



70-66

October 27, 2004

Mr. Robert Schultz  
Alameda County Health Care Services Agency  
Environmental Health Services  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502

Alameda County Health Care Services Agency  
NOV 01 2004  
Environmental Health Services

**Re: Evaluation of Interim Remedial Action, ACEH Case # RO0000066  
Former BP Service Station #11126  
1700 Powell Street  
Emeryville, California  
URS Project #38486831**

Dear Mr. Schultz:

On behalf of the Atlantic Richfield Company (a BP affiliated company), URS Corporation (URS) is submitting this evaluation of the interim remedial action at the Former BP Service Station #11126, located at 1700 Powell Street, Emeryville, California. The interim remedial action consisted of bi-weekly groundwater batch extraction from five onsite wells as proposed in our *Interim Remedial Action and Offsite Assessment Work Plan* dated July 11, 2003, modified in our letter of April 20, 2004 and approved in the Alameda County Health Care Services Agency, Environmental Health Services (ACEH) letter dated April 28, 2004.

URS began batch extraction on a bi-weekly basis starting June 8, 2004. Groundwater recovery has been very poor due to low formation permeability, with an estimated average of only about 14 gallons per event recovered before the wells purged dry, and a total of only about 125 gallons removed as of October 5, 2004. The estimated groundwater volume extracted per event per well, and the cumulative total volume extracted are summarized in Table 1.

Mass removal calculations based on the groundwater volume extracted and the quarterly groundwater monitoring results at each extraction well indicate that the total mass of hydrocarbons extracted is approximately 0.032 pounds gasoline range organics (GRO), 0.003 pounds benzene, and 0.008 pounds methyl tertiary butyl ether (MTBE). Based on the low groundwater volumes and hydrocarbon mass extracted, URS believes that groundwater batch extraction is ineffective at this site. URS has ceased batch extraction at this site consistent with ACEH concurrence with our letter dated October 7, 2004. The mass removal calculations are summarized in Table 2.

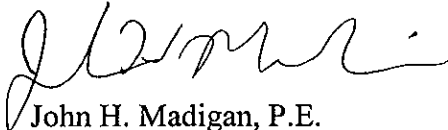


Mr. Robert Schultz  
October 27, 2004  
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If you have any questions regarding this submission, please call me at (510) 874-1720.

Sincerely,

**URS CORPORATION**



John H. Madigan, P.E.  
Environmental Engineer



Leonard P. Niles, R.G./C.H.G.  
Project Manager

Attachments:	Table 1	Groundwater Extraction Volumes And Depth To Water Measurements
	Table 2	Estimated Hydrocarbon Mass Extracted By Batch Extraction
cc:	Mr. Kyle Christie	Atlantic Richfield Company (RM) (copy uploaded to ENFOS)
	Ms. Liz Sewell	ConocoPhillips, 76 Broadway, Sacramento, CA 95818

**Table 1**  
**Groundwater Extraction Volumes and Depth To Water Measurements**  
Former BP Service Station #11126  
1700 Powell Street, Emeryville, CA

Well Number	Date	Pre-extraction Depth To Water (ft)	Intermediate <sup>1</sup> Depth To Water (ft)	Final <sup>2</sup> Depth To Water (ft)	Volume Extracted (gal) <sup>3</sup>	Cumulative	Comments
						Volume Extracted (gal)	
MW-1	6/8/2004	3.54	3.29	3.20	1.87	1.87	
	6/25/2004	3.24	3.24	6.29	1.92	3.79	
	7/8/2004	4.22	3.55	6.35	1.76	5.55	
	7/20/2004	3.18	3.25	6.19	1.93	7.48	
	8/3/2004	5.89	3.79	7.43	1.49	8.96	
	8/17/2004	3.55	3.47	7.44	1.87	10.83	
	8/31/2004	3.49	3.33	5.30	1.88	12.71	
	9/14/2004	3.89	3.40	4.03	1.81	14.52	
	9/28/2004 <sup>4</sup>	--	--	--	--	--	
10/5/2004	3.58	3.49	7.32	1.86	16.39		
MW-2	6/8/2004	4.78	4.57	8.54	1.67	1.67	
	6/25/2004	4.62	4.61	7.19	1.69	3.36	
	7/8/2004	4.70	4.69	7.75	1.68	5.04	
	7/20/2004	4.77	4.77	8.26	1.67	6.71	
	8/3/2004	4.80	4.79	5.72	1.66	8.38	
	8/17/2004	4.80	4.80	5.70	1.66	10.04	
	8/31/2004	4.67	4.46	5.15	1.69	11.73	
	9/14/2004	4.63	4.64	5.38	1.69	13.42	
	9/28/2004 <sup>4</sup>	--	--	--	--	--	
10/5/2004	4.79	4.80	5.17	1.67	15.09		
MW-4	6/8/2004	8.05	5.56	7.65	1.13	1.13	
	6/25/2004	7.92	6.42	8.83	1.16	2.29	
	7/8/2004	6.15	5.32	8.88	1.44	3.73	
	7/20/2004	6.83	5.70	9.57	1.33	5.07	
	8/3/2004	6.93	5.70	10.12	1.32	6.38	
	8/17/2004	5.45	5.20	10.14	1.56	7.94	
	8/31/2004	6.50	5.60	9.35	1.39	9.33	
	9/14/2004	5.79	5.66	10.25	1.50	10.83	
	9/28/2004 <sup>4</sup>	--	--	--	--	--	
10/5/2004	6.13	5.44	9.59	1.45	12.28		
MW-8	6/8/2004	4.87	4.66	8.66	1.65	1.65	
	6/25/2004	4.63	4.63	9.23	1.69	3.35	
	7/8/2004	4.59	4.60	11.58	1.70	5.04	
	7/20/2004	4.71	4.71	10.00	1.68	6.72	
	8/3/2004	4.66	4.67	10.40	1.69	8.41	
	8/17/2004	4.75	4.75	10.39	1.67	10.08	
	8/31/2004	4.75	4.74	11.55	1.67	11.76	
	9/14/2004	4.71	4.75	8.96	1.68	13.44	
	9/28/2004 <sup>4</sup>	--	--	--	--	--	
10/5/2004	4.88	4.88	9.68	1.65	15.09		

**Table 1**  
**Groundwater Extraction Volumes and Depth To Water Measurements**  
Former BP Service Station #11126  
1700 Powell Street, Emeryville, CA

Well Number	Date	Pre-extraction Depth To Water (ft)	Intermediate <sup>1</sup> Depth To Water (ft)	Final <sup>2</sup> Depth To Water (ft)	Volume Extracted (gal) <sup>3</sup>	Cumulative		Comments
						Volume Extracted (gal)	Volume Extracted (gal)	
MW-9	6/8/2004	3.55	NM	13.10	7.47	7.47		Sheen observed
	6/25/2004	3.63	NM	11.37	7.42	14.90		
	7/8/2004	3.76	DRY	13.10	7.34	22.23		Sheen observed
	7/20/2004	3.80	NM	9.27	7.31	29.54		Sheen observed
	8/3/2004	3.87	13.26	10.52	7.27	36.81		
	8/17/2004	3.73	NM	8.53	7.36	44.17		Sheen observed
	8/31/2004	3.84	NM	10.07	7.28	51.45		Sheen observed
	9/14/2004	3.76	NM	7.78	7.34	58.79		Sheen observed
	9/28/2004 <sup>4</sup>	--	--	--	--	--		
	10/5/2004	4.03	NM	10.25	7.16	65.95		Sheen observed
<b>Total Cumulative Volume Extracted, gal</b>			<b>124.79</b>					

Notes:

- 1 = Depth to water measurement taken after extraction from well MW-9, but before extraction from wells MW-1, MW-2, MW-4 and MW-8.
- 2 = Depth to water measurement taken after extraction from all extraction wells (MW-9, MW-1, MW-2, MW-4 and MW-8).
- 3 = Volume extracted estimated based calculated well volume and number of times dewatered (typically 1 per event)
- 4 = Extraction event cancelled due to vacuum truck breakdown.

ft = feet  
gal = gallons  
NM = not measured

**Table 2**  
**Estimated Hydrocarbon Mass Extracted by Batch Extraction**  
Former BP Service Station #11126  
1700 Powell Street, Emeryville, CA

Well Number	Date	Volume Extracted, gal <sup>1</sup>	GRO Concentration, ug/L <sup>2</sup>	Mass GRO Extracted, mg	Cumulative Mass GRO Extracted, mg	Benzene Concentration, ug/L <sup>2</sup>	Mass Benzene Extracted, mg	Cumulative Mass Benzene Extracted, mg	MTBE Concentration, ug/L <sup>2</sup>	Mass MTBE Extracted, mg	Cumulative Mass MTBE Extracted, mg
MW-1	6/8/2004	1.87	1,600	11.33	11.33	100	0.71	0.71	200	1.42	1.42
	6/25/2004	1.92	1,600	11.62	22.95	100	0.73	1.43	200	1.45	2.87
	7/8/2004	1.76	1,600	10.65	33.60	100	0.67	2.10	200	1.33	4.20
	7/20/2004	1.93	1,600	11.68	45.28	100	0.73	2.83	200	1.46	5.66
	8/3/2004	1.49	1,600	9.00	54.29	100	0.56	3.39	200	1.13	6.79
	8/17/2004	1.87	1,600	11.32	65.60	100	0.71	4.10	200	1.41	8.20
	8/31/2004	1.88	1,700	12.09	77.69	220	1.56	5.66	180	1.28	9.48
	9/14/2004	1.81	1,700	11.67	89.35	220	1.51	7.17	180	1.24	10.72
	10/5/2004	1.86	1,700	11.99	101.34	220	1.55	8.73	180	1.27	11.98
	MW-2	6/8/2004 <sup>3</sup>	1.67	12,500	78.91	78.91	690	4.36	4.36	31,000	195.69
6/25/2004 <sup>3</sup>		1.69	12,500	80.14	159.05	690	4.42	8.78	31,000	198.75	394.44
7/8/2004 <sup>3</sup>		1.68	12,500	79.52	238.57	690	4.39	13.17	31,000	197.22	591.66
7/20/2004 <sup>3</sup>		1.67	12,500	78.98	317.56	690	4.36	17.53	31,000	195.88	787.54
8/3/2004 <sup>3</sup>		1.66	12,500	78.75	396.31	690	4.35	21.88	31,000	195.31	982.85
8/17/2004 <sup>3</sup>		1.66	12,500	78.75	475.06	690	4.35	26.22	31,000	195.31	1,178.16
8/31/2004		1.69	140,000	893.27	1,368.33	8,200	52.32	78.54	11,000	70.19	1,248.34
9/14/2004		1.69	140,000	896.73	2,265.06	8,200	52.52	131.07	11,000	70.46	1,318.80
10/5/2004	1.67	140,000	882.89	3,147.96	8,200	51.71	182.78	11,000	69.37	1,388.17	
MW-4	6/8/2004 <sup>4</sup>	1.13	12,500	53.66	53.66	125	0.54	0.54	3,600	15.45	15.45
	6/25/2004 <sup>4</sup>	1.16	12,500	54.66	108.32	125	0.55	1.08	3,600	15.74	31.20
	7/8/2004 <sup>4</sup>	1.44	12,500	68.33	176.65	125	0.68	1.77	3,600	19.68	50.88
	7/20/2004 <sup>4</sup>	1.33	12,500	63.08	239.73	125	0.63	2.40	3,600	18.17	69.04
	8/3/2004 <sup>4</sup>	1.32	12,500	62.31	302.04	125	0.62	3.02	3,600	17.94	86.99
	8/17/2004 <sup>4</sup>	1.56	12,500	73.73	375.77	125	0.74	3.76	3,600	21.24	108.22
	8/31/2004 <sup>4</sup>	1.39	1,250	6.56	382.34	12.5	0.07	3.82	1,800	9.45	117.67
	9/14/2004 <sup>4</sup>	1.50	1,250	7.11	389.45	12.5	0.07	3.89	1,800	10.24	127.91
	10/5/2004 <sup>4</sup>	1.45	1,250	6.85	396.30	12.5	0.07	3.96	1,800	9.86	137.77

**Table 2**  
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Well Number	Date	Volume Extracted, gal <sup>1</sup>	GRO Concentration, ug/L <sup>2</sup>	Mass GRO Extracted, mg	Cumulative Mass GRO Extracted, mg	Benzene Concentration, ug/L <sup>2</sup>	Mass Benzene Extracted, mg	Cumulative Mass Benzene Extracted, mg	MTBE Concentration, ug/L <sup>2</sup>	Mass MTBE Extracted, mg	Cumulative Mass MTBE Extracted, mg
MW-8	6/8/2004 <sup>5</sup>	1.65	730	4.57	4.57	1.25	0.01	0.01	170	1.06	1.06
	6/25/2004 <sup>5</sup>	1.69	730	4.68	9.24	1.25	0.01	0.02	170	1.09	2.15
	7/8/2004 <sup>5</sup>	1.70	730	4.69	13.94	1.25	0.01	0.02	170	1.09	3.25
	7/20/2004 <sup>5</sup>	1.68	730	4.64	18.58	1.25	0.01	0.03	170	1.08	4.33
	8/3/2004 <sup>5</sup>	1.69	730	4.66	23.24	1.25	0.01	0.04	170	1.09	5.41
	8/17/2004 <sup>5</sup>	1.67	730	4.62	27.86	1.25	0.01	0.05	170	1.08	6.49
	8/31/2004 <sup>4</sup>	1.67	1,250	7.91	35.77	12.5	0.08	0.13	170	1.08	7.56
	9/14/2004 <sup>4</sup>	1.68	1,250	7.94	43.72	12.5	0.08	0.21	170	1.08	8.64
	10/5/2004 <sup>4</sup>	1.65	1,250	7.81	51.53	12.5	0.08	0.28	170	1.06	9.71
MW-9	6/8/2004	7.47	47,000	1,329.59	1,329.59	5,600	158.42	158.42	8,500	240.46	240.46
	6/25/2004	7.42	47,000	1,320.30	2,649.89	5,600	157.31	315.73	8,500	238.78	479.24
	7/8/2004	7.34	47,000	1,305.21	3,955.10	5,600	155.51	471.25	8,500	236.05	715.28
	7/20/2004	7.31	47,000	1,300.56	5,255.66	5,600	154.96	626.21	8,500	235.21	950.49
	8/3/2004	7.27	47,000	1,292.43	6,548.09	5,600	153.99	780.20	8,500	233.74	1,184.23
	8/17/2004	7.36	47,000	1,308.69	7,856.78	5,600	155.93	936.13	8,500	236.68	1,420.91
	8/31/2004	7.28	35,000	965.04	8,821.83	3,700	102.02	1,038.15	6,500	179.22	1,600.13
	9/14/2004	7.34	35,000	971.96	9,793.79	3,700	102.75	1,140.90	6,500	180.51	1,780.64
	10/5/2004	7.16	35,000	948.61	10,742.40	3,700	100.28	1,241.18	6,500	176.17	1,956.81
		<b>Total Mass Extracted, mg</b>		<b>GRO, mg</b>	<b>14,439.53</b>		<b>Benzene, mg</b>	<b>1,436.93</b>		<b>MTBE, mg</b>	<b>3,504.45</b>
		<b>Total Mass Extracted, lbs</b>		<b>GRO, lbs</b>	<b>0.032</b>		<b>Benzene, lbs</b>	<b>0.003</b>		<b>MTBE, lbs</b>	<b>0.008</b>

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Well Number	Date	Volume Extracted, gal <sup>1</sup>	GRO Concentration, ug/L <sup>2</sup>	Mass GRO Extracted, mg	Cumulative Mass GRO Extracted, mg	Benzene Concentration, ug/L <sup>2</sup>	Mass Benzene Extracted, mg	Cumulative Mass Benzene Extracted, mg	MTBE Concentration, ug/L <sup>2</sup>	Mass MTBE Extracted, mg	Cumulative Mass MTBE Extracted, mg
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Notes.

- 1 = Volume extracted estimated based calculated well volume and number of times dewatered (typically 1 per event).
- 2 = Hydrocarbon concentrations estimated based on most recent quarterly groundwater monitoring results for each well at time of extraction.
- 3 = GRO concentrations estimated as half the detection limit for mass removal calculation.
- 4 = GRO and benzene concentrations estimated as half the detection limit for mass removal calculation.
- 5 = Benzene concentrations estimated as half the detection limit for mass removal calculation.

Mass hydrocarbons extracted, mg = (volume extracted, gal)(3.785 liters/gallon)(hydrocarbon concentration, ug/L)(0.001 mg/ug)

Total mass hydrocarbons extracted, lbs = (total mass hydrocarbons extracted, mg)(1 lb/454 g)(1 g/1000 mg)

g = grams

gal = gallons

lbs = pounds

ug/L = micrograms per liter

mg = milligrams