



Infrastructure, environment, facilities

Mr. Allan Brouillet
Environmental Response Division
Michigan Department of Environmental Quality
Saginaw Bay District
503 North Euclid Street
Bay City, MI 48706

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.446.8053
www.arcadis-us.com

Subject:

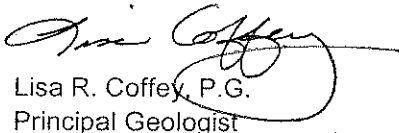
Monthly Report #168 – November 2008
GM SMI Plant Property, REALM Inc. Green Point Landfill and
Drum Remediation Area RI/FS/RAP, and Green Point Landfill Closure

Dear Mr. Brouillet:

On behalf of the General Motors Corporation (GM) and Waste Management, Inc. (WMI), the November 2008 monthly report for the GM SMI Plant Property and the Remediation and Liability Management Company Inc. (REALM) Green Point Landfill Property is attached. Please contact me if you have any questions regarding the enclosed information.

Sincerely,

ARCADIS


Lisa R. Coffey, P.G.
Principal Geologist

LRC/plf
Attachments

Copies:

Ms. Susan Kaelber-Matlock, MDEQ, ERD
John Fordell Leone, Esq., Department of Attorney General
Ms. Cheryl Hiatt/Mr. Edward Peterson, GM WFG
Anthony Thrubis, Esq., GM Legal
Mr. Kent Bainbridge, Waste Management, Inc.
Mr. Jim Forney, Waste Management, Inc.
Ms. Jo Ann Robertson, ARCADIS
Ms. Micki Maki, ARCADIS

Date:

December 12, 2008

Contact:

Lisa R. Coffey, P.G.

Phone:

315.671.9164

Email:

lisa.coffey@arcadis-us.com

Our ref:

B0027608 #2.08

Imagine the result

Significant RI/FS/RAP and Interim Measure Activities and Events

- The light non-aqueous phase liquid (LNAPL) recovery system located south of the main plant building is not currently operating due to plant decommissioning activities. The recovery wells and the monitoring wells were gauged on November 20, 2008. Small accumulations of LNAPL were recorded (Table 1). The wells in this area will continue to be monitored and bailed, when possible, until power can be restored to the recovery system (once the building is down).
- The Quench Pit Area was not accessible during the month of November 2008. As allowed by plant decommissioning activities, the wells in this area will be manually bailed until power is restored to the automated recovery system.
- A groundwater sample from monitoring well MW-186WT, located in the Saginaw River berm area, was collected for PCB analysis on October 10, 2008. The final validated data show that PCBs were not detected in the primary or duplicate sample. The data validation report and the soil boring/well installation log for MW-186WT are attached.
- The semi-annual groundwater monitoring event for the former underground storage tank (UST) 7 area was completed on November 7, 2008.
- 21 monitoring wells located near the SMI Plant that are not included in the long term monitoring program were abandoned during the week of November 17th, 2008. MDEQ Well abandonment logs are attached.

Significant Green Point Landfill Closure Activities and Events

- A Green Point Landfill Cap inspection was completed on November 7, 2008 (attached). Several holes in the fence were noted during the inspection and repairs are being planned.

Key Correspondence and Communications

- The October 2008 monthly report, dated November 11, 2008, was submitted to the MDEQ.
- On November 21, 2008, Susan Kaelber-Matlock (MDEQ) sent an electronic mail to Cheryl Hiatt (GM), with preliminary comments on the Site Remedial Action Plan.

Anticipated Activities for December 2008

- Continuation of LNAPL recovery activities using manual means, until a power supply to the automated recovery systems can be established given planned decommissioning and demolition activities.

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Monthly Report #168

**General Motors Corporation Saginaw Malleable Iron Plant Property and
REALM Inc. Green Point Landfill and Drum Remediation Area
November 2008**

- Submittal of a monthly report.
- Submittal of groundwater sampling data for the former UST 7 area for samples that were collected in November 2008.
- Submittal of revised sections of the Remedial Action Plan, prepared in response to preliminary comments provided by the MDEQ. The intent is to provide resolution of as many comments as possible prior to submittal by the MDEQ of an *approval with modifications* letter.

Table 1. Groundwater and LNAPL Measurement Summary, March 2004 Through the Present, GM Saginaw Malleable Iron Plant, Saginaw, Michigan

Date	MW-147WT reference elevation = 592.07				MW-157WT reference elevation = 591.72				MW-158WT reference elevation = 591.78			
	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)
March 8, 2004	NA	NA	NA	NA	--	--	--	--	8.41	0.01	8.42	NA
April 29, 2004	6.36	1.64	8.00	585.58	--	--	--	--	NA	NA	NA	NA
June 1, 2004	5.20	1.25	6.45	586.77	--	--	--	--	NA	NA	NA	NA
June 30, 2004	6.05	1.26	7.31	585.92	--	--	--	--	7.90	0.01	7.91	583.88
July 28, 2004	NA	NA	NA	NA	--	--	--	--	8.21	0.01	8.22	583.57
August 17, 2004	6.76	1.34	8.10	585.20	--	--	--	--	NP	0.00	8.39	583.39
September 27, 2004	6.91	1.61	8.52	585.03	--	--	--	--	8.41	0.01	8.42	583.37
October 29, 2004	7.04	1.78	8.82	584.89	--	--	--	--	8.56	0.01	8.57	583.22
November 30, 2004	6.35	1.72	8.07	585.58	--	--	--	--	8.35	0.01	8.36	583.43
December 27, 2004	NA	NA	NA	NA	--	--	--	--	NA	NA	NA	NA
January 26, 2005	6.28	2.03	8.31	585.63	--	--	--	--	NP	0.00	7.98	583.80
February 7, 2005	6.57	1.96	8.53	585.34	--	--	--	--	8.07	0.02	8.09	583.71
March 17, 2005	6.55	2.04	8.59	585.36	7.27	0.66	7.93	584.40	NP	0.00	8.24	583.64
April 13, 2005	6.44	1.74	8.18	585.49	7.18	0.18	7.36	584.53	NP	0.00	8.23	583.55
May 31, 2005	6.53	1.76	8.29	585.40	7.23	0.25	7.48	584.47	NP	0.00	8.14	583.64
June 28, 2005	5.83	1.73	7.56	586.10	6.23	0.21	6.44	585.47	NP	0.00	7.72	584.06
July 29, 2005	5.59	1.58	7.17	586.35	6.21	0.70	6.91	585.45	NP	0.00	7.69	584.09
August 18, 2005	6.19	1.75	7.94	585.74	6.96	0.23	7.19	584.74	NP	0.00	7.96	583.80
September 28, 2005	6.49	1.59	8.08	585.45	7.37	0.04	7.41	584.35	8.33	0.01	8.34	583.45
October 18, 2005	6.85	1.93	8.78	585.07	7.68	0.38	8.06	584.01	NP	0.00	8.56	583.22
November 30, 2005	6.33	1.76	8.09	585.60	7.09	0.03	7.12	584.63	NP	0.00	8.31	583.47
December 26, 2005	6.15	1.96	8.11	585.76	6.89	0.19	7.08	584.81	NP	0.00	8.14	583.64
January 31, 2006	5.21	1.91	7.12	586.71	5.74	0.51	6.25	585.94	NP	0.00	7.53	584.25
February 24, 2006	6.38	1.86	8.24	585.54	6.87	0.27	7.14	584.83	NP	0.00	7.98	583.80
March 22, 2006	5.70	1.63	7.33	586.24	5.68	0.13	5.81	586.03	NP	0.00	7.71	584.07
April 27, 2006	6.23	1.69	7.92	585.70	7.17	0.03	7.20	584.55	8.14	0.01	8.15	583.64
May 25, 2006	NA	NA	NA	NA	6.37	0.14	6.51	585.34	NP	0.00	7.95	583.83
June 27, 2006	6.32	1.70	8.02	585.61	7.20	0.04	7.24	584.52	NP	0.00	8.17	583.61
July 11, 2006	5.99	1.67	7.66	585.95	6.96	0.11	7.07	584.75	NP	0.00	8.03	583.75
August 23, 2006	6.24	1.65	7.89	585.70	7.20	0.01	7.21	584.52	NP	0.00	8.08	583.70
September 26, 2006	5.67	1.64	7.31	586.27	6.69	0.11	6.80	585.02	NP	0.00	7.90	583.88
October 30, 2006	5.36	1.65	7.01	586.58	5.71	0.22	5.93	585.99	7.49	0.02	7.51	584.29
November 27, 2006	6.00	1.66	7.66	585.94	6.89	0.12	7.01	584.82	7.92	0.01	7.93	583.86
December 27, 2006	6.12	1.65	7.77	585.82	7.00	0.02	7.02	584.72	NP	0.00	7.94	583.84
January 25, 2007	NA	NA	NA	NA	7.42	0.04	7.46	584.30	NA	NA	NA	NA
March 6, 2007	7.08	1.60	8.68	584.86	NP	0.00	7.72	584.00	NA	NA	NA	NA
March 23, 2007	6.16	1.64	7.82	585.76	7.23	0.02	7.25	584.49	NP	0.00	8.09	583.69
April 30, 2007	6.13	1.47	7.60	585.82	7.10	0.05	7.15	584.82	8.05	0.01	8.06	583.73
May 17, 2007	6.19	1.57	7.76	585.75	7.16	0.04	7.20	584.56	NA	NA	NA	NA
June 12, 2007	6.30	1.58	7.88	585.64	7.20	0.02	7.22	584.52	NP	0.00	8.11	583.67
July 18, 2007	6.42	1.62	8.04	585.52	7.19	0.02	7.21	584.53	NP	0.00	8.16	583.62
August 28, 2007	5.93	1.51	7.44	586.02	6.71	0.02	6.73	585.01	NP	0.00	7.97	583.81
September 19, 2007	5.59	1.53	7.12	586.36	6.03	0.12	6.15	585.68	NP	0.00	7.51	584.27
October 25, 2007	6.53	1.72	8.25	585.40	7.46	0.08	7.54	584.25	NP	0.00	8.31	583.47
November 27, 2007	6.47	1.58	8.05	585.47	7.06	0.06	7.12	584.66	NP	0.00	7.64	584.14
January 7, 2008	5.46	1.18	6.64	586.52	6.01	0.26	6.27	585.69	NP	0.00	6.49	585.29
February 22, 2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March 17, 2008	4.09	1.23	5.32	587.88	NA	NA	NA	NA	NP	0.00	5.42	586.36
April 7, 2008	4.68	0.97	5.65	587.31	4.96	0.31	5.27	586.74	NP	0.00	5.66	586.12
May 5, 2008	5.91	0.74	6.65	586.10	5.72	0.29	6.01	585.98	NP	0.00	6.68	585.10
June 2, 2008	5.98	0.66	6.64	586.04	6.26	0.25	6.51	585.44	NP	0.00	6.81	584.97
July 7, 2007	4.96	0.64	5.60	587.06	5.21	0.18	5.39	586.50	NP	0.00	6.00	585.78
August 13, 2008	5.19	0.63	5.82	586.83	5.32	0.18	5.50	586.39	NP	0.00	6.21	585.57
September 8, 2008	5.45	0.51	5.96	586.58	5.61	0.18	5.79	586.10	NP	0.00	6.35	585.43
October 9, 2008	5.16	0.42	5.58	586.88	5.36	0.16	5.52	586.35	NP	0.00	6.03	585.75
November 20, 2008	5.85	0.30	6.15	586.20	5.66	0.28	5.94	586.04	NP	0.00	6.64	585.14

See Notes on Page 6.

Table 1. Groundwater and LNAPL Measurement Summary, March 2004 Through the Present, GM Saginaw Malleable Iron Plant, Saginaw, Michigan

Date	MW-160WT reference elevation = 591.53				MW-161WT reference elevation = 591.80				MW-168WT reference elevation = 592.11				MW-169WT reference elevation = 591.82			
	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)
March 8, 2004	8.33	0.31	8.64	583.18	--	--	--	--	8.32	0.23	8.55	583.77	NA	NA	NA	NA
April 29, 2004	8.41	0.19	8.60	583.10	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA
June 1, 2004	7.83	0.11	7.94	583.69	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA
June 30, 2004	8.25	0.09	8.34	583.27	--	--	--	--	NA	NA	NA	NA	7.82	0.01	7.63	584.20
July 28, 2004	8.43	0.11	8.54	583.09	--	--	--	--	NA	NA	NA	NA	7.94	0.01	7.95	583.88
August 17, 2004	8.46	0.11	8.57	583.06	--	--	--	--	NA	NA	NA	NA	NP	0.00	8.17	583.65
September 27, 2004	8.54	0.17	8.71	582.98	--	--	--	--	NA	NA	NA	NA	NP	0.00	8.23	583.59
October 29, 2004	8.58	0.09	8.67	582.94	--	--	--	--	NA	NA	NA	NA	8.35	0.01	8.36	583.47
November 30, 2004	8.47	0.07	8.54	583.05	--	--	--	--	NA	NA	NA	NA	8.44	0.01	8.45	583.38
December 27, 2004	NA	NA	NA	NA	--	--	--	--	NA	NA	NA	NA	NP	0.00	8.23	583.59
January 26, 2005	8.21	0.35	8.56	583.29	--	--	--	--	NA	NA	NA	NA	NP	0.00	8.30	583.52
February 7, 2005	8.10	0.11	8.21	583.42	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA
March 17, 2005	8.43	0.13	8.56	583.09	NP	0.00	7.60	584.20	NA	NA	NA	NA	NA	NA	NA	NA
April 13, 2005	8.39	0.13	8.52	583.13	NP	0.00	7.82	583.98	NA	NA	NA	NA	NA	NA	NA	NA
May 31, 2005	8.39	0.15	8.54	583.13	NP	0.00	7.57	584.23	NA	NA	NA	NA	NP	0.00	8.20	583.62
June 28, 2005	8.14	0.09	8.23	583.38	NP	0.00	7.34	584.46	NA	NA	NA	NA	NP	0.00	7.92	583.90
July 29, 2005	8.13	0.04	8.17	583.40	7.39	0.01	7.40	584.41	NA	NA	NA	NA	NP	0.00	7.92	583.90
August 18, 2005	8.30	0.04	8.34	583.23	NP	0.00	7.51	584.29	NA	NA	NA	NA	NA	NA	NA	NA
September 28, 2005	8.46	0.02	8.48	583.07	NP	0.00	7.75	584.05	NA	NA	NA	NA	NA	NA	NA	NA
October 18, 2005	8.66	0.06	8.72	582.87	NP	0.00	8.00	583.80	NA	NA	NA	NA	NA	NA	NA	NA
November 30, 2005	8.52	0.01	8.53	583.01	NP	0.00	7.78	584.02	NA	NA	NA	NA	NA	NA	NA	NA
December 26, 2005	8.44	0.01	8.45	583.09	NP	0.00	7.76	584.04	NA	NA	NA	NA	NA	NA	NA	NA
January 31, 2006	NP	0.00	8.21	583.32	NP	0.00	7.37	584.43	NA	NA	NA	NA	NA	NA	NA	NA
February 24, 2006	NP	0.00	8.38	583.15	NP	0.00	7.49	584.31	NA	NA	NA	NA	NA	NA	NA	NA
March 22, 2006	8.24	0.01	8.25	583.29	NP	0.00	7.23	584.57	NA	NA	NA	NA	NA	NA	NA	NA
April 27, 2006	NP	0.00	8.43	583.10	NP	0.00	7.35	584.45	NA	NA	NA	NA	NA	NA	NA	NA
May 25, 2006	NA	NA	NA	NA	NP	0.00	7.21	584.59	NA	NA	NA	NA	NA	NA	NA	NA
June 27, 2006	NP	0.00	8.44	583.09	NP	0.00	7.39	584.41	NA	NA	NA	NA	NA	NA	NA	NA
July 11, 2006	NP	0.00	8.40	583.13	NP	0.00	7.46	584.34	NA	NA	NA	NA	NA	NA	NA	NA
August 23, 2006	NP	0.00	8.41	583.12	NP	0.00	7.41	584.39	NA	NA	NA	NA	NA	NA	NA	NA
September 26, 2006	NP	0.00	8.32	583.21	NP	0.00	7.38	584.42	NA	NA	NA	NA	NA	NA	NA	NA
October 30, 2006	NP	0.00	8.13	583.40	NP	0.00	7.17	584.63	NA	NA	NA	NA	NA	NA	NA	NA
November 27, 2006	NP	0.00	8.40	583.13	NP	0.00	7.36	584.44	NA	NA	NA	NA	NA	NA	NA	NA
December 27, 2006	NP	0.00	8.34	583.19	NP	0.00	7.32	584.48	NA	NA	NA	NA	NA	NA	NA	NA
January 25, 2007	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March 6, 2007	NP	0.00	8.59	582.94	NP	0.00	7.78	584.02	NA	NA	NA	NA	NA	NA	NA	NA
March 23, 2007	NP	0.00	8.53	583.00	NP	0.00	7.58	584.22	NA	NA	NA	NA	NA	NA	NA	NA
April 30, 2007	NP	0.00	8.46	583.07	NP	0.00	7.40	584.40	NA	NA	NA	NA	NA	NA	NA	NA
May 17, 2007	NP	0.00	8.44	583.09	NP	0.00	7.39	584.41	NA	NA	NA	NA	NA	NA	NA	NA
June 12, 2007	NP	0.00	8.50	583.03	NP	0.00	7.45	584.35	NA	NA	NA	NA	NA	NA	NA	NA
July 18, 2007	NP	0.00	8.54	582.99	NP	0.00	7.59	584.21	NA	NA	NA	NA	NP	0.00	8.31	583.51
August 28, 2007	NP	0.00	8.46	583.07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
September 19, 2007	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
October 25, 2007	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
November 27, 2007	NP	0.00	7.61	583.92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
January 7, 2008	NP	0.00	6.31	585.22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
February 22, 2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March 17, 2008	5.82	0.03	5.85	585.71	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
April 7, 2008	5.96	0.06	6.02	585.57	NP	0.00	6.49	585.31	NA	NA	NA	NA	NA	NA	NA	NA
May 5, 2008	6.89	0.03	7.13	584.43	NP	0.00	7.04	584.76	NA	NA	NA	NA	NA	NA	NA	NA
June 2, 2008	6.80	0.23	7.03	584.71	NP	0.00	7.12	584.68	NA	NA	NA	NA	NP	0.00	7.10	584.72
July 7, 2007	6.08	0.21	6.29	585.43	NP	0.00	6.79	585.01	NA	NA	NA	NA	NP	0.00	6.66	585.26
August 13, 2008	6.31	0.21	6.52	585.20	NP	0.00	7.02	584.78	NA	NA	NA	NA	NP	0.00	6.78	585.04
September 8, 2008	6.54	0.12	6.66	584.98	NP	0.00	7.20	584.60	NA	NA	NA	NA	NP	0.00	7.03	584.79
October 9, 2008	6.11	0.09	6.20	585.41	NP	0.00	6.95	584.85	NA	NA	NA	NA	NP	0.00	6.72	585.10
November 20, 2008	6.66	0.23	6.89	584.85	NP	0.00	7.27	584.53	NA	NA	NA	NA	NP	0.00	7.13	584.89

See Notes on Page 6.

Table 1. Groundwater and LNAPL Measurement Summary, March 2004 Through the Present, GM Saginaw Malleable Iron Plant, Saginaw, Michigan

Date	MW-172WT reference elevation = 591.51				MW-175WT reference elevation not available				MW-178WT reference elevation = 590.35			
	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)
March 8, 2004	8.18	0.44	8.62	583.29	NA	NA	NA	NA	NA	NA	NA	NA
April 29, 2004	7.98	0.56	8.54	583.49	NA	NA	NA	NA	NP	0.00	7.21	583.14
June 1, 2004	NA	NA	NA	NA	NA	NA	NA	NA	7.37	1.24	8.61	582.88
June 30, 2004	8.55	0.06	8.61	582.96	6.71	0.01	6.72	NA	NA	NA	NA	NA
July 28, 2004	8.32	0.36	8.68	583.16	6.88	0.01	6.89	NA	7.45	1.25	8.70	582.80
August 17, 2004	8.33	0.49	8.82	583.14	7.01	0.01	7.02	NA	7.46	1.33	8.79	582.78
September 27, 2004	8.42	0.48	8.90	583.05	7.18	0.01	7.19	NA	7.51	1.02	8.53	582.76
October 29, 2004	NA	NA	NA	NA	7.24	0.01	7.25	NA	NA	NA	NA	NA
November 30, 2004	8.39	0.72	9.11	583.06	NP	0.00	7.11	NA	NA	NA	NA	NA
December 27, 2004	NA	NA	NA	NA	NP	0.00	7.11	NA	7.53	0.59	8.12	582.77
January 28, 2005	NA	NA	NA	NA	NP	0.00	7.01	NA	7.55	0.65	8.20	582.75
February 7, 2005	8.00	0.19	8.19	583.49	7.11	0.01	7.12	NA	7.17	0.39	7.56	583.15
March 17, 2005	8.34	0.28	8.62	583.15	NP	0.00	7.22	NA	7.63	0.65	8.28	582.67
April 13, 2005	8.33	0.35	8.68	583.15	NP	0.00	7.12	NA	7.46	0.69	8.15	582.83
May 31, 2005	8.29	0.38	8.67	583.19	NP	0.00	6.98	NA	7.56	0.83	8.39	582.72
June 28, 2005	8.06	0.04	8.10	583.45	6.67	0.01	6.68	NA	7.39	0.56	7.95	582.92
July 29, 2005	8.06	0.02	8.08	583.45	NP	0.00	6.73	NA	7.44	0.82	8.28	582.84
August 18, 2005	8.24	0.17	8.41	583.26	NP	0.00	6.83	NA	7.51	1.26	8.77	582.74
September 28, 2005	8.36	0.21	8.57	583.13	NP	0.00	7.04	NA	7.49	0.32	7.81	582.83
October 18, 2005	8.51	0.42	8.93	582.97	NP	0.00	7.26	NA	7.57	0.32	7.89	582.75
November 30, 2005	8.41	0.32	8.73	583.07	NP	0.00	7.16	NA	7.54	0.51	8.05	582.77
December 26, 2005	8.32	0.35	8.67	583.16	NP	0.00	7.19	NA	7.54	1.24	8.78	582.71
January 31, 2006	8.08	0.27	8.35	583.41	NP	0.00	6.79	NA	7.45	0.16	7.61	582.89
February 24, 2006	8.32	0.33	8.65	583.16	NP	0.00	6.99	NA	7.56	0.60	8.16	582.74
March 22, 2006	8.17	0.08	8.25	583.33	NP	0.00	6.75	NA	7.42	0.14	7.56	582.92
April 27, 2006	8.33	0.11	8.44	583.17	NP	0.00	6.84	NA	7.43	0.26	7.69	582.90
May 25, 2006	8.20	0.18	8.38	583.30	NP	0.00	6.62	NA	7.39	0.36	7.75	582.93
June 27, 2006	8.39	0.31	8.70	583.10	NP	0.00	6.79	NA	7.43	0.37	7.80	582.89
July 11, 2006	8.27	0.36	8.63	583.21	NP	0.00	6.79	NA	7.46	0.34	7.80	582.86
August 23, 2006	8.36	0.19	8.55	583.13	NP	0.00	6.81	NA	7.39	0.47	7.86	582.92
September 26, 2006	8.21	0.23	8.44	583.28	NP	0.00	6.70	NA	7.41	0.29	7.70	582.92
October 30, 2006	8.07	0.15	8.22	583.43	NP	0.00	6.56	NA	7.35	0.38	7.73	582.97
November 27, 2006	8.29	0.16	8.45	583.21	NP	0.00	6.79	NA	7.37	0.34	7.71	582.95
December 27, 2006	NA	NA	NA	NA	NP	0.00	6.83	NA	7.36	0.33	7.69	582.96
January 25, 2007	NA	NA	NA	NA	NA	NA	NA	NA	7.41	0.38	7.79	582.91
March 6, 2007	8.44	0.29	8.73	583.05	NA	NA	NA	NA	7.51	0.51	8.02	582.80
March 23, 2007	8.41	0.33	8.74	583.07	NP	0.00	7.13	NA	7.51	0.46	7.97	582.80
April 30, 2007	8.34	0.36	8.70	583.14	NP	0.00	6.89	NA	7.48	0.25	7.73	582.85
May 17, 2007	8.32	0.19	8.51	583.17	NP	0.00	6.86	NA	7.13	0.33	7.46	583.19
June 12, 2007	8.33	0.38	8.71	583.15	NP	0.00	6.91	NA	7.47	0.28	7.75	582.86
July 18, 2007	NA	NA	NA	NA	NP	0.00	7.02	NA	7.46	0.32	7.78	582.86
August 28, 2007	NA	NA	NA	NA	NP	0.00	6.96	NA	7.46	0.29	7.75	582.87
September 19, 2007	NA	NA	NA	NA	NP	0.00	6.66	NA	6.87	0.11	6.98	583.47
October 25, 2007	NP	0.00	8.42	583.09	NP	0.00	7.08	NA	7.59	0.25	7.84	582.74
November 27, 2007	7.50	0.02	7.52	584.01	NA	NA	NA	NA	6.52	0.14	6.66	583.82
January 7, 2008	NP	0.00	6.16	585.35	NP	0.00	6.53	NA	5.44	0.05	5.49	584.91
February 22, 2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
March 17, 2008	NP	0.00	5.73	585.78	NA	NA	NA	NA	NA	NA	NA	NA
April 7, 2008	NP	0.00	5.88	585.63	NP	0.00	5.84	NA	5.30	0.02	5.32	585.05
May 5, 2008	NP	0.00	6.85	584.66	NP	0.00	6.31	NA	6.25	0.02	6.27	584.10
June 2, 2008	NP	0.00	6.75	584.76	NP	0.00	6.39	NA	5.93	0.01	5.94	584.42
July 7, 2007	NP	0.00	5.99	585.52	NP	0.00	5.96	NA	5.32	0.02	5.34	585.03
August 13, 2008	NA	NA	NA	NA	NP	0.00	6.14	NA	NP	0.00	5.81	584.54
September 8, 2008	NA	NA	NA	NA	NP	0.00	6.36	NA	5.86	0.01	5.87	584.49
October 9, 2008	6.00	0.02	6.02	585.51	NP	0.00	6.13	NA	NP	0.00	5.68	584.67
November 20, 2008	6.57	0.15	6.72	584.93	NP	0.00	6.58	NA	NP	0.00	6.18	584.17

See Notes on Page 6.

Table 1. Groundwater and LNAPL Measurement Summary, March 2004 Through the Present, GM Saginaw Malleable Iron Plant, Saginaw, Michigan

Date	MW-179WT reference elevation not available				MW-180WT reference elevation = 590.67				RW-1 reference elevation = 592.18			
	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)
March 8, 2004	--	--	--	--	--	--	--	--	8.10	0.18	8.28	584.07
April 29, 2004	--	--	--	--	--	--	--	--	8.63	0.17	8.80	583.54
June 1, 2004	--	--	--	--	--	--	--	--	7.71	0.27	7.98	584.45
June 30, 2004	--	--	--	--	--	--	--	--	8.30	0.13	8.43	583.87
July 28, 2004	--	--	--	--	--	--	--	--	8.76	0.39	9.15	583.39
August 17, 2004	--	--	--	--	--	--	--	--	8.89	0.46	9.35	583.25
September 27, 2004	--	--	--	--	--	--	--	--	8.87	0.38	9.25	583.28
October 29, 2004	--	--	--	--	--	--	--	--	NA	NA	NA	NA
November 30, 2004	--	--	--	--	--	--	--	--	8.79	0.95	9.74	583.31
December 27, 2004	--	--	--	--	--	--	--	--	8.76	0.55	9.31	583.38
January 26, 2005	--	--	--	--	--	--	--	--	8.43	1.29	9.72	583.65
February 7, 2005	--	--	--	--	--	--	--	--	8.59	0.70	9.29	583.53
March 17, 2005	NP	0.00	7.13	NA	7.15	0.02	7.17	583.52	NA	NA	NA	NA
April 13, 2005	NP	0.00	6.91	NA	NP	0.00	6.87	583.80	8.60	0.28	8.88	583.56
May 31, 2005	NP	0.00	6.96	NA	NP	0.00	7.01	583.66	8.58	0.21	8.79	583.58
June 28, 2005	NP	0.00	6.82	NA	6.84	0.01	6.85	583.83	8.13	0.21	8.34	584.03
July 29, 2005	NP	0.00	6.73	NA	NP	0.00	6.73	583.94	8.05	0.17	8.22	584.12
August 18, 2005	NP	0.00	6.78	NA	NP	0.00	6.78	583.89	8.18	0.79	8.97	583.94
September 28, 2005	NP	0.00	6.95	NA	6.99	0.01	7.00	583.68	8.81	0.59	9.40	583.32
October 18, 2005	NP	0.00	7.14	NA	7.20	0.01	7.21	583.47	8.83	0.91	9.74	583.28
November 30, 2005	7.03	0.01	7.04	NA	NP	0.00	7.11	583.56	8.54	0.68	9.22	583.59
December 28, 2005	NP	0.00	7.14	NA	NP	0.00	7.20	583.47	NA	NA	NA	NA
January 31, 2006	NP	0.00	7.63	NA	NP	0.00	6.81	583.86	NA	NA	NA	NA
February 24, 2006	NP	0.00	7.82	NA	NP	0.00	6.81	583.86	8.49	0.33	8.82	583.66
March 22, 2006	NP	0.00	6.68	NA	NP	0.00	6.69	583.98	8.35	0.52	8.87	583.79
April 27, 2006	6.79	0.01	6.80	NA	NP	0.00	6.82	583.85	8.72	0.67	9.39	583.41
May 25, 2006	NP	0.00	6.74	NA	NP	0.00	6.76	583.91	8.45	0.56	9.01	583.69
June 27, 2006	NP	0.00	6.84	NA	NP	0.00	6.85	583.82	8.71	0.71	9.42	583.41
July 11, 2006	NP	0.00	6.83	NA	NP	0.00	6.90	583.77	8.49	0.86	9.35	583.82
August 23, 2006	NP	0.00	6.61	NA	NP	0.00	6.65	584.02	8.51	0.97	9.48	583.59
September 26, 2006	NA	NA	NA	NA	NP	0.00	6.76	583.91	8.31	0.48	8.79	583.83
October 30, 2006	NA	NA	NA	NA	NP	0.00	6.49	584.18	NA	NA	NA	NA
November 27, 2006	NA	NA	NA	NA	NP	0.00	6.59	584.08	8.43	0.61	9.04	583.70
December 27, 2006	NA	NA	NA	NA	NP	0.00	6.64	584.03	NA	NA	NA	NA
January 25, 2007	NA	NA	NA	NA	NP	0.00	6.76	583.91	NA	NA	NA	NA
March 6, 2007	NP	0.00	7.13	NA	NP	0.00	7.16	583.51	8.53	0.27	8.80	583.63
March 23, 2007	NP	0.00	6.90	NA	NP	0.00	6.93	583.74	8.31	0.27	8.58	583.85
April 30, 2007	NP	0.00	6.56	NA	NP	0.00	6.58	584.09	8.52	0.09	8.61	583.65
May 17, 2007	NA	NA	NA	NA	NP	0.00	6.52	584.15	8.38	0.14	8.52	583.79
June 12, 2007	NP	0.00	6.57	NA	NP	0.00	6.58	584.09	8.39	0.07	8.46	583.78
July 18, 2007	NP	0.00	6.75	NA	NP	0.00	6.78	583.89	8.46	0.63	9.09	583.67
August 28, 2007	NP	0.00	6.82	NA	NP	0.00	6.85	583.82	8.23	0.11	8.34	583.94
September 19, 2007	NP	0.00	6.65	NA	NP	0.00	6.69	583.98	7.93	0.11	8.04	584.24
October 25, 2007	NP	0.00	6.98	NA	NP	0.00	7.02	583.65	8.80	0.45	9.25	583.34
November 27, 2007	NA	NA	NA	NA	NP	0.00	7.07	583.60	8.03	0.15	8.18	584.14
January 7, 2008	NA	NA	NA	NA	NP	0.00	7.01	583.66	6.76	0.04	6.80	585.42
February 22, 2008	NA	NA	NA	NA	NA	NA	NA	NA	6.06	0.03	6.09	586.12
March 17, 2008	NA	NA	NA	NA	NA	NA	NA	NA	5.95	0.02	5.97	586.23
April 7, 2008	NP	0.00	6.46	NA	NP	0.00	6.45	584.22	6.24	0.06	6.30	585.94
May 5, 2008	NA	NA	NA	NA	NP	0.00	6.52	584.15	7.17	0.02	7.19	585.01
June 2, 2008	NP	0.00	6.55	NA	NP	0.00	6.56	584.11	7.16	0.03	7.19	585.02
July 7, 2007	NA	NA	NA	NA	NP	0.00	6.14	584.53	6.24	0.01	6.25	585.94
August 13, 2008	NA	NA	NA	NA	NP	0.00	6.25	584.42	NP	0.00	6.49	585.69
September 8, 2008	NA	NA	NA	NA	NP	0.00	6.45	584.22	NP	0.00	6.60	585.58
October 9, 2008	NA	NA	NA	NA	NP	0.00	6.31	584.36	NP	0.00	6.34	585.84
November 20, 2008	NA	NA	NA	NA	NP	0.00	6.56	584.11	NP	0.00	6.99	585.19

See Notes on Page 6.

Table 1. Groundwater and LNAPL Measurement Summary, March 2004 Through the Present, GM Saginaw Malleable Iron Plant, Saginaw, Michigan

Date	RW-2 reference elevation = 592.07				RW-3 reference elevation = 592.32				TP-2			
	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Depth to Water (feet)	Groundwater Elevation (corrected)
March 8, 2004	NA	NA	NA	NA	8.27	0.01	8.28	584.05	NA	NA	NA	NA
April 29, 2004	NA	NA	NA	NA	7.78	0.01	7.79	584.54	8.65	0.75	9.40	NA
June 1, 2004	NA	NA	NA	NA	NP	0.00	5.61	586.71	7.64	0.23	7.87	NA
June 30, 2004	8.66	0.01	8.67	583.41	NP	0.00	7.44	584.88	NA	NA	NA	NA
July 28, 2004	8.83	0.01	8.84	583.24	NP	0.00	8.14	584.18	NA	NA	NA	NA
August 17, 2004	8.94	0.01	8.95	583.13	NP	0.00	8.51	583.81	NA	NA	NA	NA
September 27, 2004	9.09	0.01	9.10	582.98	NP	0.00	8.50	583.82	8.75	0.71	9.46	NA
October 29, 2004	8.71	0.02	8.73	583.36	NP	0.00	7.72	584.60	NA	NA	NA	NA
November 30, 2004	9.02	0.01	9.03	583.05	NP	0.00	8.07	584.25	8.67	1.00	9.67	NA
December 27, 2004	NP	0.00	9.03	583.04	NP	0.00	7.84	584.48	NA	NA	NA	NA
January 26, 2005	NP	0.00	8.69	583.38	NP	0.00	6.92	585.40	8.33	1.09	9.42	NA
February 7, 2005	NP	0.00	8.73	583.34	NP	0.00	7.57	584.75	8.44	1.05	9.49	NA
March 17, 2005	NP	0.00	8.92	583.15	NP	0.00	7.82	584.50	8.61	1.30	9.91	NA
April 13, 2005	NP	0.00	8.94	583.13	NP	0.00	7.83	584.49	8.49	1.13	9.62	NA
May 31, 2005	NP	0.00	8.93	583.14	NP	0.00	7.88	584.44	8.54	0.33	8.87	NA
June 28, 2005	NP	0.00	8.71	583.36	NP	0.00	7.04	585.28	8.01	0.48	8.49	NA
July 29, 2005	NP	0.00	8.69	583.38	NP	0.00	6.77	585.55	7.97	0.25	8.22	NA
August 18, 2005	NP	0.00	8.67	583.40	NP	0.00	7.72	584.60	8.28	0.75	9.03	NA
September 28, 2005	NP	0.00	9.01	583.06	NP	0.00	8.41	583.91	8.69	0.82	9.51	NA
October 18, 2005	NP	0.00	8.99	583.08	NP	0.00	8.41	583.91	--	--	--	NA
November 30, 2005	NP	0.00	8.93	583.14	NP	0.00	8.02	584.30	--	--	--	NA
December 26, 2005	NP	0.00	8.99	583.08	NP	0.00	7.98	584.34	8.43	0.87	9.30	NA
January 31, 2006	NP	0.00	8.72	583.35	NP	0.00	5.50	586.82	7.82	0.72	8.54	NA
February 24, 2006	NP	0.00	8.87	583.20	NP	0.00	6.78	585.54	8.36	1.04	9.40	NA
March 22, 2006	NA	NA	NA	NA	NP	0.00	6.29	586.03	8.22	0.81	9.03	NA
April 27, 2006	NA	NA	NA	NA	NP	0.00	7.66	584.66	8.57	0.99	9.56	NA
May 25, 2006	NA	NA	NA	NA	NP	0.00	7.25	585.07	8.31	0.96	9.27	NA
June 27, 2006	NA	NA	NA	NA	NP	0.00	7.91	584.41	NA	NA	NA	NA
July 11, 2006	NA	NA	NA	NA	NP	0.00	7.34	584.98	8.03	1.70	9.73	NA
August 23, 2006	NA	NA	NA	NA	NP	0.00	7.89	584.43	NA	NA	NA	NA
September 26, 2006	NP	0.00	8.90	583.17	NP	0.00	7.08	585.24	NA	NA	NA	NA
October 30, 2006	NP	0.00	8.75	583.32	NP	0.00	7.05	585.27	NA	NA	NA	NA
November 27, 2006	NP	0.00	8.94	583.13	NP	0.00	7.50	584.82	NA	NA	NA	NA
December 27, 2006	NP	0.00	8.76	583.31	NP	0.00	7.33	584.99	NA	NA	NA	NA
January 25, 2007	NA	NA	NA	NA	NP	0.00	7.90	584.42	NA	NA	NA	NA
March 6, 2007	NP	0.00	9.14	582.93	NP	0.00	8.18	584.14	8.54	0.92	9.46	NA
March 23, 2007	NP	0.00	8.64	583.43	NA	NA	NA	NA	8.28	0.89	9.17	NA
April 30, 2007	NP	0.00	8.98	583.09	NP	0.00	8.03	584.29	8.37	0.79	9.16	NA
May 17, 2007	NP	0.00	8.99	583.08	NP	0.00	7.98	584.34	8.34	0.77	9.11	NA
June 12, 2007	NP	0.00	9.03	583.04	NP	0.00	8.21	584.11	8.29	0.76	9.05	NA
July 18, 2007	NP	0.00	9.07	583.00	NP	0.00	8.27	584.05	8.44	0.01	8.45	NA
August 28, 2007	NP	0.00	9.00	583.07	NP	0.00	7.57	584.75	8.12	0.45	8.57	NA
September 19, 2007	NP	0.00	8.44	583.63	NP	0.00	7.03	585.29	7.82	0.11	7.93	NA
October 25, 2007	NP	0.00	8.93	583.14	NP	0.00	8.32	584.00	8.69	0.39	9.08	NA
November 27, 2007	NP	0.00	8.04	584.03	NP	0.00	8.22	584.10	7.95	0.22	8.17	NA
January 7, 2008	NA	NA	NA	NA	NP	0.00	7.30	585.02	6.66	0.04	6.70	NA
February 22, 2008	NP	0.00	6.56	585.51	NP	0.00	5.19	587.13	NA	NA	NA	NA
March 17, 2008	NP	0.00	6.36	585.71	NP	0.00	4.45	587.87	5.79	0.02	5.81	NA
April 7, 2008	NP	0.00	6.51	585.56	NP	0.00	5.03	587.29	6.15	0.02	6.17	NA
May 5, 2008	NP	0.00	6.18	585.89	NP	0.00	6.79	585.53	7.18	0.01	7.19	NA
June 2, 2008	NP	0.00	7.33	584.74	NP	0.00	7.51	584.81	7.09	0.02	7.11	NA
July 7, 2007	NA	NA	NA	NA	NP	0.00	6.78	585.54	6.13	0.03	6.16	NA
August 13, 2008	NA	NA	NA	NA	NP	0.00	6.95	585.37	6.38	0.04	6.42	NA
September 8, 2008	NA	NA	NA	NA	NP	0.00	7.31	585.01	6.60	0.02	6.62	NA
October 9, 2008	NP	0.00	6.69	585.38	NP	0.00	6.83	585.49	NP	0.00	6.25	NA
November 20, 2008	NP	0.00	7.19	584.88	NP	0.00	7.56	584.76	6.89	0.02	6.91	NA

See Notes on Page 6.

Table 1. Groundwater and LNAPL Measurement Summary, March 2004 Through the Present, GM Saginaw Malleable Iron Plant, Saginaw, Michigan

Notes:

The reference elevation for each of the recovery wells (RW-1, RW-2, RW-3, and RW-4) is the ground surface elevation; approximately equal to the elevation of the edge of the vault.

NA = not available; monitoring well inaccessible (e.g., covered by pallet, gravel, roll-off, vehicle, or snowpile).

-- = Not measured.

NP = LNAPL was not present in well. An LNAPL density of 0.92 was used to correct the water level elevations for the presence of LNAPL.

LNAPL is periodically removed by bailing from monitoring well MW-178WT.



**CONESTOGA-ROVERS
& ASSOCIATES**

2055 Niagara Falls Blvd., Suite #3
Niagara Falls, New York 14304
Telephone: (716) 297-6150 Fax: (716) 297-2265
www.CRAworld.com

MEMORANDUM

TO: JoAnn Robertson [Jrobertson@bbl-inc.com]

REF. NO.: 017307-128020

FROM: Kathleen Willy/bjw/1 *W*

DATE: November 14, 2008

E-Mail and Hard Copy if Requested

RE: Data Quality Assessment and Validation
GMPT-SMI - MW-186WT Sampling
Saginaw, Michigan
October 2008

The following details a quality assessment and validation of the analytical data resulting from the October 2008 collection of two samples from the GMPT-SMI Site in Saginaw, Michigan. The sample summary detailing sample identification, sample location, QC samples, and analytical parameters is presented in Table 1. Sample analysis was completed at TestAmerica in North Canton, Ohio, in accordance with the methodologies presented in Table 2.

The QC criteria used to assess the data were established by the methods and the following guidance document:

- i) "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", United States Environmental Protection Agency (USEPA) 540/R-99/008, October 1999.

Full Contract Laboratory Program (CLP)-equivalent raw data deliverables were provided by the laboratory. The data quality assessment and validation presented in the following subsections were performed based on the sample results and supporting quality assurance/quality control (QA/QC) provided. This includes calibration data, blank data, matrix spike/matrix spike duplicates, laboratory control samples, surrogate recoveries, and retention time results.

Sample Preservation and Holding Times

Sample holding time periods and preservation requirements are presented in the analytical method. All samples were prepared and analyzed within the method-required holding times.

All samples were properly preserved and cooled to 4°C (+2°C).

Initial Calibration

Initial calibration data are used to demonstrate that each instrument is capable of generating acceptable quantitative data. A five point calibration curve containing all compounds of interest is analyzed to characterize instrument response for each analyte over a specific concentration range.

Initial calibration criteria for organic analyses are evaluated against the following criteria:

- i) GC (all compounds using an average for multi-response compounds) - the %RSD must not exceed 20 percent or a correlation coefficient of 0.995 when linear regression calibration curves are used.

Calibration standards were analyzed at the required frequency and the results met the above criteria for linearity and sensitivity.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, continuing calibration standards must be analyzed every 12 hours for GC/MS analyses and every ten samples by GC. The following criteria are employed to evaluate the continuing calibration data:

- i) GC (all compounds using average for multi-response compounds) - the %D between mean initial calibration factor and the continuing calibration factor must not exceed 15 percent; and
- ii) GC (compounds determined by linear regression) - the percent drift between the true value and the continuing calibration value must not exceed 15 percent.

Calibration standards were analyzed at the required frequency and the results met the above criteria for instrument sensitivity and linearity of response and sensitivity.

Laboratory Blank Samples

Method blank samples are prepared and analyzed with the investigative samples to assess the presence and the magnitude of sample contamination introduced during sample analysis.

For this study, method blanks were analyzed at a minimum frequency of one per analytical batch. The blank results were non-detect for the analytes of interest.

Surrogate Compounds

In accordance with the methods employed, all samples, blanks, and standards analyzed for organics are spiked with surrogate compounds prior to sample extraction and /or analysis. Surrogate recoveries provide a means to evaluate the effects of individual sample matrices on analytical efficiency and are assessed against method control limits.

All surrogate recoveries were within the laboratory control limits demonstrating acceptable analytical accuracy.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the relative percent difference (RPD) of the concentrations were determined. The MS/MSD percent recovery and RPD control limits are established by the laboratory. The samples selected for MS/MSD analysis are identified in Table 1.

Upon review of the data, it was determined that all MS/MSDs associated with this project were within the specified control limits.

Laboratory Control Sample (LCS) Analysis

The LCS analyses serve as a monitor of the overall performance in all steps of the sample analysis and are analyzed with each sample batch. The LCS percent recoveries were evaluated against laboratory established control limits.

The LCS percent recoveries were within the laboratory control limits for all analytes of interest demonstrating acceptable overall analytical accuracy and precision.

Field Quality Assurance/Quality Control

Field QA/QC consisted of one field duplicate sample set.

To assess overall analytical and sampling precision, field duplicates were collected and submitted "blind" to the laboratory for analysis as shown in Table 1.

All sample results outside estimated ranges of detection showed acceptable sampling and analytical precision.

Total Versus Dissolved Polychlorinated biphenyls (PCBs)

All dissolved PCB results associated with this project were either less than the total results or had variability within the acceptance criterion of 20 %D.

Target Compound Identification

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time and mass spectra (if applicable) were evaluated according to identification criteria established by the methods. The organic compounds reported adhered to the specified identification criteria.

Target Compound Quantitation

The reported quantitation results and detection limits were checked to ensure results reported were accurate. No discrepancies were found between the raw data and the sample results reported by the laboratory.

System Performance

System performance between various QC checks was evaluated to monitor for changes that may have caused the degradation of data quality. No technical problems or chromatographic anomalies were observed which would require qualification of the data.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision based on the provided information and may be used without qualification.

TABLE 1
SAMPLE COLLECTION AND ANALYSIS SUMMARY
MW-186WT SAMPLING
GENERAL MOTORS
SAGINAW, MICHIGAN
OCTOBER 2008

<i>Sample ID</i>	<i>Location ID</i>	<i><u>Analysis/Parameters</u></i>				<i>Comments</i>
		<i>Collection Date (mm/dd/yy)</i>	<i>Collection Time (hr:min)</i>	<i>PCBs</i>	<i>Dissolved PCBs</i>	
MW-186WT(101008)	MW-186WT	10/10/08	10:40	X	X	MS/MSD
DUPE-1(101008)	MW-186WT	10/10/08	10:40	X		Field duplicate of sample MW-186WT(101008)

Notes:

MS Matrix Spike.
MSD Matrix Spike Duplicate.
PCBs Polychlorinated Biphenyls

TABLE 2

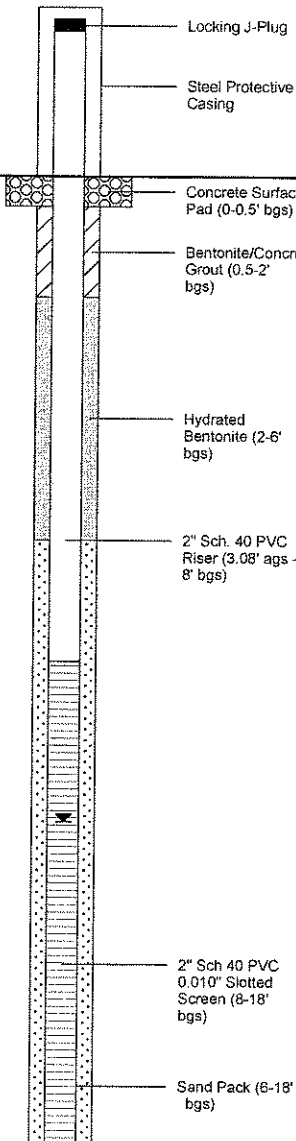
SAMPLE HOLDING TIMES CRITERIA AND ANALYTICAL METHODS SUMMARY
MW-186WT SAMPLING
GENERAL MOTORS
SAGINAW, MICHIGAN
OCTOBER 2008

<i>Parameter</i>	<i>Matrix</i>	<i>Analytical Method</i>
Polychlorinated Biphenyls (PCBs)	Water	8082 ⁽¹⁾

Notes:

- ⁽¹⁾ Referenced from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", (SW-846), Third Edition, 1986 and subsequent revisions.

Date Start/Finish: 7/17/08 Drilling Company: Boart Longyear Driller's Name: T. Williams Drilling Method: Rotosonic Sampling Method: 5' X 6" Sonic Core Rig Type: Sonic ATV	Northing: NA Easting: NA Casing Elevation: NA Borehole Depth: 18' bgs Surface Elevation: NA Descriptions By: Jim Kralik	Well ID: MW-186WT Client: General Motors Corporation Location: GM SMI Saginaw, Michigan
---	--	---

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
									 Locking J-Plug Steel Protective Casing Concrete Surface Pad (0-0.5' bgs) Bentonite/Concrete Grout (0.5-2' bgs) Hydrated Bentonite (2-6' bgs) 2" Sch. 40 PVC Riser (3.08' ags - 8' bgs) 2" Sch 40 PVC 0.010" Slotted Screen (8-18' bgs) Sand Pack (6-18' bgs)
	0							TOPSOIL and ORGANICS. Dark gray (7.5YR 4/1) CLAY (CL), some very fine to medium Sand, stiff, medium plasticity, moist.	
		1	0-5	5	0.0	CL		Dark brown (7.5YR 3/3) fine to coarse SAND (SW) AND medium GRAVEL SLAG and METAL debris, loose, dry. [FILL]	
						SW			
						ML		Very dark gray (7.5YR 3/1) SILT (ML), some very fine to fine Sand, little stiff medium plasticity Clay, faint laminar bedding, trace Plant Roots and Metal debris, stiff, moist.	
5	-5							Very dark gray (10YR 3/1) Sandy CLAY (SC), trace fine Gravel, soft to very soft, non-plastic, moist.	
		2	5-10	0.5	0.0	SC			
10	-10							Very dark gray (10YR 3/1) Sandy CLAY (SC), little Metal debris, thin (1-2") lenses of dark yellowish brown (10YR 3/4) Peat and Silty Peat, soft to very soft, Plant debris and Mollusk Shells, wet. Water @ 10.65 ft. bgs	
		3	10-15	5	0.0	SC			
15	-15							Dark gray (10YR 4/1) medium poorly sorted SAND (SP), trace Plant debris and Mollusk Shells, Metal fragments (from 15 - 15.5' bgs), loose to medium dense, wet.	
		4	15-18	3	0.0	SP			

	Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available
---	---

Client: General Motors Corporation

Well/Boring ID: MW-186WT

Site Location:

GM SMI
Saginaw, Michigan

Borehole Depth: 18' bgs

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	USCS Code	Geologic Column	Stratigraphic Description	Well/Boring Construction
		4	15-18	3	0.0	SP		Dark gray (10YR 4/1) medium poorly sorted SAND (SP), trace Plant debris and Mollusk Shells, Metal fragments (from 15 - 15.5' bgs), loose to medium dense, wet.	 Sand Pack (6-18' bgs) 2" Sch 40 PVC 0.010" Slotted Screen (6-18' bgs)
-20	-20							End of boring at 18 ft. bgs	
-25	-25								
-30	-30								
-35	-35								
 infrastructure. environment. facilities								Remarks: ags = above ground surface; bgs = below ground surface; NA = Not Applicable/Available	



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
AMERA #:	NA	Section:	26
MW #:	BBL-MW-2	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692773.2608 E : 13228172.7		

DATES			
Date Installed:	5/2/1996	Installed by:	NA
Date Abandon:	11/19/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	15 feet bgs.	Yes	Yes
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15 ft. bgs
Galvanized:		to (ft.)	1 ft. bgs
PVC:	PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2"	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	10 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well materials.
Tremie Pipe ?	Grout installed via tremie pipe through augers.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	1/4, 1/4, 1/4:	NW, SW, SW
MERA #:	NA	Section:	26
MW #:	BBL-MW-3	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692718.2105 E : 13228139.46		

DATES			
Date Installed:	5/2/1996	Installed by:	NA
Date Abandon:	11/19/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	15 feet bgs.	Yes	Yes
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15 ft. bgs
Galvanized:		to (ft.)	1 ft. bgs
PVC:	2" PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2"	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	Yes	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	10 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well materials.
Tremie Pipe ?	Grout installed via tremie pipe through augers.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
AMERA #:	NA	Section:	26
MW #:	BBL-MW-4	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N : 692672.9361 E : 13228164.62		

DATES			
Date Installed:	5/3/1996	Installed by:	NA
Date Abandon:	11/19/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	5-15 feet bgs.	Yes	Yes
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15 ft. bgs
Galvanized:		to (ft.)	1 ft. bgs
PVC:	PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2" PVC	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	10 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well materials.
Tremie Pipe ?	Grout installed via tremie pipe through augers.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
MEIRA #:	NA	Section:	26
MW #:	BBL-MW-5	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692734.6333 E: 13228250.92		

DATES			
Date Installed:	5/3/1996	Installed by:	NA
Date Abandon:	11/18/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	15 feet bgs.	Yes	Yes
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15 ft. bgs
Galvanized:		to (ft.)	1 ft. bgs
PVC:	PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2"	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	2"	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	10 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well materials, tremie pump.
Tremie Pipe ?	Grout through augers during auger removal.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	1/4, 1/4, 1/4:	NW, SW, SW
AMERA #:	NA	Section:	26
MW #:	MW-132WT	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692257.16 E: 13227783.57		

DATES			
Date Installed:	1/20/1995	Installed by:	NA
Date Abandon:	11/20/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	14 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	4-14 feet bgs.	Yes	YES
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15' bgs
Galvanized:	--	to (ft.)	1' bgs
PVC:	PVC	grout type:	
Stainless Steel:	--	Casing	
Casing I.D.:	2" PVC	Pulled:	YES
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	
Stainless Steel:	--	hole grouted?	
Length (ft.):	5 feet	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrilled to remove well materials; grout installed via tremie pipe through augers.
Tremie Pipe ?	
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
AMERA #:	NA	Section:	26
MW #:	MW-132SI	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692264.7 E: 13227789.73		

DATES			
Date Installed:	1/20/1995	Installed by:	NA
Date Abandon:	11/20/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	27 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	22-27 feet bgs.	Yes	YES
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	30' bgs
Galvanized:	--	to (ft.)	1' bgs
PVC:	PVC	grout type:	
Stainless Steel:	--	Casing	
Casing I.D.:	2" PVC	Pulled:	9 feet
Screen Type:		Cut off:	Remaining destroyed in-situ during the drilling process
PVC:	PVC	depth bgl (ft.):	
Stainless Steel:	--	hole grouted?	
Length (ft.):	5	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill attempted, lost well materials after 9' bgs;
Tremie Pipe ?	Remaining PVC destroyed in-situ during the drilling process, grout installed via tremie
Other? (explain):	Pipe through augers.

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
MERA #:	NA	Section:	26
MW #:	MW-135WT	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692733.84 E: 13228353.84		

DATES			
Date Installed:	2/7/1995	Installed by:	NA
Date Abandon:	11/19/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	5-15 feet bgs.	Yes	Yes
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15 ft. bgs
Galvanized:		to (ft.)	2 ft. bgs
PVC:	2" PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2"	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	2" PVC	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	10 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well material.
Tremie Pipe ?	Tremie pipe through augers to install grout.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	1/4, 1/4, 1/4:	NW, SW, SW
MEIRA #:	NA	Section:	26
MW #:	MW-135SI	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692740.06 E: 13228359.04		

DATES			
Date Installed:	2/7/1995	Installed by:	NA
Date Abandon:	11/17/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	28.7 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	23.7-28.7 feet bgs.	Yes	
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	28.7 ft.
Galvanized:		to (ft.)	2 ft.
PVC:	PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2"	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	5 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well materials, tremie pump.
Tremie Pipe ?	Bentonite grout as augers removed.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
AMERA #:	NA	Section:	26
MW #:	MW-135S2	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692729.85 E: 13228357.31		

DATES			
Date Installed:	2/7/1995	Installed by:	NA
Date Abandon:	11/18/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	37 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	32-37 feet bgs.	Yes	Yes
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	37 ft. bgs
Galvanized:		to (ft.)	2 ft. bgs
PVC:	2" PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2"	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	2" PVC	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	5 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well materials, tremie pump.
Tremie Pipe ?	Bentonite grout through augers during auger removal.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Allyn Fedoronko	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
AMERA #:	NA	Section:	26
MW #:	MW-135S3	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692736.29 E: 13228362.76		

DATES			
Date Installed:	2/7/1995	Installed by:	NA
Date Abandon:	11/17/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	47.5 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	42.5-47.5 feet bgs.	Yes	
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	47.5 ft. bgs
Galvanized:		to (ft.)	2 ft. bgs
PVC:	PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2"	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	2" PVC	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	5 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well materials, tremie pump.
Tremie Pipe ?	Bentonite grout as augers removed.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
MEIRA #:	NA	Section:	26
MW #:	MW-153WT	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692467.25 E: 13227550.3		

DATES			
Date Installed:	9/28/1995	Installed by:	NA
Date Abandon:	11/21/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	16 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	6-16 feet bgs.	Yes	YES
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	16 bgs
Galvanized:	--	to (ft.)	1 bgs
PVC:	PVC	grout type:	Cement/Bentonite grout
Stainless Steel:	--	Casing	
Casing I.D.:	2" PVC	Pulled:	NO
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	1 foot bgs
Stainless Steel:	--	hole grouted?	
Length (ft.):	10 feet	Grout Type:	Cement/Bentonite grout

ABANDONMENT METHOD	
Thru casing ?	Cut off above-ground well protector and cut off 2" PVC riser 1' below ground; tremie pumped grout to surface allowed to drop to 1' bgs
Tremie Pipe ?	
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
MEIRA #:	NA	Section:	26
MW #:	MW-161WT	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692176.2741 E: 13227927.61		

DATES			
Date Installed:	5/1/1996	Installed by:	NA
Date Abandon:	11/20/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	5-15 feet bgs.	Yes	YES
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15 bgs
Galvanized:	--	to (ft.)	1 bgs
PVC:	PVC	grout type:	
Stainless Steel:	--	Casing	
Casing I.D.:	2" PVC	Pulled:	YES
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	
Stainless Steel:	--	hole grouted?	
Length (ft.):	10	Grout Type:	Cement/Bentonite grout

ABANDONMENT METHOD	
Thru casing ?	Overdrilled to remove well materials; grout installed via tremie pipe through augers.
Tremie Pipe ?	
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
AMERA #:	NA	Section:	26
MW #:	MW-162WT	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692263.5835 E: 13227811.54		

DATES			
Date Installed:	4/23/1996	Installed by:	NA
Date Abandon:	11/19/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	14 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	4-14 feet bgs.	Yes	Yes
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15 ft. bgs
Galvanized:		to (ft.)	1 ft. bgs
PVC:	PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2" PVC	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	10 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrilled to remove well materials.
Tremie Pipe ?	Grout installed via tremie pipe through augers.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
MERA #:	NA	Section:	26
MW #:	MW-165WT	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692520.9185 E: 13227509.48		

DATES			
Date Installed:	4/25/1996	Installed by:	NA
Date Abandon:	11/21/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS			GROUTING INFORMATION	
Well Depth:	14	feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	4-14	feet bgs.	Yes	yes
Water Table:	NA	feet bgs.	No	
Casing Type:			from (ft.)	15
Galvanized:	--		to (ft.)	1
PVC:	PVC		grout type:	Cement/Bentonite grout
Stainless Steel:	--		Casing	
Casing I.D.:	2" PVC		Pulled:	yes
Screen Type:			Cut off:	
PVC:	PVC		depth bgl (ft.):	
Stainless Steel:	--		hole grouted?	
Length (ft.):	10 feet		Grout Type:	Cement/Bentonite grout

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well materials; grout installed via tremie pipe through augers.
Tremie Pipe ?	
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
AMERA #:	NA	Section:	26
MW #:	TP-1	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 690145.153 E: 13228680.37		

DATES			
Date Installed:	1997	Installed by:	NA
Date Abandon:	11/20/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	5-15 feet bgs.	Yes	YES
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15 bgs
Galvanized:	--	to (ft.)	1 bgs
PVC:	PVC	grout type:	Cement/Bentonite grout
Stainless Steel:	--	Casing	
Casing I.D.:	2" PVC	Pulled:	YES
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	
Stainless Steel:	--	hole grouted?	
Length (ft.):	10 feet	Grout Type:	Cement/Bentonite grout

ABANDONMENT METHOD	
Thru casing ?	Overdrilled to remove well materials; grout installed via tremie pipe through augers.
Tremie Pipe ?	
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
MERA #:	NA	Section:	26
MW #:	UST 4-1	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 693194.5987 E: 13228279.45		

DATES			
Date Installed:	6/1/1994	Installed by:	NA
Date Abandon:	11/21/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	14.5 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	9.5-14.5 feet bgs.	Yes	YES
Water Table:	Unknown feet bgs.	No	
Casing Type:		from (ft.)	5' bgs
Galvanized:	--	to (ft.)	1' bgs
PVC:	--	grout type:	
Stainless Steel:	--	Casing	
Casing I.D.:	2 x 3/4" poly/HDPE	Pulled:	Destroyed in-situ
Screen Type:		Cut off:	
PVC:	--	depth bgl (ft.):	
Stainless Steel:	--	hole grouted?	
Length (ft.):	--	Grout Type:	Cement/Bentonite grout

ABANDONMENT METHOD	
Thru casing ?	Overdrill; removed some portion of HDPE/poly tubing; remainder destroyed in-situ;
Tremie Pipe ?	Grout installation via tremie pipe through augers.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	1/4, 1/4, 1/4:	NW, SW, SW
MERA #:	NA	Section:	26
MW #:	UST 4-3	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 693178.4838 E: 13228349.35		

DATES			
Date Installed:	6/2/94	Installed by:	NA
Date Abandon:	11/21/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	10.3-15.3 feet bgs.	Yes	YES
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	3' bgs
Galvanized:	--	to (ft.)	1' bgs
PVC:	--	grout type:	
Stainless Steel:	--	Casing	
Casing I.D.:	2 x 3/4" HDPE/poly	Pulled:	NO
Screen Type:		Cut off:	Destroyed in-situ
PVC:	--	depth bgl (ft.):	
Stainless Steel:	--	hole grouted?	
Length (ft.):	Unknown	Grout Type:	Cement/Bentonite grout

ABANDONMENT METHOD	
Thru casing ?	Overdrilled to destroy pipes in-situ, grout installed via tremie pipe through augers.
Tremie Pipe ?	
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS
Unable to drill deeper due to auger refusal; may need to revisit later with bigger drill rig.



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
NERA #:	NA	Section:	26
MW #:	UST 4-4	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 693172.8682 E: 13228319.13		

DATES			
Date Installed:	6/2/94	Installed by:	NA
Date Abandon:	11/21/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	10.3-15.3 feet bgs.	Yes	YES
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	3' bgs
Galvanized:	--	to (ft.)	1' bgs
PVC:	--	grout type:	
Stainless Steel:	--	Casing	
Casing I.D.:	2 x ¾" HDPE/poly	Pulled:	NO
Screen Type:		Cut off:	Destroyed in-situ
PVC:	--	depth bgl (ft.):	
Stainless Steel:	--	hole grouted?	
Length (ft.):	Unknown	Grout Type:	Cement/Bentonite grout

ABANDONMENT METHOD	
Thru casing ?	Overdrilled to destroy pipes in-situ, grout installed via tremie pipe through augers.
Tremie Pipe ?	
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	1/4, 1/4, 1/4:	NW, SW, SW
MERA #:	NA	Section:	26
MW #:	UST-7-1	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N : 692739.313 E : 13228180.61		

DATES			
Date Installed:	6/3/1994	Installed by:	NA
Date Abandon:	11/19/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	10 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	5-10 feet bgs.	Yes	Yes
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	10 ft. bgs
Galvanized:		to (ft.)	1 ft. bgs
PVC:	PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	2"	Pulled:	Yes
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	10 ft.	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Overdrill to remove well materials.
Tremie Pipe ?	Grout installed via tremie pipe through augers.
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	1/4, 1/4, 1/4:	NW, SW, SW
MERA #:	NA	Section:	26
MW #:	UST-MW	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 693242.617 E: 13228249.42		

DATES			
Date Installed:	Unknown	Installed by:	NA
Date Abandon:	11/21/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	11 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	6-11 feet bgs.	Yes	YES
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	11' bgs
Galvanized:	--	to (ft.)	1' bgs
PVC:	PVC	grout type:	Cement/bentonite
Stainless Steel:	--	Casing	
Casing I.D.:	4" PVC	Pulled:	NO
Screen Type:		Cut off:	
PVC:	PVC	depth bgl (ft.):	1' bgs
Stainless Steel:	--	hole grouted?	YES
Length (ft.):	5 feet	Grout Type:	Cement/Bentonite grout

ABANDONMENT METHOD	
Thru casing ?	Unable to remove or overdrill 4" PVC riser/screen; tremie pipe grout into well bottom to top.
Tremie Pipe ?	
Other? (explain):	

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kravik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name:	
name:		Name:	

COMMENTS



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
MONITOR WELL ABANDONMENT RECORD**

PROJECT		LOCATION	
Site Name:	GM Saginaw Malleable Iron Plant	County:	Saginaw
Project Number:	B0064434	¼, ¼, ¼:	NW, SW, SW
MERA #:	NA	Section:	26
MW #:	UST-MW-D	Town:	12 N
MIRIS well ID #:	NA	Range:	4 E
GPS Coord :	N: 692770.4444 E: 13228248.22		

DATES			
Date Installed:	NA	Installed by:	NA
Date Abandon:	11/19/2008	Abandoned by:	CRA Services

WELL SPECIFICATIONS		GROUTING INFORMATION	
Well Depth:	15 feet bgs.	2" annulus grouted:	4" annulus grouted:
Screen Depth:	NA feet bgs.	Yes	Yes
Water Table:	NA feet bgs.	No	
Casing Type:		from (ft.)	15 ft. bgs
Galvanized:		to (ft.)	1 ft. bgs
PVC:	2 x 1" PVC	grout type:	
Stainless Steel:		Casing	
Casing I.D.:	1" PVC	Pulled:	No
Screen Type:		Cut off:	
PVC:	1" PVC	depth bgl (ft.):	
Stainless Steel:		hole grouted?	
Length (ft.):	NA	Grout Type:	Cement/Bentonite

ABANDONMENT METHOD	
Thru casing ?	Well vault overdrilled, well materials destroyed during drilling, grout emplaced
Tremie Pipe ?	through augers during removal. Drilled to 15 ft., driller reports possible native soils/
Other? (explain):	undisturbed soils at 10 ft. bgs.

ABANDON CREW		STATE EMPLOYEE WITNESS	
name: (ARCADIS)	Jim Kralik	Name:	
name: (CRA)	Jason Hurshman	Name:	
name: (CRA)	Chris Bryan	Name: -	
name:		Name:	

COMMENTS

GREEN POINT LANDFILL POST-CLOSURE INSPECTION FORM

Inspection Date: 11/7/08

Time Arrived: 9:15 AM

Time Departed: 10:30 AM

Inspectors: M COURTNEY

Weather Conditions

Rain None
Snow None
Temperature 60
Barometric Pressure

Inspection Items	Site/Area Condition		Comments
	Satisfactory	Unsatisfactory	
A. Site Access Road	✓		
• Erosion/Washout/Settlement	✓		
• Sufficient Gravel	✓		
B. Site Security	✓		
• Access Gates	✓		
• Fence Integrity		✓	9 HOLES LOCATED
• Fence Straight	✓		
• Post Condition	✓		
• Signs	✓		
• Locks	✓		
C. Vegetative Cover	✓		
• Bare Spots	✓		
• Stressed Vegetation	✓		
• Cracks	✓		
• Burrowing Animals	✓		
• Erosion	✓		

GREEN POINT LANDFILL POST-CLOSURE INSPECTION FORM

Inspection Date:

11/7/08

Inspection Items	Site/Area Condition		Comments
	Satisfactory	Unsatisfactory	
• Settlement	✓		
• Water Ponding	✓		
• Protruding Objects	✓		
• Undesirable Growth	✓		
• Slope Movement	✓		
D. Leachate Breakouts	✓		
• Area Locations	✓		
• Entering Surface Water	✓		
E. Surface Water Drainage System	✓		
• Exposed Clay Barrier	✓		
• Drainage Swales	✓		
• Culverts	✓		
• Downchutes	✓		
• Primary Sedimentation Basin	✓		
• Bank Erosion	✓		
• Silt Levels	✓		
• Berms	✓		
F. Ground-Water Monitoring System	✓		
• Casing	✓		
• Locks	✓		

**GREEN POINT LANDFILL
POST-CLOSURE INSPECTION FORM**

Inspection Date:

11/7/08

Inspection Items	Site/Area Condition		Comments
	Satisfactory	Unsatisfactory	
• Bollards	✓		
• Surface Seal	✓		
G. Surface Water Monitoring System	✓		
H. Gas Management System	✓		
• Vent Condition	✓		
• Detectable Odor	✓		
• Surface Seal	✓		
I. Overall Site Appearance	✓		
J. Wetlands	✓		