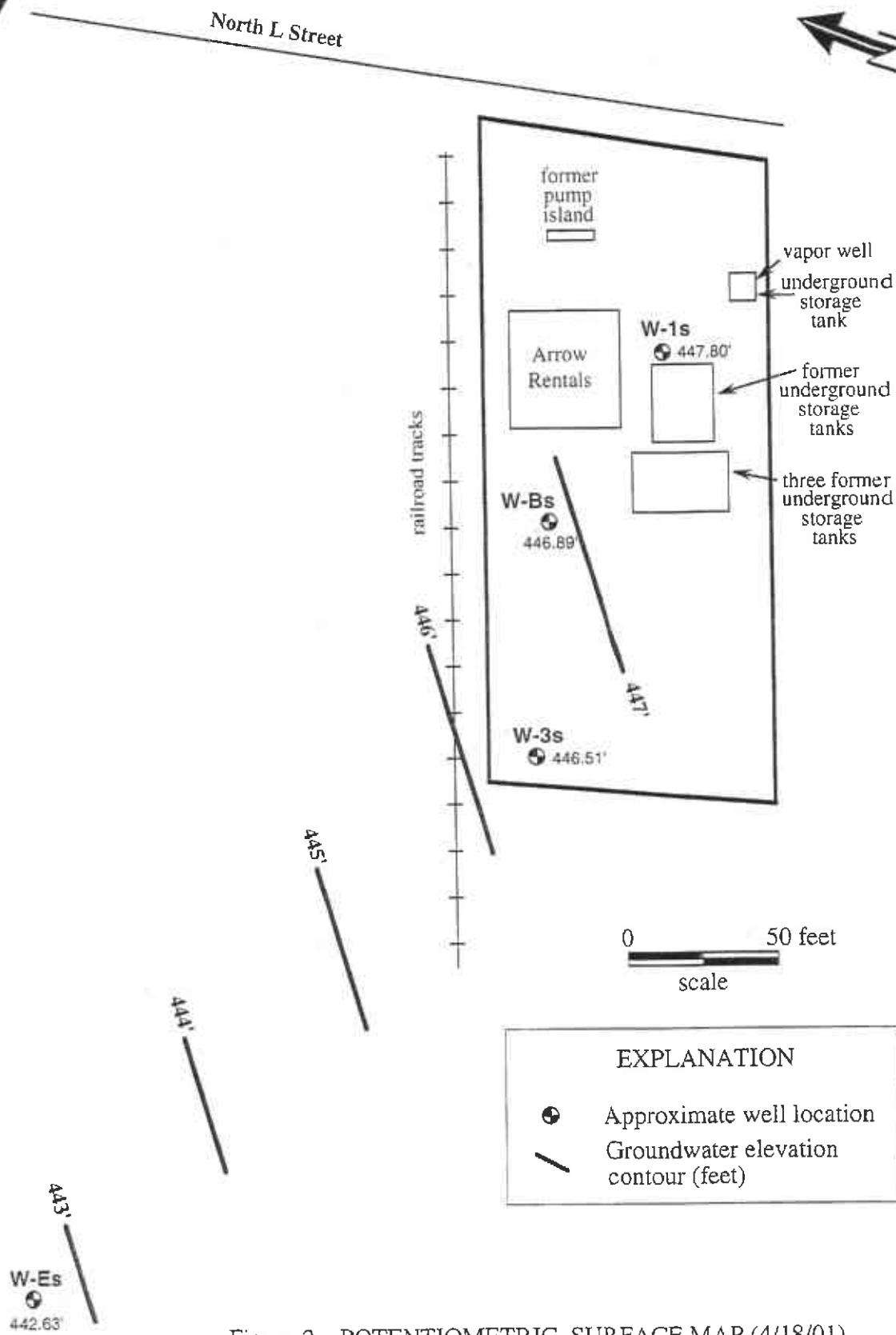


Figure 2. POTENTIOMETRIC SURFACE MAP (4/18/01)
187 North L Street, Livermore, California

Table 1. GROUNDWATER ELEVATION DATA
 187 North L Street, Livermore, California
 April 18, 2001

Well Number	Top of Casing Elevation (feet above MSL)	Depth to Water (feet below TOC)	Water Elevation (feet above MSL)
W-1s	479.09	31.29	447.80
W-3s	476.98	30.47	446.51
W-Bs	478.82	31.93	446.89
W-Es	474.66	32.03	442.63

MSL = mean sea level (elevations based on City of Livermore datum)

TOC = top of well casing

Table 2. ANALYTICAL RESULTS FOR GROUNDWATER - PETROLEUM HYDROCARBONS
187 North L Street, Livermore, California
April 18, 2001

Well Number	TPH- gasoline (µg/L)	TPH- diesel (µg/L)	TPH- motor oil (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Naphthalene (µg/L)	2-Methyl- naphthalene (µg/L)
W-1s	54,000*†	6,800†‡	NA	5,200	1,800	1,500	7,000	< 330	NA	NA
W-3s	2,300*	1,600‡§	NA	320	8.0	16	7.0	< 20	NA	NA
W-Bs	20,000*	2,500‡	NA	2,400	180	880	1,800	< 20	NA	NA
Travel Blank	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0	NA	NA
MDL	50	50	--	0.5	0.5	0.5	0.5	5.0-330	--	--
MCL	NE	NE	NE	1	150	700	1,750	5	NE	NE

µg/L = micrograms per liter [parts per billion (ppb)]

NA = not analyzed

NE = none established

TPH-gasoline = total petroleum hydrocarbons quantified as gasoline

TPH-diesel = total petroleum hydrocarbons quantified as diesel

TPH-motor oil = total petroleum hydrocarbons quantified as motor oil

MTBE = methyl tertiary butyl ether

MDL = method detection limit

MCL = Maximum Contaminant Level, February 2000

* Unmodified or weakly modified gasoline is significant.

† Lighter than water immiscible sheen is present.

‡ Gasoline range compounds are significant.

§ Oil range compounds are significant.

Table 3. SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
187 North L Street, Livermore, California

Well Number	Date Sampled	TPH-gasoline (µg/L)	TPH-diesel (µg/L)	TPH-motor oil (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Lead (µg/L)	Naphthalene (µg/L)	2-Methyl-naphthalene (µg/L)
W-1s	3/22/96	6,400	NA	NA	580	470	85	1,100	< 500	NA	NA	NA
W-1s	11/22/96	170,000	NA	NA	13,000	18,000	3,500	18,000	< 10,000	NA	NA	NA
W-1s	7/15/97	140,000	38,000*	3,000	12,000	12,000	2,600	16,000	< 800	NA	NA	NA
W-1s	10/29/97	650,000	180,000	1,600	14,000	19,000	7,800	35,000	< 3,000	NA	NA	NA
W-1s	4/27/98	6,700	2,200†	NA	410	250	77	870	< 30	< 5	NA	NA
W-1s	10/23/98	99,000	18,000†	NA	9,800	9,400	1,800	11,000	< 600	NA	NA	NA
W-1s	4/9/99	70,000	24,000	NA	6,500	7,000	1,800	8,900	360	NA	330	ND
W-1s	10/5/99	82,000	60,000‡	NA	5,500	4,500	2,500	14,000	< 300	NA	510	280
W-1s	4/5/00	47,000	15,000‡	NA	4,300	2,300	1,500	6,100	170	NA	330	110
W-1s	10/26/00	50,000	1,200	< 500	3,800	1,800	1,700	7,600	< 50	NA	350	180
W-1s	4/18/01	54,000\$,**	6,800**,††	NA	5,200	1,800	1,500	7,000	< 330	NA	NA	NA
W-3s	3/22/96	100	NA	NA	13	6.9	5.3	14	< 5	NA	NA	NA
W-3s	11/22/96	3,200	NA	NA	270	29.0	63.0	100	< 100	NA	NA	NA
W-3s	7/15/97	2,100	340*	740	230	7	33	51	< 20	NA	NA	NA
W-3s	10/29/97	2,800	750	88	630	31	71	69	< 30	NA	NA	NA
W-3s	4/27/98	< 50	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 3	NA	NA	NA
W-3s	10/23/98	3,800	1,000†	NA	500	28	90	37	35	NA	NA	NA
W-3s	4/9/99	980	430	NA	240	4	37	3	< 12	NA	NA	NA
W-3s	10/5/99	1,500	1,000‡,‡‡	NA	290	9.5	53	9.8	< 6	NA	NA	NA
W-3s	4/5/00	810	320‡	NA	150	3.0	9.0	5.7	< 5	NA	ND	ND
W-3s	10/26/00	310	120	140	83	3.5	6.4	1.2	< 5	NA	NA	NA
W-3s	4/18/01	2,300\$	1,600††,\$\$	NA	320	8.0	16	7.0	< 20	NA	NA	NA
W-Bs	3/22/96	61,000	NA	NA	9,800	8,000	2,200	11,000	< 5,000	NA	NA	NA
W-Bs	11/22/96	47,000	NA	NA	5,100	3,100	1,400	7,800	< 2,500	NA	NA	NA
W-Bs	7/15/97	66,000	17,000*	490	7,800	4,900	1,900	10,000	< 600	NA	NA	NA
W-Bs	10/29/97	44,000	27,000	4,000	6,000	500	1,500	6,400	380	NA	NA	NA
W-Bs	4/27/98	63,000	17,000†	NA	6,100	5,400	1,900	9,100	< 600	NA	NA	NA
W-Bs	10/23/98	48,000	9,600†	NA	6,700	1,200	1,500	6,200	< 300	NA	NA	NA
W-Bs	4/9/99	39,000	12,000	NA	4,100	1,900	1,400	5,600	< 300	NA	NA	NA

Table 3 (continued). SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
187 North L Street, Livermore, California

Well Number	Date Sampled	TPH-gasoline (µg/L)	TPH-diesel (µg/L)	TPH-motor oil (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Lead (µg/L)	Naphthalene (µg/L)	2-Methyl-naphthalene (µg/L)
W-Bs	10/5/99	38,000	7,300‡	NA	3,800	390	1,600	5,900	< 60	NA	NA	NA
W-Bs	4/5/00	34,000	9,600‡	NA	3,500	1,200	1,400	4,700	< 150	NA	280	68
W-Bs	10/26/00	23,000	650	< 50	2,500	210	1,100	2,600	150	NA	260	88
W-Bs	4/18/01	20,000§	2,500††	NA	2,400	180	880	1,800	< 20	NA	NA	NA
W-Es	3/22/96	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 5	NA	NA	NA
W-Es	11/22/96	280	NA	NA	24	0.6	1.8	2.2	< 5	NA	NA	NA
W-Es	10/23/98	82	69†	NA	< 0.5	0.8	< 0.5	0.8	4	NA	NA	NA
W-Es	10/5/99	68	88‡	NA	< 0.5	< 0.5	< 0.5	< 1.0	4	NA	NA	NA
W-Es	10/26/00	110	< 50	< 50	0.7	< 0.5	< 0.5	< 1.0	< 5	NA	NA	NA
Travel Blank	7/15/97	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 3	NA	NA	NA
Travel Blank	10/29/97	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 3	NA	NA	NA
Travel Blank	4/27/98	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 3	NA	NA	NA
Travel Blank	10/23/98	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 3	NA	NA	NA
Travel Blank	4/9/99	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 3	NA	NA	NA
Travel Blank	10/5/99	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 1.0	< 3	NA	NA	NA
Travel Blank	4/5/00	< 50	NA	NA	1.8	< 0.5	< 0.5	< 1.0	< 5	NA	NA	NA
Travel Blank	10/26/00	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 1.0	< 5	NA	NA	NA
Travel Blank	4/18/01	< 50	NA	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0	NA	NA	NA
MCL		NE	NE	NE	1	150	700	1,750	5	50	NE	NE
AL		NE	NE	NE	NE	NE	NE	NE	35	15	NE	NE

µg/L = micrograms per liter [parts per billion (ppb)]

NA = not analyzed

NE = none established

TPH-gasoline = total petroleum hydrocarbons quantified as gasoline

TPH-diesel = total petroleum hydrocarbons quantified as diesel

MTBE = methyl tertiary butyl ether

MCL = Maximum Contaminant Level, February 2000

AL = Action Level, February 2000

* The method blank contained heavy oil at 120 µg/L

† The chromatogram does not match the typical diesel pattern

‡ The sample contained a lower boiling point mixture of hydrocarbons quantitated as diesel.

§ Unmodified or weakly modified gasoline is significant.

** Lighter than water immiscible sheen is present.

†† Gasoline range compounds are significant.

‡‡ The sample contained a higher boiling point hydrocarbon mixture quantitated as diesel.

§§ Oil range compounds are significant.

APPENDIX A

FIELD ACTIVITY REPORT

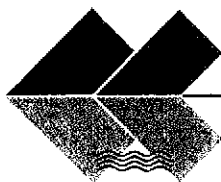
FIELD ACTIVITY REPORT

**SEMI-ANNUAL GROUNDWATER
MONITORING EVENT
APRIL 2001**

**ARROW RENTALS
LIVERMORE, CALIFORNIA**

Prepared for: Don-Sul, Inc.
187 North L Street
Livermore, California 94550

Date Prepared: May 17, 2001



**Environmental
Sampling Services**

FIELD ACTIVITY REPORT

**SEMI-ANNUAL GROUNDWATER MONITORING EVENT
ARROW RENTALS
LIVERMORE, CALIFORNIA**

ESS Personnel: Jacqueline Lee and Stephen Penman

Date of Activities: April 18, 2001

Decontamination Procedures

All downhole equipment was cleaned with a solution of Liqui-Nox® laboratory-grade detergent and potable water, rinsed with potable water, followed by a final rinse with distilled water.

Groundwater Level Measurements

A total of four monitoring wells were measured for static water level. All readings were performed with an Oil/Water Interface meter (Table 1). Water level measurements were referenced to the surveyor's mark (a black mark on the top of well casing).

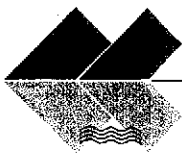
Prior to measuring, monitoring wells were allowed to equilibrate with the atmosphere. static water level was determined by lowering the interface probe into the well and obtaining three successive readings that agree to within one-hundredth of a foot. The presence of oil was not detected in the four monitoring wells.

Field Equipment Calibration

All field measurements were performed in accordance with the instruments' calibration and operating procedures. Field measurements included: pH, Specific Conductance, Turbidity, and Temperature. Physical characteristic such as color and odor were also noted.

Well Purging and Sampling Methods

A Grundfos® Redi-Flow submersible pump and new tubing were used for well purging at monitoring wells: W-1s, W-Bs, and W-3s. A minimum removal of three casing volumes and stabilization of water quality parameters were required prior to sampling. All wells were sampled for the following analyses: EPA Method 8015M (TPH (Gasoline)/BTEX, and MTBE), and TPH as Diesel. All wells were sampled with the submersible pump set at the slowest pump speed.



**Environmental
Sampling Services**

Laboratory, Sample Containers & Preservation

McCampbell Analytical Laboratories of Pacheco, California supplied all sample containers and performed all required analyses. All samples were properly preserved according to analysis.

Gasoline, BTEX, and MTBE samples were contained in three 40-ml glass containers preserved with hydrochloric acid.


Diesel samples were contained in a non-preserved, 1-liter amber glass container.

QA/QC

Trip blanks for EPA Method 8015M were supplied and remained in the cooler containing all sample containers. No other QA/QC samples were required nor requested.

Comments

All work was performed under satisfactory workmanship and according to the Alameda County Health and Care Services' directive, dated October 8, 1997, March 15, 1999, and January 10, 2000. On April 18, 2001, Ms. Eva Chu directed ESS not to collect samples for PNAS or Oxygenates.

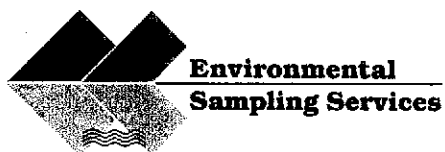

Jacqueline Lee
President

Attachment

Table 1

Water Sample Log Sheets

Chain of Custody



**TABLE 1: SUMMARY OF
GROUNDWATER LEVEL MEASUREMENTS
ARROW RENTALS
LIVERMORE, CALIFORNIA**

WELL IDENTIFICATION	DEPTH TO GROUNDWATER (ft., TOC) (Measured April 18, 2001)	WELL DEPTH (ft., TOC)
W-1s	31.29	44.64
W-Bs	31.93	44.47
W-3s	30.47	44.76
W-Es	32.03	44.32

TOC = Top of well casing

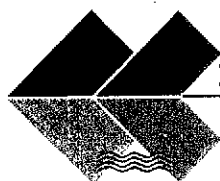
APPENDIX B

LABORATORY REPORT
AND
CHAIN-OF-CUSTODY DOCUMENTATION



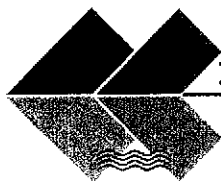
Environmental Sampling Services

WATER QUALITY SAMPLE LOG SHEET				WELL IDENTIFICATION: W-3s DATE: 4/18/01				
Project Name: <u>Arrow Rentals - Livermore, CA</u>				Project Task: <u>Semi-Annual Groundwater Monitoring</u>				
Weather Conditions: <u>Partly cloudy / low clouds, 77°F</u>								
Well Description: .75" 2" 3" <u>4"</u> 5" 6"				Well Type: <u>PVC</u> Stainless Steel Other: _____				
Is Well Secured? <u>Yes</u> / No Bolt Size <u>15/16"</u>				Type of lock / Lock number: <u>Master</u>				
Observations / Comments: _____								
Purge Method: Teflon / PVC Disposable Bailer Peristaltic Pump <u>GrundFos Redi-flow</u> Other: _____								
Pump Lines: NA <u>New</u> Cleaned / Dedicated				Bailer Line: <u>NA</u> <u>New</u> / Cleaned / Dedicated				
Method of Cleaning Pump: NA Alconox <u>Liqui-Nox Tap Water DI Rinse</u> Other: _____								
Method of Cleaning Bailer: <u>NA</u> Alconox Liqui-Nox Tap Water DI Rinse Other: <u>Well Washing</u>								
Sampling Method: Disp. Teflon Bailer Disp. PVC Bailer <u>GrundFos Redi-flow Pump</u> Other: _____								
pH Meter Serial No.: 217254 / <u>330089</u>				Spec. Cond. Meter Serial No.: <u>96H0203AB</u> <u>AE</u>				
Date/Time Calibrated: <u>4/18/01 12:40</u> <u>4 7 10 @ 25°C</u>				Spec. Cond. Meter Calibration: Self Test Other: _____				
Method to Measure Water Level: Solinst Serial No.: <u>960 Ind.</u> P.I.D. Reading: <u>NA</u> ppm @ Well Head								
Water Level at Start (DTW): <u>30.47 @ 13:03</u> Water Level Prior To Sampling: <u>32.30</u>								
TD = 44.76 <u>30.47</u> (DTW) = <u>14.29</u> (ft. of water) x "K" = <u>9.33</u> (Gals./CV) x <u>3</u> (No. of CV) = <u>27.9</u> (Gals.)								
"K" = .023(.75" well) "K" = 0.163(2" well) <u>"K" = 0.653(4" well)</u> "K" = 1.02(5" well) "K" = 1.46(6" well)								
FIELD WATER QUALITY PARAMETERS								
Date	Time	Discharge (Gallons)	pH	Temp. (°C)	Specific Conductance mS (S)	Turbidity	Color	Comments
<u>4/18/01</u>	<u>13:11</u>	<u>4</u>	<u>7.06</u>	<u>20.4</u>	<u>636</u>	<u>24.6</u>	<u>slightly cloudy</u>	<u>light oily sheen + pet odor</u>
	<u>13:13</u>	<u>8</u>	<u>7.03</u>	<u>19.8</u>	<u>641</u>	<u>14.0</u>	<u>clear</u>	
	<u>13:15</u>	<u>12</u>	<u>7.01</u>	<u>19.7</u>	<u>652</u>	<u>3.43</u>	<u>"</u>	
	<u>13:17</u>	<u>16</u>	<u>7.05</u>	<u>19.8</u>	<u>659</u>	<u>7.18</u>	<u>"</u>	
	<u>13:19</u>	<u>20</u>	<u>7.04</u>	<u>20.1</u>	<u>663</u>	<u>6.98</u>	<u>"</u>	
	<u>13:21</u>	<u>24</u>	<u>7.04</u>	<u>19.9</u>	<u>662</u>	<u>7.64</u>	<u>"</u>	
	<u>13:22</u>	<u>28</u>	<u>7.03</u>	<u>20.0</u>	<u>658</u>	<u>7.55</u>	<u>"</u>	
	<u>13:24</u>	<u>32</u>	<u>7.04</u>	<u>20.1</u>	<u>665</u>	<u>7.23</u>	<u>"</u>	
	<u>13:32</u>	After Sampling	<u>7.02</u>	<u>20.4</u>	<u>662</u>	<u>8.16</u>	<u>"</u>	<u>light sheen + petro. odor.</u>
Total Discharge:		<u>35</u>	gallons		Casing Volumes Removed:		<u>3.75</u>	
Method of disposal of discharged water: <u>55 Gallon Drum(s)</u> Poly Tank Treatment System Other: _____								
Date/Time Sampled: <u>4/18/01 @ 13:30</u> Analysis/No. of Bottles: <u>EPA 8015M/8020-TPHq/BTEX, MTBE (3-40ml VOCs w/HCl), TPHd (1-1 Liter Glass Ambers, Non-Preserved).</u>								
QA/QC: _____ @ _____ as an Equipment Blank Blind Duplicate MS/MSD Field Blank								
Comments: _____								
Sampled By: <u>Jacki Lee / Stephen Penman</u> Signature(s): <u>[Signature]</u>								



Environmental Sampling Services

WATER QUALITY SAMPLE LOG SHEET				WELL IDENTIFICATION: W-Bs DATE: 4/18/01				
Project Name: <u>Arrow Rentals - Livermore, CA</u>				Project Task: <u>Semi-Annual Groundwater Monitoring</u>				
Weather Conditions: <u>Sunny, warm; slight breeze 77°F</u>								
Well Description: .75" 2" 3" <u>4"</u> 5" <u>6"</u>				Well Type: <u>PVC</u> Stainless Steel Other: _____				
Is Well Secured? <u>Yes</u> No Bolt Size <u>15/16"</u>				Type of lock / Lock number: <u>Master</u>				
Observations / Comments: _____								
Purge Method: Teflon / PVC Disposable Bailer Peristaltic Pump <u>GrundFos Redi-flow</u> Other: _____								
Pump Lines: NA <u>New</u> / Cleaned / Dedicated				Bailer Line: NA New / Cleaned / Dedicated				
Method of Cleaning Pump: NA Alconox <u>Liqui-Nox Tap Water DI Rinse</u> Other: _____								
Method of Cleaning Bailer: <u>NA</u> Alconox Liqui-Nox Tap Water DI Rinse Other: _____								
Sampling Method: Disp. Teflon Bailer Disp. PVC Bailer <u>GrundFos Redi-flow Pump</u> Other: _____								
pH Meter Serial No.: 217254 / <u>330089</u>				Spec. Cond. Meter Serial No.: 96H0203AB / AE				
Date/Time Calibrated: <u>4/18/01 12:40</u> 7 10 @ 25°C				Spec. Cond. Meter Calibration: <u>Self Test</u> Other: _____				
Method to Measure Water Level: Solinst Serial No.: <u>9W Ind</u> P.I.D. Reading: NA ppm @ Well Head								
Water Level at Start (DTW): <u>31.93 @ 13:09</u>				Water Level Prior To Sampling: <u>40.70</u>				
TD = 44.47 - <u>31.93</u> (DTW) = <u>12.54</u> (ft. of water) x "K" = <u>8.48</u> (Gals./CV) x <u>3</u> (No. of CV) = <u>24.5</u> (Gals.)								
"K" = .023(.75" well) "K" = 0.163(2" well) <u>"K" = 0.653(4" well)</u> "K" = 1.02(5" well) <u>"K" = 1.46(6" well)</u>								
FIELD WATER QUALITY PARAMETERS								
Date	Time	Discharge (Gallons)	pH	Temp. (°C)	Specific Conductance mS <u>(uS)</u>	Turbidity	Color	Comments
<u>4/18/01</u>	<u>13:56</u>	<u>4.0</u>	<u>6.72</u>	<u>20.0</u>	<u>405.8</u>	<u>14</u>	<u>slightly gray/clr.</u>	<u>Pot. odor</u>
	<u>13:59</u>	<u>8.0</u>	<u>6.72</u>	<u>19.9</u>	<u>406.6</u>	<u>66</u>	<u>Light gray/clr</u>	" "
	<u>14:02</u>	<u>12.0</u>	<u>6.70</u>	<u>20.4</u>	<u>407.6</u>	<u>57</u>	<u>" / clr</u>	" "
	<u>14:04</u>	<u>16.0</u>	<u>6.69</u>	<u>20.2</u>	<u>408.0</u>	<u>4.3</u>	<u>" / clr</u>	" "
	<u>14:10</u>	<u>25.0</u>	<u>6.76</u>	<u>19.9</u>	<u>432.8</u>	<u>6.8</u>	<u>clr.</u>	" "
	<u>14:14</u>	<u>35.0</u>	<u>6.84</u>	<u>19.5</u>	<u>458.6</u>	<u>15.5</u>	<u>lt. gray / clr</u>	" "
	<u>14:19</u>	<u>45.0</u>	<u>6.82</u>	<u>19.7</u>	<u>480.1</u>	<u>33.1</u>	<u>lt gray/tan</u>	" "
	<u>14:25</u>	<u>55.0</u>	<u>6.83</u>	<u>19.8</u>	<u>472.3</u>	<u>90.3</u>	<u>lt tan/cldy</u>	" "
	<u>14:35</u>	<u>65.0</u>	<u>6.92</u>	<u>20.1</u>	<u>573</u>	<u>170.4</u>	<u>lt gray</u>	" "
		<u>After Sampling</u>	<u>6.94</u>	<u>20.2</u>	<u>509</u>	<u>240.0</u>		<u>Day</u>
Total Discharge:		<u>65</u> gallons	Casing Volumes Removed: <u>3.55</u>					
Method of disposal of discharged water: <u>55 Gallon Drum(s)</u> Poly Tank Treatment System Other: _____								
Date/Time Sampled: <u>4/18/01 @ 14:36</u> Analysis/No. of Bottles: EPA 8015M/8020-TPHgas/BTEX, MTBE (3-40ml VOCs w/HCl); TPHd (2-1 Liter Glass Amber, Non-Preserved)								
QA/QC: <u>None</u> @ _____ as an Equipment Blank Blind Duplicate MS/MSD Field Blank								
Comments: <u>W-Ess 8 = 32030 12:40</u>								
<u>Used 2 full drums for W35 + W8s.</u>								
Sampled By: <u>Jacki Lee / Stephen Penman</u> Signature(s): <u>[Signatures]</u>								



Environmental Sampling Services

WATER QUALITY SAMPLE LOG SHEET				WELL IDENTIFICATION: W-1s DATE: 4/18/01				
Project Name: <u>Arrow Rentals - Livermore, CA</u>				Project Task: <u>Semi-Annual Groundwater Monitoring</u>				
Weather Conditions: <u>Sunny, some clouds, slight breeze; light drizzle</u>								
Well Description: .75" 2" 3" 4" 5" <u>6"</u>				Well Type: <u>PVC</u> Stainless Steel Other: _____				
Is Well Secured? Yes / No Bolt Size <u>15/16"</u>				Type of lock / Lock number: <u>Master</u>				
Observations / Comments: _____								
Purge Method: Teflon / PVC Disposable Bailer Peristaltic Pump <u>GrundFos Redi-flow</u> Other: _____								
Pump Lines: NA <u>New</u> Cleaned / Dedicated				Bailer Line: <u>NA</u> New / Cleaned / Dedicated				
Method of Cleaning Pump: NA Alconox <u>Liqui-Nox Tap Water DI Rinse</u> Other: _____								
Method of Cleaning Bailer: <u>NA</u> Alconox <u>Liqui-Nox Tap Water DI Rinse</u> Other: _____								
Sampling Method: Disp. Teflon Bailer Disp. PVC Bailer <u>GrundFos Redi-flow Pump</u> Other: _____								
pH Meter Serial No.: 217254 / <u>330089</u>				Spec. Cond. Meter Serial No.: 96H0203AB / <u>AE</u>				
Date/Time Calibrated: <u>4/18/01 12:40</u> 4 7 10 @ 25°C				Spec. Cond. Meter Calibration: <u>Self Test</u> Other: _____				
Method to Measure Water Level: Solinst Serial No.: <u>4/10 Ind.</u> P.I.D. Reading: <u>NA</u> ppm @ Well Head								
Water Level at Start (DTW): <u>31.29 @ 12:56</u>				Water Level Prior To Sampling: <u>39.50</u>				
$TD = 44.64 - 31.29 (DTW) = 13.35$ (ft. of water) x "K" = <u>18.71</u> (Gals./CV) x <u>3</u> (No. of CV) = <u>56.4</u> (Gals.) <u>58.4</u> "K" = .023(.75" well) "K" = 0.163(2" well) "K" = 0.653(4" well) "K" = 1.02(5" well) <u>"K" = 1.46(6" well)</u>								
FIELD WATER QUALITY PARAMETERS								
Date	Time	Discharge (Gallons)	pH	Temp. (°C)	Specific Conductance mS uS	Turbidity	Color	Comments
<u>4/18/01</u>	<u>15:05</u>	<u>10</u>	<u>6.77</u>	<u>20.3</u>	<u>680</u>	<u>10</u>	<u>wt tan/clr</u>	<u>Pet. odor</u>
	<u>15:11</u>	<u>20</u>	<u>6.77</u>	<u>19.8</u>	<u>675</u>	<u>5.8</u>	<u>clr</u>	<u>" "</u>
	<u>15:17</u>	<u>30</u>	<u>6.80</u>	<u>20.1</u>	<u>664</u>	<u>16.7</u>	<u>slightly clay.</u>	<u>" "</u>
								<u>Drye-36 gals</u>
	<u>15:58</u>	<u>Bef. Sampl</u>	<u>6.95</u>	<u>21.4</u>	<u>679</u>	<u>101</u>	<u>"</u>	<u>7 = 39.50 Pet. Odor</u>
<u>↓</u>	<u>16:01</u>	<u>After Sampling</u>	<u>6.88</u>	<u>20.8</u>	<u>692</u>	<u>63</u>	<u>"</u>	<u>" "</u>
Total Discharge: <u>36</u> gallons				Casing Volumes Removed: <u>1.84</u>				
Method of disposal of discharged water: <u>55 Gallon Drum</u> Poly Tank Treatment System Other: _____								
Date/Time Sampled: <u>15:58 @ 4/18/01</u> Analysis/No. of Bottles: <u>EPA 8015M/8020-TPHq/BTEX, MTBE (3-40ml VOCs w/HCl); TPH (Diesel) 2-1L ambers, Non-Preserved</u>								
QA/QC: <u>None</u> @ _____ as an Equipment Blank Blind Duplicate MS/MSD Field Blank								
Comments: <u>1 drum filled to 40 gals</u>								
Sampled By: <u>Jacki Lee / Stephen Penman</u> Signature(s): <u>[Signatures]</u>								

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #107
PACIFIC CO. CA 94553-5560

Telephone: (925) 798-1620

Fax: (925) 798-1622

Report To: Jacki Lee Bill To: Same as Report To

Company: Environmental Sampling Services

6680 Alhambra Avenue #102

Martinez, CA 94553

Tele: (925) 372-8108

Fax: (925) 372-6705

Project #:

Project Name: Arrow Rentals

Project Location: Livermore, CA

Sampler Signature: [Signature]

CHAIN OF CUSTODY RECORD

TURN AROUND TIME

☐ RUSH

☐ 24 HR

☐ 48 HR

☐ 72 HR

☒ 5 DAY

Analysis Request

Other

Comments

SAMPLE ID	LOCATION	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED				BTEX & TPH as Gas (6010 & 8015)	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB	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	pH	TSS	TOC	Specific Conductivity	
		Date	Time			Water	Soil	Air	Sludge	Other	Ice	HCl	HNO ₃	Other																				
Trip Blank		4/18/01	11:00	1	glass	X						X	X		X	X																		
W-3S		4/18/01	13:30	4	glass	X						X	X		X	X																		
W-BB		4/18/01	14:36	4	glass	X						X	X		X	X																		
W-1S		4/18/01	15:58	4	glass	X						X			X	X																		

Relinquished By: <u>[Signature]</u>	Date: <u>4/18/01</u>	Time: <u>17:18</u>	Received By: <u>[Signature]</u>
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Remarks:

APPENDIX B

LABORATORY REPORT
AND
CHAIN-OF-CUSTODY DOCUMENTATION



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

Environmental Sampling Services 6680 Alhambra Ave, #102 Martinez, CA 94553	Client Project ID: Arrow Rentals	Date Sampled: 04/18/01
		Date Received: 04/18/01
	Client Contact: Jacki Lee	Date Extracted: 04/18/01
	Client P.O:	Date Analyzed: 04/18/01

04/25/2001

Dear Jacki:

Enclosed are:

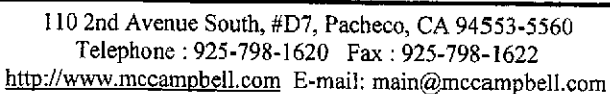
- 1). the results of 4 samples from your **Arrow Rentals** project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

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



Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel with Silica Gel Clean-up
EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

* 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.



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<http://www.mccampbell.com> E-mail: main@mccampbell.com

QC REPORT

Date: 04/20/01-04/21/01 Matrix: Water

Extraction: TTLC

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 41801				Instrument: GC-7			
Surrogate1	0.000	99.0	102.0	100.00	99	102	3.0
Xylenes	0.000	30.3	29.1	30.00	101	97	4.0
Ethyl Benzene	0.000	9.4	9.3	10.00	94	93	1.1
Toluene	0.000	9.6	9.4	10.00	96	94	2.1
Benzene	0.000	9.2	9.0	10.00	92	90	2.2
MTBE	0.000	8.3	8.2	10.00	83	82	1.2
GAS	0.000	97.3	94.8	100.00	97	95	2.6
SampleID: 41901				Instrument: GC-6 A			
Surrogate1	0.000	110.0	109.0	100.00	110	109	0.9
TPH (diesel)	0.000	8725.0	8600.0	7500.00	116	115	1.4

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

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

RPD means Relative Percent Deviation

Remarks:	VGAS	O&G	METALS	OTHER
ICE/+ ✓	✓			
GOOD CONDITION ✓				
HEAD SPACE ABSENT ✓				
PRESERVATION APPROPRIATE CONTAINERS ✓				



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Environmental Sampling Services 6680 Alhambra Ave, #102 Martinez, CA 94553	Client Project ID: Arrow Rentals	Date Sampled: 04/18/01
		Date Received: 04/18/01
	Client Contact: Jacki Lee	Date Extracted: 04/18/01
	Client P.O:	Date Analyzed: 04/18/01

04/25/2001

Dear Jacki:

Enclosed are:

- 1). the results of 4 samples from your **Arrow Rentals** 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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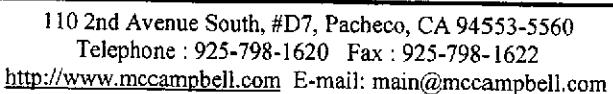
Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*
EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

* 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.

 Edward Hamilton, Lab Director



Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel with Silica Gel Clean-up
EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

* 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.



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<http://www.mccampbell.com> E-mail: main@mccampbell.com

QC REPORT

Date: 04/20/01-04/21/01 Matrix: Water

Extraction: TTLC

Compound	Concentration: ug/L			%Recovery			RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	
SampleID: 41801				Instrument: GC-7			
Surrogate1	0.000	99.0	102.0	100.00	99	102	3.0
Xylenes	0.000	30.3	29.1	30.00	101	97	4.0
Ethyl Benzene	0.000	9.4	9.3	10.00	94	93	1.1
Toluene	0.000	9.6	9.4	10.00	96	94	2.1
Benzene	0.000	9.2	9.0	10.00	92	90	2.2
MTBE	0.000	8.3	8.2	10.00	83	82	1.2
GAS	0.000	97.3	94.8	100.00	97	95	2.6
SampleID: 41901				Instrument: GC-6 A			
Surrogate1	0.000	110.0	109.0	100.00	110	109	0.9
TPH (diesel)	0.000	8725.0	8600.0	7500.00	116	115	1.4

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

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

RPD means Relative Percent Deviation

