CONESTOGA-ROVERS & ASSOCIATES

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July 8, 2009 Reference No. 017390-03

Glenn May, CPG
Division of Environmental Remediation, Region 9
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2999

Dear Mr. May:

Re: GM Powertrain − Tonawanda, New York
Endoline Area Semiannual Groundwater Monitoring Report

Conestoga-Rovers & Associates (CRA) has prepared this Semiannual Groundwater Monitoring Report on behalf of the General Motors Corporation (GM) in accordance with the Sampling and Analysis Plan (SAP) for Monitored Natural Attenuation – Endoline Area Chlorinated Solvent Plume, dated August 2008. The New York State Department of Environmental Conservation (NYSDEC) approved the SAP on October 8, 2008. The SAP specifies the groundwater sample collection schedule, sampling methods, laboratory analysis, and reporting schedule for the MNA program. In addition, the NYSDEC requested sampling to be conducted for gasoline constituents at MW-2 through MW-5, located adjacent to the chlorinated solvent plume, in order to evaluate current conditions related to Petroleum Spill No. 9875474. This sampling is conducted annually in October.

The second round of semiannual groundwater monitoring was completed on May 20, 2009. All samples were sent to TestAmerica Laboratories (formerly Severn Trent Laboratories) of North Canton, Ohio for analysis. Groundwater samples were collected from MW-2, MW-11, and MW-12 and analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) and the following natural attenuation parameters:

- Total organic carbon (TOC)
- Total iron
- Dissolved iron (field filtered)
- Total manganese
- Dissolved manganese (field filtered)
- Sulfate
- Sulfide
- Nitrate
- Nitrite
- Total nitrogen (as ammonia)
- Orthophosphate phosphorus
- Total heterotrophic microbial count
- Total 1,1,1

- TCA specific microbial count
- Chemical oxygen demand (COD)
- Biological oxygen demand (BOD)
- Alkalinity
- Methane
- Ethane

Groundwater samples were collected from perimeter monitoring wells MW-1, MW-9, MW-101, MW-102, and MW-103 and analyzed for TCL VOCs to monitor for potential plume migration.

Monitoring well locations are shown on Figure 1. Analytical results for the MNA program are summarized on Table 1.

The data was validated by CRA. Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review," EPA-540/R-99/008, October 1999. The data were found to exhibit acceptable levels of accuracy and precision with the qualifiers noted on the tables.

No evaluation of the effectiveness of the MNA program is being done at this time. As stated in the approved SAP, CRA will evaluate the effectiveness of the MNA program after 2 years (four rounds of semiannual sampling). An MNA evaluation report will be prepared and submitted to the NYSDEC with recommendations for future sampling or additional remedial actions if necessary.

Please contact Jim Hartnett at 315-463-2391 (GM) or Katherine Galanti at 716-856-2142 (CRA) if you should have any questions or comments.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Katherine B. Galanti

KBG/CMB/jap/May-001
Encls.

cc: M. Antonetti – GM
J. Hartnett – GM
K. Malinowski – CRA

MW101
MW-1
MW-12
MW-8
MW-13
MW-7
MW-6
MW-5
MW-4
MW-3
MW-11
MW-9
MW-10
MW-2
MW102
MW103
A-21 INDUSTRIAL WASTE SUMP
FORMER PAINT MIX BUILDING
TUNNEL
INDUST. WASTE LINE
12" FP
6" PVC
6" CCP
PK NAIL
0 20 40ft
N

figure 1

LEGEND

MW-1 ● MONITORING WELL LOCATION

EXTENT OF GROUNDWATER CONTAMINATION

EXTENT OF GROUNDWATER CONTAMINATION AND MONITORING WELL LOCATIONS
ENDOLINE AREA CHLORINATED SOLVENT PLUME MNA
GM POWERTRAIN GROUP TONAWANDA ENGINE PLANT
Tonawanda, New York

17390-01(MAY001)GN-BU001 JUL 06/2009

TABLE 1

ANALYTICAL RESULTS SUMMARY
MNA SEMIANNUAL SAMPLING
GENERAL MOTORS CORPORATION
TONAWANDA, NEW YORK
MAY 2009

Location ID:			*MW-1*	*MW-2*	*MW-9*	*MW-101*	*MW-102*	*MW-102*	*MW-103*
Sample Name:			*WG-30264-052009-001*	*WG-30264-052009-002*	*WG-30264-052009-009*	*WG-30264-052009-005*	*WG-30264-052009-003*	*WG-30264-052009-004*	*WG-30264-052009-007*
Sample Date:			*5/20/2009*	*5/20/2009*	*5/20/2009*	*5/20/2009*	*5/20/2009*	*5/20/2009*	*5/20/2009*
								Duplicate	
Parameters	***Units***	***NYS TOGs***							
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/L	5	1.0 U	**15000**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	5	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	µg/L	1	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/L	5	1.0 U	**23000**	2.0	1.0 U	3.2	3.3	0.25 J
1,1-Dichloroethene	µg/L	5	1.0 U	**630**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	µg/L	0.6	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethene (total)	µg/L	5	2.0 U	**42 J**	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dichloropropane	µg/L	1	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dioxane	µg/L	NC	50 U	4200 U	50 U	50 U	50 U	50 U	50 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	50	10 U	830 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	50	10 U	830 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	NC	10 U	830 U	10 U	10 U	10 U	10 U	10 U
Acetone	µg/L	50	10 U	830 U	10 U	10 U	10 U	10 U	10 U
Benzene	µg/L	1	1.0 U	**250**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	µg/L	50	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	µg/L	50	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	5	1.0 UJ	83 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ
Carbon disulfide	µg/L	60	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	µg/L	5	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	µg/L	5	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	µg/L	5	1.0 U	**1800 J**	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	µg/L	7	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl Chloride)	µg/L	5	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	µg/L	NC	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	µg/L	50	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	µg/L	5	1.0 U	**140**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	µg/L	5	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	µg/L	5	1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	5	1.0 UJ	83 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ
Toluene	µg/L	5	1.0 U	**140**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	µg/L		1.0 U	83 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	5	1.0 U	**94**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	2	1.0 U	**160**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	µg/L	NC	2.0 U	670	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Metals									
Iron	µg/L	300	--	152	--	--	--	--	--
Manganese	µg/L	300	--	40.1	--	--	--	--	--
Metals (Dissolved)									
Iron (Dissolved)	µg/L	300	--	100 U	--	--	--	--	--
Manganese (Dissolved)	µg/L	300	--	36.6	--	--	--	--	--

TABLE 1

ANALYTICAL RESULTS SUMMARY
MNA SEMIANNUAL SAMPLING
GENERAL MOTORS CORPORATION
TONAWANDA, NEW YORK
MAY 2009

Parameters	*Location ID:* *Sample Name:* *Sample Date:*	*Units*	*NYS TOGs*	*MW-1* *WG-30264-052009-001* *5/20/2009*	*MW-2* *WG-30264-052009-002* *5/20/2009*	*MW-9* *WG-30264-052009-009* *5/20/2009*	*MW-101* *WG-30264-052009-005* *5/20/2009*	*MW-102* *WG-30264-052009-003* *5/20/2009*	*MW-102* *WG-30264-052009-004* *5/20/2009* *Duplicate*	*MW-103* *WG-30264-052009-007* *5/20/2009*
Dissolved Gases										
Ethane		µg/L	NC	--	18	--	--	--	--	--
Methane		µg/L	NC	--	3300	--	--	--	--	--
Field Parameters										
Conductivity		mS/cm	NC	2.87	1.67	2.73	33.9	1.453	1.453	3.02
Dissolved Oxygen		ug/L	NC	2.48	0.96	3.24	6.71	1.74	1.74	1.45
Oxidation Reduction Potential		millivolts	NC	0.80	-239	-11	28	-153	-153	0.70
pH		pH units	NC	7.85	7.71	8.09	7.76	8.03	8.03	7.77
Temperature, Field		Deg C	NC	14.39	13.96	15.50	16.69	15.59	15.59	19.65
Turbidity		NTU	NC	8	3.93	3	2	4	4	2
Wet Chemistry										
Total Aerobic Microbial Population Counts		***(CFUs/ml)***	NC	--	1.47E+04	--	--	--	--	--
Aerobic 1,1,1-TCA Specific Microbial Counts		***(CFUs/ml)***	NC	--	8.60E+03	--	--	--	--	--
Total Anaerobic Microbial Population Counts		***(CFUs/ ml)***	NC	--	1.49E+04	--	--	--	--	--
Anaerobic 1,1,1-TCA Specific Microbial Counts		***(CFUs/ ml)***	NC	--	7.72E+03	--	--	--	--	--
Alkalinity, Total (as CaCO3)		mg/L	NC	--	169	--	--	--	--	--
Ammonia		mg/L	2	--	7.5	--	--	--	--	--
Biochemical Oxygen Demand (BOD)		mg/L	NC	--	12	--	--	--	--	--
Chemical Oxygen Demand (COD)		mg/L	NC	--	42	--	--	--	--	--
Nitrate (as N)		mg/L	10	--	0.10 U	--	--	--	--	--
Nitrite (as N)		mg/L	1	--	0.10 U	--	--	--	--	--
Orthophosphate		mg/L	NC	--	0.1	--	--	--	--	--
Sulfate		mg/L	250	--	9.7	--	--	--	--	--
Sulfide		mg/L	NC	--	3.5	--	--	--	--	--
Total Organic Carbon (TOC)		mg/L	NC	--	11	--	--	--	--	--

Notes:

- Not analyzed.
J - Estimated.
U - Not detected.
UJ - Not detected, estimated reporting limit.

TABLE 1

ANALYTICAL RESULTS SUMMARY
MNA SEMIANNUAL SAMPLING
GENERAL MOTORS CORPORATION
TONAWANDA, NEW YORK
MAY 2009

	Location ID:	*MW-11*	*MW-12*
	Sample Name:	*WG-30264-052009-008*	*WG-30264-052009-006*
	Sample Date:	*5/20/2009*	*5/20/2009*
Parameters	***Units***		
Volatile Organic Compounds			
1,1,1-Trichloroethane	µg/L	**610**	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	6.7 U	1.0 U
1,1,2-Trichloroethane	µg/L	6.7 U	1.0 U
1,1-Dichloroethane	µg/L	**2100**	**59**
1,1-Dichloroethene	µg/L	**1400**	0.21 J
1,2-Dichloroethane	µg/L	**10**	1.0 U
1,2-Dichloroethene (total)	µg/L	**100**	2.0 U
1,2-Dichloropropane	µg/L	6.7 U	1.0 U
1,4-Dioxane	µg/L	250 J	59
2-Butanone (Methyl Ethyl Ketone)	µg/L	67 U	10 U
2-Hexanone	µg/L	67 U	10 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	67 U	10 U
Acetone	µg/L	67 U	10 U
Benzene	µg/L	6.7 U	1.0 U
Bromodichloromethane	µg/L	6.7 U	1.0 U
Bromoform	µg/L	6.7 U	1.0 U
Bromomethane (Methyl Bromide)	µg/L	6.7 UJ	1.0 UJ
Carbon disulfide	µg/L	6.7 U	1.0 U
Carbon tetrachloride	µg/L	6.7 U	1.0 U
Chlorobenzene	µg/L	6.7 U	1.0 U
Chloroethane	µg/L	20 J	1.0 UJ
Chloroform (Trichloromethane)	µg/L	6.7 U	1.0 U
Chloromethane (Methyl Chloride)	µg/L	6.7 U	1.0 U
cis-1,3-Dichloropropene	µg/L	6.7 U	1.0 U
Dibromochloromethane	µg/L	6.7 U	1.0 U
Ethylbenzene	µg/L	6.7 U	1.0 U
Methylene chloride	µg/L	6.7 U	1.0 U
Styrene	µg/L	6.7 U	1.0 U
Tetrachloroethene	µg/L	6.7 U	1.0 U
Toluene	µg/L	6.7 U	1.0 U
trans-1,3-Dichloropropene	µg/L	6.7 U	1.0 U
Trichloroethene	µg/L	**13**	1.0 U
Vinyl chloride	µg/L	**27**	0.23 J
Xylene (total)	µg/L	13 U	2.0 U
Metals			
Iron	µg/L	**639**	100 U
Manganese	µg/L	240	33.6
Metals (Dissolved)			
Iron (Dissolved)	µg/L	**466**	100 U
Manganese (Dissolved)	µg/L	251	37.4

TABLE 1

ANALYTICAL RESULTS SUMMARY
MNA SEMIANNUAL SAMPLING
GENERAL MOTORS CORPORATION
TONAWANDA, NEW YORK
MAY 2009

	Location ID:	*MW-11*	*MW-12*
	Sample Name:	*WG-30264-052009-008*	*WG-30264-052009-006*
	Sample Date:	*5/20/2009*	*5/20/2009*
Parameters	*Units*		
Dissolved Gases			
Ethane	µg/L	4.2	0.58
Methane	µg/L	970	10
Field Parameters			
Conductivity	mS/cm	11.08	5.37
Dissolved Oxygen	ug/L	0.33	0.76
Oxidation Reduction Potential	millivolts	-35	98
pH	pH units	7.24	7.56
Temperature, Field	Deg C	17.11	15.86
Turbidity	NTU	3.71	1.86
Wet Chemistry			
Total Aerobic Microbial Population Counts	***(CFUs/ml)***	2.98E+03	4.50E+01
Aerobic 1,1,1-TCA Specific Microbial Counts	***(CFUs/ml)***	9.95E+02	1.25E+02
Total Anaerobic Microbial Population Counts	***(CFUs/ ml)***	3.15E+02	2.15E+02
Anaerobic 1,1,1-TCA Specific Microbial Counts	***(CFUs/ ml)***	1.80E+02	3.50E+01
Alkalinity, Total (as CaCO3)	mg/L	404	452
Ammonia	mg/L	2.0 U	3.1
Biochemical Oxygen Demand (BOD)	mg/L	2 U	2 U
Chemical Oxygen Demand (COD)	mg/L	150	78
Nitrate (as N)	mg/L	0.10 U	0.10 U
Nitrite (as N)	mg/L	2.0 U	2.0 U
Orthophosphate	mg/L	0.1 U	0.1 U
Sulfate	mg/L	1690	1050
Sulfide	mg/L	1.4	0.60 J
Total Organic Carbon (TOC)	mg/L	6	7

Notes:

- Not analyzed.
J - Estimated.
U - Not detected.
UJ - Not detected, estimated reporting limit.