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July 10, 1990

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Mr. Robert Wenning
Engineering Manager
James River Corporation
2101 Williams Street
San Leandro, California 94577

11-5081-02/3

Subject: First Quarter Groundwater Monitoring Report,

James River Corporation, Flexible Packaging Plant,

2101 Williams Street, San Leandro, California

Dear Mr. Wenning:

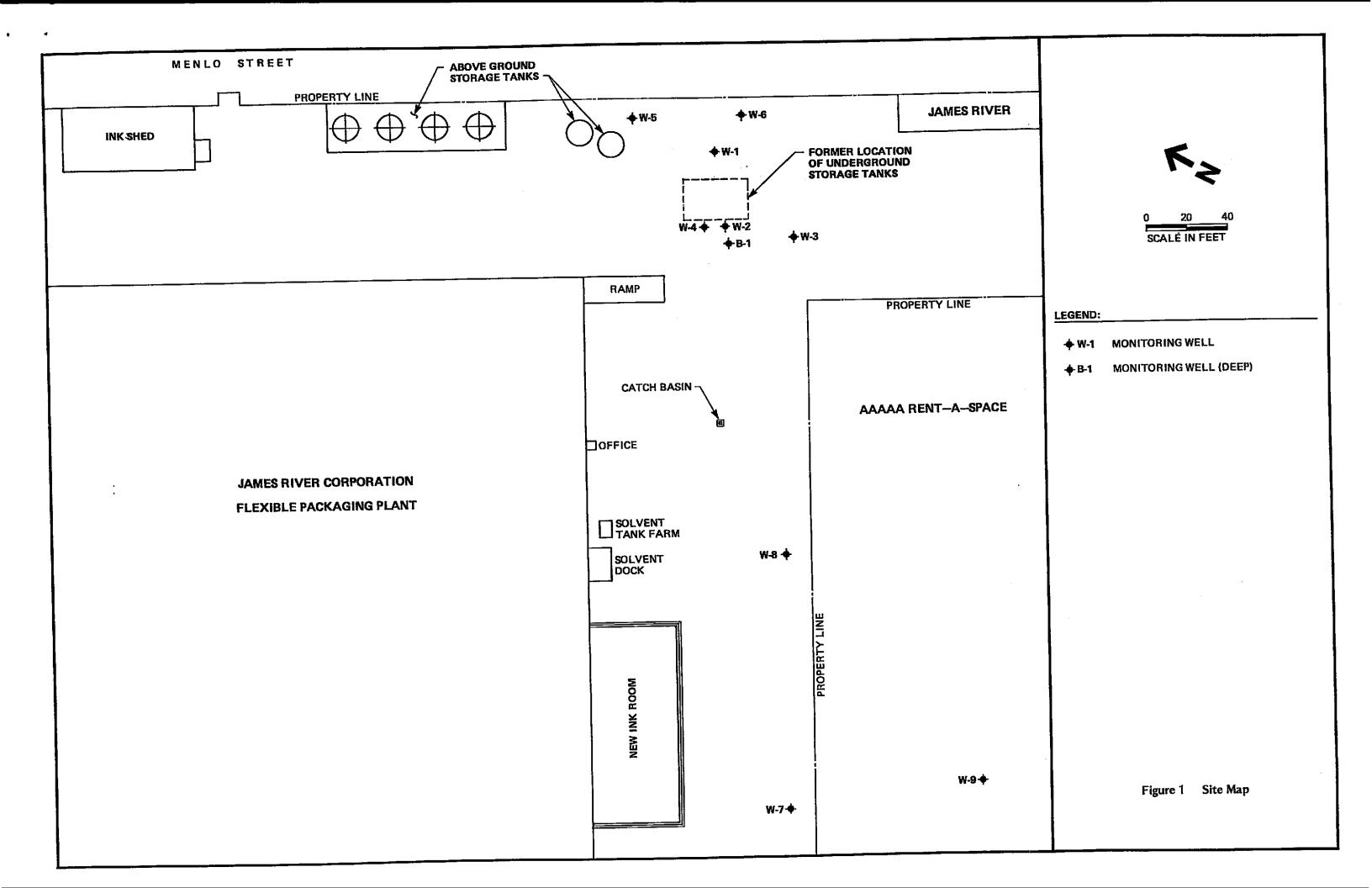
This letter report presents the methods and results of the first quarterly groundwater sampling conducted on March 6 and 7, 1990 at the subject facility. This work was performed under the terms and conditions of our engineering services agreement dated December 8, 1988, and your Purchase Order No. SL02826-EE dated February 6, 1990.

#### Background

Ten groundwater monitoring wells were installed in the vicinity of the former underground storage tanks (UST's) by Harding-Lawson Associates in the period from 1984 to 1986 (Figure 1). The monitoring wells were installed during an investigation of acetates and acetones in the shallow groundwater at the site. Documented releases of isopropyl acetate and n-propyl acetate occurred from the UST's. All USTs were removed from this location in 1989.

Wells W-1 through W-9 monitor a gravelly sand to sandy gravel encountered at approximately 25 feet below grade. The sandy unit averages 10 to 15 feet in thickness. Well B-1 monitors a deeper gravelly interval encountered at approximately 45 feet below grade. A 5-foot thick silty clay separates the two water-bearing zones at the location of B-1.

James River initiated design of a groundwater remediation system to remove the acetates from the shallow groundwater in 1988. The proposed system consisted of extracting the groundwater, pumping it to above ground storage tanks, and then discharging it to the San Leandro sanitary sewer on a daily basis. In April 1988, the City of San Leandro issued James River a permit to discharge the extracted groundwater to the



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sanitary sewer. The permit specified discharge limitations for a variety of compounds, as established in San Leandro Administrative Code, Title 12, Chapter 5.

In March 1989, Brown and Caldwell collected groundwater samples from eight existing wells prior to initiation of the groundwater remediation program. Results of the sampling indicated chlorinated hydrocarbons were present in several shallow groundwater monitoring wells. The highest levels of chlorinated hydrocarbons were detected in wells located hydraulically upgradient of the site. These levels exceeded permit discharge limitations, thus, the groundwater remediation plan was not implemented.

In April 1989, excavation related to construction activities encountered pigment stained soils in the area shown on Figure 1. These soils were later excavated and properly disposed of by James River. During the 1989 removal of the USTs, additional stained soils were encountered in the area illustrated on Figure 1.

Based on discussions with Alameda County Health Agency (County) personnel, a plan for further investigations at the site was developed. The plan includes an investigation of shallow groundwater immediately upgradient of the site, further excavation of soils in the vicinity of the ink room, and quarterly groundwater monitoring of the nine existing wells. A groundwater remediation plan will be formulated when all data from the planned investigations is reviewed.

## Field Methods

Groundwater samples were collected from nine of the ten existing monitoring wells. A groundwater sample could not be collected from well W2 due to blockage of the well casing which prevented the pump suction line from reaching groundwater. Prior to sample collection, 3 to 5 well volumes of water were purged from each well using a gasoline powered centrifugal pump. As each well was purged, the specific conductance, pH, and temperature of the groundwater were measured. The purpose of monitoring these parameters was to ensure that all stagnant water present in the well casing was removed prior to sample collection. Samples were collected after these parameters had stabilized. Data sheets presenting these measurements are Water produced during purging of included as Attachment A. monitoring wells was stored on-site in sealed 55-gallon drums pending receipt of laboratory analyses.

Samples were collected with a Teflon bailer and decanted into 40 milliliter, glass sample vials equipped with a Teflon septum. The vials were provided by Brown and Caldwell Analytical (BCA). The vials were filled so that no head space was present in the sample container. Samples were stored in a

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chilled ice chest until delivery to BCA. Standard chain-of-custody procedures were followed during sample handling.

The bailer and suction line of the pump were washed with laboratory-grade detergent and rinsed with tap water between sample locations. A new length of rope was attached to the bailer prior to sampling each well to prevent cross-contamination of samples.

### Analytical Methods

Groundwater samples were submitted for analysis to BCA on March 7, 1990. The samples were analyzed for purgeable priority pollutant organic chemicals using EPA test method 8240. This test method uses gas chromatography/mass spectrometry methods. The analytical method is described in detail in the EPA Publication SW-846, "Test Methods for Evaluating Solid Waste", November 1986.

### Groundwater Quality Results

Analytical results for the first quarter samples are summarized in Table 1. Only constituents present above method detection limits are included. Analytical results for samples collected in April and August 1989 are included for comparison purposes. The chain-of-custody form and laboratory analytical reports for the first quarter samples are included as Attachment B. The following paragraphs summarize significant findings.

Alcohol, Acetates, and Acetone. Total acetate and total alcohol concentrations have declined from several thousand milligrams per liter (mg/1) in 1984 (Harding-Lawson Associates), to non-detectable levels.

Acetone was detected in wells W1, W4, and W8 at concentrations ranging from 290,000 to 400,000 micrograms per liter (ug/l). Acetone was reported using semi-quantified methods for samples collected in April and August, 1989. However, the results were actually quantified results reported incorrectly. A letter from BCA documenting their reporting error is included as Attachment C. The results indicate that acetone concentrations are decreasing. The source of acetone in the groundwater has not been determined.

Purgeable Organic Chemicals. The hydrocarbons toluene, tetrachloroethylene (PCE), trichloroethylene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride were identified in shallow groundwater samples collected this quarter. Due to changes in detection limits between samples collected this quarter and those previously collected, comparisons between sampling events cannot be made for all constituents. However, where comparisons are possible, the

Table 1. Groundwater Analytical Results

Well Identification		W1		W2		W3			W4	
Sampling Date	Apr-89	Aug-89	Mar-90	Apr-89	Apr-89	Aug-89	Mar-90	Apr-89	Aug-89	Mar-90
PARAMETER								17.4		
Purgeable Organic										
Compounds, ug/l			-							
Acetone	68,000	370,000	290,000	66,000	25,000	3,000	<50	760,000	560,000	400,000
Benzene	<100	<500	<500	<50	<10	<50	<5	<100	<2000	<500
Tetrachloroethene	300	<500	<500	1,000	1,200	100	29	140	<2000	<500
Trichloroethene	<100	<500	<500	<50	230	<50	130	<100	<2000	<500
Toluene	<100	<500	<500	920	<10	<50	<5	2,900	8,000	1,200
Vinyl Chloride	300	<500	<500	450	39	<50	24	<100	<2000	<500
1,2-Dichloroethene	730	<500	<500	1,400	170	<50	<5	720	<2000	< 500
1,1,1-Trichloroethane	<100	<500	<500	<50	<10	<50	<5	<100	<2000	< 500
cis-1,2-Dichloroethene	-	-	<500		- 10		400	-	-	<500
Semi-Quantified Results			TB		100					
2-Butanone					-	-	_	_		_
2-Hexanone	_	_		1,700	540		_	8,200	40,000	_
C3H602 Ester	m=		-	_	Halling:	-		60,000	100,000	_
C5H1002 Ester	-	_	-	1,000	42.0	_	_	-	_	_
Diisopropyl Ether	_	_	-		-	_	30	_	-	
Ethanol	-	_	-	500	-	-	_	-	-	_
Isopropanol	-	_	-	6,000	500	_	_	30,000	199	_
Methyl Acetate	-	-	-	200	_	-	-		-	
Methylethylacetate	-	_	-	-	_	-	-	-	-	10,000
N-Butyl Acetate	-	-	-	4,400	-	-	_			
Propyl Acetate		-0.	-	900	-	-			-	-
Total Xylene Isomers		_	-		-	-	-	400	-	-
Methyl Ethyl Ketone	-	_	_	-	_	_	-	-		-

#### Notes:

- ug/l = micrograms per liter
- 2. \* denotes duplicate sample
- 3. Well W2 is damaged and is no longer sampled.
- 4. indicates not reported
- 5. Semi-quantified results based upon comparison of total ion count of the compound with that of the nearest internal standard

Table 1. Groundwater Analytical Results (continued)

Well Identification		W	5			W6	-		W7	_
Sampling Date	Apr-89	Aug-89	Aug-89*	Mar-90	Apr-89	Aug-89	Mar-90	Apr-89	Aug-89	Mar-90
PARAMETER					W 5					
Purgeable Organic					43.5					
Compounds, ug/l	1 3				1000					
Acetone	77	_		<20	_	_	<200	2,100	-	<50
Benzene	<1	<50	<50	<20	<1	<5	<20	<1	<5	<5
Tetrachloroethene	5,000	1,300	1,100	5,600	1,400	920	1,700	1,100	940	740
Trichloroethene	600	450	450	460	240	240	280	260	240	240
Toluene	7	<50	<50	<20	<1	<5	<20	4	<5	<5
Vinyl Chloride	1,000	690	620	190	<1	<5	<20	43	<5	<5
1,2-Dichloroethene	6,000	5,000	4,000	<20	12	<5	<20	140	60	<5
1,1,1-Trichloroethane	<1	<50	<50	<20	<1	5	<20	<1	<5	<5
cis-1,2-Dichloroethene	-	-	-	1,900	-	-	<20	-	-	72
Semi-Quantified Results								A STATE OF		
2-Butanone	301	_	_	-	-	_	100		_	-
2-Hexanone	9		-	_	-	-	_		-	-
C3H602 Ester	-	_	_	_	-	-	-	-	-	-
C5H1002 Ester	-			_	-	-	-	-		-
Disopropyl Ether	-	-		_	-	-	-	-	_	-
Ethanol				_	-	_	-	20	-	_
Isopropanol	23	_	_	_	1	_	-	200	-	-
	-	_	_	_	_	_	_	-	_	_
Methyl Acetate	-		_	_		_		-	_	_
Methylathylacetate	-			_	-	_	-	-	-	_
N-Butyl Acetate	-		_		-	_				_
Propyl Acetate								-	_	_
Total Xylene Isomers							_	79	4 F=	
Methyl Ethyl Eetone	100 14									

#### Notes:

- ug/l = micrograms per liter
- 2. \* denotes duplicate sample
- 3. indicates not reported
- Semi-quantified results based upon comparison of total ion count of the compound with that of the nearest internal standard

Table 1. Groundwater Analytical Results (continued)

Well Identification		W8			W9	No.		81	
Sampling Date	Apr-89	Aug-89	Mar-90	Apr-89	Aug-89	Mar-90	Apr-89	Aug-89	Mar-90
PARAMETER									
PARAMETER									
Purgeable Organic Compounds, ug/1									
Compounds, ug/1									
Acetone	780,000	8,300	870,000	1,400	_	<10	4,500	_	<10
Benzene	<5	<50	<1000	2	<1	<1	<1	<1	<1
Tetrachloroethene	120	<50	<1000	33	37	13	12	6	2
Trichloroethene	<5	<50	<1000	34	37	21	<1	<1	<1
Toluene	200	<50	<1000	7	<1	<1	10	<1	<1
Vinyl Chloride	15	<50	<1000	3	<1	<1	<1	<1	<1
1,2-Dichloroethene	35	<50	<1000	16	<1	<1	7	<1	<1
1,1,1-Trichloroethane	<5	<50	<1000	3	2	<1	<1	6	<1
cis-1,2-Dichloroethene	-	-	<1000		-	<1	-	-	2
Semi-Quantified Results									
2-Butanone	_	2,600		_	_		_	_	_
2-Hexanone	6,400	-	-	3.6		-	38	-	_
C3H602 Ester	_	- 7		_	-	-	200		-
C5H1002 Ester	_	-	-	_	-		-	-	-
Diisopropyl Ether	_	-	-	_	_	_	_	_	_
Ethanol	200	-	-	10	_	-	_	_	_
Isopropanol	5,000	-		100	-	-	60	-	-
Methyl Acetate	40	-	-	-				_	_
Methylethylacetate	-		-	-	-	-	-	-	-
N-Butyl Acetate	-	-	-	-	-	-	-	-	-
Propyl Acetate	-	-	-		-	-	-	-	_
Total Xylene Isomers	-	-	-	-		-	-	-	-
Methyl Ethyl Ketone		-	-	-	_	-	- 176	-	_

#### Notes:

- 1. ug/l = micrograms per lite.
- 2. \* denotes duplicate sampl-
- 3. indicates not reported
- 4. Semi-quantified results based upon comparison of total ion count of the compound with that of the nearest internal standard

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data indicate that, in general, concentrations of organic compounds in the shallow groundwater are decreasing. An exception to this trend is the concentration of PCE in wells W5 and W6, which increased slightly.

Cis-1,2-dichloroethene had not been detected in previous sampling events. However, 1,2-Dichloroethane was previously present in wells that now contain reported concentrations of cis-1,2-DCE. BCA personnel indicate that previously reported 1,2-DCE concentrations represent the total 1,2-DCE concentration. The 1,2-DCE concentration is now reported for individual isomers (i.e. cis-1,2-DCE or trans-1,2-DCE).

### Groundwater Flow

Water levels were measured with an electric water level sounder in each monitoring well on March 5, 1990. Groundwater elevations were calculated using top-of-casing elevations as reported in an April 10, 1986 Harding-Lawson Associates report. Groundwater elevation data are summarized in Table 2. Data collected on August 16, September 9, October 10, and November 12, 1989 are included for comparison purposes.

Historical groundwater elevation data indicate that groundwater levels measured in March 1990 are higher than those measured in the months of August to November 1989. The higher groundwater levels in March are probably a reflection of increased precipitation and recharge during the wet season (November through April).

Figure 2 illustrates the configuration of the shallow groundwater in the vicinity of the site based on the March 5, 1990 measurements Groundwater flows to the southwest, toward San Francisco Bay, under a hydraulic gradient of approximately 0.004 feet per foot. This gradient is higher than that calculated from the November 1989 data. San Francisco Bay is located approximately one-half mile southwest of the site.

The groundwater mound in the vicinity of the former tank location may be a result of removing the relatively impermeable asphalt in that location to conduct tank and pipeline removal. Increased infiltration of precipitation may be occurring in the area where no asphalt is present, causing groundwater levels to rise. The asphalt will be replaced upon the completion of pipeline removal. Future water level monitoring will aid in determining whether the mound is an actual hydrologic feature or is related to increased infiltration.

Table 2 Summary of Groundwater Level Elevations

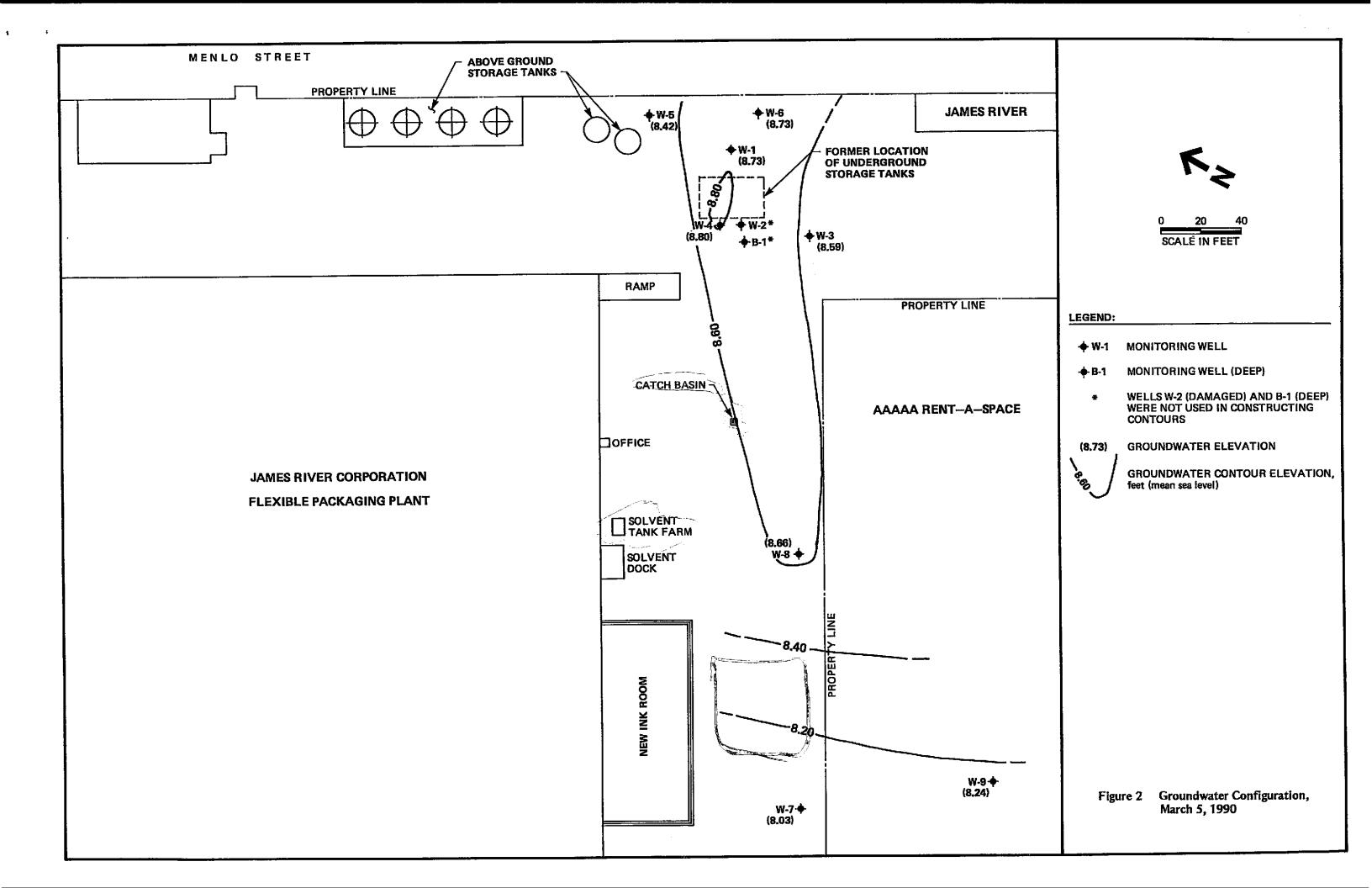
WELL I.D. TOC Elevation	W1 20.67	W2 20.02	₩3 20.80	W4 21.00	W5 21.64	W6 21.05	W7 20.41	₩8 20.50	พ9 20.16	B1 20.59
DATE						<u> </u>				
3/5/90	8.73	7.58	8.59	8.80	8.42	8.73	8.03	8.66	8.24	8.66
11/13/89	7.01	5.71	6.95	6.99	6.92	7.00	6.59	7.09	6.79	7.00
10/9/89	7.07	-	6.98	7.04	6.99	7.06	6.65	6.94	6.87	7.04
9/28/89	7.01	_	6.93	6.98	6.96	7.03	6.59	7.14	-	7.01
8/16/89	7.04	-	6.95	7.02	6.96	7.03	7.09	6.73	6.85	6.99

#### Note:

All groundwater elevations in feet above mean sea level.

TOC = top of casing elevations, from Harding-Lawson Associates, 1984.

- indicates no data available.



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## Summary

Alcohols and acetates were not detected in the groundwater samples collected this quarter. Acetone was detected in wells W1, W4, and W8. With the exception of PCE in wells W5 and W6, concentrations of purgeable organic constituents have generally decreased when compared to previous analytical results.

Groundwater levels have increased when compared to data collected during the dry season last year. The increase probably reflects seasonal variations related to precipitation. Groundwater in the vicinity of the James River Corporation site flows to the southwest, toward San Francisco Bay.

We appreciate this opportunity to be of service to you. Please contact me if you have any questions or comments regarding this report.

a L. Couringtor

Very truly yours, BROWN AND CALDWELL

Donna L. Courington Project Manager

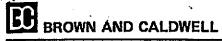
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Enclosures

cc: Mr. Larry Seto, Alameda County Health Agency
Mr. Lester Feldman, San Francisco Regional Water Quality
Control Board



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20910	WRIVE SITE PICK OF PACKET 7 33 GALL	SPUM	
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		1 .4	<u>.                                    </u>
		-1111	
		+++++	<del></del>
		1	SHEET NO.
JOB NUMBER	SUBJECT	DATE	EN-004-3/5/85

BC Personnel KLM (SH)
Job Number 5081-07

				Datea_@^_C
Well ID. 13-1	Casing Dia.	4"	T.D. 48,23	Pump Used TRASH-BAIL
Static W.L	Borehole Dia.	<u></u>		Samples Collected <u>BZAO</u>
Well Volume	Casing Above L.S.	<del></del>		Other

Time	p.it.	TEMPERATURE	CONDUCTIVITY	Gallons Removed	Remarks	
1324	4.02	18.9	312×2K	14	Clear	
1328	7.08	19.0	728 x 2k	36	et .	1f
1331	7.10	19.0	,706x2k	· ·	(1)	t/
1350			·		SAMPLED	
	<del> </del>				<u> </u>	
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						······································
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	<del>                                     </del>					
<u></u>						

.3

<u>CAPACITIES</u> - Gallons per Linear Foot

BC	GROUNDWATER	DATA

BC Pe	rsonnel	CLM	1214	
Job	Number .	<u> </u>	<u>(-03</u>	
	Date.	3.0	0.90	

Well ID.	W-1
Static W.L.	11.94+
Well Volume	-

Casing Dia. \_\_\_\_\_
Borehole Dia. \_\_\_\_
Casing Above L.S. \_\_\_\_

4" 1.D. 38.90°

Pump Used TRACE EALC
Samples Collected 87AC
Other

Time	p.H.	TEMPERATURE	CONDUCTIVITY	Gallons Removed	Remarks
1432	6.60	10.4	-811×7k	18	DARY, GRAY-BLUE, SILTY, 'METAL' OLOR
1437	6.54	19.7	732×24	36	CLEANER CLEARER, LESS SICTS
1444	6.58	19.6	735 x2k	55	t. tt
1451					SAMPLED
				· ·	•
•			· · · · · · · · · · · · · · · · · · ·	•	
			· · · · · · · · · · · · · · · · · · ·		
	•				

<u>CAPACITIES</u> — Gallons per Linear Foot

# BC GROUNDWATER DATA

Well ID.	W-3
Static W.L.	12.21
Well Volume	

Casing Dia.

Barehole Dia.

Casing Above L.S.

4 "	To=	34.1	1
		_ ,	

Pump Used TRASH - BIAL Samples Collected 8240

Other.

Time	p.H.	TEMPERATURE	CONDUCTIVITY	Gallons Removed	Remarks
1321	6.70	P.7	.777×2k	18	CLEAR, VERY FINE, YERY FOW SANDS
1330	6.84	19.2	.767×24	36	CLEAR
1334	6.84	19.1	.758×2K	55	CLEAR CLEAR SAMPLED
1345					SAMPLED
	-				
-					
				<del></del>	
·					
			·		
			·		

CAPACITIES - Gallons per Linear Foot

H	GROUNDWATER DATA
~~	ALIA ALIA III II BITTIN

Well Volume .

Well ID.	W-4.	Casing Dia.	<u> 4 "                                    </u>	T.D. 37.50'
Static W.L.	12.20'	Borehole Dia.	_B"	

Casing Above L.S.

BC Personnel Job Number	Kulsii
Job Number	50%1-07
Date_	3.690
Pump Used_	TRASH-BALL
Samples Collected_	67.40
Othor	

Time	p.H.	TEMPERATURE	CONDUCTIVITY	Gallons Removed	Remarks
1510	6.14	19.8	.110 x 20K		oder the manended particles; efferient
1618	6.68 6.26	19.8	.122 x rok	36 64	pareticles; effered cent
1519	6.26	19.10	.128 x 20 K	64	u a
1528				, 	Gampled
		·			
,					
,					
		:			
				<u> </u>	
		<u> </u>			
<u> </u>	1		1		

<u>CAPACITIES</u> - Gallons per Linear Foot

BC	GROUNDWATER DATA
	• · · • • · · · · · · · · · · · · · · ·

Well 1D.	W-5
Static W.L.	13.22.1
Well Volume	

Casing Dia.		
Borehole Dia.		
Cosing Ahove	ī	c

211	T.D. 33.75'
66"	

BC Personnel _	Kim SH
Job Number _	5081-08-
Date _	3.690
Pump Used _	TRASH-RAIL

Other\_

Time	p.H.	TEMPERATURE	CONDUCTIVITY	Gallons Removed	Remarks
1505	6.78	19.7	.749+2K	18	SLIGHTY CLOUDED, 9-: GRAYING, VERY FINE SILTS CLEANER, STILL CLOUDY
1510	6.73	19.0	1729×212	36	CLEANER, STILL CLOUDY
1514	6.82	18.6	.740×7K	55	H O
1525					SAMPLED
^					
					:

 $\underline{CAPACITIES} - \textbf{Gattons per Linear Foot}$ 

# BC GROUNDWATER DATA

Well ID. Static W.L. Well Volume

DATA				BC Personnel   KLM   SH
-	Casing Dia. Borehole Dia.	24 811	T.D. 36.55'	Pump Used <u>Track</u> - hall Samples Collected <u>87.40</u>
	Casina Above L.S.			Other

Time	p.H.	TEMPERATURE	CONDUCTIVITY	Gallons Removed	Remarks
1420	6.88	19.3	692 x2k	18	mellag
1423	692	19.0	· 402 x2k	36	Same_
1426	6,94	19.1	· 402 x 2k	54	same Same Sampled
1436				,	Sampled
					0
·					
				, ,	
				:	
	· <del>-</del> ·				
				, <u></u>	-
				<u> </u>	

CAPACITIES - Gallons per Linear Foot

# GROUNDWATER DATA

Well ID. Static W.L. Well Volume

Casing Dia. Borehole Dia. Casing Above L.S. CV=15.57 BV=16.35

Job Number Date. Pump Used TRASH BALL Samples Collected\_ Other.

**BC** Personnel

Time	p.H.	TEMPERATURE	CONDUCTIVITY	Gallons Removed	Remarks
1138	4.75				·
1139	4.86	14,4	.291 x2K	19	Bample clans
1143	6,82	18.8	.797 x2K	36	Bample clear
1145	6.82	18.9	:822 22k	54	Sample clear
115%					Sampled
			•.		
				***	
		-			·
			1, 100		
		· · · · · · · · · · · · · · · · · · ·		<u></u>	

<u>CAPACITIES</u> — Gallons per Linear Foot

2" Hole 4" Hole 6" Hole 6.5" Hole 8" Hole 10" Hole - 0.16 - 0.65 - 1.46 - 1.7 - 2.6 - 4.1

BHCFCF

# BC GROUNDWATER DATA

Well ID. W-8
Static W.L. 11.84
Well Volume 30.44

Casing Dia.

Borehole Dia.

Casing Above L.S.

4" (D=34.68) 6" 67= 22.84! CV= 14.85 BV= 15.59

Time	p.tt.	TEMPERATURE	CONDUCTIVITY	Gallons Removed	Remarks
1045	6.52	18,7	.231 X20K	18	MOSTLY CLEAR W/ VETLY FINE SANDS, LIGHT TUTGSIDITY
6050	6.39	19.8	1234 x 20K	36	Faint solvent odor
1056	6.39	18.8.	1235 x20K	54	i( /
1110				·	SAMPLED
			,		
<u> </u>					

<u>CAPACITIES</u> — Gallons per Linear Foot

GROUNDWATER DATA	_	
	GROUNDWATER	DATA

Well ID.	wa
Static W.L.	11.921
Well Volume	

Casing Dia.	4"	1.0. 31.39
Borehole Dia.	911	
Casing Above L.S.	<del></del>	-

BC Personnel KUM -SH Job Number 5081-02
Date3.9-90
Pump Used Wath-bail
Samples Collected 2740
Other

Time	p.tl.	TEMPERATURE	CONDUCTIVITY	Gallons Removed	Remarks
0924	7.02	18.5	A5 12k	18 .	Cloudy, brown trut entew, very fine silts, Cleaner, Cleaver, fine sand
0931	2.06	18.6	. Hol x 21L	60	Cleaner, Cleaver, fine sand
0934	4.0%	ાજ. જ	. 240 x ZK	54	И
0950					SAMPLED
			·		·
		,			
	,				·.
		•			

<u>CAPACITIES</u> - Gallons per Linear Foot

CHAIN	OF (	CHETON	RECORD
VIIAIII	vri	70310DI	NEVUND

BC Log Number

Client na	Client name					Project or PO# 5091-02				Analyses required											
Address		MAKE.		·	<del> </del>	Phone #			<u></u>	1									/ */ *		
City, State	9. Zio		LEAG	94523	Report atten	TONNA CO	OUR INGT	2 <i>L</i> J	<del>,. ,, -</del>	1		/ 1									
Lab	. , , , , , , , , , , , , , , , , , , ,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Type*	Sampled by	MCLLIE	NNA, S.A	MICK	No	imber	/	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	¥,	/ ,	/ /	//	/ /	Ι.,			100 mg	(%) 3
Sample number	Date sampled	Time sampled	See key below	-		ele description		con	of tainers	/							Z.	\$ 3° /-	Rema	rks	
1	1-6		aW	W-3 6						X									1		
2	4		1	W-7					<u> </u>	1	-										
7				W-3 1														ΚĿ	PT ON 1	CE	
4		-		BIL											., .,					( ) ( ) ( )	
5				7-1																	
b				W-5						,,,									2 ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (		
7				W-4																	
00	٠.			W-64																	
9	5-7		1	W-90	<i>y</i> *																
									<u> </u>				2.5								
	·													*		1, 1, 1	: 4.4 : 4.4				
			<u> </u>															1		51.4	***
		Signatur				Print Name					F-8		Compa	ny '	•				Date	Time	
Relinquis	hed by	- / · · ·	14 B.		KEV	INI.MIL	VENLA	-	B	٧ 🛴 .	.	<u>: H</u>	,				· · · · · · · · · · · · · · · · · · ·		3-7-90		
Received	by														<u> </u>						
Relinquis	shed by			·			, was								:	· · · · · · · · · · · · · · · · · · ·					# S
Received	l by		1											<del> </del>	<del></del>						
Relinquis	shed by	$\overline{\Lambda}$	1					$\perp$									· 				
Received	l by Laborator	Win	ne	John	J	10nika	Sca		-	0	5	<u> </u>		<u> </u>					3-7-9(		
BROWN	I AND CAI	DWELL L	ABORATO	RIES				Note:		discarde	ed 30 de	ıys after	results	are red	orted ui	nless of	her arra	ıngeme	nts are made.		Sept.

☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300

373 South Fair Oaks Avenue, Pasadena, CA 91105 (618) 795-7553

1200 Pacifico Avenue, Anaheim, CA 92805

Hazardous samples will be returned to client or disposed of at client expense.

\*KEY: AQ-Aqueous NA-Nonaqueous SL-Sludge GW-Groundwater SO-Soil OT-Other PE-

## ATTACHMENT B

# CHAIN OF CUSTODY FORM/ LABORATORY ANALYTICAL REPORTS

LOG NO: E90-03-212

Received: 07 MAR 90 Reported: 22 MAR 90

Ms. Donna Courington
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Project: 5081-02

### REPORT OF ANALYTICAL RESULTS

Page 1

LOG NO SAMPLE DESCRIPTION,	GROUND WAT	ER SAMPLES		DA	TE SAMPLED
03-212-1 W-8 03-212-2 W-7 03-212-3 W-3 03-212-4 B-1 03-212-5 W-1					06 MAR 90 06 MAR 90 06 MAR 90 06 MAR 90 06 MAR 90
PARAMETER	03-212-1	03-212-2	03-212-3	03-212-4	03-212-5
Purgeable Priority Pollutants Date Extracted 1,1,1-Trichloroethane, ug/L 1,1,2,2-Tetrachloroethane, ug/L 1,1-Dichloroethane, ug/L 1,1-Dichloroethane, ug/L 1,2-Dichloroethane, ug/L 1,2-Dichloroethane, ug/L 1,2-Dichloropropane, ug/L 1,3-Dichloropropane, ug/L 2-Chloroethylvinylether, ug/L Acetone, ug/L Acrolein, ug/L Acrolein, ug/L Bromodichloromethane, ug/L Bromodichloromethane, ug/L Bromoform, ug/L Chlorobenzene, ug/L Carbon Tetrachloride, ug/L Chloroform, ug/L Chloroform, ug/L	03.14.90	03.20.90 <5 <5 <5 <5 <5 <5 <50 <50 <50	03.20.90 <5 <5 <5 <5 <5 <5 <50 <50 <50	03.14.90 <1 <1 <1 <1 <1 <1 <1 <1 <1 <10 <10 <10	03.14.90 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <500 <5



LOG NO: E90-03-212

Received: 07 MAR 90 Reported: 22 MAR 90

Ms. Donna Courington
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Project: 5081-02

## REPORT OF ANALYTICAL RESULTS

Page 2

LOG NO	SAMPLE DESCRIPTION,	GROUND WAT	ER SAMPLES		DA	TE SAMPLED
	W-8 W-7 W-3 B-1 W-1					06 MAR 90 06 MAR 90 06 MAR 90 06 MAR 90 06 MAR 90
PARAMETER		03-212-1	03-212-2	03-212-3	03-212-4	03-212-5
Dibromochle Ethylbenze Freon 113, Methyl ethy Methyl iso Methylene Styrene, up Trichloroe Trichloroe Trichlorof Toluene, up Tetrachloro Vinyl aceta Vinyl chlor Total Xylen cis-1,2-Dic trans-1,2-l	ulfide, ug/L oromethane, ug/L ne, ug/L ug/L yl ketone, ug/L butyl ketone, ug/L chloride, ug/L g/L thene, ug/L luoromethane, ug/L g/L oethene, ug/L	<1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000 <1000	<5 <5 <5 <5 <100 <5 <5 240 <5 <5 740 <5 <5 <5 <5	<5 <5 <5 <5 <100 <5 <5 <5 29 <5 24 <5 400 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <6 <6 <6 <6 <6 <6 <6 <6 <6 <6 <6 <7 <6 <7 <7 <6 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7 <7	<1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <	<500 <500 <500 <500 <500 <10000 <500 <50
	ified Results ** yl Ether, ug/L			30		



LOG NO: E90-03-212

Received: 07 MAR 90 Reported: 22 MAR 90

Ms. Donna Courington
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Project: 5081-02

## REPORT OF ANALYTICAL RESULTS

Page 3

LOG NO	SAMPLE DESCRIPTION,	GROUND V	JATER	SAMPLES		DA	TE SAMPLED
03-212-1 03-212-2 03-212-3 03-212-4 03-212-5	W-8 W-7 W-3 B-1 W-1					*** <u>.</u>	06 MAR 90 06 MAR 90 06 MAR 90 06 MAR 90 06 MAR 90
PARAMETER	Single based upon	03-212		03-212-2	03-212-3	03-212-4	03-212-5

\*\* Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.



LOG NO: E90-03-212

Received: 07 MAR 90 Reported: 22 MAR 90

Ms. Donna Courington
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Project: 5081-02

# REPORT OF ANALYTICAL RESULTS

Page 4

LOG NO	SAMPLE DESCRIPTION, GROUND	WATER SAMPLES		DA?	re sampled
· · · · ·	W-5 W-4 W-6 W-9				06 MAR 90 06 MAR 90 07 MAR 90 07 MAR 90
PARAMETER			03-212-7	03-212-8	03-212-9
Date Extra 1,1,1-Tric 1,1,2,2-Te 1,1,2-Tric 1,1-Dichlo 1,1-Dichlo 1,2-Dichlo 1,2-Dichlo 2-Chloroet 2-Hexanone Acetone, u Acrolein, Acrylonith Bromodichl Bromometha Benzene, u Bromoform, Chloroetha Carbon Tei Chloroetha	hloroethane, ug/L trachloroethane, ug/L hloroethane, ug/L croethane, ug/L croethane, ug/L croethane, ug/L cropropane, ug/L cropropene, ug/L chylvinylether, ug/L cy/L cy/L cy/L cy/L cy/L cy/L cy/L coromethane, ug/L chy/L coromethane, ug/L	03.14.90 <20 <20 <20 <20 <20 <20 <20 <20 <20 <2	03.14.90 <500 <500 <500 <500 <500 <500 <500 <500 <500 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000 <5000	<20 <20 <20 <20 <20 <20 <200 <200 <200	03.15.90 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1 <1
Chloroford Chlorometl	n, ug/L nane, ug/L	<20	<500	<20	<1



LOG NO: E90-03-212

Received: 07 MAR 90 Reported: 22 MAR 90

Ms. Donna Courington
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Project: 5081-02

### REPORT OF ANALYTICAL RESULTS

Page 5

LOG NO	SAMPLE DESCRIPTION, GRO	OUND WATER SAMPLES		DA	TE SAMPLED
03-212-8	W-5 W-4 W-6 W-9				06 MAR 90 06 MAR 90 07 MAR 90 07 MAR 90
PARAMETER		03-212-6	03-212-7	03-212-8	03-212-9
Dibromochl Ethylbenze Freon 113, Methyl eth Methyl iso Methylene Styrene, u Trichloroe Trichloroe Toluene, u Tetrachlor Vinyl acet Vinyl chlo Total Xyle cis-1,2-Di trans-1,2- trans-1,3-	ug/L yl ketone, ug/L butyl ketone, ug/L chloride, ug/L g/L thene, ug/L cluoromethane, ug/L g/L coethene, ug/L ate, ug/L cride, ug/L chloroethene, ug/L Dichloropropene, ug/L	<20 <20 <20 <400 <20 <20 <20 <20 <20 <20 <20 460 <20 <20 190 <20 1900 <20 1900 <20 <20	<500 <500 <500 <500 <1000 <500 <500 <500	<20 <20 <20 <400 <20 <20 <20 <20 <20 <20 <20 <20 <20 <	<1 <1 <1 <20 <1 <1 <1 <1 13 <1 <1 <1 <1 <1 <1
•	ified Results ** ylacetate, ug/L		10000		

\*\* Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street Emeryville, CA 94608 415/428-2300 Fax: 415/547-3643



B C Analytical

CHAIN	OF	CUST	YOU	REC	n	RD

8C Log Number .....

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City, Stat			LEAS	94523	Report attention	JA COURINGTO	,N			/(								•		
Lab Sample	Date	Time	Type* See key	Sampled by K,	MCILVENNA, S: HALLOCK N		Nu	mber of			/ /	////								
number	sampled	sampled	below		Sample descripti			tainers			$\angle$					\200 cg		Remarks	<b>;</b>	
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# BROWN AND CALDWELL LABORATORIES

☐ 1255 Powell Street, Emeryville, CA\_94608 (415) 428-2300

373 South Fair Oaks Avenue, Pasadena, CA 91105 (818) 795-7553

1200 Pacifico Avenue, Anaheim, CA 92805

Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

\*KEY: AQ-Aqueous NA-Nonaqueous SL-Sludge GW-Groundwater SO-Soil OT-Other PE-Petroleum

## ATTACHMENT C

# LETTER FROM BCA DOCUMENTING REPORT ERROR



B C Analytical

April 20, 1990

Ms. Donna Courington Brown and Caldwell Consulting 3480 Buskirk Avenue Pleasant Hill, California 94523-4342

Dear Ms. Courington:

Groundwater samples from your project 4459 were analyzed by BC Analytical (BCA) Emeryville laboratory in April and August of 1989. The data for the samples were reported under logs E89-04-609 and E89-08-375, with acetone as one of the contaminants detected in the samples by EPA 8240. Acetone was incorrectly reported as a semi-quantitatively detected compound in the reports. Acetone was calibrated with a five concentration level calibration and quantitatively determined.

Please make note of the error in our report format. If you have any questions, please call me at (415) 428-2300.

Very truly yours,

Chihsan Ho

Client Services Representative, BCA

CH

cc: H. Ficklin, BCA

LOG NO: E90-07-036

Received: 03 JUL 90 Reported: 18 JUL 90

Ms. Donna Courington
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Project: 5081

	REPORT OF ANA	LYTICAL RESULTS	Page 1
LOG NO	SAMPLE DESCRIPTION, GROUND WA	TER SAMPLES	DATE SAMPLED
07-036-1			חם זווז כח
PARAMETER		07 0361	
	Priority Pollutants		
Date Anal		07.10.90	
Date Extr		07.10.90	
	Factor, Times	1	
	ichloroethane, ug/L	<1	•
	Cetrachloroethane, ug/L	<1	
	ichloroethane, ug/L	<1	
	loroethane, ug/L	<1	
	loroethene, ug/L	<1	
	loroethane, ug/L	<1	
	loropropane, ug/L	<1	
	loropropene, ug/L	<1	
	ethylvinylether, ug/L	<1	
Acrolein,		<10	
	trile, ug/L	<10	
	nloromethane, ug/L	. <1	
	nane, ug/L	<1	
Benzene,		<1	
Bromoform	<del>-</del>	<1	
	nzene, ug/L	<1	
	etrachloride, ug/L	<1	
	hane, ug/L	<1	
Chlorofo	• •	<1	
	thane, ug/L	<1	
	hloromethane, ug/L	<1	
	zene, ug/L	<1	
	e chloride, ug/L	<5	
• •	<del>-</del>		



LOG NO: E90-07-036

Received: 03 JUL 90 Reported: 18 JUL 90

Ms. Donna Courington
Brown and Caldwell
3480 Buskirk Avenue
Pleasant Hill, California 94523

Project: 5081

PARAMETER  O7-036-1  Trichloroethene, ug/L  Trichlorofluoromethane, ug/L  Toluene, ug/L  Tetrachloroethene, ug/L  Vinyl chloride, ug/L  cis-1,2-Dichloroethene, ug/L  3  41  42  43  44  45  46  47  48  48  48  48  48  48  48  48  48		Page 2
LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
07-036-1	GS-9	03 JUL 90
PARAMETER	07-036-1	
Trichloro Toluene, Tetrachlo Vinyl chl cis-1,2-D trans-1,2	fluoromethane, ug/L  ug/L  roethene, ug/L  oride, ug/L  ichloroethene, ug/L  3  <1  3  <1  3  3	

Sim D. Lessley, Ph.D., Laboratory Director

### **CHAIN OF CUSTODY RECORD**

BCA Log Number 9007536

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City, Stat	e, Zip				Report attention	Couring	ter	1		5/								
Lab Sample number	Date sampled	Time sampled	Type* See key below	Sampled by	Sample d	un myror	Number of containers	/	/S 87/		/				/ /2 <sup>32</sup> c		Remarks	
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### **BCANALYTICAL**

- e ☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300 ☐ 801 Western Avenue, Glendale, CA 91201 (818) 247-5737
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Note: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client's expense.

Disposal arrangements: \_\_\_\_

GW-Groundwater SO-Soil OT-Other PE-Petroleum