



Suncor Energy Products Partnership  
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September 5, 2013

Ms. Sharilyn Johnston  
Environmental Officer  
Aamjiwnaang First Nation  
978 Tashmoo Avenue  
Sarnia, ON N7T 7H5

Dear Ms. Johnston,

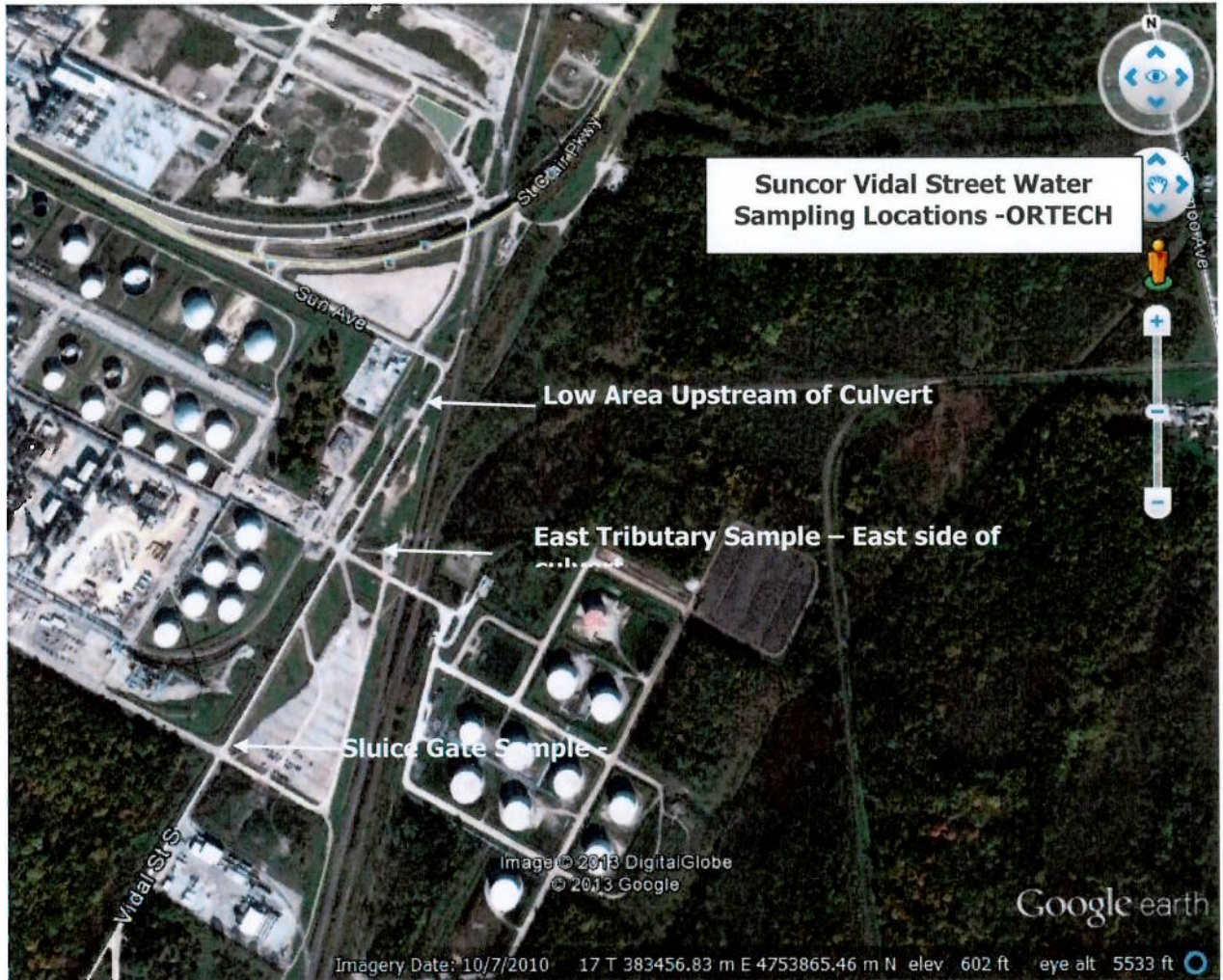
The intent of this letter is to provide an update to yourself, Chief Plain and the Aamjiwnaang Council regarding progress with respect to the ongoing efforts to address the benzene contamination located in the pipeline trench passing under Vidal Street.

At present there has been no change to the technique for recovering benzene, though investigation activities are underway to evaluate next steps. Currently two recovery wells, which are pumped on a weekly basis, continue to be the method of extraction utilized.

#### **Monitoring Update**

No rain event as per the "MISA Protocol for Conducting a Storm Water Control Study" has occurred since the July 31<sup>st</sup> – August 1<sup>st</sup> rain event therefore no additional stormwater sample data is available at this time.

ORTECH Environmental initiated weekly grab sampling activities on August 15, 2013 at three locations outside of the identified impacted area. (Please see "Suncor Vidal Street Water Grab Sampling Locations" map provided below). Sampling activities conducted on August 15<sup>th</sup>, 22<sup>nd</sup> and 29<sup>th</sup>, 2013 respectively resulted in non-detect readings at all three locations.



The 2 existing extraction wells have been pumped since August 2006 and have recovered 227,911L of ground water and 64.5 L of benzene. The graph below shows the concentrations of benzene measured. The data in the graph is measured in parts per billion, so 1% would be 10,000,000 on the scale.

In addition to sampling activities described above, Pollutech Enviroquatics conducted sampling activities for 8 existing groundwater wells installed during the 2006 investigation activities. Please see attached document "Suncor Energy Approximate Well Locations.pdf". Benzene was detected in 3 of the 8 groundwater wells with concentration values provided below;

- MW17 = 5000 ppb
- MW19 = 887 ppb
- MW 21 = 24900 ppb

## Phase 2 – Culvert Bypass Execution Update

In order to facilitate long-term management of surface water in the identified area Suncor Energy is currently installing approximately 1000 feet of large HDPE pipe in the west Vidal Street ditch between the clay berms to allow clean water to bypass the contaminated area via gravity flow. A diesel pump and associated hosing will remain in place to ensure that the bermed area level is maintained.

Suncor operations personnel will monitor the water level in the Vidal Street Ditch and initiate pumping activities to maintain the water level. Please note that during abnormal rain events, vacuum truck and additional pumps will be utilized to maintain water levels within the ditch and isolation controls implemented. Water within the bermed area will be returned the Suncor Energy Sarnia Refinery for processing through the waste water treatment via existing sumps and sewers.

On August 23, 2013 a partially collapsed culvert located in the west Vidal Street ditch was removed, with replacement activities completed by August 27, 2013. Additionally, the required sections of HDPE pipe were delivered August 20, 2013 and welding activities initiated on August 21<sup>st</sup> – which are now complete.

Grading activities within the west Vidal Street ditch, which are required to facilitate the installation of the HDPE pipe bypass, were completed on August 29th, 2013 and were followed by the initiation of pipe installation activities.

Installation activities are expected to take approximately 4 days to completed, depending on weather conditions, with forecast completion date of September 6, 2013.

The removal of a culvert north of the impacted area which is inhibiting flow from the north is expected to occur the week of September 9, 2013.

Suncor Energy has issued a request to identified third party expertise to provide consultation, with response expected by September 16, 2013.

The existing extraction wells have been pumped since August 2006 and have recovered 227,911L of ground water and 64.5 L of benzene. The graph below shows the concentrations of benzene measured. The data in the graph is measured in parts per billion, so 1% would be 10,000,000 on the scale.

Suncor is fully committed to the remediation of the benzene contamination. Suncor will continue with the Aamjiwnaang First Nation and Ministry of the Environment (MOE) on this matter and will continue to forward you recovery data on a monthly basis. Attached, please find a complete set of recovery data to date.

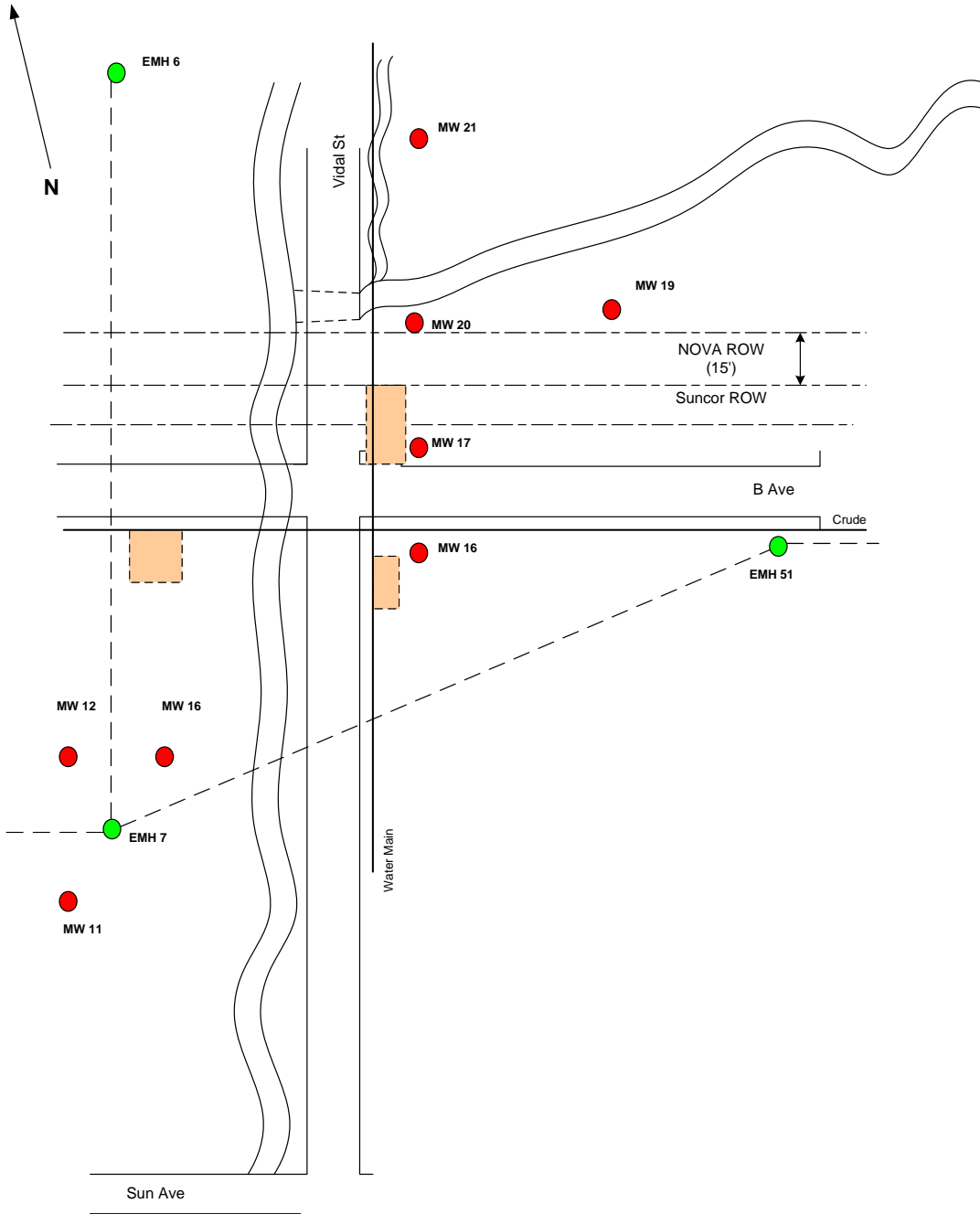
Sincerely,



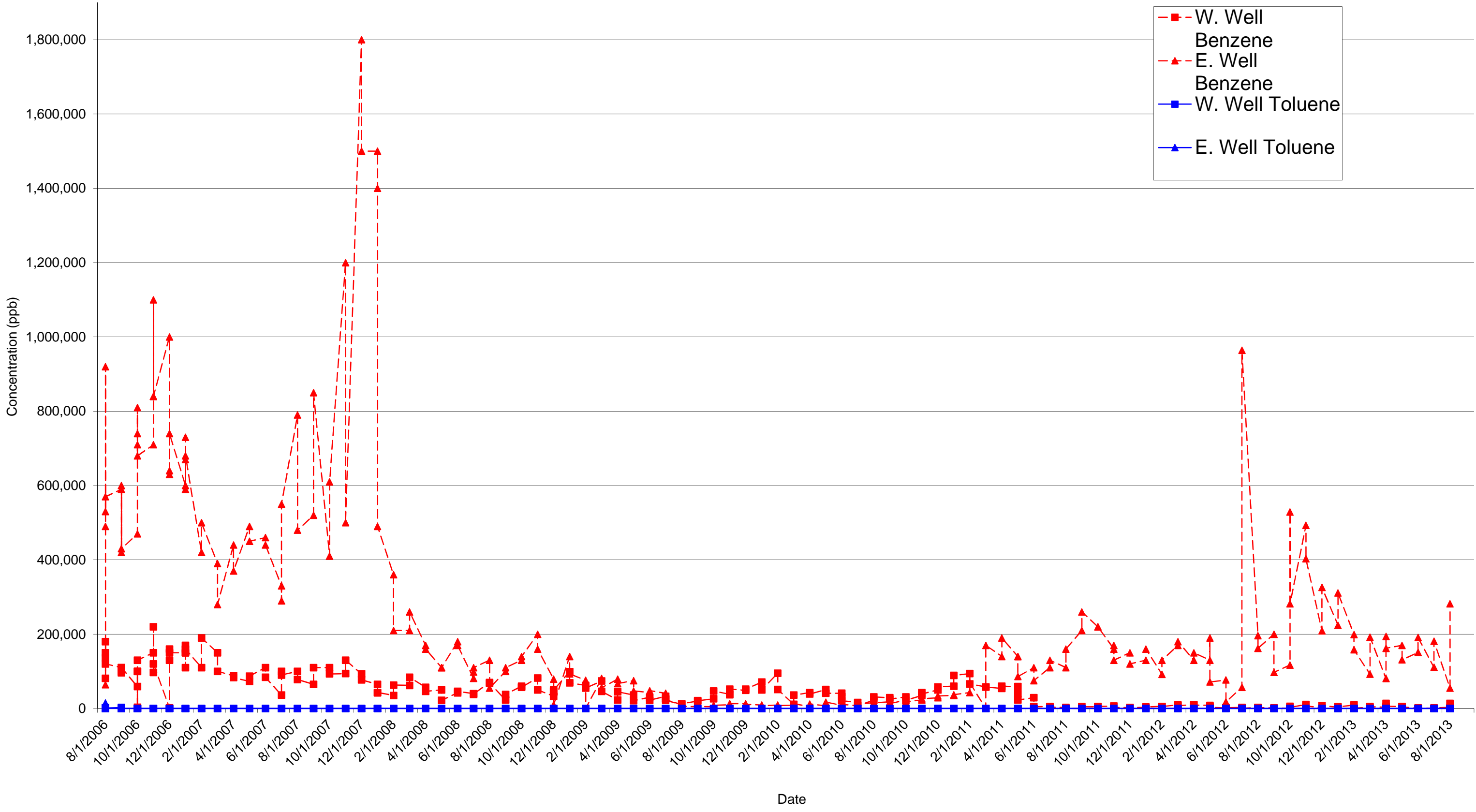
Lisa Nauta

Suncor Energy - Sarnia Refinery

cc. Ms. Mary Jane Corda, Ontario Ministry of the Environment, Supervisor



# Extraction Well Trending











**Suncor Extraction Well Results**

Date	MDL	4/21/2009	5/5/2009	5/19/2009	6/2/2009	6/18/2009	7/6/2009	7/15/2009	7/28/2009	8/11/2009	8/25/2009	9/9/2009	9/21/2009	10/5/2009	10/19/2009	11/3/2009	11/17/2009	11/30/2009	12/14/2009	12/30/2009	1/12/2010	1/26/2010	2/9/2010	2/23/2010	3/9/2010	3/24/2010	4/6/2010	4/20/2010	5/4/2010
<b>West Well</b>																													
Benzene (ppb)	0.15	45,000	36,000	21,000	30,000	22,000	33,000	< 27,000	24,000	10,000	13,000	20,000	21,000	26,000	47,000	38,000	37,000	52,000	49,000	52,000	71,000	50,000	95,000	51,000	11,000	36,000	43,000	39,000	51,000
Toluene (ppb)	0.08	0	0	0	0	0	<	<	85	<	<	<	<	3.2	4	4.3	5.5	6.1	8.6	10	6.9	15	8.1	140	5.4	5.1	4.1	3.9	
Volume Removed (L)		190	180	270	180	640	170	250	200	320	250	220	280	430	180	290	320	210	230	310	150	360	360	160	140	170	140	210	150
Level (inches)							54	57	51	42.5	54	51.5	50	53.5	52	56.5	53.5	49.5	51.5	55	47.5	55	52	46.5	50	50	47	44.5	
Level (m)		1.17	1.28	1.3	1.37	1.38	1.37	1.45	1.30	1.08	0.00	1.37	1.31	1.27	1.36	1.32	1.44	1.36	1.26	1.31	1.4	1.21	1.40	1.32	1.18	1.27	1.27	1.19	1.13
<b>East Well</b>																													
Benzene (ppb)	0.15	67,000	75,000	47,000	43,000	48,000	41,000	28,000	22,000	10,000	5,600	5,000	4,950	4,900	8,700	9,900	13,000	13,000	13,000	11,000	9,300	6,700	9,300	7,800	8,700	13,000	5,100	12,000	7,000
Toluene (ppb)	0.08	0	100	54	0	0	180	<	67	39	55	35	15	31	17	20	13	14	9.5	7	8	7.8	11	16	6.9	3.6	4.5	4.9	
Volume Removed (L)		230	610	810	550	880	370	910	640	1,450	1,240	710	1,010	570	550	1,110	830	760	550	650	780	480	400	970	560	1,160	800	1,210	1,000
Level (inches)							23.5	28	21	13	24	21.5	20	24	23	27.5	23.5	23	22.5	26	17.5	25.75	21.5	17.5	21.5	19.5	19	15	
Level (m)		0.48	0.56	0.5842	0.66	0.62	0.60	0.71	0.53	0.33	0.00	0.61	0.55	0.51	0.61	0.58	0.70	0.60	0.58	0.57	0.66	0.44	0.65	0.55	0.44	0.55	0.50	0.48	0.38
<b>Total to Date</b>																													
<b>Water Removal (L)</b>	<b>227,911</b>	420	790	1,080	730	1,520	540	1,160	840	1,770	1,490	930	1,290	1,000	730	1,400	1,150	970	780	960	930	840	760	1,130	700	1,330	940	1,420	1,150
<b>Benzene Removal (g)</b>	<b>56,558</b>	24	52	44	29	56	21	32	19	18	10	8	11	14	13	22	23	21	18	23	18	21	38	16	6	21	10	23	15
<b>Benzene Removal (L)</b>	<b>64.5</b>	<b>0.03</b>	<b>0.06</b>	<b>0.05</b>	<b>0.03</b>	<b>0.06</b>	<b>0.02</b>	<b>0.04</b>	<b>0.02</b>	<b>0.02</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.02</b>	<b>0.02</b>	<b>0.03</b>	<b>0.03</b>	<b>0.02</b>	<b>0.02</b>	<b>0.03</b>	<b>0.02</b>	<b>0.02</b>	<b>0.04</b>	<b>0.02</b>	<b>0.01</b>	<b>0.02</b>	<b>0.01</b>	<b>0.03</b>	<b>0.02</b>

Note: the West and East Well Volume Removed values for February and March 2010 have been updated to indicate the total volumes removed during each month.

\* All concentrations reported are Benzene.  
 \*\* All water levels are taken from top of extraction well.  
 \*\*\* 0 indicates less than MDL - Therefore not detected

**Assumptions for benzene volume calculations:**

Benzene density is 0.8765 grams per cubic centimetre

Benzene concentration in water pumped on a given day is constant and equal to the concentration of the sample concentration collected that day

**Suncor Extraction Well Results**

Date	MDL	5/17/2010	6/1/2010	6/14/2010	6/28/2010	7/13/2010	7/27/2010	8/10/2010	8/24/2010	9/8/2010	9/21/2010	10/5/2010	10/19/2010	11/2/2010	11/16/2010	11/30/2010	12/15/2010	12/30/2010	1/11/2011	1/25/2011	2/9/2011	2/24/2011	3/8/2011	3/22/2011	4/4/2011	4/19/2011	5/2/2011	5/17/2011	5/31/2011	6/13/2011	6/28/2011
<b>West Well</b>																															
Benzene (ppb)	0.15	41,000	41000	32000	21000	16000	7800	22000	31000	29000	25000	31000	22000	35000	43000	39000	50000	58000	60000	89000	94000	66000	58000	58000	54000	60000	59000	40000	23000	29000	4700
Toluene (ppb)	0.08	3.8	2.8	2.6	2.7	2	1.4	2.5	2.6	2.2	2.4	4.5	1.8	3.3	3.6	3.9	4.7	4.6	5.4	7.8	9.2	6.2	7.4	7	6.6	4.8	4.5	3.2	2.4	2	1.1
Volume Removed (L)		200	260	350	150	180	270	140	180	220	250	360	190	250	200	460	170	200	250	440	180	250	250	250	190	370	300	310	530	180	270
Level (inches)		41	46	42	52	46.5	51	59.5	63	59.5	53	44.5	49.5	56.5	50	41	50	50.5	50.5	50	48.5	43	40.5	39	41.5	41	43	37	39	48	38
Level (m)		1.04	1.17	1.07	1.32	1.18	1.30	1.51	1.60	1.51	1.35	1.13	1.26	1.44	1.27	1.04	1.27	1.28	1.28	1.27	1.23	1.09	1.03	0.99	1.05	1.04	1.09	0.94	0.99	1.22	0.97
<b>East Well</b>																															
Benzene (ppb)	0.15	17,000	8400	7600	11000	7800	11000	16000	15000	18000	13000	23000	18000	23000	26000	26000	29000	34000	35000	37000	43000	69000	well frozen	170000	140000	190000	140000	140000	86000	110000	75000
Toluene (ppb)	0.08	8.6	5.5	6.2	6	5.6	7.3	7.8	7.8	8.5	8.5	12	7	8.7	9.3	8.4	8.3	7.7	8.7	8.3	12	19	well frozen	53	48	57	46	51	41	45	26
Volume Removed (L)		760	560	420	460	420	680	500	450	490	350	340	360	520	480	400	290	390	380	330	390	420	180	430	200	500	300	270	120	370	370
Level (inches)		15	15.5	13	22.5	16.5	22.5	31.5	28.5	31.5	25	16	21	26.5	22	14.5	24	25	24	25.5	23	18.5	well frozen	16	18	18	21.5	15.5	19	29.5	20
Level (m)		0.38	0.39	0.33	0.57	0.42	0.57	0.80	0.72	0.80	0.64	0.41	0.53	0.67	0.56	0.37	0.61	0.64	0.61	0.65	0.58	0.47	NA	0.41	0.46	0.46	0.55	0.39	0.48	0.75	0.51
<b>Total to Date</b>																															
Water Removal (L)	227,911	960	820	770	610	600	950	640	630	710	600	700	550	770	680	860	460	590	630	770	570	670	430	680	390	870	600	580	650	550	640
Benzene Removal (g)	56,558	21	15	14	8	6	10	11	12	15	11	19	11	21	21	28	17	25	28	51	34	45	15	88	38	117	60	50	23	46	29
Benzene Removal (L)	64.5	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.02	0.02	0.03	0.02	0.03	0.03	0.06	0.04	0.05	0.02	0.10	0.04	0.13	0.07	0.06	0.03	0.05	0.03

Note: the Benzene and Toluene concentrations noted for the two week period of June 14, 2010 are from samples collected on June 8, 2010.

\* All concentrations reported are Benzene.  
 \*\* All water levels are taken from top of extraction well.  
 \*\*\* 0 indicates less than MDL - Therefore not detected

**Assumptions for benzene volume calculations:**  
 Benzene density is 0.8765 grams per cubic centimetre

Benzene concentration in water pumped on a given day is constant and equal to the concentration of the sample concentration collected that day

**Suncor Extraction Well Results**

Date	MDL	7/12/2011	7/26/2011	8/9/2011	8/23/2011	9/7/2011	9/20/2011	10/4/2011	10/18/2011	11/1/2011	11/15/2011	11/29/2011	12/13/2011	12/28/2011	1/10/2012	1/24/2012	2/7/2012	2/22/2012	3/6/2012	3/20/2012	4/3/2012	4/17/2012	5/1/2012	5/15/2012	5/28/2012	6/11/2012	6/25/2012	7/10/2012	7/24/2012	8/8/2012	8/21/2012
<b>West Well</b>																															
Benzene (ppb)	0.15	5400	4000	2700	0.1	0.1	4800	4600	5400	6500	3600	3200	2400	2400	3000	4200	5400	5300	9600	7500	10000	9400	8300	4800	2840	1910	2110	2900	714	2660	2480
Toluene (ppb)	0.08	1.2	1.1	1	0.1	0.1	1.3	1	1	1.4	1	1	1.1	1.2	1.2	1.2	1.6	1.7	2.2	2	2	1.6	1.1	1.3	<dl	<dl	<dl	<dl	<dl	<dl	<dl
Volume Removed (L)		190	270	240	250	170	350	330	340	190	350	420	380	230	250	190	180	520	210	340	200	180	250	230	190	210	210	140	170	350	310
Level (inches)		47.5	48	41.5	45	50.5	45.5	45	49.5	44	45.5	31	42.5	42	44	39.5	43.5	41	42	42.5	47	47.5	46	43	46.06	46.46	47.64	51.57	49.21	44.09	41.73
Level (m)		1.21	1.22	1.05	1.14	1.28	1.16	1.14	1.26	1.12	1.16	0.79	1.08	1.07	1.12	1.00	1.10	1.04	1.07	1.08	1.19	1.21	1.17	1.09	1.17	1.18	1.21	1.31	1.25	1.12	1.06
<b>East Well</b>																															
Benzene (ppb)	0.15	110000	130000	110000	160000	210000	260000	220000	220000	160000	170000	130000	150000	120000	130000	160000	92000	130000	170000	180000	130000	150000	130000	190000	71400	76800	17700	57100	964000	196000	162000
Toluene (ppb)	0.08	35	30	30	48	60	57	60	61	57	53	40	50	43	43	49	35	44	49	52	53	58	52	48	5.3	175	60.4	<dl	58.2	<dl	<dl
Volume Removed (L)		360	240	280	460	380	280	360	390	390	260	340	390	440	340	400	240	460	500	470	420	380	360	440	370	300	370	290	350	320	250
Level (inches)		31	31	23	27	34.5	28	26.5	29.5	27	25	15	26	20	23.5	19	22.5	17	20	24	26.5	32	29.75	29	33.46	36.22	38.58	44.09	35.43	31.49	29.92
Level (m)		0.79	0.79	0.58	0.69	0.88	0.71	0.67	0.75	0.69	0.64	0.38	0.66	0.51	0.60	0.48	0.57	0.43	0.51	0.61	0.67	0.81	0.76	0.74	0.85	0.92	0.98	1.12	0.90	0.80	0.76
<b>Total to Date</b>																															
Water Removal (L)	227,911	550	510	520	710	550	630	690	730	580	610	760	770	670	590	590	420	980	710	810	620	560	610	670	560	510	580	430	520	670	560
Benzene Removal (g)	56,558	41	32	31	74	80	74	81	88	64	45	46	59	53	45	65	23	63	87	87	57	59	49	85	27	23	7	17	338	64	41
Benzene Removal (L)	64.5	0.05	0.04	0.04	0.08	0.09	0.08	0.09	0.10	0.07	0.05	0.05	0.07	0.06	0.05	0.07	0.03	0.07	0.10	0.10	0.06	0.07	0.06	0.10	0.03	0.03	0.01	0.02	0.39	0.07	0.05

\* All concentrations reported are Benzene.  
 \*\* All water levels are taken from top of extraction well.  
 \*\*\* 0 indicates less than MDL - Therefore not detected

**Assumptions for benzene volume calculations:**

Benzene density is 0.8765 grams per cubic centimetre

Benzene concentration in water pumped on a given day is constant and equal to the concentration of the sample concentration collected that day

**Suncor Extraction Well Results**

Date	MDL	9/5/2012	9/18/2012	10/2/2012	10/16/2012	10/31/2012	11/13/2012	11/27/2012	12/11/2012	12/27/2012	1/8/2013	1/22/2013	2/4/2013	2/19/2013	3/5/2013	3/19/2013	4/1/2013	4/15/2013	4/29/2013	5/13/2013	5/27/2013	6/10/2013	6/24/2013	7/8/2013	7/22/2013	8/6/2013	8/19/2013	
<b>West Well</b>																												
Benzene (ppb)	0.15	1440	764	686	5840	3180	10700	6390	2550	7600	3390	4400	9340	1020	3380	5120	3070	13800	5850	5300	4480	462	1780	0.5	1610	2850	13600	
Toluene (ppb)	0.08	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	
Volume Removed (L)		0	180	330	150	240	80	230	220	230	250	150	300	260	250	310	400	190	220	290	330	130	220	420	120	180	330	
Level (inches)		40.8	44.08	52.35	45.66	30.7	43.3	46.44	40.93	41.33	40.54	45.26	44.87	41.33	40.54	41.72	46.44	44.08	37.79	45.66	46.44	34.24	42.9	33.46	46.44	53.53	55.89	
Level (m)		1.04	1.12	1.33	1.16	0.78	1.10	1.18	1.04	1.05	1.03	1.15	1.14	1.05	1.03	1.06	1.18	1.12	0.96	1.16	1.18	0.87	1.09	0.85	1.18	1.36	1.42	
<b>East Well</b>																												
Benzene (ppb)	0.15	200000	97300	117000	529000	282000	493000	403000	209000	326000	224000	311000	199000	158000	92200	192000	80700	194000	162000	170000	131000	151000	191000	111000	181000	54800	282000	
Toluene (ppb)	0.08	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	<dl	
Volume Removed (L)		550	420	520	190	410	380	430	390	370	380	440	520	450	380	330	290	430	420	320	410	480	410	690	400	360	160	
Level (inches)		32.4	32.67	42.51	40.15	20.86	105.88	29.91	22.04	26.37	23.22	34.64	30.31	78.33	18.89	20.86	29.72	20.07	19.29	31.49	36.21	22.14	38.57	21.65	43.3	44.48	46.05	
Level (m)		0.82	0.83	1.08	1.02	0.53	2.69	0.76	0.56	0.67	0.59	0.88	0.77	1.99	0.48	0.53	0.75	0.51	0.49	0.80	0.92	0.56	0.98	0.55	1.10	1.13	1.17	
<b>Total to Date</b>																												
<b>Water Removal (L)</b>	<b>227,911</b>	550	600	850	340	650	460	660	610	600	630	590	820	710	630	640	690	620	640	610	740	610	630	1,110	520	540	490	
<b>Benzene Removal (g)</b>	<b>56,558</b>	110	41	61	101	116	188	175	82	122	86	138	106	71	36	65	25	86	69	56	55	73	79	77	73	20	50	
<b>Benzene Removal (L)</b>	<b>64.5</b>	0.13	0.05	0.07	0.12	0.13	0.21	0.20	0.09	0.14	0.10	0.16	0.12	0.08	0.04	0.07	0.03	0.10	0.08	0.06	0.06	0.08	0.09	0.09	0.08	0.02	0.06	

\* All concentrations reported are Benzene.  
 \*\* All water levels are taken from top of extraction well.  
 \*\*\* 0 indicates less than MDL - Therefore not detected

**Assumptions for benzene volume calculations:**

Benzene density is 0.8765 grams per cubic centimetre

Benzene concentration in water pumped on a given day is constant and equal to the concentration of the sample concentration collected that day