



P.O. Box 1247 ☆ Ft. Morgan, Colorado 80701 ☆ (970) 867-9507 ☆ Fax (970) 542-0765

December 14, 2009

Mr. John Axelson
Colorado Oil and Gas Conservation Commission
9203 E. 155th Drive
Brighton, Colorado 80602

Re: Amen No. 1
Groundwater Monitoring Report
CSW Section 19, Twn 5N, Range 67W
API # 05-123-10593
Weld County, Colorado
Rem # 3548

Dear Mr. Axelson;

On behalf of Petro-Canada Resources (USA) Inc. (Petro-Canada), Western Clean Up Corporation (Western) is pleased to present this groundwater monitoring report. This report provides a brief site history and a summary of groundwater monitoring data and conclusions. A site diagram is presented as Figure 1 in Attachment A.

Background

Corrosion induced a hole in a partially buried steel production fluid water tank causing a release of tank fluids to soil and shallow groundwater. Approximately 250 cubic yards of petroleum-impacted soil was excavated and stockpiled on site by Petro-Canada. The excavated soil was transported to Petro-Canada's landfarm in Weld County. The excavation remained open to facilitate removal of impacted groundwater via vacuum trucks. A Form 19 "Spill Report" and Form 27 "Site Investigation and Remediation Work Plan" were completed and submitted to the Colorado Oil and Gas Conservation Commission (COGCC).

On September 14, 2005 Western and Petro-Canada mobilized to the site and installed four (4) 1-inch diameter monitoring wells (MW-1 through MW-4). Western mobilized to the site on October 7, 2005 to collect groundwater samples. Per the approved work plan, Western conducted additional remediation activities. Petroleum-impacted soils were excavated from December 9, through 13, 2005. Approximately 460 cy were transported to Petro-Canada's landfarm in Weld County. Clean soil fill was imported to the site and used to backfill the excavation. Depth of groundwater ranged from 5 to 7 feet bgs in the excavations. Western installed two (2) 3-ft diameter recovery wells in December 2005 and evacuated fluids via vacuum truck from these recovery wells. Western transported the fluids for disposal to a Class V re-injection well operated by Conquest Disposal located at 22625 County Road 64 in Weld County. During excavation activities in December 2005 monitoring wells MW-2 through MW-4 were destroyed, but later re-installed. On February 9, 2006 Western installed three (3) 2-inch diameter monitoring wells (MW-5 through MW-7).

Amen #1
Weld County, Colorado

In March 2006, Western installed a solar product skimmer system in recovery well RW-2. On various dates, Western has evacuated petroleum-impacted groundwater wells from RW-1 and RW-2, MW-5, MW-6, and MW-7, and transported the groundwater to Conquest Disposal.

On October 6, 2009 Western removed the remediation equipment from recovery wells RW-1 and RW-2, and abandoned these wells. Photo-documentation of equipment removal and evacuation of fluids from selected monitoring wells are shown in Attachment B.

Groundwater Sampling

Western mobilized to the site on October 6, 2009 to collect groundwater samples. A clean, disposable bailer was used to sample each monitoring well. Groundwater samples were collected in the appropriate sampling containers (40 ml VOA/VOC vials) and all samples were immediately labeled and stored in an iced cooler. Preservatives were used in all water samples to reduce degradation effects, and it was insured that bubbles or headspace were not present in the sample bottles. Groundwater samples were submitted for laboratory analysis for benzene, toluene, ethylbenzene and toluene (BTEX) using EPA Method 8260B. The samples were transported in an iced cooler under standard chain-of-custody procedures to Origins Laboratory in Denver, Colorado, and were received within QA/QC parameters.

HYDROGEOLOGY

The wells have not been surveyed. Groundwater is approximately 6 ft below ground surface and is estimated to flow in a south-southeasterly-west direction toward the Big Thompson River.

FREE PHASE PRODUCT

Liquid phase hydrocarbons were not detected in any of the monitoring wells during the monitoring event.

GROUNDWATER ANALYTICAL RESULTS

BTEX was not measured above the laboratory detection limits in monitoring wells MW-2, MW-3, MW-5, MW-6, and MW-7. Figure 1 in Attachment A presents a groundwater analytical data map and Table 2 in Attachment C presents groundwater analytical data. Attachment D contains a copy of the laboratory analytical report.

CONCLUSIONS

The groundwater analytical data indicates that the site remedial efforts have been successful and that the dissolved groundwater plume has attenuated.

Should you have any questions about the changes or require any additional information, please feel free to contact me at (303) 562-6854.

Sincerely,



Nick Fischer
Project/Chemical Engineer

C:
File
Rick Eggleston, Petro-Canada Resources (USA)

Amen #1
Weld County, Colorado

Enc.

Attachment A

Figure 1 - Site Map / Groundwater Results Diagram

Attachment B

Photo-Documentation

Attachment C

Table 1 - Groundwater Elevation Data

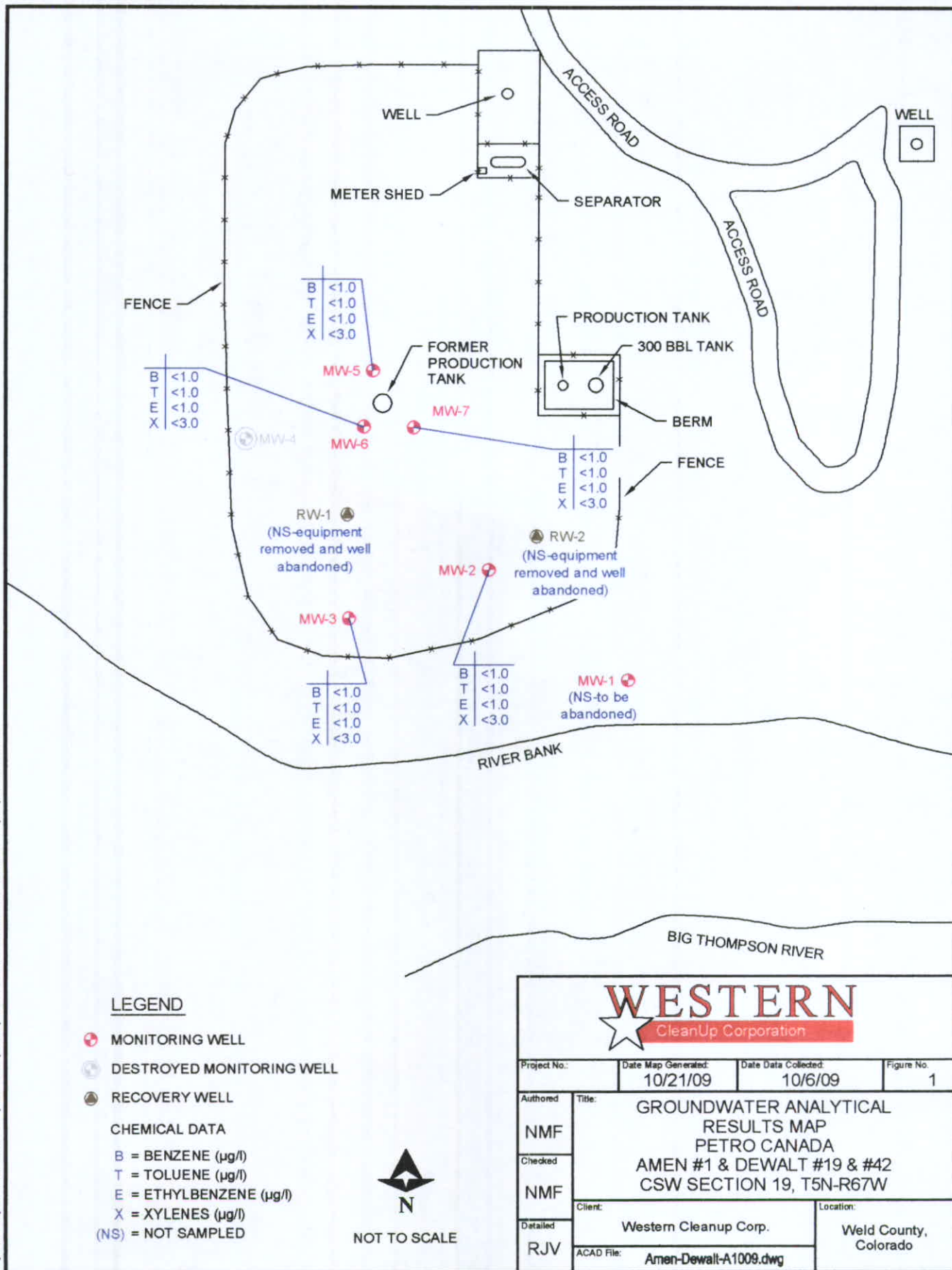
Table 2 - Groundwater Analytical Results

Attachment D

Laboratory Data

ATTACHMENT A

Figures



ATTACHMENT B

Photo-Documentation



Amen No 1 - Weld County - API # 05-123-10593
Remediating Groundwater via Vacuum Truck Fluid Recovery



Amen No 1 - Weld County - API # 05-123-10593
Remediating Groundwater via Vacuum Truck Fluid Recovery



Amen No 1 - Weld County - API # 05-123-10593
Recovery Well RW-1 Equipment Removal



Amen No 1 - Weld County - API # 05-123-10593
Recovery Well RW-1 Equipment Removal



Amen No 1 - Weld County - API # 05-123-10593
Recovery Well RW-1 Equipment Removal



Amen No 1 - Weld County - API # 05-123-10593
Recovery Well RW-1 Equipment Removal



Amen No 1 - Weld County - API # 05-123-10593
Recovery Well RW-2 Equipment Removal



Amen No 1 - Weld County - API # 05-123-10593
Recovery Well RW-2 – Excavation Backfilled



Amen No 1 - Weld County - API # 05-123-10593
Recovery Well Equipment – Transported Offsite



Amen No 1 - Weld County - API # 05-123-10593
Recovery Well Equipment – Transported Offsite

ATTACHMENT C

Tables

TABLE 1
Groundwater Elevation Data
Petro-Canada Amen #1 Well Site
Weld County, Colorado

Well	Date	TOC to Ground Level (feet)	Depth to Product (feet)	Depth to Water from TOC	Product Thickness (feet)	Ground Level to Ground Water Elevation
MW-1	10/7/05	2.2	ND	7.42	0.00	5.22
MW-1	12/10/05	2.2	ND	7.72	0.00	5.52
MW-1	3/9/06	2.2	ND	7.70	0.00	5.50
MW-1	6/10/06	2.2	ND	7.11	0.00	4.91
MW-1	2/22/07	2.2	ND	7.10	0.00	4.90
MW-1	6/18/07	2.2	ND	7.49	0.00	5.29
MW-1	9/11/07	2.2	ND	7.63	0.00	5.43
MW-1	1/9/08	2.2	ND	7.41	0.00	5.21
MW-1	5/12/08	2.2	ND	7.16	0.00	4.96
MW-1	8/14/08	2.2	ND	7.25	0.00	5.05
MW-1	10/6/09	2.2	ND	6.94	0.00	4.74
MW-2	10/7/05	.53	ND	7.02	0.00	6.49
MW-2	12/10/05	.53	ND	7.36	0.00	6.83
MW-2	3/9/06	covered				
MW-2	6/10/06	.83	ND	5.93	0.00	5.10
MW-2	2/22/07	.83	ND	5.89	0.00	5.06
MW-2	6/18/07	.83	ND	6.07	0.00	5.24
MW-2	9/11/07	.83	ND	6.23	0.00	5.40
MW-2	1/9/08	covered				
MW-2	5/12/08	.83	ND	6.27	0.00	5.44
MW-2	8/14/08	.83	ND	6.40	0.00	5.57
MW-2	10/6/09	.83	ND	6.11	0.00	5.28
MW-3	10/7/05	.71	ND	5.87	0.00	5.16
MW-3	12/10/05	.71	ND	6.14	0.00	5.43
MW-3	3/9/06	covered				
MW-3	6/10/06	.77	ND	6.56	0.00	5.79
MW-3	2/22/07	covered				
MW-3	6/18/07	covered				
MW-3	9/11/07	.77	ND	6.87	0.00	6.10
MW-3	1/9/08	.77	ND	6.67	0.00	5.90
MW-3	5/12/08	.77	ND	6.43	0.00	5.66
MW-3	8/14/08	.77	ND	6.53	0.00	5.76
MW-3	10/6/09	.77	ND	6.16	0.00	5.39
MW-4	10/7/05	.91	ND	6.48	0.00	5.57
MW-4	12/10/05	.91	ND	6.75	0.00	5.84
MW-4	3/9/06	destroyed				
MW-5	3/9/06	.46	ND	7.20	0.00	6.74
MW-5	6/10/06	0.4	ND	6.72	0.00	6.32
MW-5	2/22/07	0.4	ND	6.58	0.00	6.18
MW-5	6/18/07	0.4	ND	7.01	0.00	6.61
MW-5	9/11/07	0.4	ND	7.31	0.00	6.91
MW-5	1/9/08	0.4	ND	7.07	0.00	6.67
MW-5	5/12/08	0.4	ND	6.93	0.00	6.53
MW-5	8/14/08	0.3	ND	6.98	0.00	6.68
MW-5	10/6/09	0.3	ND	6.58	0.00	6.28
MW-6	3/9/06	1.1	ND	6.92	0.00	5.82

TABLE 1
Groundwater Elevation Data
Petro-Canada Amen #1 Well Site
Weld County, Colorado

Well	Date	TOC to Ground Level (feet)	Depth to Product (feet)	Depth to Water from TOC	Product Thickness (feet)	Ground Level to Ground Water Elevation
MW-6	6/10/06	1.2	ND	6.80	0.00	5.60
MW-6	2/22/07	1.2	ND	6.78	0.00	5.58
MW-6	6/18/07	1.2	ND	7.05	0.00	5.85
MW-6	9/11/07	1.2	ND	7.37	0.00	6.17
MW-6	1/9/08	1.2	ND	7.10	0.00	5.90
MW-6	5/12/08	1.2	ND	6.90	0.00	5.70
MW-6	8/14/08	.8	ND	6.95	0.00	6.15
MW-6	10/6/09	.8	ND	6.56	0.00	5.76
MW-7	3/9/06	.5	ND	6.84	0.00	6.34
MW-7	6/10/06	.5	ND	6.40	0.00	5.90
MW-7	2/22/07	.5	ND	6.35	0.00	5.85
MW-7	6/18/07	.5	ND	6.78	0.00	6.28
MW-7	9/11/07	.5	ND	7.05	0.00	6.55
MW-7	1/9/08	.5	ND	6.90	0.00	6.40
MW-7	5/12/08	.5	ND	6.73	0.00	6.23
MW-7	8/14/08	.3	ND	6.75	0.00	6.45
MW-7	10/6/09	.3	ND	6.32	0.00	6.02
RW-1	6/10/06	4.0	ND	9.30	0.00	5.30
RW-1	2/22/07	4.0	ND	9.21	0.00	5.21
RW-1	6/18/07	4.0	ND	9.73	0.00	5.73
RW-2	6/10/06	2.2	ND	8.50	0.00	6.30
RW-2	2/22/07	2.2	ND	8.37	0.00	6.17
RW-2	6/18/07	2.2	ND	8.85	0.00	6.65

Notes

ND = Not Detected

NM = Not Measured

TABLE 2
Groundwater Analytical Data
Amen #1
CSW Section 19 Twn 5N Range 67W
Weld County, Colorado

Sample ID	Date	Benzene (µg/l)	Toluene (µg/l)	E-benzene (µg/l)	Xylenes (µg/l)
COGCC's Allowable Limits		5	1,000	680	10,000
MW-1	10/7/05	<1.0	<1.0	<1.0	<3.0
MW-1	3/9/06	<1.0	<1.0	<1.0	<3.0
MW-1	6/10/06	<1.0	<1.0	<1.0	<3.0
MW-1	9/21/06	<1.0	<1.0	<1.0	<3.0
MW-1	2/22/07	<1.0	<1.0	<1.0	<3.0
MW-1	6/18/07	<1.0	<1.0	<1.0	<3.0
MW-1	9/11/07	<1.0	<1.0	<1.0	<3.0
MW-1	1/9/08	<1.0	<1.0	<1.0	<3.0
MW-1	5/12/08	<1.0	<1.0	<1.0	<3.0
MW-1	8/14/08	<1.0	<1.0	<1.0	<3.0
MW-2	10/7/05	195	78.8	12.5	238
MW-2	3/9/06	Covered			
MW-2	6/10/06	<1.0	<1.0	<1.0	<3.0
MW-2	9/21/06	<1.0	<1.0	<1.0	<3.0
MW-2	2/22/07	3.6	44.5	8.8	33.3
MW-2	6/18/07	<1.0	<1.0	<1.0	<3.0
MW-2	9/11/07	<1.0	<1.0	<1.0	<3.0
MW-2	1/9/08	Covered			
MW-2	5/12/08	<1.0	<1.0	<1.0	<3.0
MW-2	8/14/08	<1.0	<1.0	<1.0	<3.0
MW-2	10/6/09	<1.0	<1.0	<1.0	<3.0
MW-3	10/7/05	29.1	<1.0	<1.0	<3.0
MW-3	3/9/06	Covered			
MW-3	6/10/06	<1.0	<1.0	<1.0	<3.0
MW-3	9/21/06	<1.0	<1.0	<1.0	<3.0
MW-3	2/22/07	Covered			
MW-3	6/18/07	Covered			
MW-3	9/11/07	<1.0	<1.0	<1.0	<3.0
MW-3	1/9/08	<1.0	<1.0	<1.0	<3.0
MW-3	5/12/08	<1.0	<1.0	<1.0	<3.0
MW-3	8/14/08	<1.0	<1.0	<1.0	<3.0
MW-3	10/6/09	<1.0	<1.0	<1.0	<3.0
MW-4	10/7/05	<1.0	<1.0	<1.0	<3.0
MW-4	3/9/06	Covered			
MW-4	6/10/06	<1.0	<1.0	<1.0	<3.0
MW-4	9/21/06	Destroyed			
MW-5	3/9/06	271	1.4	248	1,020
MW-5	6/10/06	80.1	<1.0	140	374
MW-5	9/21/06	230	<1.0	190	360
MW-5	2/22/07	9.5	11.9	12.5	25.5
MW-5	6/18/07	260	<1.0	190	211
MW-5	9/11/07	3.9	<1.0	1.4	3.1
MW-5	1/9/08	<1.0	<1.0	<1.0	<3.0
MW-5	5/12/08	<1.0	<1.0	<1.0	<3.0
MW-5	8/14/08	<1.0	<1.0	<1.0	<3.0
MW-5	10/6/09	<1.0	<1.0	<1.0	<3.0

TABLE 2
Groundwater Analytical Data
Amen #1
CSW Section 19 Twn 5N Range 67W
Weld County, Colorado

Sample ID	Date	Benzene (µg/l)	Toluene (µg/l)	E-benzene (µg/l)	Xylenes (µg/l)
MW-6	3/9/06	44	1.2	29.9	161
MW-6	6/10/06	142	<1.0	3.13	11
MW-6	9/21/06	30	<1.0	18	2.3
MW-6	2/22/07	20.4	<1.0	25.8	34.4
MW-6	6/18/07	1.1	<1.0	<1.0	2.0
MW-6	9/11/07	3.8	<1.0	1.7	3.3
MW-6	1/9/08	108	<1.0	115	99.6
MW-6	5/12/08	<1.0	<1.0	<1.0	<3.0
MW-6	8/14/08	3.7	<1.0	1.7	<3.0
MW-6	10/6/09	<1.0	<1.0	<1.0	<3.0
MW-7	3/9/06	664	341	112	1,170
MW-7	6/10/06	65.0	1.4	96.8	73.6
MW-7	9/21/06	3.1	<1.0	2.5	2.5
MW-7	2/22/07	273	<1.0	294	137
MW-7	6/18/07	3.6	<1.0	2.7	5.5
MW-7	9/11/07	3.9	<1.0	1.4	3.1
MW-7	1/9/08	<1.0	<1.0	<1.0	<3.0
MW-7	5/12/08	<1.0	<1.0	<1.0	<3.0
MW-7	8/14/08	24.9	<1.0	23.4	18.6
MW-7	10/6/09	<1.0	<1.0	<1.0	<3.0
RW-1	3/9/06	3.5	<1.0	1.8	<3.0
RW-1	6/10/06	5.3	<1.0	<1.0	<3.0
RW-1	9/21/06	<1.0	<1.0	<1.0	<3.0
RW-1	2/22/07	<1.0	<1.0	<1.0	<3.0
RW-1	6/18/07	<1.0	<1.0	<1.0	<3.0
RW-1	9/11/07	<1.0	<1.0	<1.0	<3.0
RW-1	1/9/08	<1.0	<1.0	<1.0	<3.0
RW-1	10/6/09	Equipment Removed and Excavation Backfilled			
RW-2	3/9/06	2.4	2.0	<1.0	<3.0
RW-2	6/10/06	10.0	<1.0	1.5	<3.0
RW-2	9/21/06	<1.0	<1.0	<1.0	<3.0
RW-2	2/22/07	<1.0	<1.0	<1.0	<3.0
RW-2	6/18/07	<1.0	<1.0	<1.0	<3.0
RW-2	9/11/07	<1.0	<1.0	<1.0	<3.0
RW-2	1/9/08	<1.0	<1.0	<1.0	<3.0
RW-2	10/6/09	Equipment Removed and Excavation Backfilled			
Big Thompson River	11/15/05	<1.0	<1.0	<1.0	<3.0
Big Thompson River	6/10/06	<1.0	<1.0	<1.0	<3.0
Big Thompson River	9/21/06	<1.0	<1.0	<1.0	<3.0

Notes

< = Less than the laboratory detection limit.

ATTACHMENT D

Laboratory Reports



4640 Pecos Street | Unit C | Denver, Colorado 80211
303.433.1322 Phone 303.265.9645 Fax

October 16, 2009

Western Clean Up Corporation
P.O Box 1247
Fort Morgan CO 80701

Ron Greene
Project Number: [none]
Project: Amen #1 - Petro-Canada

Attached are the analytical results for Amen #1 - Petro-Canada received by Origins Laboratory, Inc. 10/6/2009 12:37:00PM. Please let us know if you have any questions, or if we can help with anything at all.

Noelle E Doyle
Laboratory Manager

The analytical results in the following report were analyzed under the guidelines of EPA Methods specified in SW-846. The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. This laboratory report is intended solely for the above addressee and it is only to be used and or reproduced in its entirety.

4640 Pecos Street | Unit C
Denver, Colorado 80211
303.433.1322 | Laboratory
303.265.9645 | Fax



Western Clean Up Corporation
P.O Box 1247
Fort Morgan CO 80701

Ron Greene
Project Number: [none]
Project: Amen #1 - Petro-Canada

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Sampled	Date Received
MW-2	X910027-01	Water	10/6/2009 8:00:00AM	10/06/2009 12:37
MW-3	X910027-02	Water	10/6/2009 8:35:00AM	10/06/2009 12:37
MW-5	X910027-03	Water	10/6/2009 11:20:00AM	10/06/2009 12:37
MW-6	X910027-04	Water	10/6/2009 11:25:00AM	10/06/2009 12:37
MW-7	X910027-05	Water	10/6/2009 11:30:00AM	10/06/2009 12:37

Origins Laboratory, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Noelle E Doyle, Laboratory Manager



Ron Greene
Project Number: [none]
Project: Amen #1 – Petro-Canada

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative						Matrix				Analysis	Sample Instructions	
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Sampling Container #	Other					
MW-2	Oct 6	8:00		<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>						1	
MW-3		8:35													2	
MW-5		11:20													3	
MW-8		11:35													4	
MW-7	7	11:30													5	
															6	
															7	
															8	
															9	
															10	
Relinquished by: <i>[Signature]</i>	Date: Oct 6 '09	Time: 13:37		Received By:						Date:				Time:	Turnaround Time: Some Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> Standard <input checked="" type="checkbox"/>	
Relinquished by: <i>[Signature]</i>	Date:	Time:		Received By: <i>[Signature]</i>						Date: 10-6-09				Time: 12:37		

4640 North Pecos Street | Unit C | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Naule G.

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Noelle E Doyle, Laboratory Manager

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Western Clean Up Corporation
P.O Box 1247
Fort Morgan CO 80701

Ron Greene
Project Number: [none]
Project: Amen #1 - Petro-Canada

MW-2

X910027-01 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	9J09002	10/09/2009	10/15/2009
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	95.2 %	85.7-134	"	"	"
Surrogate: Toluene-d8	100 %	81.4-121	"	"	"
Surrogate: 4-Bromofluorobenzene	106 %	74.7-127	"	"	"

Origins Laboratory, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Noelle E Doyle, Laboratory Manager

4640 Pecos Street | Unit C
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303.433.1322 | Laboratory
303.265.9645 | Fax



Western Clean Up Corporation

Ron Greene

P.O Box 1247

Project Number: [none]

Fort Morgan CO 80701

Project: Amen #1 - Petro-Canada

MW-3

X910027-02 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	9J09002	10/09/2009	10/15/2009
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	94.4 %	85.7-134	"	"	"
Surrogate: Toluene-d8	101 %	81.4-121	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	74.7-127	"	"	"

Origins Laboratory, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Noelle E Doyle, Laboratory Manager

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Western Clean Up Corporation
P.O Box 1247
Fort Morgan CO 80701

Ron Greene
Project Number: [none]
Project: Amen #1 - Petro-Canada

MW-5

X910027-03 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	9J09002	10/09/2009	10/15/2009
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	93.9 %	85.7-134	"	"	"
Surrogate: Toluene-d8	101 %	81.4-121	"	"	"
Surrogate: 4-Bromofluorobenzene	104 %	74.7-127	"	"	"

Origins Laboratory, Inc.

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Ron Greene
Project Number: [none]
Project: Amen #1 - Petro-Canada

MW-6
X910027-04 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	9J09002	10/09/2009	10/15/2009
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	93.3 %	85.7-134	"	"	"
Surrogate: Toluene-d8	100 %	81.4-121	"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	74.7-127	"	"	"

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Ron Greene

Project Number: [none]

Project: Amen #1 - Petro-Canada

MW-7

X910027-05 (Water)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

Origins Laboratory, Inc.

BTEX by EPA 8260B

Benzene	ND	1.00	ug/L	1	9J09002	10/09/2009	10/15/2009
Toluene	ND	1.00	"	"	"	"	"
Ethylbenzene	ND	1.00	"	"	"	"	"
o-Xylene	ND	1.00	"	"	"	"	"
m,p-Xylene	ND	2.00	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	92.9 %	85.7-134	"	"	"
Surrogate: Toluene-d8	99.1 %	81.4-121	"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	74.7-127	"	"	"

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Ron Greene
Project Number: [none]
Project: Amen #1 - Petro-Canada

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9J09002 - EPA 5030B

Blank (9J09002-BLK1)

Prepared: 10/09/2009 Analyzed: 10/09/2009

Benzene	ND	1.00	ug/L							
Toluene	ND	1.00	"							
Ethylbenzene	ND	1.00	"							
o-Xylene	ND	1.00	"							
m,p-Xylene	ND	2.00	"							
Surrogate: 1,2-Dichloroethane-d4	75.6		"	62.5		121	85.7-134			
Surrogate: Toluene-d8	64.5		"	62.5		103	81.4-121			
Surrogate: 4-Bromofluorobenzene	79.5		"	62.5		127	74.7-127			

Blank (9J09002-BLK2)

Prepared: 10/09/2009 Analyzed: 10/09/2009

Benzene	ND	1.00	ug/L							
Toluene	ND	1.00	"							
Ethylbenzene	ND	1.00	"							
o-Xylene	ND	1.00	"							
m,p-Xylene	ND	2.00	"							
Surrogate: 1,2-Dichloroethane-d4	71.7		"	62.5		115	85.7-134			
Surrogate: Toluene-d8	64.5		"	62.5		103	81.4-121			
Surrogate: 4-Bromofluorobenzene	74.3		"	62.5		119	74.7-127			

LCS (9J09002-BS1)

Prepared: 10/09/2009 Analyzed: 10/09/2009

Benzene	52.6	1.00	ug/L	50.0		105	74.9-126			
Toluene	57.3	1.00	"	50.0		115	73.3-128			
Surrogate: 1,2-Dichloroethane-d4	74.2		"	62.5		119	85.7-134			
Surrogate: Toluene-d8	60.6		"	62.5		97.0	81.4-121			
Surrogate: 4-Bromofluorobenzene	78.1		"	62.5		125	74.7-127			

LCS (9J09002-BS2)

Prepared: 10/09/2009 Analyzed: 10/09/2009

Benzene	54.5	1.00	ug/L	50.0		109	74.9-126			
Toluene	61.1	1.00	"	50.0		122	73.3-128			

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 Project: Amen #1 - Petro-Canada

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9J09002 - EPA 5030B										
LCS (9J09002-BS2)					Prepared: 10/09/2009 Analyzed: 10/09/2009					
Surrogate: 1,2-Dichloroethane-d4	74.0		ug/L	62.5		118	85.7-134			
Surrogate: Toluene-d8	60.5		"	62.5		96.8	81.4-121			
Surrogate: 4-Bromofluorobenzene	80.3		"	62.5		129	74.7-127			S-GC
Matrix Spike (9J09002-MS1)					Source: X910027-01 Prepared: 10/09/2009 Analyzed: 10/09/2009					
Benzene	47.2	1.00	ug/L	50.0	ND	94.3	78.1-132			
Toluene	57.4	1.00	"	50.0	ND	115	71.7-124			
Surrogate: 1,2-Dichloroethane-d4	71.0		"	62.5		114	85.7-134			
Surrogate: Toluene-d8	61.1		"	62.5		97.7	81.4-121			
Surrogate: 4-Bromofluorobenzene	80.9		"	62.5		129	74.7-127			S-GC
Matrix Spike (9J09002-MS2)					Source: X910027-02 Prepared: 10/09/2009 Analyzed: 10/09/2009					
Benzene	51.5	1.00	ug/L	50.0	ND	103	78.1-132			
Toluene	57.2	1.00	"	50.0	ND	114	71.7-124			
Surrogate: 1,2-Dichloroethane-d4	70.5		"	62.5		113	85.7-134			
Surrogate: Toluene-d8	61.3		"	62.5		98.1	81.4-121			
Surrogate: 4-Bromofluorobenzene	81.6		"	62.5		131	74.7-127			S-GC
Matrix Spike Dup (9J09002-MSD1)					Source: X910027-01 Prepared: 10/09/2009 Analyzed: 10/09/2009					
Benzene	48.5	1.00	ug/L	50.0	ND	97.0	78.1-132	2.80	24.8	
Toluene	56.4	1.00	"	50.0	ND	113	71.7-124	1.78	25	
Surrogate: 1,2-Dichloroethane-d4	73.6		"	62.5		118	85.7-134			
Surrogate: Toluene-d8	62.2		"	62.5		99.6	81.4-121			
Surrogate: 4-Bromofluorobenzene	79.9		"	62.5		128	74.7-127			S-GC
Matrix Spike Dup (9J09002-MSD2)					Source: X910027-02 Prepared: 10/09/2009 Analyzed: 10/09/2009					
Benzene	48.1	1.00	ug/L	50.0	ND	96.3	78.1-132	6.71	24.8	
Toluene	54.8	1.00	"	50.0	ND	110	71.7-124	4.18	25	
Surrogate: 1,2-Dichloroethane-d4	73.1		"	62.5		117	85.7-134			

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Volatile Organic Compounds by EPA Method 8260B - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9J09002 - EPA 5030B

Matrix Spike Dup (9J09002-MSD2)

Source: X910027-02

Prepared: 10/09/2009 Analyzed: 10/09/2009

Surrogate: Toluene-d8	62.5		ug/L	62.5	100		81.4-121			
Surrogate: 4-Bromofluorobenzene	81.0		"	62.5	130		74.7-127			S-GC

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Notes and Definitions

S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

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