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REPORT

Resource Conservation and Recovery Act Facility Investigation Phase I Report

Volume IV of IV

General Motors Corporation
NAO Flint Operations Site
Flint, Michigan

June 28, 2002

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BLASLAND, BOUCK & LEE, INC.
engineers & scientists

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Volume IV

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Appendix G

Analytical Data Review and Validation Report Summaries

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TIER II
DATA VALIDATION REPORT

SDG# 3006059

VOLATILE, SEMIVOLATILE,
AND INORGANIC ANALYSES

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Summary

The following is an assessment of data package 3006059 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-36-05(0.8-02)	3006059001	Soil	12/18/00	x	x		x	
RFI-36-05(08-10)	3006059002	Soil	12/18/00	x	x		x	
RFI-36-05(16-18)	3006059003	Soil	12/18/00	x	x		x	
RFI-36-04(0.6-02)	3006059004	Soil	12/19/00	x	x		x	
RFI-36-04(08-10)	3006059005	Soil	12/19/00	x	x		x	
RFI-36-04(18-20)	3006059006	Soil	12/19/00	x	x		x	
RFI-36-06(0.7-02)	3006059007	Soil	12/19/00	x	x		x	
RFI-36-06(06-08)	3006059008	Soil	12/19/00	x	x		x	
RFI-36-06(16-17)	3006059009	Soil	12/19/00	x	x		x	
RFI-36-DUP1[2]	3006059010	Soil	12/19/00	x	x		x	
RFI-36-16(0.9-02)	3006059011	Soil	12/19/00	x	x		x	
RFI-36-16(08-10)	3006059012	Soil	12/19/00	x	x		x	
RFI-36-16(18-20)[1]	3006059013	Soil	12/19/00	x	x		x	
RFI-RB-1	3006059014	Water	12/19/00	x	x		x	
RFI-TB-1	3006059015	Water	12/19/00	x				

1 MS/MSD/DUP analysis performed on sample
2 Duplicate analysis performed on sample RFI-36-04(18-20)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above the acceptable limit for Bromomethane and Methylene chloride. Associated samples RFI-36-05(0.8-02), RFI-36-05(08-10), RFI-36-05(16-18), RFI-36-04(0.6-02), RFI-36-04(08-10) and RFI-36-04(18-20) have been qualified as estimated based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Tetrachloroethene. Associated samples RFI-36-06(0.7-02), RFI-36-DUP1, RFI-36-16(0.9-02), RFI-36-16(08-10) and RFI-36-16(18-20) have been qualified as estimated based on the deviation.

The continuing calibration %D was above the acceptable limit due to an increase in response by Acetone. Associated sample RFI-36-06(0.7-02) has been qualified as estimated based on the deviation.

The MS/MSD %R were below the acceptable limit for 1,1-Dichloroethylene. Associated sample RFI-36-16(18-20) has been qualified as estimated based on the deviation.

Acetone was detected in the method blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated sample RFI-36-04(08-10) has been qualified as estimated for all compounds associated with Perylene-d12.

The initial calibration %RSD was above the acceptable limit for 4-Chloroaniline. Data have been qualified as estimated for the compound.

The initial calibration %RSD was above the acceptable limit for 3-Nitroaniline and 3,3-Dichlorobenzidine. Associated samples RFI-36-05(0.8-02), RFI-36-05(08-10), RFI-36-05(16-18), RFI-36-04(0.6-02), RFI-36-04(08-10), and RFI-36-04(18-20) have been qualified as estimated for these compounds.

The continuing calibration %D was above the acceptable limit due to a decrease in response by bis(2-Chloroethoxy)methane and Hexachlorocyclopentadiene. Soil sample results have been qualified as

estimated for these compounds.

The continuing calibration %D was above the acceptable limit due to a decrease in response by bis(2-Chloroethoxy)methane; associated sample RFI-RB-1; a decrease in response by 4-Chlorophenyl phenyl ether, N-Nitrosodi-n-propylamine, and 4-Bromophenyl phenyl ether; associated samples RFI-36-05(0.8-02), RFI-36-05(08-10), RFI-36-05(16-18), RFI-36-04(08-10), and RFI-36-04(18-20); a decrease in response by Dimethyl phthalate, 4-Chlorophenyl phenyl ether, N-Nitrosodi-n-propylamine, and 3-Nitroaniline; associated samples RFI-36-06(06-08), RFI-36-DUP1, RFI-36-16(08-10), and RFI-36-16(18-20); a decrease in response by Indeno(1,2,3-cd)pyrene associated samples RFI-36-06(0.7-2.7), RFI-36-06(16-17), and RFI-36-16(0.9-02). Sample results have been qualified as estimated based on these deviations.

The MS/MSD %R were below the acceptable limit for 2,4-Dinitrophenol. Non-detected sample results for soil samples have been qualified as rejected for this compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	January 25, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	October 1, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3006080

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3006080 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-36-15 (0.8-2)	300608001	Soil	12/20/00	X	X		X	
RFI-36-15 (8-10)	300608002	Soil	12/20/00	X	X		X	X
RFI-36-15 (14-16)[1]	300608003	Soil	12/20/00	X	X		X	X
RFI-36-12 (0.8-2)	300608004	Soil	12/20/00	X	X		X	X
RFI-36-12 (8-10)	300608005	Soil	12/20/00	X	X		X	X
RFI-36-3 (0.8-2)	300608006	Soil	12/2000	X	X		X	X
RFI-36-3 (8-10)	300608007	Soil	12/20/00	X	X		X	X
RFI-36-3 (14-16)	300608008	Soil	12/20/00	X	X		X	X
RFI-36-7 (0.8-2)	300608009	Soil	12/20/00	X	X		X	X
RFI-36-7 (8-10)	300608010	Soil	12/20/00	X	X		X	X
RFI-36-7 (12-14)	300608011	Soil	12/20/00	X	X		X	X
RFI-36-7 (12-14) DL		Soil	12/20/00	X	X		X	X
RFI-36-RB-2	300608012	Water	12/20/00	X	X		X	X
RFI-TB-2	300608013	Water	12/20/00	X	X		X	X
RFI-36-11 (0.8-2)	300608014	Soil	12/21/00	X	X		X	X
RFI-36-11 (8-10)	300608015	Soil	12/21/00	X	X		X	X
RFI -36-11 (10-12)	300608016	Soil	12/21/00	X	X		X	X
RFI-36-Dup 2	300608017	Soil	12/21/00	X	X		X	X
RFI-36-15 Oil	300608018	Oil	12/21/00	X	X		X	X
RFI-36-16 Oil	300608019	Oil	12/21/00	X	X		X	X

[1] MS/MSD/DUP analysis performed on sample.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The %D for Acetone, MIBK, Carbon tetrachloride, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, Tetrachloroethene, and Bromoform were outside acceptable limits in the continuing calibration standard. Data for the listed compounds have been qualified as estimated in sample RFI-36-15 (14-16) based on the deivations.

The %D for cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, styrene, and 2-Hexanone were outside acceptable limits in the continuing calibration standard. Data for the listed compounds have been qualified as estimated in samples RFI 36-RB-2 and RFI-TB-2 based on the deviations.

The initial calibration %RSD for Bromomethane was outside acceptable limits. Data for the listed compound has been qualified as estimated in sample RFI-36-15 Oil and RFI-36-16 Oil based on this deviation.

The %D for Chloroethane, Acetone, MIBK, MEK, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, 2-Hexanone, and Bromoform were outside acceptable limits in the continuing calibration standard. Data for the listed compounds have been qualified as estimated in samples RFI-36-15 and RFI-36-16.

The laboratory control samples analyzed on 12/23/00 exhibited high % recovery for Acetone, MEK, cis-1,3-Dichloropropene, and MIBK. None of the data was qualified due to this deviation.

The matrix spike RPD Tetrachloroethene was outside acceptable limits in sample RFI-36-15 (14-16). Tetrachloroethene was not detected in the sample therefore, the data was not qualified.

The concentration which the all volatile tunes were analyzed (250 ng) was not method compliant. None of the data was qualified due to this deviation.

Acetone was detected in the rinse blank. Sample results less than the blank action level calculated from the blank background contamination were qualified as non-detected.

All "D" and "DM" lab qualifiers that did not apply to the sample results were removed.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)		X	
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD for 4-Chloroaniline, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene were outside acceptable limits. Data for the listed compounds have been qualified as estimated in samples RFI-36-12 (0.8-2), RFI-36-12 (8-10), RFI-36-3 (0.8-2), RFI-36-3 (8-10), RFI-36-3 (14-16), RFI-36-7 (0.8-2), RFI-36-7 (8-10), RFI-36-7 (12-14), RFI-36-15 (0.8-2), RFI-36-15 (8-10), RFI-36-15 (14-16), RFI-36-7 (0.8-2), RFI-36-11 (0.8-2), and RFI-36-11 (8-10) based on this deviation.

The %D for N-Nitrosodi-n-propylamine, Bis(2-chloroethoxy)methane, 4-Chloroaniline, 2,4-Dinitrophenol, 4-Nitrophenol, Butylbenzylphthalate, 3,3'-Dichlorobenzidine, and BEHP were outside of acceptable limits in the continuing calibration standard. Data for the listed compounds have been qualified as estimated in samples RFI-36-12 (0.8-2), RFI-36-12 (8-10), RFI-36-3 (0.8-2), RFI-36-3 (8-10), RFI-36-3 (14-16), RFI-36-7 (0.8-2), RFI-36-7 (8-10), and RFI-36-7 (12-14) based on this deviation.

The %D for Bis(2-chloroethoxy)methane, 4-Chloroaniline, 4-Nitrophenol, 3,3'-Dichlorobenzidine, and Benzo(g,h,i)perylene were outside of acceptable limits in the continuing calibration standard. Data for the listed compounds have been qualified as estimated in samples RFI-36-15 (0.8-2), RFI-36-15 (8-

10), RFI-36-15 (14-16), RFI-36-11 (0.8-2), RFI-36-16 Oil, and RFI-36-11 (8-10) based on this deviation.

The %D for N-Nitrosodi-n-propylamine, Bis(2-chloroethoxy)methane, 4-Chloroaniline, Hexachlorocyclopentadiene, Benzidine, and 3,3'-Dichlorobenzidine were outside of acceptable limits in the continuing calibration standard. Data for the listed compounds have been qualified as estimated in samples RFI 36-RB-2, RFI-36-11 (10-12), RFI-36-Dup 2, and RFI-36-15 Oil based on this deviation.

The laboratory control sample (LCS) and laboratory control duplicate sample (LCSD) associated with extraction batch 2735 exhibited % recoveries which were outside of acceptable limits for Bis(2-chloroisopropyl)ether and Bis(2-Chloroethoxy)methane. Data for the listed compounds have been qualified in samples RFI-36-15 (0.8-2), RFI-36-15 (8-10), RFI-36-15 (14-16), RFI-36-12 (0.8-2), RFI-36-12 (8-10), RFI-36-3 (0.8-2), RFI-36-3 (8-10), RFI-36-3 (14-16), RFI-36-7 (0.8-2), RFI-36-7 (8-10), RFI-36-7 (12-14), RFI-36-11 (0.8-2), RFI-36-11 (8-10), RFI-36-11 (10-12), and RFI-36-Dup 2.

The LCS relative % difference (RPD) associated with extraction batch 2735 exhibited many compounds outside of acceptable limits. All non-detected sample results associated with the LCS (RPD) deviation were not qualified.

The LCS and LCSD sample associated with extraction batch 2735 exhibited % recoveries which were outside of acceptable limits for Hexachloroethane and Hexachlorobutadiene. Data for the listed compounds have been qualified in sample RFI 36-RB-2.

The MS/MSD was performed on sample RFI-36-15 (14-16). The MS and/or MSD compounds which exhibited low recoveries but were greater than 10 % for the following compounds resulted in the qualification of the data as an estimated 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dichlorophenol, 2,6-Dinitrotoluene, Bis(2-chloroethoxyl)methane, Bis(2-chloroethyl)ether, bis(2-chloroisopropyl)ether, and Nitrobenzne. The MS and/or MSD compounds which exhibited recoveries less than 10 % for the following compounds resulted in the qualification of the data as rejected 2-nitroaniline, 3-nitroaniline.

Although review of the spectra of compounds is not part of this review process since the spectra for 2-Hexanone was missing from the datapackage once it was received from the lab it was reviewed and determined that in samples RFI-36-15 Oil and RFI-36-16 OIL the compound 2-hexanone should have been reported as non-detected.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS and MSD % recovery for arsenic and barium were outside the laboratory's acceptable. Data for the listed analytes have been qualified as estimated in all soil samples within this SDG based on the deviation.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)			X
	Surrogate (% Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

No matrix spike/laboratory spike duplicate analysis was performed on the samples in this data set.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	April 14, 2002
Validation performed by:	(Daniel Beacham)
Date of Validation:	November 29, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3010379

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3010379 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-05-14(08-10)[1]	3010379001	Soil	1/22/01	x	x	x	x	
RFI-05-13(08-10)	3010379002	Soil	1/22/01	x	x	x	x	
RFI-05-11(08-10)	3010379003	Soil	1/23/01	x	x	x	x	
RFI-05-02(08-10)	3010379004	Soil	1/23/01	x	x		x	
RFI-05-05(08-10)	3010379005	Soil	1/23/01	x	x	x	x	
RFI-05-10(08-10)	3010379006	Soil	1/23/01	x	x	x	x	
RFI-05-10(10-12)	3013079007	Soil	1/23/01	x	x	x	x	
RFI-05-05(10-12)	3010379008	Soil	1/23/01	x	x	x	x	
RFI-05-02(10-12)	3010379009	Soil	1/23/01	x	x		x	
RFI-05-11(10-12)	3010379010	Soil	1/23/01	x	x	x	x	
RFI-05-13(10-12)	3010379011	Soil	1/22/01	x	x	x	x	
RFI-05-14(10-12)	3010379012	Soil	1/22/01	x	x	x	x	
RFI-DUP[2]	3010379013	Soil	1/23/01	x	x	x	x	

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample RFI-05-10(10-12)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Bromomethane. Sample results have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Bromomethane. Sample results have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated samples RFI-05-10(08-10) and RFI-DUP have been qualified as estimated for all compounds associated with Perylene-d12. Data from the confirmation run was used for sample RFI-DUP.

The internal standard response was below the acceptable limit for Perylene-d12, Phenanthrene-d10, and Chrysene-d10. Associated sample RFI-05-14(10-12) has been qualified as estimated for all compounds associated with the listed internal standards. Data from the confirmation run was used for sample RFI-05-14(10-12).

The initial calibration %RSD was above the acceptable limit for Hexachlorocyclopentadiene and 2,4-Dinitrotoluene; associated samples RFI-05-14(08-10), RFI-05-13(08-10), RFI-05-11(08-10), RFI-05-02(08-10), RFI-05-05(08-10), RFI-05-10(08-10), RFI-05-10(10-12), RFI-05-05(10-12), RFI-05-02(10-12), RFI-05-11(10-12), and RFI-05-13(10-12); Pentachlorophenol, associated sample RFI-05-10(08-10); 4-Chloroaniline, and Hexachlorocyclopentadiene; associated samples RFI-05-14(10-12) and RFI-

DUP. Data have been qualified as estimated for the compounds, based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by bis(2-Chloroethoxy)methane, Hexachlorocyclopentadiene, 4-Chloroaniline, and 3,3-Dichlorobenzidine; associated samples RFI-05-14(08-10), RFI-05-13(08-10), RFI-05-11(08-10) and RFI-05-02(08-10); a decrease in response by bis(2-Chloroethoxy)methane, 3,3-Dichlorobenzidine, and 4-Chloroaniline;, associated samples RFI-05-05(08-10), RFI-05-10(08-10), RFI-05-10(10-12), RFI-05-05(10-12), RFI-05-02(10-12), RFI-05-11(10-12) and RFI-05-13(10-12); a decrease in response by bis(2-Chloroethoxy)methane, Dimethyl phthalate, 4-Chlorophenyl phenyl ether, 4-Chloroaniline, 3-Nitroaniline, and 3,3-Dichlorobenzidine; associated samples RFI-05-14(10-12) and RFI-DUP. Data have been qualified as estimated for the compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R were above the acceptable limits for Arsenic, Barium, Cadmium, Lead and Silver. Detected sample results for these analytes have been qualified as estimated.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	February 26, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 10, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3010397

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3010397 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-05-04(08-10)	3010397001	Soil	1/24/01	x	x		x	
RFI-81-04(08-10)	3010397002	Soil	1/25/01	x	x		x	
RFI-81-04(08-10)	3010397003	Soil	1/24/01	x	x		x	
RFI-05-07(08-10)	3010397004	Soil	1/24/01	x	x		x	
RFI-05-12(08-10)	3010397005	Soil	1/24/01	x	x	x	x	
RFI-05-12(10-12)	3010397006	Soil	1/24/01	x	x	x	x	

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Bromomethane. Sample results have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated sample RFI-81-04(08-10) has been qualified as estimated for all compounds associated with Perylene-d12.

The initial calibration %RSD was above the acceptable limit for Hexachlorocyclopentadiene and 2,4-Dinitrotoluene. Sample results have been qualified as estimated based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 4-Chloroaniline, and bis(2-Chloroethoxy)methane; associated samples RFI-05-04(08-10), RFI-81-04(08-10), RFI-81-04(08-10), RFI-05-07(08-10) and RFI-05-12(08-10); a decrease in response by Hexachlorocyclopentadiene, bis(2-Chloroethoxy)methane, and 4-Chlorophenylphenylether, associated sample RFI-05-12(10-12); a decrease in response by 3,3-Dichlorobenzidine, Hexachlorocyclopentadiene and 4-Bromophenyl phenyl ether, associated sample RFI-81-04(08-10). Data have been qualified as estimated for the compounds, based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R were above the acceptable limit for Barium and Lead. Sample results have been qualified as estimated for the analytes based on the deviations.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	February 26, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 10, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3010423

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3010423 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-05-14(00-02)	3010423001	Soil	1/26/01	x	x	x	x	
RFI-05-13(00-02)	3010423002	Soil	1/26/01	x	x	x	x	
RFI-05-12(00-02)	3010423003	Soil	1/26/01	x	x	x	x	
RFI-05-11(00-02)	3010423004	Soil	1/26/01	x	x	x	x	
RFI-05-10(00-02)	3010423005	Soil	1/26/01	x	x	x	x	
RFI-05-05(00-02)	3010423006	Soil	1/26/01	x	x		x	
RFI-05-02(00-02)	3010423007	Soil	1/26/01	x	x	x	x	
RFI-05-04(00-02)[1]	3010423008	Soil	1/26/01	x	x		x	
RFI-05-07(00-02)	3010423009	Soil	1/26/01	x	x		x	
RFI-DUP-3(00-02)[2]	3010423011	Soil	1/26/01	x	x		x	

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample RFI-05-02(00-02)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Bromomethane. Sample results have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to an increase in response by Acetone. Associated samples RFI-05-04(00-02) and RFI-05-07(00-02) have been qualified as estimated for the compound.

The field duplicate RPD between sample RFI-05-02(00-02) and duplicate RFI-DUP-03(00-02) was above the acceptable limit for m&p-Xylene. Positive data in the associated samples have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12 and Chrysene-d12. Associated samples RFI-05-14(00-02), RFI-05-13(00-02), RFI-05-12(00-02) and RFI-05-10(00-02) have been qualified as estimated for compounds associated with Perylene-d12. Associated samples RFI-05-12(00-02) and RFI-05-10(00-02) have been qualified as estimated for compounds associated with Chrysene-d12.

The initial calibration %RSD was above the acceptable limit for Hexachlorocyclopentadiene and 2,4-Dinitrotoluene; associated samples RFI-05-14(00-02) and RFI-05-13(00-02); 4-Chloroaniline and Hexachlorocyclopentadiene; associated samples RFI-05-12(00-02), RFI-05-11(00-02), RFI-05-10(00-02), RFI-05-05(00-02), RFI-05-02(00-02), RFI-05-04(00-02), RFI-05-07(00-02) and RFI-DUP-3(00-02). Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the 20% acceptable limit due to a decrease in response by bis(2-Chloroethoxy)methane, bis(2-Chloroethyl)ether, Dimethyl phthalate, and 4-Bromophenyl phenyl ethe;, associated samples RFI-05-14(00-02) and RFI-05-13(00-02); a decrease in response by bis(2-

Chloroethoxy)methane, associated samples RFI-05-12(00-02), RFI-05-11(00-02), RFI-05-10(00-02), RFI-05-05(00-02), and RFI-05-02(00-02); a decrease in response by Hexachlorocyclopentadiene and bis(2-Chloroethoxy)methane, associated samples RFI-05-04(00-02), RFI-05-07(00-02) and RFI-DUP-3(00-02). Data have been qualified as estimated for the compounds based on the deviations.

The MS/MSD %R were below the acceptable limit for 1,4-Dichlorobenzene and N-Nitrosodi-n-propylamine. Associated sample RFI-05-04(00-02) has been qualified as estimated based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD % recoveries were above the acceptable limit for Barium and Lead. Sample results have been qualified as estimated for these analytes.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	February 26, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 12, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3010453

VOLATILE, SEMIVOLATILE,
AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3010453 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-83/84-4(0-2)	3010453001	Soil	1/29/01	x	x		x	
RFI-83/84-4(8-10)	3010453002	Soil	1/29/01	x	x		x	
RFI-83/84-4(12-14)	3010453003	Soil	1/29/01	x	x		x	
RFI-83/84-10(0-2)	3010453004	Soil	1/29/01	x	x		x	
RFI-83/84-10(8-10)	3010453005	Soil	1/29/01	x	x		x	
RFI-83/84-10(10-12)	3010453006	Soil	1/29/01	x	x		x	
RFI-83/84-3(0-2)	3010453007	Soil	1/29/01	x	x		x	
RFI-83/84-3(8-10)[1]	3010453008	Soil	1/29/01	x	x		x	
RFI-83/84-3(10-12)	3010453009	Soil	1/29/01	x	x		x	
RFI-DUP-5[2]	3010453010	Soil	1/29/01	x	x		x	
RFI-DUP-4[3]	3010453011	Soil	1/29/01	x	x		x	
RFI-83/84-10(8-10)RR	3010453012	Soil	1/29/01		x			
RFI-DUP-5-RR	3010453013	Soil	1/29/01		x			

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample RFI-83/84-03(10-12)
3 Duplicate analysis performed on sample RFI-83/84-10(10-12)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Bromomethane. Sample results have been qualified as estimated for this compound.

The continuing calibration %D was above the acceptable limit for 1,1,2,2-Tetrachloroethane. Associated samples RFI-83/84-4(0-2), RFI-83/84-4(8-10), and RFI-DUP-4 have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Chrysene-d12 and Perylene-d12. Associated samples RFI-83/84-4(8-10) and RFI-83/84-3(8-10) have been qualified as estimated for all compounds associated with Chrysene-d12 and Perylene-d12.

The internal standard response was below the acceptable limit for Perylene-d12. Associated samples RFI-83/84-4(0-2) and RFI-83/84-10(0-2) have been qualified as estimated for compounds associated with Perylene-d12. Data from the confirmation run has been used for sample RFI-83/84-4(0-2).

Data from the dilution runs were used for sample RFI-DUP-5.

The initial calibration %RSD was above the acceptable limit for 4-Chloroaniline and Hexachlorocyclopentadiene; associated samples RFI-83/84-4(8-10), RFI-83/84-4(12-14), RFI-83/84-10(10-12), RFI-83/84-3(0-2) and RFI-DUP-4; 4-Chloroaniline, 2,4-Dinitrophenol and 4,6-Dinitro-2-methylphenol; associated samples RFI-83/84-4(0-2), RFI-83/84-10(0-2), RFI-83/84-3(8-10), RFI-83/84-3(10-12), RFI-DUP-5, RFI-DUP-5-RR and RFI-83/84-10(8-10)RR; Phenanthrene; associated

sample RFI-DUP-5-RR. Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by bis(2-Chloroethoxy)methane, 3-Nitroaniline, 3,3-Dichlorobenzidine, 4-Chloroaniline, Dimethyl phthalate and 4-Chlorophenyl phenyl ether; associated samples RFI-83/84-4(8-10), RFI-83/84-4(12-14), RFI-83/84-10(10-12), RFI-83/84-3(0-2), RFI-83/84-3(8-10), RFI-83/84-3(10-12) and RFI-DUP-4; a decrease in response by N-Nitrosodi-n-propylamine, Diethyl phthalate, 4-Bromophenyl phenyl ether and Benzo(b)fluoranthene; associated samples RFI-83/84-3(8-10) and RFI-83/84-3(10-12); a decrease in response by 4-Chloroaniline, Hexachlorocyclopentadiene, Benzo(b)fluoranthene, bis(2-Chloroethoxy)methane, Dimethyl phthalate, 4-Chlorophenyl phenyl ether and 4-Bromophenyl phenyl ether; associated samples RFI-83/84-4(0-2), RFI-83/84-10(0-2), RFI-DUP-5-RR and RFI-83/84-10(8-10); a decrease in response by 3-Nitroaniline and Diethyl phthalate, associated sample RFI-83/84-10(0-2). Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Benzo(g,h,i)perylene and Dibenzo(a,h)anthracene; associated samples RFI-83/84-4(0-2) and RFI-83/84-10(0-2) ; an increase in response by Indeno(1,2,3-cd)pyrene, associated sample RFI-83/84-4(0-2). Data have been qualified as estimated for the compounds based on the deviations.

The field duplicate RPD was above the acceptable limit between sample RFI-83/84-3(10-12) and duplicate RFI-DUP-5-RR for Fluorene and Phenanthrene. Data have been qualified as estimated for the compounds in the associated samples.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R were above the acceptable limits for Arsenic and Barium. Sample results have been qualified as estimated for the analytes based on the deviations.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	March 5, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 13, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011294

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3011294 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI 36-27 (0-2)[2]	3011294001	Soil	3/26/01	X	X	X	X	X
RFI 36-24 (6-8)	3011294002	Soil	3/26/01	X	X	X	X	X
RFI 36-24 (8-10)[3]	3011294003	Soil	3/26/01	X	X	X	X	X
RFI 36-27 (8-10)	3011294004	Soil	3/26/01	X	X	X	X	X
RFI 36-26 (0-2)	3011294005	Soil	3/27/01	X	X	X	X	X
RFI 36-27 (14-16)	3011294006	Soil	3/26/01	X	X	X	X	X
RFI 36-27 (14-16)DL	3011294022	Soil	3/26/01		X			
RFI Dup-02[4]	3011294007	Soil	3/26/01	X	X	X	X	X
RFI 36-27 (12-14)	3011294008	Soil	3/26/01	X	X	X	X	X
RFI 36-27 (12-14)DL	3011294023	Soil	3/26/01		X			
RFI 36-24 (0-2)	3011294009	Soil	3/26/01	X	X	X	X	X
RFI 36-24 (10-12)	3011294010	Soil	3/26/01	X	X	X	X	X
RFI 36-25 (12-14)	3011294011	Soil	3/27/01	X	X	X	X	X
RFI 36-25 (8-12)	3011294012	Soil	3/27/01	X	X	X	X	X
RFI 36-26 (8-10)	3011294013	Soil	3/27/01	X	X	X	X	X
RFI 36-26 (10-12)	3011294014	Soil	3/27/01	X	X	X	X	X
RFI 36-26 (2-4)	3011294015	Soil	3/27/01	X	X	X	X	X
RFI 36-25 (0-2)	3011294016	Soil	3/27/01	X	X	X	X	X
RFI 36-22 (10-12)[1]	3011294017	Soil	3/27/01	X	X	X	X	X
RFI 36-35 (12-14)	3011294018	Soil	3/27/01	X	X	X	X	X
RFI 36-35 (8-10)	3011294019	Soil	3/27/01	X	X	X	X	X
RFI Dup-01[5]	3011294020	Soil	3/27/01	X	X	X	X	X
Methanol Blank	3011294021	Liquid	3/28/01	X				

1 MS/MSD analysis performed on sample (8260 and 8082 only)
2 MS/MSD analysis performed on sample (metals only)
3 MS/MSD analysis performed on sample (Cyanide only)
4 Field duplicate of sample 36-24 (10-12)
5 Field duplicate unidentifiable

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was greater than the acceptable limit for the following compounds: Bromomethane and Methyl acetate (affected samples: all soil samples in this SDG). The sample results have been qualified as estimated.

The continuing calibration %D was outside the acceptance limit due to a decrease in response by Bromomethane and Methyl Acetate; associated samples RFI 36-27 (0-2), RFI 36-24 (6-8), RFI 36-24 (08-10), RFI 36-27 (8-10), RFI 36-26 (0-2), RFI 36-27 (14-16), RFI Dup-02, RFI 36-27 (12-14), RFI-36-24 (10-12), RFI-36-25 (12-14), RFI-36-25 (8-10), RFI-36-26 (8-10), and RFI-36-26 (10-12); a decrease in response by Dichlorodfiflouromethane, Bromomethane, 1,1,2-Trichloro-1,2,2-Trifluoroethane, Acetone and Methyl Acetate; associated samples RFI- 36-24 (0-2), RFI 36-26 (2-4), RFI-36-25 (0-2), RFI-36-22 (10-12), RFI-36-35 (12-14), RFI-36-35 (8-10), and RFI-Dup 1). Data have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The response was below acceptance limits for the following internal standards: Perylene-d12, associated samples RFI-36-24 (0-2), RFI-36-25 (0-2) (confirmation analysis reported), and RFI-Dup 2; Chrysene-d12 and Perylene-d12, associated samples RFI-36-24 (8-10), RFI-36-26 (0-2), RFI-Dup-02 (confirmation analysis reported), RFI-36-27 (12-14), RFI-36-24 (10-12), RFI-36-25 (8-10); Acenaphthene-d10, Phenanthrene-d10, Chrysene-d10 and Perylene-d12; associated samples RFI-36-27 (14-16)). The sample results have been qualified as estimated for all compounds associated with the deviant internal standards.

The initial calibration %RSD was greater than the acceptable limit for 4-Chloroanaline. Soil samples have been qualified as estimated for the compound.

The continuing calibration %D was outside the acceptance limit due to an increase in response by Benzo(g,h,i)perylene. Associated sample RFI-36-25 (8-10) has been qualified as estimated for the compound.

The continuing calibration %D was above the acceptance limit due to a decrease in by 4-chloroanaline and Hexachlorocyclopentadiene, associated samples RFI-36-26 (2-4), RFI-36-25 (0-2), RFI-36-22 (10-12), RFI-36-35 (12-14), RFI-36-35 (8-10), and RFI-Dup 1; a decrease in response by 4-Chloroanaline associated sample RFI-36-27 (14-16). Data have been qualified as estimated for the compounds based on the deviations.

The field duplicate RPD for Phenanthrene was outside control limits between sample 36-24 (10-12) and duplicate RFI-Dup 2. Soil samples have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Recovery for one surrogate was less than 10% in samples RFI-36-26 (2-4) and RFI-36-25 (0-2). The sample results have been qualified as rejected based on the deviation.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was below acceptance limits for Barium. Soil samples have been qualified as estimated for the analyte based on the deviation.

The continuing calibration %D was below control limits for Antimony and Barium. Associated samples RFI-36-24 (10-12), RFI-36-25 (12-14), RFI-36-25 (8-10), RFI-36-26 (8-10), RFI-36-26 (10-12), RFI-36-26 (2-4), RFI-36-25 (0-2), RFI-36-22 (10-12), RFI-36-35 (12-14), RFI-36-35 (8-10), and RFI-Dup 1 have been qualified as estimated for the analytes.

The MS/MSD %Rs were below control limits for Antimony, Copper, and Mercury. Soil samples have been qualified as estimated for the analytes based on the deviations.

The MS/MSD RPD was above control limits for Barium. Detected soil sample results have been qualified as estimated for the analyte.

The laboratory duplicate RPD was above control limits for Barium, Lead, and Silver. Detected soil sample results have been qualified as estimated for the analytes.

The field duplicate RPD was outside control limits for Barium, Chromium, Copper, and Lead between sample 36-24 (10-12) and duplicate RFI-Dup 2. Detected soil sample results have been qualified as estimated for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	May 7, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	September 19, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011323

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3011323 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI Rinse Blank[1]	3011323001	Water	03/28/01	X	X	X	X	
Trip Blank	3011323002	Water	03/28/01	X				
36-23 (10-12)	3011323003	Soil	03/27/01	X	X	X	X	X
36-23 (0-2)	3011323004	Soil	03/27/01	X	X	X	X	X
36-22 (0-2)	3011323005	Soil	03/27/01	X	X	X	X	X
36-22 (10-12)[2]	3011323006	Soil	03/27/01	X	X	X	X	X
36-23 (8-10)[4]	3011323007	Soil	03/27/01	X	X	X	X	X
36-22 (8-10)	3011323008	Soil	03/27/01	X	X	X	X	X
36-35 (0-2)	3011323009	Soil	03/27/01	X	X	X	X	X
36-21 (8-10)[3]	3011323010	Soil	03/28/01	X	X	X	X	X
RFI-Dup 3[5]	3011323011	Soil	03/28/01	X	X	X	X	X
RFI-Dup 4	3011323012	Soil	03/28/01	X	X	X	X	X
36-30 (10-12)	3011323013	Soil	03/28/01	X	X	X	X	X
36-30 (10-12) DL	3011323024	Soil	03/28/01	X				
36-29 (10-12)	3011323014	Soil	03/28/01	X	X	X	X	X
36-29 (8-10)	3011323015	Soil	03/28/01	X	X	X	X	X
36-31 (8-10)	3011323016	Soil	03/28/01	X	X	X	X	X
36-30 (0-2)	3011323017	Soil	03/28/01	X	X	X	X	X
36-21 (12-14)	3011323018	Soil	03/28/01	X	X	X	X	X
36-21 (8-10)	3011323019	Soil	03/28/01					X
36-32 (16-18)	3011323020	Soil	03/28/01	X	X	X	X	X
36-30 (8-10)	3011323021	Soil	03/28/01	X	X	X	X	
36-30 (8-10) DL	3011323023	Soil	03/28/01	X				
VOC Meth Blank	3011323022	Soil	03/29/01	X				

1 MS/MSD analysis performed on sample (8260 and 8270 only)
2 MS/MSD analysis performed on sample (Cyanide, 8260 and 8270 only)
3 MS/MSD analysis performed on sample
4 MS/MSD analysis performed on sample (metals only)
5 Field duplicate performed on sample 36-29 (10-12)

Notes:
Sample RFI-Dup 5 reported in SDG-3011335 is the field duplicate of sample 36-32 (16-18).
Sample RFI-Dup 4 is the field duplicate of sample RFI-36-21 (06-08) reported in SDG-3011335.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Acetone and Chloroform were detected in the rinse blank. Detected samples results below the blank action level have been qualified as non-detected.

Samples 36-30 (10-12) and 36-30 (8-10) contained Ethylbenzene, O-Xylene, P&M-Xylene, Toluene, and Benzene(sample 36-30 (8-10) only) above the linear range. The original sample results for those compounds have been replaced with the sample results from the dilution analysis.

The initial calibration %RSD was greater than the acceptable limit for Bromomethane and Methyl acetate. Soil samples have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Dichlorodifluoromethane, Bromomethane, 1,1,2-Trichloro-1,2,2-Trifluoroethane, Acetone and Methyl Acetate; associated samples 36-23 (10-12), 36-22 (0-2), 36-22 (10-12), 36-23 (8-10), and 36-22 (8-10), 36-32 (16-18), 36-30 (8-10); a decrease in response by Dichlorodifluoromethane, Bromomethane, 1,1,2-Trichloro-1,2,2-Trifluoroethane, Acetone, Methyl Acetate, and 2-Hexanone; associated samples

36-23 (0-2), 36-35 (0-2), 36-21 (8-10), RFI-Dup 03, RFI-Dup 4, 36-30 (10-12), 36-29 (10-12), 36-29 (8-10), 36-31 (8-10), 36-30 (0-2), and 36-21 (12-14). Data have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The response was below acceptance limits for the following internal standards: Perylene-d12, associated samples 36-23 (10-12), 36-21 (8-10), and RFI-Dup 4); Perylene-d12 and Chrysene-d12 associated samples 36-23 (0-2), 36-22 (0-2), 36-30 (0-2), and 36-30 (8-10)); Perylene-d12, Chrysene-d12, and Phenanthrene-d10; associated samples RFI-Dup 3, 36-29 (10-12),and 36-21 (12-14). The sample results associated with the deviant internal standard have been qualified as estimated.

The initial calibration %RSD was greater than the acceptable limit for 4-Chloroanaline, Pentachlorophenol, and Benzo(g,h,i)perylene, associated samples 36-23 (10-12), 36-23 (0-2), 36-22 (0-2), 36-22 (10-12), 36-23 (8-10), 36-23 (9-10), 36-35 (0-2), 36-21 (8-10), RFI-Dup 3, and RFI-Dup 4); 4-Chloroanaline; associated samples 36-30 (10-12), 36-29 (10-12), 36-29 (8-10), 36-31 (8-10), 36-30 (0-2), 36-21 (12-14), 36-32 (16-18), and 36-30 (8-10). Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 4-

Chloroanaline. Soil samples have been qualified as estimated for the compounds based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3,3'-Dichlorobenzidiene. Associated samples (36-23 (10-12), 36-23 (0-2), 36-22 (0-2), 36-22 (10-12), 36-23 (8-10), 36-22 (8-10), 36-30 (10-12), 36-29 (10-12), 36-35 (0-2), 36-21 (8-10), RFI-Dup 3, RFI-Dup 4, and 36-21 (12-14) have been qualified as estimated for the compound.

The field duplicate RPD for 2-Methyl Naphthalene was outside control limits between sample 36-29 (10-12) and duplicate RFI-Dup 3. Soil samples have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS and/or MSD % recoveries were below control limits for Antimony, Copper, Mercury, and Zinc. Soil samples have been qualified as estimated for the analytes based on the deviations.

The MS/MSD RPD for Barium was above control limits. Detected soil sample results have been qualified as estimated for the analyte.

The laboratory duplicate RPD was above control limits for Barium, Lead, and Silver. Detected soil sample results have been qualified as estimated for the analytes.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	May 7, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	September 14, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011335

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3011335 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RF-36-32 (08-10)	3011335001	Soil	03/28/01	X	X	X	X	X
RF-36-32 (12-14)	3011335002	Soil	03/28/01	X	X	X	X	X
RF-36-33 (00-02)	3011335003	Soil	03/29/01	X	X	X	X	X
RF-36-28 (08-10)	3011335004	Soil	03/29/01	X	X	X	X	X
RF-36-33 (16-18)	3011335005	Soil	03/29/01	X	X	X	X	X
RF-36-33 (08-10)[1]	3011335006	Soil	03/29/01	X	X	X	X	X
RFI-DUP-06[4]	3011335007	Soil	03/29/01	X	X	X	X	X
RF-36-21 (10-12)	3011335008	Soil	03/28/01	X	X	X	X	X
RF-36-28 (14-16)	3011335009	Soil	03/29/01	X	X	X	X	X
RF-36-32 (00-02)	3011335010	Soil	03/28/01	X	X	X	X	X
RF-36-31 (10-12)	3011335011	Soil	03/28/01	X	X	X	X	X
RF-36-29 (00-02)	3011335012	Soil	03/28/01	X	X	X	X	X
RF-36-31 (00-02)	3011335013	Soil	03/28/01	X	X	X	X	X
RF-36-21 (06-08)	3011335014	Soil	03/28/01	X	X	X	X	X
RF-DUP-05	3011335015	Soil	03/28/01	X	X	X	X	X
RF-36-28 (00-02)	3011335016	Soil	03/28/01	X	X	X	X	X
RF-36-28 (10-12)	3011335017	Soil	03/29/01	X	X	X	X	X
RF-Drum 1[1]	3011335018	Soil	03/29/01	X	X	X	X	X
RF-Drum 2	3011335019	Soil	03/28/01	X	X	X	X	X
RF-Drum 3 / 4	3011335020	Soil	03/28/01	X	X	X	X	X
Methanol Blank	3011335021	Liquid	03/28/01	X				
RF-36-33 (00-02) DL	3011335022	Soil	03/29/01		X			
RF-36-31 (00-02) DL	3011335023	Soil	03/28/01		X			

[1] MS/MSD analysis performed on sample
[2] MS/MSD analysis performed on sample for 8270 only
[3] MS/MSD analysis performed on sample for Cyanide and Sulfide only
[4] Parent sample RFI-36-28 (08-10)

Notes:
Sample RFI-36-32 (16-18) in SDG 3011323 is the parent sample of RFI-Dup 05

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was greater than the acceptable limit for Bromomethane and Methyl Acetate; associated samples RFI-36-32 (08-10), RFI-36-32 (12-14), RFI-36-33 (00-02), RFI-36-28 (08-10), RFI-36-33 (16-18), RFI-36-33 (08-10), RFI-Dup 06, RFI-36-21 (10-12), RFI-36-26 (14-16), RFI-36-32 (00-02), RFI-36-31 (10-12), RFI-36-29 (00-02), RFI-36-31 (00-02), RFI-36-31 (00-02), RFI-36-21 (06-08), RFI-Dup-05, RFI-36-28 (00-02), RFI-36-28 (10-12), and Methanol Blank; 2-Butanone and 1,2-Dichloroethane; associated samples RFI-Drum 1, RFI-Drum 2, and RFI-Drum 3/4. Non-detected sample results have been qualified as estimated.

The continuing calibration %D was outside the acceptable limit due to a decrease in response by Dichlorodifluoromethane, Bromomethane, 1,1,2-Trichloro-1,2,2-Trifluoroethane, Acetone, and Methyl Acetate; associated samples RFI-36-32 (08-10), RFI-36-32 (12-14), RFI-36-33 (00-02), RFI-36-28 (08-10), RFI-36-33 (08-10), RFI-Dup 06, RFI-36-21 (10-12), and Methanol Blank; a decrease in response by Dichlorodifluoromethane, Bromomethane, 1,1,2-Trichloro-1,2,2-Trifluoroethane, Acetone, Methyl Acetate and 2-Hexanone; associated samples RFI-36-26 (14-16), RFI-36-32 (00-02), RFI-36-31 (10-12), RFI-36-29 (00-02), RFI-36-31 (00-02), RFI-36-31 (00-02), RFI-36-21 (06-08), RFI-Dup-05, RFI-

36-28 (00-02), RFI-36-28 (10-12); a decrease in response by Bromomethane, 1,1,2-Trichloro-1,2,2-Trifluoroethane and Methyl Acetate, associated sample RFI-38-33 (16-18). Data have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Responses for internal standards were below acceptable limits for Perylene-d12; associated samples RFI-36-32 (08-10), RFI-36-32 (12-14), RFI-36-32 (00-02), and RFI-36-31 (10-12); Chrysene-d12 and Perylene-d12, associated samples RFI-36-33 (00-02), RFI-36-21 (10-12), and RFI-36-31 (00-02) DL; Phenanthrene-d10, Chrysene-d12 and Perylene-d12; associated samples RFI-36-28 (08-10), RFI-36-33 (16-18), RFI-Dup 06), RFI-36-29 (00-02), and RFI-36-31(00-02). The samples were confirmed by re-analysis and the results have been qualified as estimated for compounds associated with the deviant internal standards.

Sample RFI-36-33 (00-02) contained Benzylbutylphthalate above the linear range and sample RFI-36-31 (00-02) contained Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)flouranthene, Chrysene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene and Pyrene above the linear range. The original sample results for those compounds have been replaced with the sample results from the dilution analysis.

The initial calibration %RSD was greater than the acceptable limit for the following compounds: Benzaldehyde, 4-Chloroanaline, 2-Methylnaphthalene, Biphenyl, Acenaphthene, Dibenzofuran, Phenanthrene, Anthracene, Fluoranthene, Fluorene, Chrysene, and Benzo(k)flouranthene; associated samples RFI-36-32 (08-10), RFI-36-32 (12-14), RFI-36-33 (00-02), RFI-36-28 (08-10), RFI-36-33 (16-18), RFI-36-33 (08-10), RFI-Dup-06, RFI-36-21 (10-12), RFI-36-28 (14-16), RFI-36-32 (00-02), RFI-36-31 (10-12), RFI-36-29 (00-02), RFI-36-31 (00-02), RFI-36-21 (06-08), RFI-Dup-05, RFI-36-28 (00-02), and RFI-36-28 (10-12). Sample results for those compounds have been qualified as estimated.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 4-Chloroanaline and 3-3'-Dichlorobenzidine. Associated samples RFI-36-32 (08-10), RFI-36-32 (12-14), RFI-36-33 (00-02), RFI-36-28 (08-10), RFI-36-33 (16-18), RFI-36-33 (08-10), RFI-Dup-06, RFI-36-21 (10-12), RFI-36-28 (14-16), RFI-36-32 (00-02), RFI-36-31 (10-12), RFI-36-29 (00-02), RFI-36-31 (00-02), RFI-36-21 (06-08), RFI-Dup-05, RFI-36-28 (00-02), and RFI-36-28 (10-12) have been qualified as estimated for the compounds.

Non detected sample results were not qualified for a continuing calibration %D due to an increase in response for the following compounds: Benzaldehyde, 2,4-Dinitrophenol and 4,6-Dinitro-2-methylphenol, Acetophenone, 2,6-Dinitrotoluene, and 2,4-Dinitrotoluene.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Antimony was detected in the method blank. Soil sample results less than method blank action level have been qualified as non-detected.

The laboratory duplicate RPD values for Cadmium was above control limits. Detected sample results have been qualified as estimated for the analyte.

The field duplicate RPD values for Cadmium, Copper, and Cobalt were above control limits. Detected sample results have been qualified as estimated for the analytes.

The MS/MSD %R were below acceptance limits for Silver. Associated samples RFI-Drum 1, RFI-Drum 2, and RFI-Drum 3/4 have been qualified as estimated for the analyte.

The MS/MSD %R (with the exception of Arsenic and Selenium) and the %RPD values were above control limits for all soil samples. Detected soil sample results have been qualified as estimated.

The MS/MSD recoveries for Antimony and Mercury were less than 30%. Non-detected soil sample results have been rejected and detected soil sample results have been qualified as estimated for the analytes based on the deviations.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	May 7, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	September 11, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011930

VOLATILE, SEMIVOLATILE, PCB,
FORMALDEYDE, AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3011930 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
BD 94 EP-03(0.5-02)	3011930001	Soil	5/8/01	x	x	x	x	
BD 94 EP-DUP-01[1]	3011930002	Soil	5/8/01	x	x	x	x	
BD 94 EP-03(16-18)	3011930003	Soil	5/8/01	x	x	x	x	
BD 94 EP-03(08-10)	3011930004	Soil	5/8/01	x	x	x	x	
BD 94 EP-01(0.5-02)	3011930005	Soil	5/7/01	x	x	x	x	x
BD 94 EP-01(08-10)	3011930006	Soil	5/7/01	x	x	x	x	x
BD 94 EP-01(14-16)[2]	3011930007	Soil	5/7/01	x	x	x	x	x
BD 94 EP-02(08-10)	3011930008	Soil	5/7/01	x	x	x	x	
BD 94 EP-02(16-18)	3011930009	Soil	5/7/01	x	x	x	x	
BD 94 EP-02(0.33-02)	3011930010	Soil	5/7/01	x	x	x	x	

[1] Field duplicate of sample BD 94 EP-03(16-18).
[2] MS/MSD/DUP analysis performed on sample.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data are acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was greater than the acceptable limit for the following compounds: Hexachlorocyclopentadiene, 2,4-Dinitrophenol, and 4,6-Dinitro-2-methylphenol (associated samples BD 94 EP-03(16-18), BD 94 EP-01(0.5-02), BD 94 EP-01(14-16), BD 94 EP-02(08-10), and BD 94 EP-02(16-18)) and 2,4-Dinitrophenol (associated samples BD 94 EP-03(0.5-02), BD 94 EP-DUP-01, BD 94 EP-03(08-10), and BD 94 EP-01(08-10)). Data for the listed compounds have been qualified as estimated based on the deviations.

The internal standard response was outside control limits for Chrysene-d12 and Perylene-d12. Sample BD 94 EP-02(0.33-02) has been qualified as estimated for all compounds associated with Chrysene-d12 and Perylene-d12.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data are acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The data qualifier "D" was removed from sample BD 94 EP-02(0.33-02) because it does not apply to this sample.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data are acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
	CRDL standard (%R)	X		
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %R was above the acceptable limit due to a decrease in response by Thallium. Data have been qualified as estimated for the analyte based on the deviation.

The MS/MSD %R were outside acceptable limits for Arsenic, Barium, Cadmium, Manganese, Selenium, Silver, and Vanadium. Detected sample results have been qualified as estimated for the analytes.

The MS %R was outside acceptable limits for Antimony. Data have been qualified as estimated for the analyte.

The MS/MSD RPD was outside acceptable limits for Antimony. Detected sample results have been

qualified as estimated for the analyte.

The serial dilution %D was outside of acceptable limits for the following analytes: Manganese, Lead, and Barium.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data are acceptable for use as reported by the laboratory.

Sample Analysis: Formaldehyde

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %RPD was outside acceptable limits. Associated sample BD 94 EP-01(0.5-02) has been qualified as estimated based on the deviation.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data are acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 7, 2001
Validation performed by:	(Dennis Capria)
Date of Validation:	July 30, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011931

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3011931 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-84-01(0.5-02)	3011931015	Soil	5/7/01	x	x	x	x	
RFI-84-01(08-10)	3011931012	Soil	5/7/01	x	x	x	x	
RFI-84-01(16-17.5)	3011931013	Soil	5/7/01	x	x	x	x	
RFI-84-02(0.8-02)	3011931014	Soil	5/7/01	x	x	x	x	
RFI-84-02(08-10)	3011931011	Soil	5/7/01	x	x	x	x	
RFI-84-03(0.8-02)	3011931005	Soil	5/8/01	x	x	x	x	
RFI-84-03(08-10)	3011931006	Soil	5/8/01	x	x	x	x	
RFI-84-03(12-14)	3011931007	Soil	5/8/01	x	x	x	x	
RFI-84-04(0.8-02)	3011931008	Soil	5/8/01	x	x	x	x	
RFI-84-04(08-10)[1]	3011931009	Soil	5/8/01	x	x	x	x	
RFI-84-04(12-14)	3011931010	Soil	5/8/01	x	x	x	x	
RFI-94-03(0.8-02)	3011931001	Soil	5/8/01	x	x	x	x	
RFI-94-03(02-04)	3011931002	Soil	5/8/01	x	x	x	x	
RFI-94-04(0.4-02)	3011931003	Soil	5/8/01	x	x	x	x	
RFI-94-04(08-10)	3011931004	Soil	5/8/01	x	x	x	x	
RFI-94-DUP-02	3011931016	Soil	5/8/01	x	x	x	x	
Equipment Blank	3011931017	Aqueous		x	x	x	x	

[1] MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Cyclohexane. Associated samples RFI-94-03(0.8-02), RFI-94-03(02-04), RFI-94-04(0.4-02), RFI-94-04(08-10), and Equipment Blank have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to an increase in response by Methyl cyclohexane associated samples RFI-94-04(0.4-02), RFI-84-04(0.8-02), RFI-84-01(0.5-02), and RFI-94-DUP-02. Data have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for the following compounds: Benzaldehyde, 4-Chloroaniline, and 2,4-Dinitrophenol. Associated samples RFI-94-03(0.8-02), RFI-94-04(08-10), RFI-84-03(08-10), RFI-84-03(12-14), RFI-84-04(0.8-02), RFI-84-04(08-10), RFI-84-04(12-14), RFI-84-02(08-10), RFI-84-01(08-10), and RFI-84-01(16-17.5) have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 4-Chloroaniline, 3-Nitroaniline, and bis(2-Ethylhexyl)phthalate; associated samples RFI-94-03(0.8-02), RFI-94-04(08-10), RFI-84-03(08-10), RFI-84-03(12-14), RFI-84-04(0.8-02), RFI-84-04(08-10), RFI-84-04(12-14), RFI-84-02(08-10), RFI-84-01(08-10), RFI-84-01(16-17.5); a decrease in response by 4-Chloroaniline, associated sample Equipment Blank; a decrease in response by Hexachlorocyclopentadiene; associated samples RFI-94-04(08-10), RFI-84-03(08-10), Equipment Blank; a decrease in response by 4-Nitroaniline, associated samples RFI-94-04(08-10), RFI-84-03(08-10); a decrease in response by Hexachlorobenzene, associated sample Equipment Blank; a decrease in response by bis(2-Chloroisopropyl)ether, associated sample RFI-94-03(0.8-02). Data have been

qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene. Associated samples RFI-94-03(0.8-02) and RFI-84-04(0.8-02) have been qualified as estimated for the compounds based on the deviations.

Responses for internal standards were below acceptable limits for Chrysene-d12 and Perylene-d12. Compounds associated with Chrysene-d12 have been qualified as estimated in sample RFI-94-04(0.4-02). Data from the confirmation runs were used for samples RFI-94-03(02-04), RFI-94-04(0.4-02), and RFI-94-DUP-02. Compounds associated with Perylene-d12 with responses below 25% were qualified as estimated for detected compounds and qualified as rejected for non-detected compounds. Compounds associated with Perylene-d12 have been qualified as estimated for samples RFI-94-03(02-04), RFI-94-04(0.4-02), RFI-84-02(0.8-02), RFI-84-01(0.5-02), and RFI-94-DUP-02. The data from the confirmation runs were used for samples RFI-94-03(02-04), RFI-84-02(0.8-02), and RFI-84-01(0.5-02).

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %R was outside the acceptable limit for Thallium. Associated samples RFI-94-03(0.8-02), RFI-94-03(02-04), RFI-94-04(0.4-02), RFI-94-04(08-10), RFI-84-03(0.8-02), RFI-84-03(08-10), RFI-84-03(12-14), RFI-84-04(0.8-02), RFI-84-04(08-10), RFI-84-04(12-14), RFI-84-02(08-10), RFI-84-01(08-10), RFI-84-01(16-17.5), RFI-84-02(0.8-02), RFI-84-01(0.5-02), and RFI-94-DUP-02 have been qualified as estimated for the analyte based on the deviation.

The continuing calibration %R was outside the acceptable limit for Mercury. Associated samples RFI-94-03(0.8-02), RFI-94-03(02-04), and RFI-94-04(0.4-02) have been qualified as estimated for the analyte based on the deviation.

The field duplicate RPD was outside the acceptable limits for Cadmium, Thallium, and Zinc between sample RFI-94-04(0.4-02) and duplicate RFI-94-DUP-2. Sample results for these compounds have

been qualified as estimated.

The MS/MSD %Rs were outside acceptable limits for Barium, Vanadium, and Zinc. Soil sample results have been qualified as estimated for the analytes based on the deviation.

The MS/MSD %Rs were outside acceptable limits for Antimony. Positive soil sample results have been qualified as estimated and non-detected soil sample results have been qualified as rejected for the analyte based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 5, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	July, 30, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011932

PCBs

Summary

The following is an assessment of data package 3011932 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
ACSP-B3A(00-0.5)[1]	3011932001	Soil	5/8/01			X		
ACSP-B2A(08-10)	3011932002	Soil	5/8/01			X		
ACSP-B2A(06-08)	3011932003	Soil	5/8/01			X		
ACSP-B2A(04-06)	3011932004	Soil	5/8/01			X		
ACSP-B2A(00-02)	3011932005	Soil	5/8/01			X		
ACSP-B3A(06-08)	3011932007	Soil	5/8/01			X		
ACSP-DUP-01	3011932011	Soil	5/8/01			X		
ACSP-B3A(12-14)	3011932015	Soil	5/8/01			X		
ACSP-B3A(04-06)	3011932017	Soil	5/8/01			X		
ACSP-B3A(10-12)	3011932018	Soil	5/8/01			X		
ACSP-B2A(02-04)	3011932019	Soil	5/8/01			X		

[1] MS/MSD/DUP analysis performed on sample.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

No rinse blank was submitted with this data set.

The corresponding sample locations of the field duplicates for this SDG are: ACSP-DUP-01 is field duplicate of ACSP-B1A(02-04). Sample ACSP-B1A(02-04) was sampled with is SDG but the analysis was placed on hold and cancelled.

No deviations were noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	5/25/01
Validation performed by:	Dennis Capria
Date of Validation:	6/11/01

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011944

VOLATILE, SEMIVOLATILE,
AND PCB ANALYSES

Summary

The following is an assessment of data package 3011944 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
ACSP-DUP-02	3011944001	Soil	5/9/01			X		
ACSP-B2A(10-12)	3011944002	Soil	5/9/01	X	X	X		
ACSP-B4A(00-02)	3011944003	Soil	5/9/01			X		
ACSP-B4A(02-04)	3011944004	Soil	5/9/01			X		
ACSP-B4A(04-06)	3011944005	Soil	5/9/01			X		
ACSP-B4A(06-08)	3011944006	Soil	5/9/01			X		
ACSP-B4B(02-04)	3011944009	Soil	5/9/01			X		
ACSP-B4A(10-12)	3011944010	Soil	5/9/01			X		
ACSP-DUP-03	3011944011	Soil	5/9/01			X		
ACSP-B4B(06-08)	3011944013	Soil	5/9/01			X		
ACSP-B4A(08-10)	3011944014	Soil	5/9/01			X		
ACSP-B4A(12-14)	3011944015	Soil	5/9/01			X		
ACSP-B4B(10-12)	3011944016	Soil	5/9/01			X		
ACSP-B4B(08-10)	3011944017	Soil	5/9/01			X		
ACSP-B2B(12-14)	3011944019	Soil	5/9/01	X	X	X		
ACSP-B4B(04-06)	3011944021	Soil	5/9/01			X		
ACSP-B4B(00-02)	3011944023	Soil	5/9/01			X		
ACSP-EB-1	3011944026	Water	5/9/01			X		

[1] MS/MSD/DUP analysis performed on sample.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed		X	
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The %D for acetone, tetrachloroethene, 1,1,2,-Trichloro-, 1,2,2-trifluoromethane, methyl acetate, bromoform and dibromochloromethane were outside acceptable limits in the continuing standard. Data for the listed compounds have been qualified as estimated in sample ACSP-B2B (12-14) based on the deviation.

The %D for dichlorodifluoromethane, 1,1,2-Trichloro-, 1,2,2-trifluoromethane, cyclohexane, and bromoform were outside acceptable limits in the continuing calibration standard. Data for the listed compounds have been qualified as estimated in sample ACSP-B2A(10-12) based on the deviation.

One surrogate in sample ACSP-B2A(10-12) exhibited high recovery. The high surrogate recovery was confirmed by the laboratory. Detected compounds in this sample have been qualified as estimated.

No matrix spike/matrix spike duplicate analysis was performed on the sample in this data set.

No rinse blanks or trip blanks for volatile analysis were submitted for this data set.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed		X	
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The %RSD for Benzaldehyde, 4-Chloroaniline, and 2,4-Dinitrophenol was outside acceptable limits in the initial five point calibration. Data for the listed compounds have been qualified as estimated in sample ACSP-B2A(10-12) and ACSP-B2B(12-14) based on the deviation.

The %D for Benzaldehyde, Bis (2-chloroispropyl)ether, 4-Chloroanailine, Hexachlorocyclopentadiene, 2,4-Dinitrophenol, 4-Nitroanailine, and 4,6-Dinitro-2-methylphenol was outside acceptable limits in the continuing calibration standard. Data for the listed compounds have been qualified as estimated in sample ACSP-B2A(10-12) and ACSP-B2B(12-14) based on the deviation.

Hexachlorocyclopentadiene was incorrectly reported on the form one sample ACSP-B2A (10-12) as 62 J ug/kg. The result has been corrected to 200 ug/Kg.

Sample ACSP-B2A(10-12) was analyzed at a 2x dilution due to 2-Methylnaphthalene concentration being greater than the calibration range. The original result of 5700 E ug/Kg was replaced with the diluted result of 9100 D ug/Kg.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Field duplicate sampling was performed on locations ACSP-B2A (10-12) field duplicate ACSP-DUP-02 and ACSP-B4B (02-04) field duplicate ACSP-DUP-03.

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	5/25/01
Validation performed by:	Dennis Capria
Date of Validation:	6/22/01

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011945

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3011945 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-02-03(0.9-02)	3011945001	Soil	5/9/01	x	x	x	x	
RFI-02-03(08-10)	3011945002	Soil	5/9/01	x	x	x	x	
RFI-94-05(08-10)[3]	3011945003	Soil	5/9/01	x	x	x	x	
RFI-94-DUP-03[1]	3011945004	Soil	5/9/01	x	x	x	x	
RFI-94-06(0.7-02)	3011945005	Soil	5/9/01	x	x	x	x	
RFI-94-05(0.5-02)	3011945006	Soil	5/9/01	x	x	x	x	
RFI-94-06(08-10)	3011945007	Soil	5/9/01	x	x	x	x	
RFI-02-01(01-02)	3011945008	Soil	5/9/01	x	x	x	x	
RFI-02-02(0.5-02)	3011945009	Soil	5/9/01	x	x	x	x	
RFI-02-01(08-10)	3011945010	Soil	5/9/01	x	x	x	x	
RFI-02-02(08-10)	3011945011	Soil	5/9/01	x	x	x	x	
RFI-94-05(18-20)	3011945012	Soil	5/9/01	x	x	x	x	
RFI-94 Dup-4[2]	3011945013	Soil	5/9/01	x	x	x	x	

1 Field duplicate of sample RFI-94-06(08-10).
2 Field duplicate of sample RFI-94-05(18-20).
3 MS/MSD/DUP analysis performed on sample.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was greater than the acceptable limit for 2,4-Dinitrophenol. Associated samples RFI-94-06(0.7-02) and RFI-94-05(0.5-02) have been qualified as estimated for the compound based on the deviation.

The internal standard response was below acceptable limits for Perylene-d12. Data for sample RFI-94-05(0.5-02) have been replaced with data from the confirmation analysis and all compounds associated with Perylene-d12 have been qualified as estimated.

The field duplicate RPD between sample RFI-94-06(08-10) and duplicate RFI-94-DUP-03 was outside acceptable limits for Diethylphathlate. Sample results have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were outside acceptable limits for Barium, Copper, Cobalt, Chromium, Cadmium, Nickel, and Vanadium. Sample results have been qualified as estimated for the analytes based on the deviations.

The MS %R was outside acceptable limits for Antimony. Non-detected data have been qualified as rejected for the analyte and detected sample results have been qualified as estimated for the analyte.

The laboratory duplicate %D was outside acceptable limits for Copper. Data have been qualified as estimated for the analyte based on the deviations.

The serial dilution %D was outside acceptable limits for Manganese, Nickel, and Zinc. Data have

been qualified as estimated for the analytes based on the deviations.

The field duplicate RPD between sample RFI-94-06(08-10) and duplicate RFI-94-DUP-03 was outside acceptable limits for Manganese and Barium. Sample results have been qualified as estimated for the analyte.

The field duplicate RPD between sample RFI-94-05(18-20) and duplicate RFI-94-DUP-04 was outside acceptable limits for Barium, Beryllium, Chromium, Manganese, Nickel, Lead and Vanadium. Sample results have been qualified as an estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	March 23, 2001
Validation performed by:	(Dennis Capria)
Date of Validation:	April 28, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011983

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3011983 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-12-07(0.9-02)	3011983001[2]	Soil	5/10/01	x	x	x	x	x
RFI-12-07(08-10)	3011983002	Soil	5/10/01	x	x	x	x	x
RFI-12-07(12-14)	3011983003	Soil	5/10/01	x	x	x	x	x
RFI-02-06(0.7-02)	3011983004	Soil	5/10/01	x	x	x	x	x
RFI-02-04(08-10)	3011983005	Soil	5/10/01	x	x	x	x	x
RFI-02-04(1.1-02)	3011983006[1]	Soil	5/10/01	x	x	x	x	x
RFI-02-04(06-08)	3011983007	Soil	5/10/01	x	x	x	x	x
RFI-02-04(06-08)DL	3011983008	Soil	5/10/01	x	x	x	x	x

[1] MS/MSD/DUP analysis performed on sample for organics
[2] MS/MSD/DUP analysis performed on sample for metals

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Internal standard responses were below acceptable limits for sample RFI-02-04 (06-08). Original data for the sample has been replaced with data from the confirmation and dilution analyses. Compounds associated with the deviant internal standard have been qualified as estimated.

The initial calibration %RSD was above than the acceptable limit for Isophorone and 4-chloroanaline; associated samples RFI-12-07(08-10), RFI-12-07(08-10) and RFI-02-04(1.1-02); 4-chloroanaline and Benzaldehyde; associated samples RFI-12-07(0.9-02), RFI-02-06(0.7-02) and RFI-02-04(08-10); Caprolactam, associated sample RFI-02-04(06-08). Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 4-Chloroaniline, associated samples RFI-12-07(0.9-02), RFI-12-07(08-10), RFI-12-07(12-14), RFI-02-06(0.7-02), RFI-02-04(08-10) and RFI-02-04(1.1-02); a decrease in response by Hexachlorocyclopentadiene; associated samples .RFI-12-07(08-10), RFI-12-07(12-14) and RFI-02-

04(1.1-02). Data have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)			X
	Internal standard (Response)			
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R were above control limits for Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Nickel, Silver, Thallium, Vanadium, and Zinc. Positive data in associated samples RFI-12-07(0.9-02), RFI-12-07(08-10), RFI-12-07(12-14), RFI-02-06(0.7-02), RFI-02-04(08-10), RFI-02-04(1.1-02) and RFI 02-04 (06-08) have been qualified as estimated.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	July 8, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	July 25, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3011984

VOLATILE, SEMIVOLATILE, AND
PCB ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3011984 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
ACSP-B2C(08-10)	3011984004	Soil	5/10/2001	X	X	X		
WL-B6A(00-02)	3011984009	Soil	5/10/2001			X		
WL-B6A(02-04)	3011984010	Soil	5/10/2001			X		
WL-B6A(08-10)	3011984011	Soil	5/10/2001			X		
WL-B6A(04-06)	3011984012	Soil	5/10/2001			X		
WL-B6A(06-08)[1]	3011984013	Soil	5/10/2001			X		
WL-DUP-01	3011984014	Soil	5/10/2001			X		
WL-B6A(00-0.5)	3011984015	Soil	5/10/2001			X		

[1] MS/MSD/DUP analysis performed on sample.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to an decrease in response by Acetone, tetrachloroethene, 1,1,2-Trichloro-1,2,2,-trifluoroethane, Methyl acetate, and Dibromochloromethane. Associated sample results for ACSP-B2C (08-10) have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Benzaldehyde, 4-Chloroaniline and 2,4-Dinitrophenol; associated sample results for ACSP-B2C(08-10 have been qualified as estimated.

The continuing calibration %D for Benzaldehyde, 4-Chloroaniline, Hexachlorocyclopentadiene, 3-Nitroaniline, 4-Nitroaniline, Butylbenzylphthalate, BEHP, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthrancene, and Benzo(g,h,i)perylene was outside acceptable limits. Sample results for ACSP-B2C(08-10 have been qualified as estimated

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	6/6/2001
Validation performed by:	(Dennis Capria)
Date of Validation:	6/12/2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012015

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012015 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-12-08(06-08)[1]	3012015001	Soil	5/11/01	X	X	X	X	X
RFI-12-08(0.9-02)	3012015002	Soil	5/11/01	X	X	X	X	X
RFI-12-08(08-10)	3012015003	Soil	5/11/01	X	X	X	X	X
ACSP-RB-03	3012015004	Water	5/10/01			X		
ACSP-RB-02[2]	3012015005	Water	5/10/01			X		
RFI-02-RB-05[3]	3012015006	Water	5/10/01	X	X	X	X	X
RFI-TB-01	3012015007	Water	5/11/01	X				
RFI-12-08(16-18)	3012015008	Soil	5/11/01	X	X	X	X	X
RFI-02-06(08-10)	3012015009	Soil	5/11/01	X	X	X	X	X
RFI-02-06(10-12)[2]	3012015010	Soil	5/11/01	X	X	X	X	X
RFI-02-DUP-05[3]	3012015011	Soil	5/11/01	X	X	X	X	X
RFI-02-06(02-04)	3012015012	Soil	5/11/01	X	X	X	X	X
RFI-02-04(06-08)	3012015013	Soil	5/10/01	X				
RFI-12-08(0.9-02)DL	3012015014	Soil	5/11/01		X			

1 8260 and 8270 analyses performed on sample
2 PCB MS/MSD performed on sample
3 Metals MS/MSD performed on sample
4 Field duplicate of sample RFI-02-06(10-12)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptance limit due to a decrease in response by Cyclohexane. Associated samples RFI-12-08 (06-08), RFI-12-08 (0.9-02), RFI-12-08 (08-10), RFI-02-RB-05, RFI-TB-01, RFI-12-08 (16-18), RFI-02-06 (08-10), RFI-02-06 (10-12), RFI-02-DUP-05, RFI-02-06 (02-04), and RFI-02-04 (06-08) have been qualified as estimated for the compounds based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standards response was below acceptable limits for Perylene-d12. Data for sample RFI-12-08 (0.9-02) has been replaced with data from the dilution analysis and compounds associated with Perylene-d12 have been qualified as estimated.

The MS/MSD RPD were outside control limits for 2,4-Dinitrotoluene, 4-Chloro-3-methylphenol, Ace naphthalene, n-Nitroso-di-n-propylamine, Pentachlorophenol and Pyrene. Associated sample RFI-12-08 (06-08) has been qualified as estimated for the compounds based on the deviations.

The initial calibration %RSD was greater than the acceptable limit for Benzaldehyde and Nitrobenzene; associated samples RFI-12-08 (08-10), RFI-02-RB-05, RFI-02-06 (08-10) and RFI-02-06 (10-12); Benzaldehyde and n-Nitroso-di-n-propylamine, associated sample 02-04(08-10); Pentachlorophenol; associated samples RFI-02-04 (06-08) and RFI-12-08 (16-18); Caprolactam, associated samples RFI-12-08 (0.9-02) and RFI-02-06 (02-04); bis(2-Chloroethyl)ether, Pentachlorophenol, and Di-n-octylphthalate; associated sample RFI-12-08 (0.9-02) DL. Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptance limit due to a decrease in response by 4-Chloroaniline; associated samples RFI-12-08 (08-10), RFI-02-RB-05, RFI-02-06 (08-10), and RFI-02-06 (10-12); a decrease in response by 4-Chloroanaline, 3-Nitroanaline, n-Nitroso-di-n-propylamine and Hexachlorocyclopentadiene; associated sample RFI-02-DUP-05; a decrease in response by 4-Nitrophenol, associated sample RFI-12-08 (0.9-02); a decrease in response by Benzaldehyde and bis(2-chloroethyl)ether, associated sample RFI-12-08 (0.9-02) DL. Data have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %R was outside the acceptance limit for Thallium. Associated sample RFI-02-RB-05 has been qualified as estimated for the analyte.

The MS/MSD %R was above the acceptable limits for Barium, Beryllium, Cadmium, Chromium, Lead, Silver, Thallium, Vanadium, Arsenic, Cobalt, Copper and Zinc. Positive results in associated samples RFI-12-08 (06-08), RFI-12-08 (0.9-02), RFI-12-08 (08-10), RFI-12-08 (16-18), RFI-02-06 (08-10), RFI-02-06 (10-12), RFI-02-DUP-05, and RFI-02-06 (02-04) have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %R was below control limits for Cyanide. Associated sample RFI-02-RB-05 has been qualified as rejected for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-

specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 15, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	July 31, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012039

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012039 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-17-RB-06	3012039001	Water	5/14/01	x	x	x	x	
RFI-16-02(0.4-02)	3012039002	Soil	5/14/01	x	x	x	x	
RFI-16-02(08-10)[2]	3012039003	Soil	5/14/01	x	x	x	x	
RFI-16-06(0.7-02)	3012039004	Soil	5/14/01	x	x	x	x	
RFI-16-06(04-06)	3012039005	Soil	5/14/01	x	x	x	x	
RFI-16-DUP-06[1]	3012039006	Soil	5/14/01	x	x	x	x	
RFI-17-02(0.3-02)	3012039007	Soil	5/14/01	x	x	x	x	
RFI-17-02(04-06)	3012039008	Soil	5/14/01	x	x	x	x	

[1] Field duplicate of sample RFI-16-06(04-06).
[2] MS/MSD/DUP analysis performed on sample.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Cyclohexane. Data have been qualified as estimated for the compound based on the deviation.

Acetone was detected in the method blank. Soil sample results which were below the blank action level have been qualified as non-detect for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde and bis(2-Chloroethyl)ether. Associated sample RFI-17-RB-06 has been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to an increase in response by Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene. Associated sample RFI-17-02(0.3-02 has been qualified as estimated for the compounds based on the deviations.

Bis(2-ethylhexyl)phthalate was detected in the rinse blank. Sample results which were below the blank action level have been qualified as non-detected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %R was outside acceptable limit for the Thallium. Data have been qualified as estimated for the analyte based on the deviation.

The MS/MSD %Rs were outside acceptable limits for Copper, Cobalt, Chromium, Cadmium, Nickel, Vanadium, and Zinc. Data have been qualified as estimated for the analytes based on the deviations.

The MS %R was outside acceptable limits for Antimony and Barium. Non-detected data have been qualified as rejected and detected sample results have been qualified as an estimated for the analytes.

The serial dilution %D was outside acceptable limits for Nickel, and Zinc. Data have been qualified as estimated for the analytes based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	March 23, 2001
Validation performed by:	(Dennis Capria)
Date of Validation:	August 13, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012046

PCB ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012046 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
WL-B3A(04-06)	3012046010	Soil	5/14/2001			X		
WL-B3A(06-08)	3012046011	Soil	5/14/2001			X		
WL-B3A(08-10)	3012046012	Soil	5/14/2001			X		
WL-B2A(00-0.5)	3012046019	Soil	5/14/2001			X		
WL-B3A(00-0.5)	3012046020	Soil	5/14/2001			X		
WL-B5A-DUP-07	3012046021	Soil	5/14/2001			X		
WL-B1A(00-0.5)	3012046022	Soil	5/14/2001			X		
WL-B4A(00-0.5)	3012046023	Soil	5/14/2001			X		
WL-B5A(00-0.5)	3012046024	Soil	5/14/2001			X		
WL-B2A(04-06)	3012046025	Soil	5/14/2001			X		
WL-B2A(02-04)	3012046026	Soil	5/14/2001			X		
WL-B2A(06-08)	3012046027	Soil	5/14/2001			X		
WL-B2A(0.5-02)	3012046028	Soil	5/14/2001			X		
WL-B2A(08-10)	3012046029	Soil	5/14/2001			X		
WL-B4A(0.5-02)	3012046030	Soil	5/14/2001			X		
WL-B1A(14-16)	3012046031	Soil	5/14/2001			X		
WL-B1A(12-14)	3012046032	Soil	5/14/2001			X		
WL-B1A(10-12)	3012046033	Soil	5/14/2001			X		
WL-B2A-DUP-08	3012046034	Soil	5/14/2001			X		
WL-B1A(08-10)	3012046036	Soil	5/14/2001			X		
WL-B1A-DUP-09	3012046037	Soil	5/14/2001			X		
WL-B1A(06-08)	3012046038	Soil	5/14/2001			X		
WL-B5A(02-04)	3012046039	Soil	5/14/2001			X		
WL-B1A(02-04)	3012046040	Soil	5/14/2001			X		
WL-B1A(04-06)	3012046041	Soil	5/14/2001			X		
WL-B1A(0.5-02)	3012046042	Soil	5/14/2001			X		
WL-B5A(0.5-02)	3012046043	Soil	5/14/2001			X		
WL-B3A(0.5-02)	3012046044	Soil	5/14/2001			X		

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)	X		
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

No rinse blank was submitted with this data set.

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	6/6/01
Validation performed by:	(Dennis Capria)
Date of Validation:	6/10/01

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012067

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012067 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-16-03(04-06)	3012067001	Soil	5/15/01	x	x	x	x	
RFI-16-02(14-16)	3012067002	Soil	5/15/01	x	x	x	x	
RFI-16-03(0.5-02)	3012067003	Soil	5/15/01	x	x	x	x	
RFI-12-04(00-02)	3012067004	Soil	5/15/01	x	x	x	x	
RFI-12-04(08-10)	3012067005	Soil	5/15/01	x	x	x	x	
RFI-12-RB-07	3012067006	Water	5/15/01	x	x	x	x	
RFI-16-05(0.5-02)	3012067007	Soil	5/15/01	x	x	x	x	
RFI-12-02(0.7-02)[4]	3012067008	Soil	5/15/01	x	x	x	x	
RFI-12-02(14-16)[5]	3012067009	Soil	5/15/01	x	x	x	x	
RFI-16-05(02-04)	3012067010	Soil	5/15/01	x	x	x	x	
RFI-16-04(0.7-02)	3012067011	Soil	5/15/01	x	x	x	x	
RFI-16-04(04-06)	3012067012	Soil	5/15/01	x	x	x	x	
RFI-29-01(02-04)	3012067013	Soil	5/15/01	x	x	x	x	
RFI-12-02(08-10)	3012067014	Soil	5/15/01	x	x	x	x	
RFI-12-01(1.2-02)	3012067015	Soil	5/15/01	x	x	x	x	
RFI-29-01(0.6-02)	3012067016	Soil	5/15/01	x	x	x	x	
RFI-12-02(06-08)	3012067017	Soil	5/15/01	x	x	x	x	
RFI-12-DUP-11[1]	3012067018	Soil	5/15/01	x	x	x	x	
RFI-16-03(04-06)DUP[2]	3012067019	Soil	5/15/01	x	x	x	x	
RFI-12-01(06-08)	3012067020	Soil	5/15/01	x	x	x	x	
RFI-12-DUP-12[3]	3012067021	Soil	5/15/01	x	x	x	x	
RFI-12-05(02-04)	3012067022	Soil	5/15/01	x	x	x	x	
RFI 16-03 (04-06) RE	3012067023	Soil	5/15/01		x			
RFI 16-03 (0.5-02)RE	3012067024	Soil	5/15/01		x			
RFI 12-04 (00-02) RE	3012067025	Soil	5/15/01		x			
RFI 12-02 (08-10) RE	3012067027	Soil	5/15/01		x			
RFI 12-02 (08-10) RE	3012067028	Soil	5/15/01		x			
RFI-12-DUP-12[3] RE	3012067029	Soil	5/15/01		x			

[1] Field duplicate of sample RFI-12-02(08-10).
[2] Field duplicate of sample RFI-16-03(04-06).
[3] Field duplicate of sample RFI-12-02(06-08).
[4,5] MS/MSD/DUP analysis performed on sample.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D for the following compounds were greater than the acceptable limit of 20% but all deviant %D were due an increase in response by the following compounds: Dichlorodifluoromethane, Methyl acetate, Bromoform. Non-detected sample results for these compounds were not qualified within this SDG due to this deviation. Detected sample results were qualified as an estimate.

The continuing calibration %D was outside the 20% acceptance limit due to a decrease in response by the following compounds: cis-1,2-Dichloroethene, Cyclohexane, 1,2,4-Trichlorobenzene. All sample results for these compounds have been qualified as estimated in the following samples: RFI-16-04(0.7-02), RFI-16-04(04-06), RFI-29-01(02-04), RFI-29-01(0.6-02), RFI-12-DUP-11, RFI-16-03(04-06)DUP, and RFI-12-01(06-08).

The continuing calibration %D was outside the 20% acceptance limit due to a decrease in response by the following compounds: cis-1,2-Dichloroethene and Cyclohexane. All sample results for these compounds have been qualified as estimated in the following samples: RFI-16-03(04-06), RFI-16-

02(14-16), RFI-12-04(00-02), RFI-12-04(00-02), RFI-12-04(08-10), RFI-16-05(0.5-02), RFI-12-02(0.7-02), and RFI-12-02(14-16).

The continuing calibration %D was outside the 20% acceptance limit due to a decrease in response by the following compounds: cis-1,2-Dichloroethene, 1,2,4-Trichlorobenzene, 1,2-Dibromo-3-chloropropane, and Cyclohexane. All sample results for these compounds have been qualified as estimated in the following samples: RFI-16-05(02-04), RFI-12-01(1.2-02), RFI-12-DUP-12, and RFI-12-05(02-04).

The continuing calibration %D was outside the 20% acceptance limit due to a decrease in response by the following compound: Cyclohexane. All sample results for these compounds have been qualified as estimated in the following samples: RFI-12-02(08-10) and RFI-12-02(06-08).

Acetone, Methylene chloride, and 1,2-Dichloroethane were detected in the method blanks sample results for these compound which were below the blank action level have been qualified as non-detected for all soil samples within this SDG.

Toluene was detected in the rinse blank sample results for these compound which were below the blank action level have been qualified as non-detected for all soil samples within this SDG.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D for the following compounds were greater than the acceptable limit of 20% but all deviant %D were due an increase in response of the following compounds: Benzaldehyde, 3,3-Dichlorobenzidine, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 3-Nitroaniline, 4-Nitroaniline, 4,6-Dinitro-2-methylphenol, Acetophenone, 4-Chloroaniline, Hexachlorocyclopentadiene. Non-detected sample results for these compounds were not qualified within this SDG due to this deviation.

The continuing calibration %D was outside the 20% acceptance limit due to a decrease in response by the following compound: 4-Nitrophenol. All sample results for these compounds have been qualified as estimated in the following samples: RFI-16-03(04-06), RFI-16-03(0.5-02), RFI-12-04(00-02), RFI-12-02(08-10), RFI-12-02(06-08), and RFI-12-DUP-12.

The continuing calibration %D was outside the 20% acceptance limit due to a increase in response by the following compound: Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene. All sample results for these compounds have been qualified as estimated in the following sample RFI-16-

04(0.7-02).

Internal standards (Chrysene-d12 and Perylene-d12) responses were outside of the limits for sample RFI-16-03(04-06). Detected sample results associated with Chrysene-d12 with have been qualified as estimated. Non-detected sample results associated with Chrysene-d12 and Perylene-d12 have been qualified as rejected. One acid surrogate extracted with this sample exhibited recovery outside of control limits. No data were qualified due to this deviation.

The one base/neutral (B/N) surrogate for sample RFI-16-02(14-16) exhibited recovery less than 10%. The sample was re-extracted out of holding time. The B/N surrogate recoveries of the re-extract were within control limits. Therefore, the B/N sample results from the re-extract were used to replace the original sample results and qualified as an estimate due to the holding time deviation.

Internal standards (Phenanthrene-d10, Chrysene-d12, and Perylene-d12) responses were outside of the limits for sample RFI-16-03(0.5-02). Detected sample results associated with all deviant internal standards have been qualified as estimated. Non-detected sample results associated with Phenanthrene-d10 have been qualified as estimated. Non-detected sample results associated with Chrysene-d12 and Perylene-d12 have been qualified as rejected.

Internal standards (Chrysene-d12 and Perylene-d12) response were outside of the limits for sample RFI-12-04(00-02). Detected sample results associated with both deviant internal standards have been qualified as estimated. Non-detected sample results associated with Chrysene-d12 have been replaced by the re-analysis which was analyzed at dilution factor of ten. The internal standard Chrysene-d12 from the re-analysis exhibited an acceptable recovery. Non-detected sample results associated with Perylene-d12 have been replaced by the re-analysis which was analyzed at dilution factor of ten. The internal standard Perylene-d12 from the re-analysis exhibited an unacceptable recovery and the sample result have been qualified as estimated. One B/N surrogate exhibited recovery outside of control limits. No data were qualified due to this deviation.

Internal standard (Perylene-d12) response was outside of the acceptable limits for sample RFI-16-04(04-06). Sample results associated with Perylene-d12 with have been qualified as estimated.

Internal standards (Chrysene-d12 and Perylene-d12) responses were outside of the limits for sample RFI-12-02(08-10). Non-detected sample results associated with Chrysene-d12 and Perylene-d12 have been replaced by the re-analysis which was analyzed at dilution factor of twenty. The internal standards of the re-analysis exhibited an acceptable recovery. Two acid surrogate exhibited (high) recovery outside of control limits. All sample results were non-detected therfore, no data were qualified due to this deviation. One B/N surrogate exhibited recovery outside of control limits. No data were qualified due to this deviation.

One acid surrogate for sample RFI-12-01(1.2-02) exhibited recovery less than 10%. The sample was re-extracted yielding the similar results. Non-detected acid sample results have been qualified as rejected.

Internal standards (Phenanthrene-d10, Chrysene-d12, and Perylene-d12) responses were outside of the limits for sample RFI-12-02(06-08). Detected sample results associated with all deviant internal standards have been qualified as estimated. Non-detected sample results associated with Phenanthrene-d10 have been qualified as estimated. Non-detected sample results associated with Chrysene-d12 and Perylene-d12 have been replaced by the re-analysis which was analyzed at dilution factor of fifty. The internal standard Chrysene-d12 in the re-analysis exhibited an acceptable recovery. The internal standard Perylene-d12 in the re-analysis exhibited an unacceptable recovery and the sample result have been qualified as estimated. One acid and B/N surrogate exhibited recoveries outside of control limits. No data were qualified due to this deviation.

One acid surrogate in sample RFI-12-01(06-08) exhibited recoveries outside of control limits. No sample results were qualified due to this deviation.

Internal standards (Phenanthrene-d10, Chrysene-d12, and Perylene-d12) responses were outside of the limits for sample RFI-12-DUP-12. Detected sample results associated with all deviant internal standards have been qualified as estimated. Non-detected sample results associated with Phenanthrene-d10 and Chrysene-d12 have been replaced by the re-analysis which was analyzed at dilution factor of ten. The internal standards Phenanthrene-d10 and Chrysene-d12 in the re-analysis exhibited an unacceptable recovery and the sample result have been qualified as estimated. The internal standard Perylene-d12 in both the original analysis and re-analysis exhibited a recovery less than 10 percent therefore, the non-detected sample result have been qualified as rejected. One acid and B/N surrogate exhibited recoveries outside of control limits. No data were qualified due to this deviation.

bis(2-Ethylhexyl)phthalate, Butyl benzylphthalate, and Di-n-butylphthalate were detected in the rinse blank. Sample results for these compound which were below the blank action level have been qualified as non-detected for all soil samples within this SDG.

The MS/MSD RPD was above the acceptable limit for 4-Nitrophenol, 2,4 Dinitrotoluene, N-Nitrosodi-n-propylamine and Pyrene. No data have been qualified based on these deviations

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS and/or MSD %R was outside acceptable limits for Antimony and Manganese sample results within this SDG for these analytes have been qualified as estimated for the following samples: RFI-16-03(04-06), RFI-16-02(14-16), RFI-16-03(0.5-02), RFI-12-04(00-02), RFI-12-04(08-10), RFI-16-05(0.5-02), RFI-12-02(0.7-02), RFI-12-02(14-16).

The MS and/or MSD %R was outside acceptable limits for Barium, Cadmium, Chromium, Lead, Thallium, Vanadium, and Znic sample results within this SDG for these analytes have been qualified as estimated for the following samples: RFI-16-03(04-06), RFI-16-02(14-16), RFI-16-03(0.5-02), RFI-12-04(00-02), RFI-12-04(08-10), RFI-16-05(0.5-02), RFI-12-02(0.7-02), RFI-12-02(14-16).

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	March 23, 2001
Validation performed by:	(Dennis Capria)
Date of Validation:	8/13/01

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012098

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012098 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-44-05(02-04)	3012098001	Soil	5/16/01	x	x	x	x	
RFI-44-04(02-04)	3012098002	Soil	5/16/01	x	x	x	x	
RFI-44-05(0.9-02)[1]	3012098003	Soil	5/16/01	x	x	x	x	
RFI-44-04(0.9-02)	3012098004	Soil	5/16/01	x	x	x	x	
RFI-44-05(10-12)	3012098005	Soil	5/16/01	x	x	x	x	
RFI-44-05(08-10)	3012098006	Soil	5/16/01	x	x	x	x	
RFI-44-DUP-14[3]	3012098007	Soil	5/16/01	x	x	x	x	
RFI-09-DUP-13[2]	3012098008	Soil	5/16/01	x	x	x	x	
RFI-09-05(0.5-02)	3012098009	Soil	5/16/01	x	x	x	x	
RFI-09-05(06-08)	3012098010	Soil	5/16/01	x	x	x	x	
RFI-09-03(0.4-02)	3012098011	Soil	5/16/01	x	x	x	x	
RFI-09-03(02-04)	3012098012	Soil	5/16/01	x	x	x	x	
RFI-09-02(0.4-02)	3012098013	Soil	5/16/01	x	x	x	x	
RFI-09-02(02-04)	3012098014	Soil	5/16/01	x	x	x	x	
RFI-94-01(0.5-02)	3012098015	Soil	5/16/01	x	x	x	x	
RFI-94-01(02-04)	3012098016	Soil	5/16/01	x	x	x	x	
RFI-17-01(0.7-02)	3012098017	Soil	5/16/01	x	x	x	x	
RFI-17-01(02-04)	3012098018	Soil	5/16/01	x	x	x	x	
RFI-44-RB-08	3012098019	Water	5/16/01	x	x	x	x	
RFI-12-01(051601)	3012098020	Water	5/16/01	x		x		
RFI-12-01(051601)	3012098021	Water	5/16/01			x		
RFI-12-05(051601)	3012098022	Water	5/16/01	x	x	x	x	
RFI-12-05(051601)	3012098023	Water	5/16/01			x		
RFI-12-07(051601)	3012098024	Water	5/16/01	x	x	x	x	
RFI-12-07(051601)	3012098025	Water	5/16/01			x		
RFI-12-08(051601)	3012098026	Water	5/16/01	x	x	x	x	
RFI-12-08(051601)	3012098027	Water	5/16/01			x		
RFI-12-TB-02	3012098028	Water	5/16/01	x				
RFI-44-05(02-04)RE	3012098029	Soil	5/16/01		x			
RFI-44-04(02-04)RE	3012098030	Soil	5/16/01		x			
RFI-44-04(0.9-02)DL	3012098031	Soil	5/16/01		x			
RFI-12-05(051601)DL	3012098032	Water	5/16/01		x			

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample RFI-09-05(0.5-02)
3 Duplicate analysis performed on sample RFI-44-05(08-10)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was outside the acceptable limit for Bromomethane. Associated samples RFI-44-04(0.9-02), RFI-44-05(08-10), RFI-09-DUP-13, RFI-09-05(0.5-02), RFI-09-02(0.4-02), RFI-09-02(02-04), RFI-17-01(0.7-02) and RFI-17-01(02-04) have been qualified as estimated based on this deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Cyclohexane; associated samples RFI-44-05(02-04), RFI-44-04(02-04), RFI-44-RB-08, RFI-12-01(051601), RFI-12-05(051601), RFI-12-07(051601), RFI-12-08(051601), RFI-12-TB-02; a decrease in response by cis-1,2-Dichloroethene and 1,2,4-Trichlorobenzene; associated samples RFI-44-05(02-04) and RFI-44-04(02-04); a decrease in response by Bromomethane, cis-1,2-Dichloroethene, and Cyclohexane; associated samples RFI-44-05(0.9-02), RFI-44-05(10-12), RFI-44-DUP-14, RFI-09-05(06-08), RFI-09-03(0.4-02), RFI-09-03(02-04), RFI-94-01(0.5-02), RFI-94-01(02-04), RFI-44-04(0.9-02), RFI-09-DUP-13, RFI-09-05(0.5-02), RFI-09-02(0.4-02) and RFI-17-01(02-04); a decrease in response by cis-1,2-Dichloroethene and Cyclohexane; associated samples RFI-44-05(08-10), RFI-09-02(02-04), and RFI-17-01(0.7-02). All data have been qualified as estimated for the compounds

based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Chloromethane. Associated samples RFI-44-04(0.9-02), RFI-09-DUP-13, RFI-09-05(0.5-02), RFI-09-02(0.4-02) and RFI-17-01(02-04) have been qualified as estimated for the compound based on this deviation.

Methylene chloride was detected in the trip blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Toluene was detected in the rinse blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Responses for internal standards were outside acceptable limits for Chrysene-d12, Phenanthrene-d10 and Perylene-d12. Compounds associated with Perylene-d12 have been qualified as estimated in samples RFI-44-04(0.9-02), RFI-09-03(0.4-02), RFI-17-01(0.7-02), RFI-12-05(051601), RFI-09-03(02-04), RFI-09-DUP-13, RFI-09-05(0.5-02) and RFI-09-02(0.4-02). Data from the confirmation, re-extraction or dilution runs were used for samples RFI-44-05(02-04), RFI-44-04(02-04), RFI-44-04(0.9-02), RFI-09-02(0.4-02), RFI-17-01(0.7-02) and RFI-12-05(051601). Data from the initial runs were used for samples RFI-09-DUP-13, RFI-09-03(0.4-02), RFI09-05(0.5-02) and RFI-09-03(02-04). Compounds associated with Perylene-d12 with responses below 25% were qualified as estimated for detected compounds and qualified as rejected for non-detected compounds.

Data from the confirmation or re-extraction runs were used for the following samples associated with Phenanthrene-d10: RFI-44-05(02-04), RFI-44-04(02-04), RFI-44-04(0.9-02) and RFI-17-01(0.7-02). Data from the initial run was used for sample RFI-94-01(0.5-02).

Compounds associated with Chrysene-d12 have been qualified as estimated in samples RFI-44-

04(0.9-02), RFI-17-01(0.7-02), RFI-12-05(051601). Data from the confirmation, re-extraction or dilution runs were used for samples RFI-44-05(02-04), RFI-44-04(02-04), RFI-44-04(0.9-02), RFI-09-02(0.4-02) and RFI-17-01(0.7-02).

The initial calibration %RSD was greater than the acceptable limit for 2,4-Dinitrophenol; associated samples RFI-44-05(0.9-02), RFI-44-05(10-12), RFI-44-05(10-12), RFI-44-DUP-14, RFI-09-DUP-13, RFI-09-05(0.5-02), RFI-09-05(06-08), RFI-09-03(0.4-02), RFI-09-03(02-04), RFI-09-02(0.4-02), RFI-09-02(02-04), RFI-94-01(051601), RFI-94-01(02-04), RFI-17-01(0.7-02), RFI-17-01(02-04), RFI-12-07(051601), RFI-44-05(02-04) and RFI-44-04(02-04); Hexachlorocyclopentadiene; associated samples RFI-44-RB-08, RFI-12-08(051601), RFI-44-04(0.9-02) and RFI-12-05(051601); 2,4-Dinitrophenol, 4,6-Dinitro-2-methylphenol, and bis(2-Chloroethyl)ether; associated samples RFI-44-04(0.9-02) and RFI-12-05(051601). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 2,4-Dinitrophenol and Benzo(g,h,i)perylene, associated samples RFI-09-02(02-04), RFI-94-01(0.5-02), RFI-94-01(02-04), RFI-17-01(02-04) and RFI-44-04(0.9-02); 4-Nitrophenol; associated samples RFI-44-05(10-12) and RFI-09-05(06-08); a decrease in response by 2,4-Dinitrophenol and 4,6-Dinitro-2-methylphenol; associated samples RFI-09-03(0.4-02) and RFI-09-03(02-04); a decrease in response by Benzaldehyde and bis(2-Chloroethyl)ether; associated sample RFI-12-05(051601). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene. Associated samples RFI-44-05(0.9-02), RFI-09-DUP-13 and RFI-09-05(0.5-02) have been qualified as estimated for the compounds based on these deviations.

Sample RFI-12-05(051601) contained bis(2-Ethylhexyl)phthalate above the linear range. The original sample results have been replaced with the results from the dilution run, for this compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The field duplicate RPD between sample RFI-09-05(0.5-02) and duplicate RFI-09-DUP-13 was outside of acceptable limits for Aroclor-1260. Data have been qualified as estimated for Aroclor-1260, based on this deviation.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The field duplicate RPD between sample RFI-44-05(08-10) and duplicate RFI-44-DUP-14 was outside the acceptable limits for Cadmium. Data have been qualified as estimated based on this deviation

The MS/MSD %Rs were outside the acceptable limits for Barium, Cobalt, Copper, Lead, Nickel, Selenium and Zinc. Soil samples have been qualified as estimated for the analytes based on the deviation

The MS/MSD %Rs were outside the acceptable limits for Antimony. Non-detected soil sample results have been qualified as rejected and detected soil sample results have been qualified as estimated for the analyte based on these deviations.

The MS/MSD %Rs were outside the acceptable limits for Antimony, Arsenic, Barium, Cadmium,

Chromium, Cobalt, Copper, Lead, Nickel, Selenium, Silver, Thallium, Vanadium and Zinc. Positive results in associated samples RFI-44-RB-09, RFI-12-05(051601), RFI-12-07(051601) and RFI-12-08(051601) have been qualified as estimated for the analytes.

The MS/MSD %Rs were outside the acceptable limits for Manganese. Associated sample RFI-44-RB-09 has been qualified as estimated for the analyte.

The LCS was outside of acceptable limits for Selenium. Positive data in soil samples have been qualified as estimated for the analyte based on this deviation.

Antimony and Selenium were detected in the blanks. Sample results which were below the blank action level have been qualified as non-detected for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 5, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	July, 30, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012134

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012134 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-44-01(0.7-02)[1]	3012134001	Soil	5/17/01	x	x	x	x	
RFI-44-01(04-06)	3012134002	Soil	5/17/01	x	x	x	x	
RFI-44-02(0.7-02)	3012134003	Soil	5/17/01	x	x	x	x	
RFI-44-03(0.9-02)[1]	3012134004	Soil	5/17/01	x	x	x	x	
RFI-44-03(06-08)	3012134005	Soil	5/17/01	x	x	x	x	
RFI-44-DUP-12	3012134006	Soil	5/17/01	x	x	x	x	
RFI-16-03(051701)[1]	3012134007	Water	5/17/01	x	x	x	x	
RFI-16-03(051701)	3012134008	Water	5/17/01			x		
RFI-16-05(051701)	3012134009	Water	5/17/01	x	x	x	x	
RFI-16-05(051701)	3012134010	Water	5/17/01			x		
RFI-16-06(051701)[1]	3012134011	Water	5/17/01	x	x	x	x	
RFI-16-06(051701)[1]	3012134012	Water	5/17/01			x		
RFI-16-TB-03[1]	3012134013	Water	5/17/01	x				
RFI-44-02(04-06)	3012134014	Soil	5/17/01	x	x	x	x	
RFI-44-02(02-04)	3012134015	Soil	5/17/01	x	x	x	x	
RFI-44-RB-09	3012134016	Water	5/17/01	x	x	x	x	
Field Blank(051701)	3012134017	Water	5/17/01	x	x	x	x	
RFI-44-02(02-04)DL	3012134018	Soil	5/17/01	x				
RFI-16-05(051701)[1]	3012134019	Water	5/17/01		x			

[1] MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by cis-1,2-Dichloroethene; associated samples RFI-44-01(0.7-02), RFI-44-01(04-06), RFI-44-02(0.7-02), RFI-44-03(0.9-02), RFI-44-DUP-12, RFI-16-03(051701), RFI-16-05(051701), RFI-16-06(051701), RFI-16-TB-03, RFI-44-RB-09 and Trip Blank(051701); a decrease in response by Cyclohexane; associated samples RFI-44-01(0.7-02), RFI-44-01(04-06), RFI-44-02(0.7-02), RFI-44-03(0.9-02), RFI-44-03(06-08), RFI-44-DUP-12, RFI-16-03(051701), RFI-16-05(051701), RFI-16-06(051701), RFI-16-TB-03, RFI-44-02(04-06), RFI-44-02(02-04), RFI-44-RB-09 and Trip Blank (051701). Data have been qualified as estimated for the compounds based on theses deviations.

The continuing calibration was above the acceptable limit due to an increase in response by Chloromethane, associated samples RFI-44-01(0.7-02), RFI-44-01(04-06), RFI-44-02(0.7-02), RFI-44-03(0.9-02) and RFI-44-DUP-12; Trifluorotrichloroethane (Freon 113) associated sample Field Blank(051701). Data have been qualified as estimated for the compounds based on this deviation.

Methylene chloride, Acetone, Toluene, Ethyl benzene, P&M Xylene, and Chloroform were detected in

the blanks. Sample results which were below the blank action level have been qualified as non-detected for the compounds.

Methyl acetate was detected above the linear range in sample RFI-44-02(02-04). Data from the dilution analysis was used to replace the original sample result.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was greater than the acceptable limit for 2,4-Dinitrophenol. Associated samples RFI-44-01(0.7-02), RFI-44-01(04-06), RFI-44-02(0.7-02), RFI-44-03(0.9-02), RFI-44-03(06-08), RFI-44-02(04-06) and RFI-44-02(02-04) have been qualified as estimated for the compound based on this deviation.

The initial calibration %RSD was outside acceptable limits for Hexachlorocyclopentadiene. Associated samples RFI-16-05(051701), RFI-16-06(051701), RFI-44-RB-09 and Trip Blank(051701) have been qualified as estimated for the compound based on this deviation.

The initial calibration %RSD was outside acceptable limits for bis(2-Chloroethyl)ether, Hexachlorocyclopentadiene, 2,4-Dinitrophenol, and 4,6-Dinitro-2-methylphenol. Associated sample RFI-16-03(051701) has been qualified as estimated for the compounds based on the deviations.

Responses for internal standard Perylene-d12 were outside of the acceptable limit in associated samples RFI-44-02(0.7-02), RFI-44-03(0.9-02), RFI-44-03(06-08), RFI-44-DUP-12, RFI-44-02(04-06),

and RFI-44-02(02-04). Data from the confirmation runs were used for samples RFI-44-02(0.7-02), RFI-44-03(0.9-02), and RFI-44-02(04-06). Compounds associated with Perylene-d12 have been qualified as estimated in the associated samples.

bis(2-Ethylhexyl)phthalate was detected above the linear range. Data from the dilution was used to replace the original sample result for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 2,4-Dimethylphenol. Associated samples RFI-44-03(0.9-02), RFI-44-03(06-08) and RFI-44-02(04-06); bis(2-Chloroethyl)ether associated sample RFI-16-03(051701) have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Indeno(1,2,3-cd)pyrene, associated samples RFI-44-02(04-06), and RFI-44-02(02-04); Benzo(g,h,i)perylene, associated sample RFI-44-02(02-04). Data for the listed compounds have been qualified as estimated based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)			X
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were outside the acceptable limit in samples for all analytes with the exception of Beryllium and Cyanide. Detected sample results in associated samples RFI-44-RB-09 and Field Blank (051701) have been qualified as estimated.

The MS/MSD %Rs were outside of acceptable limits for Antimony, Lead, and Zinc. Soil samples results have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %Rs were outside of acceptable limits for Cyanide. Positive soil sample results for the analyte have been qualified as estimated based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 20, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 2, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012150

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012150 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-02-07(04-06)	3012150001	Soil	5/18/01	x	x	x	x	
RFI-02-07(06-08)	3012150002	Soil	5/18/01	x	x	x	x	
RFI-02-07(0.9-02)	3012150003	Soil	5/18/01	x	x	x	x	
RFI-02-05(02-04)[1]	3012150004	Soil	5/18/01	x	x	x	x	
RFI-02-05(0.7-02)	3012150005	Soil	5/18/01	x	x	x	x	
RFI-02-DUP-13	3012150006	Soil	5/18/01	x	x	x	x	
RFI-16-RB-10	3012150007	Water	5/18/01	x	x	x	x	
Tank	3012150008	Oil	5/18/01	x	x	x	x	x
RFI-02-03(051801)	3012150009	Water	5/18/01	x	x		x	
RFI-02-03(051801)	3012150010	Water	5/18/01			x		
RFI-02-02(051801)	3012150011	Water	5/18/01	x	x	x	x	
RFI-02-02(051801)[1]	3012150012	Water	5/18/01			x		
RFI-02-01(051801)	3012150013	Water	5/18/01	x	x	x	x	
RFI-02-01(051801)	3012150014	Water	5/18/01			x		
RFI-02-DUP-15	3012150015	Water	5/18/01	x	x	x	x	
RFI-02-DUP-15	3012150016	Water	5/18/01			x		
RFI-02-04(051801)	3012150017	Water	5/18/01	x	x	x	x	
RFI-02-04(051801)	3012150018	Water	5/18/01			x		
RFI-16-02(051801)	3012150019	Water	5/18/01	x	x	x	x	
RFI-16-02(051801)	3012150020	Water	5/18/01			x		
RFI-12-01(051701)	3012150021	Water	5/18/01		x		x	
RFI-02-TB-03	3012150022	Water	5/18/01	x				
RFI-12-02(051601)NL	3012150023	Oil	5/16/01	x	x	x	x	x
RFI-02-DUP-15DL	3012150024	Water	5/18/01		x			
RFI-02-04(051801)DL	3012150025	Water	5/18/01		x			

[1] MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was greater than the acceptable limit for Bromomethane. Associated samples RFI-02-07(04-06), RFI-02-07(06-08), RFI-02-07(0.9-02), RFI-02-05(02-04), RFI-02-05(0.7-02), RFI-02-DUP-13, Tank, and RFI-12-02(051601)NL have been qualified as estimated for the compound based on this deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by cis-1,2-Dichloroethene, and Cyclohexane; associated samples RFI-02-07(04-06), RFI-02-07(06-08), RFI-02-07(0.9-02), RFI-02-05(02-04), RFI-02-05(0.7-02), RFI-02-DUP-13, RFI-16-RB-10, Tank, RFI-02-03(051801), RFI-02-02(051801), RFI-02-01(051801), RFI-02-DUP-15, RFI-02-04(051801), RFI-16-02(051801), and RFI-02-TB-03; a decrease in response by Cyclohexane, associated sample RFI-12-02(051601)NL; a decrease in response by 1,2-Dichloroethane; associated sample Tank. Data for the listed compounds have been qualified as estimated based on these deviations.

Methylene chloride was detected in the trip blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Toluene was detected in the rinse blank. Soil sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was greater than the acceptable limit for bis(2-Chloroethyl)ether, Hexachlorocyclopentadiene, 2,4-Dinitrophenol, and 4,6-Dinitro-2-methylphenol. Associated sample RFI-02-05(0.7-02) has been qualified as estimated for the compounds based on these deviations.

The initial calibration %RSD was greater then the acceptable limit for 2,4-Dinitrophenol. Associated samples Tank and RFI-12-02(051601)NL have been qualified as estimated for the compound, based on this deviation .

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde and bis(2-Chloroethyl)ether. Associated sample RFI-02-05(0.7-02) has been qualified as estimated for the compounds based on this deviation.

The %R for two base surrogates were above acceptable limits in samples Tank and RFI-12-02(051601)NL. Detected base compounds in the associated samples were qualified as estimated

The MS/MSD %Rs were outside the acceptable limits for Pyrene. Associated sample RFI-02-05(02-04) has been qualified as estimated for the compound based on the deviation.

Responses for internal standards were below acceptable limits in Perylene-d12 and Chrysene-d12. All compounds associated with Perylene-d12 have been qualified as estimated in sample RFI-02-05(02-04). All compounds associated with Chrysene-d12 have been qualified as estimated in sample RFI-12-02(051601)NL.

The field duplicate RPD was outside of acceptable limits for bis(2-Ethylhexyl)phthalate between sample RFI-02-02(051801) and duplicate RFI-02-DUP-15. Sample results for this compound have been qualified as estimated.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were outside the acceptable limits for Zinc, Lead, and Antimony. Associated samples RFI-02-07(04-06), RFI-02-07(06-08), RFI-02-07(0.9-02), RFI-02-05(02-04), RFI-02-05(0.7-02), and RFI-02-DUP-13 have been qualified as estimated for the analytes.

The MS/MSD %Rs were outside the acceptable limits for Cyanide. Associated samples RFI-02-07(06-08), RFI-02-07(0.9-02), RFI-02-05(02-04) and RFI-02-05(0.7-02), have been qualified as estimated for the analyte.

The MS/MSD %Rs were above acceptable limits for Antimony. Associated sample RFI-12-02(051601)NL has been qualified as estimated and sample Tank has been qualified as rejected for the analyte.

The MS/MSD %Rs were above acceptable limits for Barium, Cadmium, Chromium, Copper, Manganese, Nickel, Selenium, Silver, Zinc and Vanadium. Oil sample results have been qualified as estimated for the analytes.

The MS/MSD %Rs were above acceptable limits for Arsenic and Selenium. Associated sample RFI-12-02(051601)NL has been qualified as estimated for the analytes based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 22, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	July 30, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012163

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012163 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-94-06(052101)	3012163001	Water	5/21/01	X	X	X	X	X
RFI-94-06(052101)	3012163002	Water	5/21/01			X		
RFI-44-02(052101)	3012163003	Water	5/21/01	X	X	X	X	X
RFI-44-02(052101)	3012163004	Water	5/21/01			X		
RFI-94-03(052101)	3012163005[1]	Water	5/21/01	X	X	X	X	X
RFI-94-03(052101)	3012163006[2]	Water	5/21/01			X		
RFI-94-TB-04	3012163007	Water	5/21/01	X				
RFI-02-08(0.7-02)	3012163008	Soil	5/21/01	X	X	X	X	X
RFI-02-08(04-06)	3012163009	Soil	5/21/01	X	X	X	X	X
RFI-84-06(0.9-02)	3012163010	Soil	5/21/01	X	X	X	X	X
RFI-84-06(04-06)	3012163011[3]	Soil	5/21/01	X	X	X	X	X
RFI-84-RB-11	3012163012[1]	Water	5/21/01	X	X	X	X	X
RFI-44-02(052101)DL	3012163013	Water	5/21/01		X			
RFI-94-03(052101)DL	3012163014	Water	5/21/01		X			

1 MS/MSD/DUP analysis performed on selected samples
2 PCB only MS/MSD analysis performed on sample
3 Metals only MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MSD %R was above control limits for benzene. Associated sample RFI-94-06 (052101) has been qualified as estimated for the compound.

The LCS %R was below control limits for cis-1,2-dichloroethene. Associated samples RFI-94-TB-04 and RFI-84-RB-11 have been qualified as estimated for the compound.

The initial calibration %RSD was greater than the acceptable limit for Bromomethane. Associated samples RFI-02-08 (0.7-02), RFI-02-08 (04-06), RFI-84-06 (0.9-02) and RFI-84-06 (04-06) have been qualified as estimated for the compound.

The continuing calibration %D was outside the acceptable limit due to a decrease in response by Cyclohexane. Associated samples RFI-94-06 (052101), RFI-44-02 (052101), RFI-93-04 (052101), RFI-94-TB-04, RFI-02-08 (0.7-02), RFI-02-08 (04-06), RFI-84-06 (0.9-02), RFI-84-06 (04-06) and RFI-84-RB-11) have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The Perylene-d12 internal standard response was below control limits. Associated sample RFI-84-06 (0.9-02) has been qualified as estimated for all compounds associated with Perylene-d12.

The continuing calibration %D was outside the acceptable limit due to a decrease in response by Benzaldehyde and bis(2-chloroethyl)ether, associated sample RFI-84-06 (04-06); a decrease in response by Isophorone, associated sample RFI-84-06 (09-02). Data have been qualified as estimated for the compounds based on the deviations.

Samples RFI-44-02 (052101 and RFI-94-03 (052101) contained bis(2-Ethylhexyl)phthalate above the linear range. The original sample results for these compounds have been replaced with the sample results from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were above acceptable limits for Arsenic, Cadmium and Selenium. Positive results in associated samples RFI-94-06 (051201), RFI-44-02 (051201) and RFI-94-03 (051201) have been qualified as estimated for the analytes.

The MSD %R was above acceptance criteria for Arsenic and Beryllium. Detected results in associated samples RFI-02-08 (0.7-02), RFI-02-08 (04-06), RFI-84-06 (0.9-02) and RFI-84-06 (04-06) have been qualified as estimated for the analytes.

The MS/MSD RPD was above acceptance limits for Barium, Lead and Manganese. Detected results in associated samples RFI-02-08 (0.7-02), RFI-02-08 (04-06), RFI-84-06 (0.9-02) and RFI-84-06 (04-06) have been qualified as estimated for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 22, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	August 9, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012194

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012194 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-44-01 (052201)	3012194001	Water	5/22/01	x	x	x	x	
RFI-44-01 (052201) D	3012194002	Water	5/22/01			x		
RFI-94-01 (052201)	3012194003	Water	5/22/01	x	x	x	x	
RFI-94-01 (052201) D	3012194004	Water	5/22/01			x		
RFI-84-03 (052201)[1]	3012194005	Water	5/22/01	x	x	x	x	
RFI-84-03 (052201) D	3012194006	Water	5/22/01			x		
RFI-84-TB-05	3012194007	Water	5/22/01	x				
RFI-94-04 (052201)	3012194008	Water	5/22/01	x	x	x	x	
RFI-94-04 (052201) D	3012194009	Water	5/22/01			x		
RFI-17-01 (052201)	3012194010	Water	5/22/01	x	x	x	x	
RFI-17-01 (052201) D	3012194011	Water	5/22/01			x		
RFI-84-Dup-14	3012194012	Water	5/22/01	x	x	x	x	
RFI-84-Dup-14 Diss P	3012194013	Water	5/22/01			x		
RFI-23-RB-11	3012194014	Water	5/22/01	x	x	x	x	
RFI-23-01 (01-02)	3012194015	Soil	5/22/01	x	x	x	x	
RFI-23-01 (02-04)	3012194016	Soil	5/22/01	x	x	x	x	
RFI-23-02 (03-3.8)	3012194017	Soil	5/22/01	x	x	x	x	
RFI-94-01 (052201)DL	3012194018	Water	5/22/01	x				
RFI-44-01 (052201)DL	3012194019	Water	5/22/01		x			

[1] MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was outside the acceptable limit for Bromomethane, associated samples RFI-23-01(01-02), RFI-23-01(02-04) and RFI-23-02(03-3.8); Dichlorodifluoromethane, associated sample RFI-94-01(052201)DL. Data has been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was outside the acceptable limits due to a decrease in response by cis-1,2-Dichloroethene and Cyclohexane; associated samples RFI-44-01(052201), RFI-94-01(052201), RFI-84-TB-05, RFI-94-04(052201), RFI-17-01(052201), and RFI-23-RB-11; a decrease in response by Cyclohexane; associated samples RFI-23-01(01-02), RFI-23-01(02-04), and RFI-23-02(03-3.8); a decrease in response by Methylene chloride, associated samples RFI-84-03(052201) and RFI-94-01(052201)DL. Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was outside the acceptable limits due to an increase in response by Dichlorodifluoromethane, associated samples RFI-94-01(052201), RFI-94-04(052201), and RFI-94-01(052201)DL; Tetrachloroethene, associated sample RFI-23-01(02-04). Data have been qualified as

estimated for the compounds based on these deviations.

The MS/MSD %R were outside acceptable limits for Trifluorotrichloroethane (Freon 113), 1,2-Dibromo-3-chloropropane, Bromodichloromethane, Bromomethane, Chloroethane, Methylcyclohexane, Ethylbenzene, Vinyl Chloride and Methyl Tert Butyl Ether (MTBE). Detected results in associated sample RFI-84-03 (052201) have been qualified as estimated for the compounds.

The LCS %R was above control limits for Dichlorodifluoromethane. Associated sample RFI-94-01(052201)DL has been qualified as estimated for the compound.

Acetone, Bromodichloromethane, Chloroform, Dibromochloromethane, and Toluene were detected in the rinse blank. Soil sample results for these compounds which were below the blank action level have been qualified as non-detected.

Methylene Chloride was detected in the trip blank sample results for this compound which were below the blank action level have been qualified as non-detected.

Sample RFI-94-01 (052201) contained Dichlorodifluoromethane above the linear range. The original sample result for this compound has been replaced with data from the dilution.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Internal standards responses were outside control limits for Chrysene-d12 and Perylene-d12. Sample RFI-44-01(052210) has been qualified as estimated for all compounds associated with Perylene-d12. Sample result for bis(2-Ethylhexyl)phthalate associated with internal standard Chrysene-d12, which was transferred from the dilution analysis for RFI-44-01(052201) has been qualified as estimated.

The initial calibration %RSD was outside the acceptable limit for 2,4-Dinitrophenol. Associated samples RFI-94-01(052201), RFI-94-04(052201), RFI-17-01(052201) and RFI-84-DUP-14 have been qualified as estimated for the compounds based the deviation.

The continuing calibration %D was outside the acceptable limit for 2,4-Dinitrophenol and 4,6-Dinitro-2-methylphenol. Associated samples RFI-94-01(052201), RFI-94-04(052201), RFI-17-01(052201) and RFI-84-DUP-14 have been qualified as estimated for the compounds based on these deviations.

The LCSD %R was above acceptable limits for Benzo(b)fluoranthene. Associated samples RFI-23-01(00-02), RFI-23-01(02-04) and RFI-23-02(03-3.8) have been qualified as estimated for the

compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS %R was below control limits for Aroclor-1248. Associated samples RFI-23-01(00-02), RFI-23-01(02-04) and RFI-23-02(03-3.8) have been qualified as estimated for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were above the acceptable limit for Arsenic and Zinc, associated samples RFI-44-01(052201), RFI-94-01(052201), RFI-84-03(052201), RFI-94-04(052201) and RFI-17-01(052201); Selenium, associated samples RFI-94-04(052201) and RFI-17-01(052201); Zinc, associated sample RFI-84-DUP-14. Positive data have been qualified as estimated for the analytes based on these deviations.

The MS/MSD %Rs were below the acceptable limit for Vanadium and Chromium. Associated samples RFI-23-01(00-02), RFI-23-01(02-04) and RFI-23-02(03-3.8) have been qualified as estimated for the analytes based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 25, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 10, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012216

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012216 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-12-04 (052301)	3012216001	Water	5/23/01	X	X	X	X	X
RFI-12-04 (052301) D	3012216002	Water	5/23/01			X		
RFI-84-04 (052301)	3012216003	Water	5/23/01	X	X	X	X	X
RFI-84-04 (052301) D	3012216004	Water	5/23/01			X		
RFI-84-01 (052301)	3012216005	Water	5/23/01	X	X	X	X	X
RFI-84-01 (052301) D	3012216006	Water	5/23/01			X		
RFI-84-TB-06	3012216007	Water	5/23/01	X				
RFI-29-01 (052301)	3012216008	Water	5/23/01	X	X	X	X	X
RFI-29-01 (052301) D	3012216009	Water	5/23/01			X		
RFI-12-RB-12	3012216010	Water	5/23/01	X	X	X	X	X
RFI-86-07 (0.7-2.7)[2]	3012216011	Soil	5/23/01	X	X	X	X	X
RFI-86-07 (8.7-10.7)[1]	3012216012	Soil	5/23/01	X	X	X	X	X
RFI-86-01 (0.5-2.5)	3012216013	Soil	5/23/01	X	X	X	X	X
RFI-86-01 (4.5-6.5)	3012216014	Soil	5/23/01	X	X	X	X	X
RFI-86-01 (8.5-10.5)	3012216015	Soil	5/23/01	X	X	X	X	X
RFI-12-03 (00-02)	3012216016	Soil	5/23/01	X	X	X	X	X
RFI-86-Dup-14[3]	3012216017	Soil	5/23/01	X	X	X	X	X
RFI-86-Dup-15[4]	3012216018	Soil	5/23/01	X	X	X	X	X
RFI-12-03 (04-5.1)	3012216019	Soil	5/23/01	X	X	X	X	X
RFI-29-01 (052301)DL	3012216020	Water	5/23/01		X			
RFI-86-01(0.5-2.5)DL	3012216021	Soil	5/23/01		X			

1 MS/MSD/DUP analysis performed on sample (except metals)
2 MS/MSD/DUP analysis performed on sample for metals only
3 Field Duplicate of RFI-86-07(0.7-2.7)
4 Field Duplicate of RFI-86-01(8.5-10.5)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were below acceptable limits for 1,2,4-Trichlorobenzene, cis-1,2-Dichloroethene and Cyclohexane. Associated sample RFI-86-07 (8.7-10.7) has been qualified as estimated for the compounds.

The LCS %R was below acceptance limits for cis-1,2-Dichloroethene. Associated samples RFI-12-04 (052301), RFI-84-04 (052301), RFI-84-01 (052301), and RFI-29-01 (052301) have been qualified as estimated for the compound.

The initial calibration %RSD was greater than the acceptable limit for Bromomethane. Associated samples RFI-86-07 (0.7-2.7), RFI-86-07 (8.7-10.7), RFI-86-01 (4.5-6.5), RFI-86-01 (8.5-10.5), RFI-86-Dup-14 and RFI-86-Dup-15. Non-detected data have been qualified as estimated for the compound.

The continuing calibration %D was outside the acceptable limit due to a decrease in response by cis-1,2-Dichloroethene and Cyclohexane; associated samples RFI-12-04- (052301), RFI-84-04 (052301) and RFI-29-01 (052301); a decrease in response by cis-1,2-Dichloroethene, Cyclohexane, 1,2-

Dichloroethane, and Tetrachloroethene; associated samples RFI-86-07 (0.7-2.7), RFI-86-07 (8.7-10.7), RFI-86-01 (4.5-6.5), RFI-86-01 (8.5-10.5), RFI-86-Dup-14 and RFI-86-Dup-15); a decrease in response by Methylene Chloride, associated sample RFI-84-01 (052301). Data have been qualified as estimated for the compounds based on the deviations.

Acetone and Chloroform were detected in the rinse blank. Methylene Chloride was detected in the trip blank. Samples results which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standards response was below control limits for Chrysene-d12 and Perylene-d12. Associated sample RFI-86-01 (0.5-2.5) has been qualified as estimated for all compounds associated with the listed internal standards.

The internal standard response was below acceptance limits for Perylene-d12 in sample RFI-12-03 (00-02). The sample was re-extracted outside the holding time and the internal standard was below acceptance limits in the re-extraction analysis. All compounds associated with Perylene-d12 have been qualified as estimated.

The LCSD %R were above control limits for 3&4-Methylphenol; associated samples RFI-12-04 (052301), RFI-84-04 (052301), RFI-84-01 (052301) and RFI-29-01 (052301); Benzo(b)fluoranthene, associated samples RFI-86-07 (0.7-2.7), RFI-86-07 (8.7-10.7), RFI-86-01 (0.5-2.5), RFI-86-01 (4.5-6.5), RFI-86-01 (8.5-10.5), RFI-12-03 (00-02), RFI-86-Dup-14, RFI-86-Dup-15, RFI-12-03 (04-5.1) and RFI-86-01 (0.5-2.5)DL). Positive data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was outside the acceptable limit due to a decrease in response by 2,4-Dinitrophenol, and 4,6-Dinitro-2-methylphenol; associated samples RFI-84-04 (052301) and RFI-29-01 (052301); a decrease in response by bis(2-chloro)ether, associated sample RFI-86-Dup-14; a decrease in response by 2,4-Dinitrophenol, associated samples RFI-12-04 (052301), RFI-84-01 (052301), RFI-86-07 (0.7-2.7), RFI-86-07 (8.7-10.7), RFI-86-01 (4.5-6.5), RFI-86-01 (8.5-10.5), RFI-86-Dup-15 and RFI-12-03 (04-5.1). Data have been qualified as estimated for the compounds based on the deviations.

Sample RFI-29-01 (052301) contained bis(2-Ethylhexyl)phthalate above the linear range and sample RFI-86-01 (0.5-2.5) contained Benzo(b)fluoranthene and Pyrene above the linear range. The original sample results for these compounds have been replaced with data from the dilution analysis.

Benzo(g,h,i)perylene exceeded the linear range in sample RFI-86-01 (0.5-2.5). Although a dilution was performed, the diluted result for that compound was considerably lower that the non-diluted result. The higher value has been reported and has been qualified as estimated.

Di-n-butylphthalate was detected in the rinse blank. Sample results which were below the blank action level have been qualified as non-detected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were above acceptable limits for Arsenic, Cadmium and Selenium. Positive data in associated samples RFI-12-04 (052301), RFI-84-04 (052301), RFI-84-01 (052301) and RFI-29-01 (052301) have been qualified as estimated for the compounds based on the deviations.

The MS/MSD %Rs were above acceptable limits for Arsenic and Beryllium. Positive data in associated samples RFI-86-07 (0.7-2.7), RFI-86-07 (8.7-10.7), RFI-86-01 (0.5-2.5), RFI-86-01 (4.5-6.5), RFI-86-01 (8.5-10.5), RFI-12-03 (00-02), RFI-86-Dup-14, RFI-86-Dup-15 and RFI-12-03 (04-5.1) have been qualified as estimated for the analytes based on the deviations.

The MS/MSD RPD was above control limits for Barium, Lead, and Manganese. Positive data in associated samples RFI-86-07 (0.7-2.7), RFI-86-07 (8.7-10.7), RFI-86-01 (0.5-2.5), RFI-86-01 (4.5-6.5), RFI-86-01 (8.5-10.5), RFI-12-03 (00-02), RFI-86-Dup-14, RFI-86-Dup-15 and RFI-12-03 (04-5.1) have been qualified as estimated for the analytes based on the deviations.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 27, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	September 12, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012265

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012265 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-84-05 (0.8-2.8)	3012265001	Soil	5/24/01	x	x	x	x	
RFI-40-01 (0.3-2.3)	3012265002	Soil	5/24/01	x	x	x	x	
RFI-12-06 (1.2-3.2)	3012265003	Soil	5/24/01	x	x	x	x	
RFI-12-06 (7.2-9.2)	3012265004	Soil	5/24/01	x	x	x	x	
RFI 84-05 (2.8-4.8)	3012265005	Soil	5/24/01					
RFI 84-05 (4.8-6.8)	3012265006	Soil	5/24/01					
RFI 84-05 (6.8-8.8)	3012265007	Soil	5/24/01	x	x	x	x	
RFI 84-05 (8.8-10.8)	3012265008	Soil	5/24/01					
RFI 84-05 (10.8-12.8)	3012265009	Soil	5/24/01					
RFI 84-05 (12.8-14.8)	3012265010	Soil	5/24/01					
RFI 84-05 (14.8-16.8)	3012265011	Soil	5/24/01					
RFI-12-03 (052401)	3012265012	Water	5/24/01	x	x	x	x	
RFI-12-03 (052401) D	3012265013	Water	5/24/01			x		
RFI-84-TB-07	3012265014	Water	5/24/01	x				
RFI-86-07 (052401)	3012265015	Water	5/24/01	x	x	x	x	
RFI-86-07 (052401) D	3012265016	Water	5/24/01			x		
RFI-86-Dup-15W	3012265017	Water	5/24/01	x	x	x	x	
RFI-86-Dup-15 Diss P	3012265018	Water	5/24/01			x		
RFI-84-02 (052401)	3012265019	Water	5/24/01	x	x	x	x	
RFI-84-02 (052401) D	3012265020	Water	5/24/01			x		
RFI-84-02(052401) DL	3012265021	Water	5/24/01		x			

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The LCS %R was below the acceptable limit for 1,1,1-Trichloroethane, cis-1,2-Dichloroethene and Ethylbenzene. Associated samples RFI-86-07(052401), RFI-86-DUP-15W and RFI-84-02(052401) have been qualified as estimated for the compounds.

Methylene chloride was detected in the trip blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Sample RFI-40-01(0.3-2.3) has been qualified as estimated for all compounds associated with Perylene-d12.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde and Benzo(g,h,i)perylene; associated sample RFI-86-07(052401); a decrease in response by bis(2-Chloroethyl)ether, Acetophenone and Caprolactam, associated samples RFI-84-05(0.8-2.8), RFI-12-06(1.2-3.2), RFI-12-06(7.2-9.2), RFI-84-05(6.8-8.8), RFI-12-03(052401), RFI-86-DUP-15W and RFI-84-02(052401). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene. Associated sample RFI-40-01(0.3-2.3) has been qualified as estimated for the compounds based on the deviations.

Sample RFI-84-02 (052401) contained bis(2-Ethylhexyl)phthalate above the linear range. The original sample results for this compound have been replaced with the sample results from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below acceptable limits for Antimony and Chromium. Associated samples RFI-84-05(0.8-2.8), RFI-40-01(0.3-2.3), RFI-12-06(1.2-3.2), RFI-12-06(7.2-9.2) and RFI-84-05(6.8-8.8) have been qualified as estimated for the analytes based on these deviations.

The MS/MSD %Rs were above the acceptable limit for Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Lead, Nickel, Selenium, Silver, Thallium, Vanadium and Zinc. Detected results in associated samples RFI-84-05(0.8-2.8), RFI-40-01(0.3-2.3), RFI-12-06(1.2-3.2), RFI-12-06(7.2-9.2) and RFI-84-05(6.8-8.8) have been qualified as estimated for the analytes.

The MS/MSD %Rs were above the acceptable limit for Antimony, Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Lead, Nickel, Selenium, Vanadium and Zinc. Detected results in associated samples RFI-12-03(052401), RFI-86-07(052401), RFI-86-DUP-15W and RFI-84-

02(052401) have been qualified as estimated for the analytes.

The Serial Dilution RPD was above the acceptable limit for Barium. Associated samples RFI-12-03(052401), RFI-86-07(052401), RFI-86-DUP-15W and RFI-84-02(052401) have been qualified as estimated for the analyte based on the deviation.

Selenium was detected in the method blank. Sample results for this analyte which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 28, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 13, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012281

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012281 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-44-03 (052501)	3012281001	Water	5/25/01	X	X	X		
RFI-44-03 (052501) D	3012281002	Water	5/25/01			X	X	X
RFI 12-06 (052501)	3012281003	Water	5/25/01	X	X	X		
RFI 12-06 (052501) D	3012281004	Water	5/25/01			X	X	X
RFI-12-TB-08	3012281005	Water	5/25/01	X				
RFI-02-03 (052501)	3012281006	Water	5/25/01			X		
RFI- South PT-01	3012281008	Water	5/25/01	X	X	X	X	X
RFI-12-RB-13	3012281009	Water	5/25/01	X	X	X	X	X
RFI-12-RB-14	3012281010	Water	5/25/01	X	X	X	X	X
RFI-12-10 (04-06)	3012281011	Soil	5/25/01	X	X	X	X	X
RFI-12-10 (06-08)	3012281012	Soil	5/25/01	X	X	X	X	X
RFI-12-06 (052501)DL	3012281013	Water	5/25/01		X			

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was outside the acceptable limit due to a decrease in response by Acetone and 2-Butanone. Associated samples RFI-12-10 (04-06) and RFI-12-10 (06-08) have been qualified as estimated for the compounds.

Methylene Chloride was detected in the rinse and trip blanks. Sample results which were below the blank action level have been qualified as non-detected for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standards response was below control limits for Chrysene-d12. Sample RFI-12-10 (06-08) has been qualified as estimated for all compounds associated with Chrysene-d12.

The continuing calibration %D was outside the acceptable limit due to a decrease in response by bis(2-Chloroethyl)ether, Acetophenone and Caprolactam; associated samples RFI-12-06 (052501), RFI-12-10 (04-06) and RFI-12-10 (06-08); a decrease in response by Benzaldehyde and Benzo(g,h,i)perylene; associated samples RFI-44-03 (052501) and RFI-south PT-01. Data have been qualified as estimated for the compounds.

Sample RFI-12-06 (052501) contained bis(2-Ethylhexyl)phthalate above the linear range. The original sample results have been replaced with data from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples			X

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were above control limits for Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Lead, Manganese, Nickel, Silver, Thallium, Vanadium and Zinc. Associated samples RFI-12-10 (04-06) and RFI-12-10 (06-08) have been qualified as estimated for the analytes.

The MS/MSD %Rs were above control limits for Arsenic, Barium, Cadmium, Copper, Nickel, Selenium, Vanadium and Zinc. Associated samples: RFI-44-03 (052501) and RFI-12-06 (052501) have been qualified as estimated for the analytes.

The MS/MSD %Rs were above control limits for Antimony, Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Silver, Thallium, Vanadium and Zinc. Associated sample RFI-south PT-01 has been qualified as estimated for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	March 23, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	August 21, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012287

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012287 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-16-04(052901)NL	3012287001	Water	5/29/01	x	x	x	x	x

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was outside the acceptable limit due to a decrease in response by Methylene Chloride. Data have been qualified as estimated for the compound.

The MSD %R was above control limits for Benzene. Positive data have been qualified as qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All of the surrogate recoveries were less than 10%. All non-detected compounds have been rejected and all detected compounds have been qualified as estimated.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R was above control limits for Aroclor-1254. Data have been qualified as estimated for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below control limits for Antimony, Barium, Manganese and Lead. Data have been qualified as estimated for the analytes.

The LCS/LCSD RPD was above control limits for Silver. Data have been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	June 5, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	August 3, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012290

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012290 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-09-08(05-07)	3012290001	Soil	5/29/01	x	x	x	x	
RFI-09-08(01-03)[1]	3012290002	Soil	5/29/01	x	x	x	x	
RFI-09-07(01-03)	3012290003	Soil	5/29/01	x	x	x	x	
RFI-09-Dup-16	3012290004	Soil	5/29/01	x	x	x	x	
RFI-09-07(3.0-5.0)	3012290005	Soil	5/29/01	x	x	x	x	
RFI-09-01(1.0-3.0)	3012290006	Soil	5/29/01	x	x	x	x	
RFI-09-09(4.7-6.7)	3012290007	Soil	5/29/01	x	x	x	x	
RFI-09-09(0.7-2.7)	3012290008	Soil	5/29/01	x	x	x	x	
RFI-09-RB-15	3012290009	Water	5/29/01	x	x	x	x	
RFI-40-01(052901)	3012290010	Water	5/29/01	x	x	x	x	
RFI-40-01(052901)Dis	3012290011	Water	5/29/01			x		
RFI-09-05(052901)	3012290012	Water	5/29/01	x	x	x	x	
RFI-09-05(052901)Dis	3012290013	Water	5/29/01			x		
RFI-09-TB-09	3012290014	Water	5/29/01	x				
RFI-09-03(052901)	3012290015	Water	5/29/01	x	x	x	x	
RFI-09-03(052901)Dis	3012290016	Water	5/29/01			x		
RFI-09-03(052901)DL	3012290017	Water	5/29/01		x			

[1] MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Acetone and 2-Butanone. Associated samples RFI-09-07(01-03), RFI-09-Dup-16, RFI-09-07(3.0-5.0), RFI-09-01(1.0-3.0), RFI-09-09(4.7-6.7) and RFI-09-09(0.7-2.7) have been qualified as estimated for the compounds based on these deviations.

The MS/MSD %Rs were below the acceptable limit for Acetone and Carbon disulfide; associated sample RFI-09-08(01-03); and Methyl acetate; associated sample RFI-09-05(052901). Data have been qualified estimated for the compounds based on these deviations.

The LCS %R were below the acceptable limit for 1,1,1-Trichloroethane, cis-1,2-Dichloroethene and Ethylbenzene. Associated samples RFI-40-01(052901), RFI-09-05(052901) and RFI-09-03(052901) have been qualified as estimated for the compounds.

The field duplicate RPD between sample RFI-09-07(03-05) and duplicate RFI-09-DUP-16 was above the acceptable limit for Benzene, Ethylbenzene, Methyl cylohexane, o-Xylene, m&p-Xylene and Toluene.

Data have been qualified as estimated for the compounds.

Acetone and Methylene chloride were detected in the trip and rinse blanks. Sample results which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below acceptable limits for Perylene-d12 in associated samples RFI-09-08(01-03), RFI-09-07(01-03) and RFI-09-09(0.7-2.7). The internal standard response for Chrysene-d8 was also below acceptable limits for sample RFI-09-09(0.7-2.7). Compounds associated with the deviant internal standards have been qualified as estimated.

The continuing calibration %D was outside the acceptable limit due to a decrease in response by bis(2-Chloroethyl)ether, associated samples RFI-09-08(05-07), RFI-09-DUP-16, RFI-09-07(03-05), RFI-09-01(01-03), RFI-09-09(4.7-6.7), RFI-09-09(0.7-2.7), RFI-40-01(052901) and RFI-09-03(052901); a decrease in response by Benzaldehyde and Benzo(g,h,i)perylene, associated sample RFI-09-05(052901); a decrease in response by Caprolactam and Acetophenone, associated samples RFI-09-01(01-03) and RFI-09-03(052901). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was outside the acceptable limit due to an increase in response by Benzo(g,h,i)perylene and Indeno(1,2,3-cd)pyrene. Detected results in associated sample RFI-09-

07(01-03) have been qualified as estimated for the compounds based on these deviations.

The LCS/LCSD RPD was above the acceptable limit for bis(2-Chloroethyl)ether. Associated sample RFI-09-08(05-07) has been qualified as estimated for the compound based on this deviation.

Diethyl phthalate was detected in the method blank. Associated sample RFI-09-03(052901) has been qualified as non-detected for this compound.

Sample RFI-09-03(052901) contained bis(2-Ethylhexyl)phthalate above the linear range. The original sample results for the compound have been replaced with data from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were below the acceptable limits for Antimony and Chromium. Soil sample results have been qualified as estimated for the analytes.

The MS/MSD %R were above the acceptable limit for Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Lead, Nickel, Selenium, Silver, Thallium, Vanadium and Zinc. Positive soil sample results have been qualified as estimated for the analytes.

The MS/MSD %R were above the acceptable limit for Antimony, Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Lead, Nickel, Selenium, Vanadium and Zinc. Detected analytes in associated samples RFI-40-01(052901), RFI-09-05(052901) and RFI-09-03(052901) have been qualified as estimated based on the deviations.

The field duplicate RPD between sample RFI-09-07(03-05) and duplicate RFI-09-DUP-16 was above

the acceptable limit for Antimony, Copper, Lead, Mercury, Silver and Zinc. Data have been qualified as estimated for detected analytes.

Selenium was detected in the method blank. Associated sample RFI-40-01(052901) has been qualified as non-detected for this analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	July 2, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 15, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012332

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012332 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-09-RB-16	3012332001	Water	5/30/01	x	x	x	x	
RFI-09-04(02-04)	3012332002	Soil	5/30/01	x	x	x	x	
RFI-09-04(00-02)	3012332003	Soil	5/30/01	x	x	x	x	
RFI-09-06(2.5-4.5)	3012332004	Soil	5/30/01	x	x	x	x	
RFI-09-06(0.5-2.5)	3012332005	Soil	5/30/01	x	x	x	x	
BUILD 94 EP-03(053101)	3012332006	Water	5/31/01	x	x	x	x	
BUILD 94 EP-03-D(053101)	3012332007	Water	5/31/01			x		
BUILD 94 EP-02(053101)[1]	3012332008	Water	5/31/01	x	x	x	x	
BUILD 94 EP-02-D(053101)	3012332009	Water	5/31/01			x		
BUILD 94 EP-Dup-16[2]	3012332010	Water	5/31/01	x	x	x	x	
BUILD 94 EP-Dup-16 Dup	3012332011	Water	5/31/01			x		
94-100(053101)	3012332012	Water	5/31/01					x
BUILD 94-TB-10	3012332013	Water	5/31/01	x				
RFI-09-02(053001)	3012332014	Water	5/30/01	x	x	x	x	
RFI-09-02(053001) Di	3012332015	Water	5/30/01			x		
RFI-12-10(053101)	3012332016	Water	5/31/01	x	x	x	x	
RFI-12-10(053101) Di	3012332017	Water	5/31/01			x		
RFI-16-01(01-03)	3012332018	Soil	5/31/01	x	x	x	x	
RFI-16-01(05-07)	3012332019	Soil	5/31/01	x	x	x	x	
RFI-16-01(08-10)	3012332020	Soil	5/31/01	x	x	x	x	
RFI-04-04(1.3-2.1)	3012332021	Soil	6/1/01	x	x	x	x	
RFI-04-04(3.1-5.1)	3012332022	Soil	6/1/01	x	x	x	x	
RFI-04-04(5.1-7.1)	3012332023	Soil	6/1/01	x	x	x	x	
RFI-04-DUP-17[3]	3012332024	Soil	6/1/01	x	x	x	x	
RFI-04 RB17	3012332025	Water	6/1/01	x	x	x	x	
RFI-04-03(0.8-2.8)	3012332026	Soil	6/1/01	x	x	x	x	
RFI-12-10(053101)DL	3012332027	Water	5/31/01		x			

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample BUILD 94 EP-02(053101)
3 Duplicate analysis performed on sample RFI-04-04(5.1-7.1)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Acetone, Tetrachloroethene, 1,2,4-Trichlorobenzene, 2-Butanone and 1,2-Dibromo-3-chloropropane; associated samples RFI-09-04(02-04), RFI-09-04(00-02) and RFI-16-01(05-07); a decrease in response by Tetrachloroethene; associated samples BUILD 94 EP-03(053101), BUILD 94 EP-02(053101) and RFI-09-02(053001); a decrease in response by 1,2-Dibromo-3-chloropropane, 1,2,4-Trichlorobenzene and Methyl acetate, associated samples RFI-09-06(2.5-4.5), RFI-09-06(0.5-2.5), RFI-16-01(01-03), RFI-16-01(08-10), RFI-04-04(3.1-5.1), RFI-04-04(5.1-7.1), RFI-04-DUP-17 and RFI-04-03(0.8-2.8). Data have been qualified as estimated for the compounds based on these deviations.

Acetone was detected in the rinse blanks. Soil samples which were below the blank action level have been qualified as non-detected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below the acceptable limit for Chrysene-d12. Samples RFI-09-04(00-02) and RFI-09-06(0.5-2.5) have been qualified as estimated for all compounds associated with Chrysene-d12.

The internal standard response was below the acceptable limit for Perylene-d12. Samples RFI-09-04(00-02), RFI-09-06(2.5-4.5) and RFI-09-06(0.5-2.5) have been qualified as estimated for all compounds associated with Perylene-d12. The confirmation runs were used for samples RFI-09-06(2.5-4.5) and RFI-09-06(0.5-2.5).

The initial calibration %RSD was above the acceptable limit for bis(2-Chloroethyl)ether. Associated samples RFI-09-06(0.5-2.5), RFI-12-10(053101), RFI-16-01(01-03), RFI-16-01(05-07), RFI-04-04(1.3-2.1), RFI-04-04(3.1-5.1), RFI-04-04(5.1-7.1), RFI-04-DUP-17 and RFI-04-03(0.8-2.8) have been qualified as estimated for the compound based on this deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by

Benzaldehyde; associated samples BD-94 EP-03(053101), BD-94 EP-DUP-16 and RFI-09-02(053001); a decrease in response by bis(2-Chloroethyl)ether and Benzaldehyde; associated samples RFI-06-01(05-07), RFI-04-04(1.3-2.1), RFI-04-04(3.1-5.1) and RFI-04-04(5.1-7.1); a decrease in response by Caprolactam; associated samples RFI-09-06(0.5-2.5), RFI-12-10(053101), RFI-16-01(01-03), RFI-16-01(08-10), RFI-04-DUP-17 and RFI-04-03(0.8-2.8); a decrease in response by Isophorone; associated sample RFI-09-04(02-04). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Benzo(g,h,i)perylene. Associated sample RFI-09-06(0.5-2.5) has been qualified as estimated for the compound based on this deviation.

The MS/MSD %R was above the acceptable limit for Benzo(g,h,i)perylene. Associated sample BD-94 EP-02(053101)has been qualified as estimated for the compound.

THE MD/MSD RPD was above the acceptable limit for bis(2-Ethylhexyl)phthalate. Associated sample BD-94 EP-02(053101)has been qualified as estimated for the compound.

Bis(2-Ethylexyl)phthalate was detected in the rinse blank. Data which was below the blank action level for the compound have been qualified as non-detected.

Sample RFI-12-10(053101) contained bis(2-Ethylexyl)phthalate above the linear range. The original sample results have been replaced with the sample results from the dilution for this compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: HPLC Formaldehyde

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)			X
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals
Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below the acceptable limit for Silver. Associated samples BD-94 EP-03(053101), BD-94 EP-02(053101), BD-94 EP-DUP-16, RFI-09-02(053001) and RFI-12-10(053101) have been qualified as estimated for the analyte based on this deviation.

The MS/MSD %Rs were below the acceptable limit for Antimony. Positive soil sample data have been qualified as estimated and non-detect data have been qualified as rejected for the analyte based on the deviation.

The MS/MSD %Rs were below the acceptable limit for Silver and Zinc. All soil samples have been qualified as estimated for these analytes.

Antimony was detected in the method blank. Sample RFI-09-04(02-04) has been qualified as non-detected for the analyte.

Antimony was detected in the instrument blank. Associated samples BD-94 EP-03(053101), BD 94 EP-02(053101) and RFI-09-02(053001) have been qualified as non-detected for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	July 3, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 16, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012417

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012417 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-04-03(07-09)[1]	3012417001	Soil	6/4/01	x	x	x	x	
RFI-04-02(0.7-2.7)	3012417002	Soil	6/4/01	x	x	x	x	
RFI-04-02(8.7-10.7)	3012417003	Soil	6/4/01	x	x	x	x	
RFI-04-03(09-11)	3012417004	Soil	6/4/01	x	x	x	x	
RFI-04-01(01-03)	3012417005	Soil	6/4/01	x	x	x	x	
RFI-04-01(09-11)	3012417006	Soil	6/4/01	x	x	x	x	
RFI-04-Dup-18[2]	3012417007	Soil	6/4/01	x	x	x	x	
RFI-12-11D(1.1-3.1)	3012417008	Soil	6/5/01	x	x	x	x	
RFI-12-11D(5.1-7.1)	3012417009	Soil	6/5/01	x	x	x	x	
RFI-South-PT-02	3012417010	Water	6/5/01	x	x	x	x	
RFI-04-RB-18	3012417011	Water	6/5/01	x	x	x	x	
RFI-16-07(0.5-2.5)	3012417012	Soil	6/6/01	x	x	x	x	
RFI-16-07(4.5-6.5)	3012417013	Soil	6/6/01	x	x	x	x	
RFI-16-RB-19	3012417014	Water	6/6/01	x	x	x	x	
RFI-16-Dup-19[3]	3012417015	Soil	6/6/01	x	x	x	x	
RFI-16-Dup-19	3012417016	Soil	6/7/01	x	x	x	x	
RFI-12-14(09-11)	3012417017	Soil	6/7/01	x	x	x	x	
RFI-16-08(1.5-3.5)	3012417018	Soil	6/7/01	x	x	x	x	
RFI-16-08(7.5-9.5)[1]	3012417019	Soil	6/7/01	x	x	x	x	
RFI-16-09(0.7-2.7)	3012417020	Soil	6/7/01	x	x	x	x	
RFI-16-09(4.7-6.6)	3012417021	Soil	6/7/01	x	x	x	x	
RFI-16-Dup-20[4]	3012417022	Soil	6/7/01	x	x	x	x	
RFI-16-RB-20	3012417023	Water	6/7/01	x	x	x	x	

1 MS/MSD analysis performed on sample
2 Duplicate of sample RFI-04-03(07-09)
3 Duplicate of sample RFI-16-07(4.5-6.5)
4 Duplicate of sample RFI-16-09(4.7-6.6)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Tetrachloroethene and Methyl acetate in associated sample RFI-South-PT-02; a decrease in response by Acetone, 2-Butanone, Methyl acetate, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzene; associated samples RFI-16-07(4.5-6.5), RFI-12-14(07-09), RFI-12-14(09-11) and RFI-16-08(7.5-9.5); a decrease in response by Chloroethane, 2-Butanone, and Methyl acetate; associated samples RFI-16-08(1.5-3.5), RFI-16-09(0.7-2.7) and RFI-16-Dup-20. Data have been qualified as estimated for the compounds based on these deviations.

The MS/MSD RPD was above the acceptable limit in associated sample RFI-16-08(7.5-9.5) for all compounds except the following: 1,1,2,2-Tetrachloroethane, 1,1-Dichloroethane and Methyl acetate. Data have been qualified as estimated for detect compounds based on this deviation.

The field duplicate RPD was above the acceptable limit between sample RFI-04-03(07-09) and duplicate RFI-04-Dup-18 for 1,1,1-Trichloroethane and Trichloroethene. Data have been qualified as estimated for the detected compounds based on these deviations.

Acetone was detected in the rinse blanks. Detected sample results which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response for Perylene-d12 was below the acceptable limit in the following samples: RFI-12-11D(1.1-3.1), RFI-12-11D(5.1-7.1), RFI-16-07(0.5-2.5), RFI-12-14(07-09), RFI-16-08(1.5-3.5) and RFI-16-08(7.5-9.5). Data have been qualified as estimated for all compounds associated with Perylene-d12. Data from the confirmation runs were used for samples RFI-12-11D(1.1-3.1), RFI-12-11D(5.1-7.1), RFI-16-DUP-19, RFI-12-14(07-09), RFI-16-08(7.5-9.5) and RFI-16-09(0.7-2.7). Data from the initial runs were used for samples RFI-16-07(0.5-2.5) and RFI-16-08(1.5-3.5).

The initial calibration %RSD was above the acceptable limit for bis(2-Chloroethyl)ether; associated samples RFI-04-02(0.7-2.7), RFI-04-03(09-11), RFI-04-01(01-03), RFI-04-01(09-11), RFI-12-11D(1.1-3.1), RFI-12-11D(5.1-7.1), RFI-16-07(0.5-2.5), RFI-16-Dup-19, RFI-12-14(07-09), RFI-16-08(1.5-3.5), RFI-16-08(7.5-9.5), RFI-16-09(0.7-2.7), RFI-16-09(4.7-6.6), and RFI-16-Dup-20; 4,6-Dinitro-2-methylphenol, associated sample RFI-04-02(8.7-10.7). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Caprolactam in associated sample RFI-04-03(09-11); a decrease in response by 4-Nitrophenol in associated sample RFI-04-02(8.7-10.7); a decrease in response by Benzaldehyde and bis(2-Chloroethyl)ether in associated samples RFI-04-01(09-11), RFI-16-09(4.7-6.6) and RFI-16-DUP-20); a decrease in response by Benzaldehyde and N-Nitrosodi-n-propylamine in associated samples RFI-04-02(0.7-2.7), RFI-04-01(01-03), RFI-12-11D(1.1-3.1), RFI-12-11D(5.1-7.1), RFI-16-07(0.5-2.5), RFI-16-Dup-19, RFI-16-Dup-19, RFI-12-14(09-11), RFI-16-08(7.5-9.5) and RFI-16-09(0.7-2.7). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene in associated samples RFI-04-02(0.7-2.7), RFI-04-01(01-03), RFI-12-11D(1.1-3.1) and RFI-16-07(0.5-2.5); an increase in response by Benzo(g,h,i)perylene in associated sample RFI-12-14(09-11). Data have been qualified as estimated for the compounds based on these deviations.

The LSC/LCSD %R was above the acceptable limit for Benzo(g,h,i)perylene; associated samples RFI-04-02(0.7-2.7) and RFI-04-01(01-03); Indeno(1,2,3-cd)pyrene; associated samples RFI-04-02(0.7-2.7), RFI-04-01(01-03), RFI-12-11D(1.1-3.1), RFI-16-07(0.5-2.5) and RFI-12-14(09-11). Data have been qualified as estimated for the compounds based on these deviations.

The LCS/LCSD %R was below the acceptable limit for bis(2-Chloroisopropyl)ether and Naphthalene. Associated samples RFI-04-03(07-09), RFI-04-02(0.7-2.7),RFI-04-03(09-11), RFI-04-01(01-03), RFI-04-01(09-11), RFI-04-DUP-18, RFI-12-11D(1.1-3.1), RFI-12-11D(5.1-7.1), RFI-16-07(0.5-2.5), RFI-16-07(4.5-6.5), RFI-16-DUP-19, RFI-12-14(07-09), RFI-12-14(09-11), RFI-16-08(1.5-3.5), RFI-16-08(7.5-9.5), RFI-16-09(0.7-2.7), RFI-16-09(4.7-6.6) and RFI-16-DUP-20 have been qualified as estimated for the compounds based on these deviations.

The LCS/LCSD RPD was above the acceptable limit for 2-Methyl naphthalene in associated samples RFI-04-02(0.7-2.7), RFI-12-11D(1.1-3.1), RFI-12-11D(5.1-7.1), and RFI-12-14(07-09); bis(2-Chloroethyl)ether in associated sample RFI-04-DUP-18. Data have been qualified as estimated for the compounds based on these deviations.

The field duplicate RPD between sample RFI-04-03(07-09) and duplicate RFI-04-DUP-18 was above the acceptable limit for bis(2-Ethylhexyl)phthalate. Data have been qualified as estimated for detected compounds.

Bis(2-Ethylhexyl)phthalate and Di-n-butylphthalate were detected in the rinse blanks. Samples which were below the blank action level have been qualified as non-detected for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %R was below the acceptable limit for Mercury. Associated sample RFI-South-PT-02 has been qualified as rejected for the analyte.

The MS/MSD %R was below the acceptable limit for Antimony. Detected soil sample results have been qualified as estimated and non-detected soil sample results have been rejected.

The MS/MSD %R was above the acceptable limit for Cyanide. Associated samples RFI-04-03(07-09), RFI-16-07(0.5-2.5), RFI-16-07(4.5-6.5) and RFI-16-DUP-19 have been qualified as estimated for the detected analytes.

The LCS %R was above the acceptable limit for Total Kjeldahl Nitrogen in associated sample RFI-SOUTH-PT-02. Data have been qualified as estimated based on this deviation.

The serial dilution %D was above the 10% acceptable limit for Manganese. Soil sample results have

been qualified as estimated based on this deviation.

The field duplicate RPD between sample RFI-04-03(07-09) and duplicate RFI-04-DUP-18 was above the acceptable limit for Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Manganese, Nickel and Vanadium. Data have been qualified as estimated based on these deviations.

The field duplicate RPD between sample RFI-16-09(4.7-6.6) and duplicate RFI-16-DUP-20 was above the acceptable limit for Manganese. Data have been qualified as estimated based on these deviations.

Barium and Silver were detected in the method blank. Associated sample, RFI-SOUTH-PT-02 has been qualified as non-detected for the analytes.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	July 5, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 20, 2001

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NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012522

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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engineers & scientists

Summary

The following is an assessment of data package 3012522 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-16-10(1.2-3.2)[1]	3012522001	Soil	6/8/01	X	X	X	X	X
RFI-16-10(3.2-5.2)	3012522002	Soil	6/8/01	X	X	X	X	X
RFI-12-15(01-03)	3012522003	Soil	6/8/01	X	X	X	X	X
RFI-16-RB-21[3]	3012522004	Water	6/8/01	X	X	X	X	X
RFI-04-04(060801)	3012522005	Water	6/8/01	X	X	X	X	X
RFI-04-04(060801) Di	3012522006	Water	6/8/01			X		
RFI-04-TB-11	3012522007	Water	6/8/01	X				
RFI-04-03(060801)	3012522008	Water	6/8/01	X	X	X	X	X
RFI-04-03(060801) Di	3012522009	Water	6/8/01			X		
RFI-09-11(0.5-2.5)	3012522010	Soil	6/11/01	X	X	X	X	X
RFI-09-11(2.5-4.5)	3012522011	Soil	6/11/01	X	X	X	X	X
RFI-09-12(0.6-2.6)	3012522012	Soil	6/11/01	X	X	X	X	X
RFI-09-12(06-08)	3012522013	Soil	6/11/01	X	X	X	X	X
RFI-09-Dup-22	3012522014	Soil	6/11/01	X	X	X	X	X
RFI-09-RB-22	3012522015	Water	6/11/01	X	X	X	X	X
RFI-16-11(01-03)	3012522016	Soil	6/12/01	X	X	X	X	X
RFI-16-11(05-07)	3012522017	Soil	6/12/01	X	X	X	X	X
RFI-04-01(061101)[1]	3012522018	Water	6/11/01	X	X	X	X	X
RFI-04-01(061101) Di[2]	3012522019	Water	6/11/01			X		
RFI-04-TB-12	3012522020	Water	6/11/01	X				
ASCP-B2B-RB-23	3012522021	Water	6/13/01	X	X	X	X	X
RFI-07-02(0.8-2.8)	3012522022	Soil	6/13/01	X	X	X	X	X
RFI-07-02(2.8-4.8)	3012522023	Soil	6/13/01	X	X	X	X	X
RFI-07-01(0.3-2.3)	3012522024	Soil	6/13/01	X	X	X	X	X
RFI-07-01(2.3-4.3)	3012522025	Soil	6/13/01	X	X	X	X	X
RFI-12-09(061301) NL[3]	3012522026	Oil	6/13/01	X	X	X	X	X
RFI-04-01(061101) DL	3012522027	Water	6/11/01		X			
RFI-12-15(01-03) DL	3012522028	Soil	6/8/01		X			
RFI-09-12(0.6-2.6)DL	3012522029	Soil	6/11/01		X			

1 MS/MSD/DUP analysis performed on sample
2 MS/MSD analysis performed on sample for PCB only
3 MS/MSD analysis performed on sample for Metals only

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were outside acceptable limits for cis-1,2-dichloroethene. Associated sample RFI-04-01 (061101) has been qualified as estimated for the compound.

The continuing calibration %D was outside the acceptable limits due to a decrease in response by 1,2,4-Trichlorobenzene; associated samples RFI-09-Dup-22, RFI-16-11 (01-03), RFI-16-11 (05-07), RFI-07-02 (0.8-2.8), RFI-07-02 (2.8-4.8), RFI-07-01 (0.3-2.3), and RFI-07-01 (2.3-4.3); a decrease in response by 1,2,4-Trichlorobenzene and 1,2-Dibromo-3-chloropropane and 1,2,4-Trichlorobenzene, associated sample RFI-12-09 (061301) NL. Data have been qualified as estimated for the compounds based on the deviations.

Acetone was detected in the rinse blanks. Sample results which were below the blank action level have been qualified as non-detected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Sample RFI-07-02 (2.8-4.8) had one B/N and two Acid surrogates below control limits. Sample results for the acid fraction of that sample have been qualified as estimated. The sample was re-extracted outside of holding time and the data is included in the data package.

The MS/MSD RPD was outside acceptance limits for Naphthalene, associated sample RFI-09-12 (0.6-2.6); Acenaphthene and Phenanthrene, associated sample RFI-09-11 (0.5-2.5). Data have been qualified as estimated for the compounds based on the deviations.

The following internal standards were below acceptance limits: Perylene-d12 (affected samples: RFI-12-15 (01-03), RFI-09-11 (0.5-2.5), and RFI-07-01 (2.3-4.3): Perylene-d12 and Chrysene-d12 (affected sample: RFI-09-12 (0.6-2.6)). The samples were confirmed by re-analysis except for RFI-12-15 (01-03) which was re-analyzed at a dilution with acceptable internal standards. The reported detection limit has been elevated for the compounds quantitated with the acceptable diluted internal standard. The compounds quantitated from the internal standards which were outside acceptance criteria have been qualified as estimated.

Sample RFI-12-15 (01-03) contained Butylbenzylphthalate above the linear range. Sample RFI-09-12 (0.6-2.6) contained Benzo(a)anthracene, Chrysene, Fluoranthene, Phenanthrene and Pyrene above the linear range. Sample RFI-04-01 (061101) contained bis(2-Ethylhexyl)phthalate above the linear range. The original sample results for those compounds have been replaced with the sample results from the dilution except for Pyrene in sample RFI-09-12 (0.6-2.6). Because the diluted result may be biased low, the undiluted sample result was reported and qualified as exceeding then linear range.

The continuing calibration %D was outside the acceptance limit due to a decrease in response by Benzaldehyde, 4-Chloroanaline and 3,3'-Dichlorobenzadiene, associated sample: RFI-07-01 (2.3-4.3); a decrease in response by Benzaldehyde, associated samples RFI-16-11 (05-07), RFI-04-01 (061101), RFI-07-02 (0.8-2.8), RFI-07-01 (0.3-2.3) and RFI-07-01 (2.3-4.3); a decrease in response by Benzaldehyde, Acetophenone, Hexachlorocyclopentadiene, 4-Nitrophenol, Hexachlorobenzene and 3,3'-Dichlorobenzadiene, associated samples RFI-07-02 (2.8-4.8) and RFI-12-09 (061301) NL. Data have been qualified as estimated for the compounds based on the deviations.

Bis(2-Ethylhexyl)phthalate was detected in the rinse blanks. Sample results which were below the blank action level have been qualified as non-detected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The surrogate recovery for DCB in sample RFI-12-15 (01-03) was less than 10%. The sample results have been rejected.

The LCS/LCSD RPD for Aroclor-1248 was above control limits. Associated sample RFI-09-11 (0.5-2.5) has been qualified as estimated for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Antimony was detected in the method blank. Sample results less than blank action level have been qualified as non-detected for the analyte.

The MS/MSD %Rs were below acceptable limits for Antimony, Barium and Manganese, associated samples were all soil samples; Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Silver, Thallium, Vanadium and Zinc, associated samples RFI-0404 (060801), RFI-04-03 (060801) and RFI-04-01 (061101); Antimony, Barium, Chromium, Copper, Lead, Manganese, Thallium and Vanadium, associated sample: RFI-12-09 (061301 NL). Sample results have been qualified as estimated for the analytes.

The MS/MSD %Rs were above acceptable limits for Manganese. Associated samples RFI-0404 (060801), RFI-04-03 (060801) and RFI-04-01 (061101) have been qualified as estimated for the analytes.

The MS/MSD RPD was outside acceptable limits for Antimony, associated samples were all soil samples; Zinc, associated samples RFI-04-03 (060801); Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Selenium, Silver, Thallium, Vanadium and Zinc, associated sample RFI-12-09 (061301) NL. Detected sample results have been qualified as estimated for the analytes.

Selenium was non-detected in the parent sample but present at a concentration of 3.3 mg/Kg in the associated field duplicate sample. All of the soil sample results for selenium have been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	July 11,2001
Validation performed by:	(Dan Beacham)
Date of Validation:	August 23,2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012644

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
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engineers & scientists

Summary

The following is an assessment of data package 3012644 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-07-03(00-02)	3012644001	Soil	6/14/01	x	x	x	x	
RFI-07-04(04-06)	3012644002	Soil	6/14/01	x	x	x	x	
RFI-07-09(00-02)	3012644003	Soil	6/14/01	x	x	x	x	
RFI-07-04(00-02)	3012644004	Soil	6/14/01	x	x	x	x	
RFI-07-05(01-03)	3012644005	Soil	6/14/01	x	x	x	x	
RFI-07-05(05-07)	3012644006	Soil	6/14/01	x	x	x	x	
RFI-07-05(09-11)[1]	3012644007	Soil	6/14/01	x	x	x	x	
RFI-07-Dup-25[2]	3012644008	Soil	6/14/01	x	x	x	x	
RFI-07-RB-24	3012644009	Water	6/14/01	x	x	x	x	
RFI-09-10(0.8-02)	3012644010	Soil	6/15/01	x	x	x	x	
RFI-86-06D(02-04)	3012644011	Soil	6/15/01	x	x	x	x	
RFI-86-06D(06-08)	3012644012	Soil	6/15/01	x	x	x	x	

[1] MS/MSD analysis performed on sample
[2] Duplicate performed on sample RFI-07-05(05-07)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,2-Dibromo-3-chloropropane and 1,2,4-Trichlorobenzene. Soil sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 2-Butanone, 1,1,2,2-Tetrachloroethane, 1,2-Dibromo-3-chloropropane and 1,2,4-Trichlorobenzene. Associated samples, RFI-07-03(00-02), RFI-07-04(04-06), RFI-07-09(00-02), RFI-07-04(00-02), RFI-07-05(01-03), RFI-07-05(05-07) and RFI-07-05(09-11) have been qualified as estimated for the compounds based on these deviations.

The MS/MSD %R were below the acceptable limit for 1,2,4-Trichlorobenzene. Associated sample RFI-07-05(09-11) has been qualified as estimated for the compound.

The LCS %R was below the acceptable limit for Chloromethane. Associated samples, RFI-07-Dup-25, RFI-09-10(0.8-02), RFI-86-06D(02-04) and RFI-86-06D(06-08) have been qualified as estimated

for the compound based on this deviation.

Acetone was detected in the rinse blank. Sample results less than the blank action level have been qualified as non-detected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Benzo(b)fluoranthene and Benzo(k)fluoranthene. Associated samples, RFI-07-09(00-02), RFI-07-04(00-02), RFI-07-05(01-03), RFI-86-06D(02-04) and RFI-86-06D(06-08) have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde. Soil sample results have been qualified as estimated for the compound based on this deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzo(g,h,i)perylene, associated samples RFI-07-09(00-02), RFI-07-05(09-11), RFI-86-06D(02-04) and RFI-86-06D(06-08); a decrease in response by 4-Nitrophenol, 3,3-Dichlorobenzidine, Hexachlorocyclopentadiene and Hexachlorobenzene, associated sample RFI-09-10(0.8-02). Data have been qualified as estimated for the compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %R was above the acceptable limit for Beryllium. Positive data in associated samples RFI-07-05(01-03), RFI-07-05(05-07), RFI-07-Dup-25, RFI-09-10(0.8-02), RFI-86-06D(02-04) and RFI-86-06D(06-08) have been qualified as estimated for the analyte.

The MS/MSD %R were below the acceptable limit for Antimony and Manganese. Soil sample results have been qualified as estimated for these analytes.

The serial dilution %D was above the acceptable limit for Zinc, Manganese, Barium and Lead. Soil sample results have been qualified as estimated for these analytes.

Silver was detected in the method blank. Soil sample result which were below the blank action level have been qualified as non-detected for the analyte.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	July 13, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 30, 2001

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012702

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3012702 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-09-RB-26	3012702001	Water	6/18/01	x	x	x	x	
RFI-83/84-02(02-3.7)	3012702002	Soil	6/18/01	x	x	x	x	
RFI-83/84-02(02-04)	3012702003	Soil	6/18/01	x	x	x	x	
RFI-83/84-02(04-06)	3012702004	Soil	6/18/01	x	x	x	x	
RFI-83/84-Dup-26[1]	3012702005	Soil	6/18/01	x	x	x	x	
RFI-10-09(00-02)	3012702006	Soil	6/18/01	x	x	x	x	
RFI-10-10(00-02)	3012702007	Soil	6/18/01	x	x	x	x	
RFI-81-15(00-02)	3012702008	Soil	6/18/01	x	x	x	x	
RFI-81-16(00-02)	3012702009	Soil	6/18/01	x	x	x	x	
RFI-81-17(00-02)	3012702010	Soil	6/18/01	x	x	x	x	
RFI-81-18(00-02)	3012702011	Soil	6/18/01	x	x	x	x	
RFI-81-14(00-02)	3012702012	Soil	6/18/01	x	x	x	x	
RFI-07-04(061401)	3012702013	Water	6/14/01	x	x	x	x	
RFI-07-04(061401) Di	3012702014	Water	6/14/01			x		
RFI-07-TB-20	3012702015	Water	6/14/01	x				
RFI-07-02(061901)	3012702016	Water	6/19/01	x	x	x	x	
RFI-07-02(061901) Di	3012702017	Water	6/19/01			x		
RFI-07-TB-13	3012702018	Water	6/19/01	x				
RFI-83/84-RB-27	3012702019	Water	6/19/01	x	x	x	x	
RFI-10-10(00-02)DL	3012702020	Soil	6/18/01	x				

[1] DUP for sample RFI-83/84-02(04-06)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,2-Dibromo-3-chloropropane and 1,2,4-Trichlorobenzene. Soil sample results have been qualified as estimated for these compounds.

The MS/MSD %R were below the acceptable limit for 1,2,4-Trichlorobenzene and above the acceptable limit for Benzene. Associated sample RFI-83/84-02(02-3.7) has been qualified as estimated for the compounds based on these deviations.

The LCS %R was below the acceptable limit for Chloromethane. Associated samples RFI-83/84-02(02-3.7), RFI-83/84-02(02-04), RFI-83/84-02(04-06), RFI-83/84-Dup-26, RFI-10-09(00-02) and RFI-10-10(00-02) have been qualified as estimated for the compound based on this deviation.

Sample RFI-10-10(00-02) contained Methyl Cyclohexane above the linear range. The original sample result for that compound has been replaced with the sample result from the dilution.

Acetone was detected in the rinse blanks collected on 6/18/01 and 6/19/01. Sample results less than the blank action level associated with these rinse blanks, have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Benzaldehyde; associated sample RFI-81-18(00-02); 4,6-Dinitro-2-methylphenol; associated samples RFI-81-15(00-02) and RFI-81-16(00-02). Data have been qualified as estimated for the compounds based on these deviations.

The MS/MSD %Rs were above the acceptable limit for 2-Methylphenol (O-Cresol), 4-Chloro-3-methylphenol and Phenol. Associated sample RFI-83/84-02(02-3.7) has been qualified as estimated for the compounds.

The LCS/LCSD %R were below the acceptable limit for 2,4-Dinitrophenol. Associated sample RFI-07-04(061401) has been qualified as estimated for the compound.

The LCS/LCSD RPD was above the acceptable limit for 2,4-Dichlorophenol, 2-Methylphenol(O-Cresol), 2-Nitrophenol, 4-Chloro-3-methylphenol, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, bis(2-Chloroethoxy)methane, bis(2-Chloroethyl)ether, bis(2-Ethylhexyl)phthalate, Butyl benzylphthalate, Chrysene, Fluoranthene, Isophorone, Phenanthrene, and Pyrene. Associated samples RFI-83/84-02(02-3.7), RFI-83/84-02(02-04), RFI-83/84-02(04-06), RFI-83/84-Dup-26, RFI-10-09(00-02), RFI-10-10(00-02), RFI-81-15(00-02), RFI-81-16(00-02), RFI-81-17(00-02), RFI-81-18(00-02) and RFI-81-14(00-02) have been qualified as estimated for detected compounds based on the deviations.

The field duplicate RPD between sample RFI-83/84-02(04-06) and duplicate RFI-83/84-DUP-26 was above the acceptable limit for bis (2-Ethylhexyl) phthalate. Data have been qualified as estimated for the detected compound.

Diethyl phthalate was detected in the method blank. Sample results less than the blank action level have been qualified as non-detected.

2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2-Chlorophenol, 2-Methylphenol, 2-Nitrophenol, 3&4-Methylphenol, 4-Chloro-3-methylphenol, bis(2-Chloroethoxy)methane, bis(2-Chloroethyl)ether, bis(2-Ethylhexyl)phthalate, Naphthalene, and Phenol was detected in the rinse blank. Sample results less than the blank action level, have been qualified as non-detected

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above the acceptable limit for Benzaldehyde and 2-Nitrophenol; associated sample RFI-81-18(00-02); Benzaldehyde; associated sample RFI-10-10(00-02); 4,6-Dinitro-2-methylphenol; associated samples RFI-81-15(00-02) and RFI-81-16(00-02); 3,3-Dichlorobenzidine; associated samples RFI-83/84-02(02-3.7), RFI-83/84-02(02-04), RFI-83/84-02(04-06), RFI-83/84-Dup-26, RFI-10-09(00-02), RFI-10-10(00-02), RFI-81-15(00-02), RFI-81-16(00-02), RFI-81-17(00-02), RFI-81-14(00-02), RFI-07-04(061401) and RFI-07-02(061901). Data have been qualified as estimated based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde; associated samples RFI-83/84-02(02-3.7), RFI-83/84-02(02-04), RFI-83/84-02(04-06), RFI-83/84-Dup-26, RFI-10-10(00-02), RFI-81-15(00-02), RFI-81-16(00-02), RFI-81-17(00-02), RFI-81-14(00-02) and RFI-07-04(061401); a decrease in response by Hexachlorocyclopentadiene, 2,4,5-Trichlorophenol, Biphenyl, Hexachlorobenzene, Pyrene, 3,3-Dichlorobenzidine, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, and Benzo(g,h,i)perylene; associated samples RFI-10-09(00-02) and RFI-07-02(061901). Data have been qualified as estimated for the compounds based on these

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below the acceptable limit for Silver. Associated samples RFI-07-04(061401) and RFI-07-02(061901) have been qualified as estimated.

The MS/MSD RPD was above the acceptable limit for Zinc. Associated samples RFI-07-04(061401) and RFI-07-02(061901) have been qualified as estimated when Zinc was detected.

The MS/MSD %Rs were below the acceptable limit for Antimony. Sample results for soil samples have been qualified as estimated when the analyte was detected and rejected when the analyte was non-detect.

The MS/MSD %Rs were above the acceptable limit for Barium, Copper, Lead and Manganese. Soil sample results have been qualified as estimated for detected analytes.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	July 18, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 22, 2001

The field duplicate RPD between sample RFI-83/84-02(04-06) and duplicate RFI-83/84-DUP-26 was above the acceptable limit for Cadmium. Data have been qualified as estimated for the analyte.

Selenium was detected in the instrument blank. Associated sample RFI-07-04(061401) has been qualified as non-detected based on this deviation.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3012748 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-86-03(02-04)	3012748001	Soil	6/20/01	x	x	x	x	
RFI-86-03(04-06)	3012748002	Soil	6/20/01	x	x	x	x	
RFI-85-03(01-03)	3012748003	Soil	6/20/01	x	x	x	x	
RFI-85-03(05-07)	3012748004	Soil	6/20/01	x	x	x	x	
RFI-85-RB-28	3012748005	Water	6/20/01	x	x	x	x	
RFI-86-RB-29	3012748006	Water	6/20/01	x	x	x	x	
RFI-86-05(01-03)	3012748007	Soil	6/20/01	x	x	x	x	
RFI-86-05(03-05)	3012748008	Soil	6/20/01	x	x	x	x	
RFI-86-05(05-07)	3012748009	Soil	6/20/01	x	x	x	x	
RFI-81-11(00-02)	3012748010	Soil	6/20/01	x	x	x	x	
RFI-81-11(02-04)	3012748011	Soil	6/20/01	x	x	x	x	
RFI-81-11(04-06)	3012748012	Soil	6/20/01	x	x	x	x	
RFI-81-Dup-28[2]	3012748013	Soil	6/20/01	x	x	x	x	
RFI-21-03(01-03)	3012748014	Soil	6/21/01	x	x	x	x	
RFI-21-03(09-11)	3012748015	Soil	6/21/01	x	x	x	x	
RFI-81-10(0.3-2.3)	3012748016	Soil	6/21/01	x	x	x	x	
RFI-81-10(8.3-10.3)	3012748017	Soil	6/21/01	x	x	x	x	
RFI-81-10(10.3-12.3)	3012748018	Soil	6/21/01	x	x	x	x	
RFI-21-03(062101)	3012748019	Water	6/21/01	x	x	x	x	
RFI-21-03(062101)Dis	3012748020	Water	6/21/01			x		
RFI-81-03(08-10)	3012748021	Soil	6/21/01	x	x	x	x	
RFI-81-03(00-02)	3012748022	Soil	6/21/01	x	x	x	x	
RFI-81-03(10-12)	3012748023	Soil	6/21/01	x	x	x	x	
RFI-81-08(00-02)[1]	3012748024	Soil	6/21/01	x	x	x	x	
RFI-11(02-04)DL	3012748025	Soil	6/20/01		x			
RFI-11(04-06)DL	3012748026	Soil	6/20/01		x			
RFI-81-03(00-02)DL	3012748027	Soil	6/21/01		x			

[1] MS/MSD analysis performed on sample
[2] Duplicate of sample RFI-81-11(00-02)

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012748

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Acetone was detected in the rinse blank. Sample results below the blank action level have been qualified as non-detected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,2-Dibromo-3-chloropropane (DBCP), and 1,2,4-Trichlorobenzene; associated samples RFI-86-03(02-04), RFI-86-03(04-06), RFI-85-03(01-03), RFI-85-03(05-07), RFI-86-05(01-03), RFI-86-05(03-05), RFI-86-05(05-07), RFI-81-11(00-02), RFI-81-11(04-06), RFI-81-Dup-28, RFI-21-03(01-03), RFI-21-03(09-11), RFI-81-10(0.3-2.3), RFI-81-10(8.3-10.3), RFI-81-10(10.3-12.3), RFI-81-03(08-10), RFI-81-03(00-02) and RFI-81-03(10-12); a decrease in response by Tetrachloroethene; associated sample RFI-21-03(062101); a decrease in response by 1,1,2,2-Tetrachloroethane; associated samples RFI-81-10(10.3-12.3), RFI-81-03(00-02) and RFI-81-03(10-12); a decrease in response by Methylene chloride, associated samples RFI-81-11(02-04) and RFI-81-08(00-02). Sample results have been qualified as estimated for the compounds based on these deviations.

The LCS %R was below the acceptable limit for 1,2,4-Trichlorobenzene associated samples RFI-81-10(10.3-12.3), RFI-81-03(00-02) and RFI-81-03(10-12); cis-1,2-Dichloroethene, associated samples RFI-85-RB-28, RFI-86-RB-29 and RFI-21-03(062101). Sample results have been qualified as estimated for the compounds based on these deviations.

samples, RFI-86-05(01-03), RFI-86-05(03-05), RFI-86-05(05-07), RFI-81-11(00-02), RFI-81-11(04-06), RFI-81-Dup-28, RFI-81-10(8.3-10.3), RFI-81-03(08-10), RFI-81-03(10-12) and RFI-81-08(00-02) have been qualified as estimated based on this deviation.

The initial calibration %RSD was above the acceptable limit for Butyl benzylphthalate. Associated sample RFI-81-11(02-04) has been qualified as estimated for the compound.

The initial calibration %RSD was above the acceptable limit for Benzaldehyde. Associated sample RFI-86-RB-29 has been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, Biphenyl, Hexachlorobenzene, Hexachlorocyclopentadiene, 4-Nitrophenol, and 3,3-Dichlorobenzidine; associated samples RFI-86-03(02-04), RFI-81-11(04-06), RFI-81-Dup-28, RFI-21-03(09-11), RFI-81-10(8.3-10.3), RFI-81-03(08-10) and RFI-81-03(10-12); a decrease in response by Benzaldehyde, Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene; associated samples RFI-86-03(04-06), RFI-86-05(01-03), RFI-86-05(03-05), RFI-86-05(05-07), RFI-81-11(00-02), and RFI-81-08(00-02); a decrease in response by Hexachlorobenzene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene, Pyrene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene; associated samples RFI-86-RB-29 and RFI-21-03(062101); a decrease in response by 4-Chloroaniline; associated samples RFI-85-03(01-03), RFI-85-03(05-07), RFI-21-03(01-03), RFI-81-11(02-04), RFI-81-03(00-02), RFI-81-10(0.3-2.3) and RFI-81-10(10.3-12.3). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable due to an increase in response by Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene, associated samples RFI-85-03(01-03), RFI-81-11(02-04) and RFI-21-03(01-03); an increase in response by Dibenzo(a,h)anthracene, associated sample RFI-81-11(02-04). Sample results have been qualified as estimated for the compounds based on these deviations.

The MS/MSD %R was below the acceptable limit for 2-Chlorophenol and 2-Nitrophenol. Associated sample RFI-81-08(00-02) has been qualified as estimated for the compounds based on these deviations.

The LCS/LCSD %R were below the acceptable limit for Dibenzo (a,h)anthracene and Hexachlorocyclopentadiene. Soil sample results have been qualified as estimated, based on these deviations.

The LCS/LCSD RPD was above the acceptable limit for 2-Methyl naphthalene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Diethyl phthalate, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, Pyrene, 2,4,6-Trichlorophenol, bis(2-Chloroethyl)ether, bis(2-Ethylhexyl)phthalate, and Fluorene. Soil sample results have been qualified as estimated for detected compounds, based on these deviations.

The following compounds were found in the method blank: Phenol, 2-Methylphenol, 3&4-Methylphenol, 2-Nitrophenol, 2-Methyl naphthalene, 2,4-Dimethylphenol, bis(2-Chloroethoxy)methane, 2,4-Dichlorophenol, 4-Chloro-3-methylphenol and 2,4,5-Trichlorophenol. Associated sample RFI-21-03(062101) has been qualified as non-detected for the compounds.

Sample RFI-81-11(02-04) contained Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Carbazole, Chrysene, Dibenzofuran, Fluoranthene, Fluorene, Phenanthrene and Pyrene above the linear range. The original sample results have been replaced with the sample results from the dilution, for the above compounds.

Sample RFI-81-11(04-06) contained Phenanthrene above the linear range. The original sample results have been replaced with the results from the dilution, for the compound.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated samples, RFI-85-03(01-03), RFI-85-03(05-07), RFI-21-03(01-03), RFI-81-10(0.3-2.3), RFI-81-03(00-02), RFI-81-11(02-04) and RFI-85-RB-28 have been qualified as estimated for compounds associated with Perylene-d12. Data from the confirmation runs were used for the following samples: RFI-85-03(01-03) and RFI-21-03(01-03).

The internal standard response was below the acceptable limit for Phenanthrene-d10. Associated samples RFI-85-RB-28 and RFI-81-11(02-04) have been qualified as estimated for compounds associated with Phenanthrene-d10.

The initial calibration %RSD was above the acceptable limit for Pentachlorophenol and Benzaldehyde. Associated sample RFI-21-03(062101) has been qualified as estimated for the compounds based on these deviations.

The initial calibration %RSD was above the acceptable limit for Benzo(b)fluoranthene. Associated

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample RFI-81-03(00-02) contained Fluoranthene, Phenanthrene, and Pyrene above the linear range. The original sample results have been replaced with the sample results from the dilution, for the listed compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	July 24, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 24, 2001

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R was below the acceptable limit for Antimony. Soil sample results have been qualified as estimated when the analyte was detected and rejected when the analyte was non- detect.

The MS/MSD %Rs were below the acceptable limit for Copper and Lead. Soil sample results have been qualified as estimated.

The Serial dilution %D was above the 10% acceptable limit for Barium. Associated sample RFI-21-03(062101) has been qualified as estimated for the analyte.

Antimony was detected in the instrument blank. Associated sample RFI-21-03(062101) has been qualified as non-detected for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3012772 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-81-22(00-02)	3012772001	Soil	6/21/01	X	X	X	X	X
RFI-81-08(06-08)	3012772002	Soil	6/21/01	X	X	X	X	X
RFI-81-RB-30	3012772003[3]	Water	6/21/01	X	X	X	X	X
RFI-21-TB-4	3012772004	Water	6/21/01	X				
RFI-85-06(0.7-2.7)	3012772005	Soil	6/22/01	X	X	X	X	X
RFI-85-06(8.7-10.7)	3012772006	Soil	6/22/01	X	X	X	X	X
RFI-85-06(10.7-12.7)	3012772007	Soil	6/22/01	X	X	X	X	X
RFI-81-10(062201)[1]	3012772008	Water	6/22/01	X	X	X	X	X
RFI-81-10(062201) Di	3012772009	Water	6/22/01			X		
RFI-85-RB-32	3012772010	Water	6/22/01	X	X	X	X	X
RFI-03-RB-31	3012772011	Water	6/22/01	X	X	X	X	X
RFI-81-TB-15	3012772012	Water	6/22/01	X				
RFI-85-02(1.3-3.3)	3012772013	Soil	6/22/01	X	X	X	X	X
RFI-85-02(7.3-9.3)	3012772014	Soil	6/22/01	X	X	X	X	X
RFI-85-02(9.3-11.3)	3012772015	Soil	6/22/01	X	X	X	X	X
RFI-05-20(0.7-2.7)	3012772016	Soil	6/22/01	X	X	X	X	X
RFI-05-20(6.7-8.6)	3012772017	Soil	6/22/01	X	X	X	X	X
RFI-85-02(062201)	3012772018	Water	6/22/01	X	X	X	X	X
RFI-85-02(062201) Di	3012772019	Water	6/22/01			X		
RFI-03-03(00-02)	3012772020	Soil	6/22/01	X	X	X	X	X
RFI-21-01(0.9-2.9)	3012772021	Soil	6/25/01	X	X	X	X	X
RFI-21-01(6.9-8.9)	3012772022	Soil	6/25/01	X	X	X	X	X
RFI-81-09(00-02)	3012772023	Soil	6/25/01	X	X	X	X	X
RFI-81-09(08-10)	3012772024	Soil	6/25/01	X	X	X	X	X
RFI-81-09(10-12)[1]	3012772025	Soil	6/25/01	X	X	X	X	X
RFI-21-RB-33[2]	3012772026	Water	6/25/01	X	X	X	X	X
RFI-83/84-11-RB-34	3012772027	Water	6/25/01	X	X	X	X	X
RFI-21-TB-16	3012772028	Water	6/25/01	X				
RFI-21-01(062501)	3012772029	Water	6/25/01	X	X	X	X	X
RFI-21-01(062501) Di	3012772030	Water	6/25/01			X		
RFI-03-02(05-07)	3012772031	Soil	6/25/01	X	X	X	X	X
RFI-03-02(03-05)	3012772032	Soil	6/25/01	X	X	X	X	X
RFI-21-02(0.7-2.7)	3012772033	Soil	6/25/01	X	X	X	X	X
RFI-21-02(6.7-8.7)	3012772034	Soil	6/25/01	X	X	X	X	X
RFI-81-22(00-02)DL	3012772035	Soil	6/21/01	X				
RFI-81-09(10-12)DL	3012772036	Soil	6/25/01		X			

[1] MS/MSD/DUP analysis performed on sample
[2] MS/MSD PCB only
[3] MS/MSD Metals only

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012772

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Acetone was detected in the rinse blank. Sample results less than the blank action level were qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was outside the acceptance limit due to a decrease in response by Acetone, Methyl Acetate, Methylene Chloride, Cyclohexane, 1,2-Dichloroethane, 1,1,2,2-Tetrachloroethane, 1,2-Dibromo-3-chloropropane, and 1,2,4-Trichlorobenzen; associated samples RFI-81-08 (06-08), RFI-85-06 (0.7-2.7), RFI-85-06 (8.7-10.7), RFI-85-06 (10.7-12.7), RFI-85-02 (1.3-3.3), RFI-85-02 (7.3-9.3), RFI-85-02 (9.3-11.3), RFI-05-20 (6.7-8.6), and RFI-03-03 (00-02); Methylene Chloride, 1,2-Dibromo-3-chloropropene, and 1,2,4-Trichlorobenzen; associated samples RFI-05-20 (0.7-2.7), RFI-21-01 (0.9-2.9), RFI-21-01 (6.9-8.9), RFI-81-09 (00-02) and RFI-81-09 (08-10); Methylene Chloride, 1,2-Dibromo-3-chloropropene, and 1,2,4-Trichlorobenzene; associated sample RFI-81-22 (00-02); Methylene Chloride, associated samples: RFI-81-09 (08-10), RFI-81-09 (10-12), RFI-03-02 (05-07), RFI-03-02 (03-05), RFI-21-02 (0.7-2.7), and RFI-21-02 (6.7-8.7). Data have been qualified as estimated for the compounds based on the deviations.

Sample RFI-81-22 (00-02) contained Methyl Cyclohexane above the linear range. The original sample result for that compound has been replaced with the sample result from the dilution analysis.

Because the diluted result may be biased low, the undiluted sample result was reported and qualified as estimated due to exceeding then linear range.

The rinse blanks RFI-85-RB-32 and RFI-85-RB-31 contained reportable levels of Caprolactam. Reported sample results less than blank action level have been qualified as non-detected.

The initial calibration %RSD was greater than the acceptable limit for Benzaldehyde. Associated samples RFI-81-22 (00-02), RFI-81-08 (06-08), RFI-85-06 (8.7-10.7) and RFI-85-02 (1.3-3.3) have been qualified as estimated for the compound.

The continuing calibration %D was Above control limits due to an increase in response by Phenanthrene. Associated samples RFI-03-03 (00-02) and RFI-21-01 (0.9-2.9) have been qualified as estimated for the compound.

The continuing calibration %D was outside the acceptable limit due to a decrease in response by bis(2-Chloroisopropyl)ether, 2-Methylnaphthalene, Biphenyl, Hexachlorobenzene, Pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, and Benzo(g,h,i)perylene; associated sample RFI-85-02 (1.3-3.3); Hexachlorocyclopentadiene, 2,4,5-Trichlorophenol, Biphenyl, Hexachlorobenzene, 3,3'-Dichlorobenzidiene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene and Benzo(g,h,i)perylene associated samples RFI-81-22 (00-02) and RFI-81-08 (06-08); bis(2-Chloroisopropyl)ether, Hexachlorocyclopentadiene, 4-Chlorophenyl-phenylether, Biphenyl, Hexachlorobenzene, Di-n-butylphthalate, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, and Benzo(g,h,i)perylene; associated sample RFI-85-06 (8.7-10.7); 4-Chloroanaline; associated samples RFI-05-20 (6.7-8.6), RFI-85-02 (062201), RFI-03-03 (00-02), RFI-21-01 (0.9-2.9), RFI-85-06 (0.7-2.7), RFI-85-06 (10.7-12.7), RFI-21-01 (062501), RFI-03-02 (05-07), RFI-03-02 (03-05), RFI-21-02 (0.7-2.7), RFI-21-02 (6.7-8.7), RFI-81-10 (062201), RFI-85-02 (7.3-9.3) and RFI-85-02 (9.3-11.3) RFI-21-01 (6.9-8.9), RFI-81-09 (00-02), RFI-81-09 (08-10) and RFI-81-09 (10-12). Data have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below control limits for Perylene-d12 in samples RFI-81-01 (06-08), RFI-85-02 (1.3-3.3) and RFI-03-03 (0.3-02) and for Chrysene-d12 and Perylene-d12 in sample RFI-21-01 (0.9-2.9). Samples have been qualified as estimated for all compounds associated with the internal standards.

The MS/MSD RPD was outside acceptable limits for Benzo(a)anthracene, Benzo(a)Pyrene, Benzo(b)fluoranthene, Chrysene, Fluoranthene, and Pyrene. Detected results in associated sample RFI-81-09 (10-12) have been qualified as estimated for the compounds.

The LCS/LCSD %R were below control limits for Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene, and Indeno(1,2,3)perylene. Associated samples RFI-03-03 (00-02), RFI-21-01 (0.9-2.9), RFI-81-09 (10-12) and RFI-21-02 (0.7-2.7) have been qualified as estimated for the compounds.

Sample RFI-81-09 (10-12) contained Pyrene above the linear range. A dilution analysis was performed and the diluted detected results were considerably lower than the primary analysis.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %R was above control limits for Antimony. Associated sample RFI-81-10 (062201) has been qualified as estimated for the analyte.

Nickel, Thallium, Silver, and Zinc were detected in the method blank. Sample results which were less than the blank action level for the analytes have been qualified as non-detected.

The MS/MSD RPD was above acceptance limits for Cobalt, Nickel and Vanadium. Associated samples RFI-81-10 (062201), RFI-85-02 (062201) and RFI-21-01 (062501) have been qualified as estimated for the compounds.

The MS/MSD %Rs for Antimony and Manganese were below acceptance limits. Soil samples have been qualified as estimated for the analytes.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	July 27, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	August 29,2001

The MS/MSD RPD for Antimony, Beryllium, Cadmium, Chromium, Manganese, Silver and Thallium was above acceptance limits in sample RFI-81-09 (10-12). Detected soil sample results for the analytes have been qualified as estimated.

The MS %R was below control limits for Cyanide. Soil samples results have been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3012828 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-03-02(01-03)	3012828001	Soil	6/25/01	x	x	x	x	
RFI-03-Dup-33[1]	3012828002	Soil	6/25/01	x	x	x	x	
RFI-83/84-11(04-06)[2]	3012828003	Soil	6/25/01	x	x	x	x	
RFI-83/84-11(00-02)	3012828004	Soil	6/25/01	x	x	x	x	
Equip Blank Lot # P/	3012828005	Water	6/25/01	x	x	x	x	
RFI-05-19(0.8-2.8)	3012828006	Soil	6/26/01	x	x	x	x	
RFI-05-19(6.8-8.8)	3012828007	Soil	6/26/01	x	x	x	x	
RFI-05-21(00-02)	3012828008	Soil	6/26/01	x	x	x	x	
RFI-05-21(06-08)	3012828009	Soil	6/26/01	x	x	x	x	
RFI-05-01(01-03)	3012828010	Soil	6/26/01	x	x	x	x	
RFI-05-01(07-09)	3012828011	Soil	6/26/01	x	x	x	x	
RFI-05-RB-35	3012828012	Water	6/26/01	x	x	x	x	
RFI-05-03(0.6-2.6)	3012828013	Soil	6/26/01	x	x	x	x	
RFI-05-03(8.6-10.6)	3012828014	Soil	6/26/01	x	x	x	x	
RFI-10-03(0.6-2.6)	3012828015	Soil	6/27/01	x	x	x	x	
RFI-10-03(6.6-8.6)	3012828016	Soil	6/27/01	x	x	x	x	
RFI-10-14(0.9-2.9)	3012828017	Soil	6/27/01	x	x	x	x	
RFI-10-14(6.9-8.9)	3012828018	Soil	6/27/01	x	x	x	x	
RFI-10-12(0.8-2.8)	3012828019	Soil	6/27/01	x	x	x	x	
RFI-10-12(6.8-8.8)	3012828020	Soil	6/27/01	x	x	x	x	
RFI-10-RB-36	3012828021	Water	6/27/01	x	x	x	x	
RFI-10-02(0.8-2.8)	3012828022	Soil	6/27/01	x	x	x	x	
RFI-10-02(6.8-8.8)	3012828023	Soil	6/27/01	x	x	x	x	
RFI-05-RB-38	3012828024	Water	6/27/01	x	x	x	x	
RFI-10-02(0.8-2.8)DL	3012828025	Soil	6/27/01		x			
RFI-10-14(0.9-2.9)DL	3012828026	Soil	6/27/01		x			
RFI-05-21(00-02)DL	3012828027	Soil	6/26/01		x			

1 Duplicate of sample RFI-03-02(05-07)
2 MS/MSD analysis performed on sample

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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012828

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below the acceptable limit for Chrysene-d12 and Perylene-d12; associated samples RFI-83/84-11(00-02), RFI-05-21(00-02), RFI-05-01(01-03), RFI-10-14(0.9-2.9), RFI-10-12(0.8-2.8), RFI-10-02(0.8-2.8), RFI-10-14(0.9-2.9)DL and RFI-05-21(00-02)DL. Data from the dilution runs were used for samples RFI-05-21(00-02), RFI-10-14(0.9-2.9) and RFI-10-02(0.8-2.8). Data have been qualified as estimated for compounds associated with Chyrsene-d12 and Perylene-d12.

The internal standard response was below the acceptable limit for Perylene-d12; associated samples RFI-05-21(06-08) and RFI-10-02(0.8-2.8)DL; Chrysene-d12, associated sample RFI-10-03(0.6-2.6); 1,4-Dichlorobenzene-D4, associated sample RFI-10-02(0.8-2.8). Data from the dilution run was used for sample RFI-10-02(0.8-2.8). Data have been qualified as estimated for compounds associated with the internal standards.

The initial calibration %RSD was above the acceptable limit for Benzo(b)fluoranthene and Benzo(k)fluoranthene; associated samples RFI-10-12(0.8-2.8) and RFI-10-02(6.8-8.8); 2,4-

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above the acceptable limit for Acetone. Associated samples RFI-10-03(0.6-2.6), RFI-10-14(0.9-2.9), RFI-10-12(0.8-2.8), RFI-10-12(6.8-8.8), RFI-10-02(0.8-2.8) and RFI-10-02(6.8-8.8) have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit for Methylene chloride. Soil sample results have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit for Acetone. Associated samples RFI-05-03(8.6-10.6), RFI-10-03(0.6-2.6), RFI-10-03(6.6-8.6), RFI-10-14(0.9-2.9), RFI-10-14(6.9-8.9), RFI-10-12(0.8-2.8), RFI-10-12(6.8-8.8), RFI-10-02(0.8-2.8) and RFI-10-02(6.8-8.8), have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Dinitrophenol; associated samples RFI-05-01(01-03), RFI-05-03(8.6-10.6), RFI-10-02(0.8-2.8)DL, and RFI-10-14(0.9-2.9)DL; Benzo(b)fluoranthene and Benzo(a)Pyrene; associated sample RFI-05-21(00-02)DL. Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol and 3,3-Dichlorobenzidine; associated samples RFI-83/84-11(00-02), RFI-03-02(01-03), RFI-03-Dup-33, RFI-83/84-11(04-06), and RFI-05-21(06-08); a decrease in response by 3&4-Methylphenol, Benzo(k)fluoranthene, and Benzo(b)fluoranthene; associated samples RFI-10-03(0.6-2.6), RFI-10-03(6.6-8.6), RFI-10-12(6.8-8.8) and RFI-10-02(6.8-8.8); a decrease in response by 3&4-Methylphenol associated samples RFI-10-12(0.8-2.8), RFI-10-02(0.8-2.8)DL, RFI-05-01(01-03), RFI-05-03(8.6-10.6), RFI-10-14(0.9-2.9)DL, RFI-05-19(0.8-2.8), RFI-05-19(6.8-8.8), and RFI-05-21(00-02)DL; a decrease in response by Benzaldehyde, associated samples RFI-05-19(0.8-2.8), RFI-05-19(6.8-8.8), RFI-05-01(01-03), RFI-05-03(8.6-10.6), RFI-10-14(0.9-2.9)DL and RFI-05-21(00-02)DL; a decrease in response by Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene; associated samples RFI-05-01(01-03), RFI-05-03(8.6-10.6) and RFI-10-14(0.9-2.9)DL; a decrease in response by Acetophenone, associated sample RFI-05-21(00-02)DL. Data have been qualified as estimated, based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Phenanthrene. Associated samples RFI-10-12(6.8-8.8) and RFI-10-02(6.8-8.8) have been qualified as estimated based on these deviations.

Surrogate recoveries were outside of the acceptable limits, detected results for associated samples RFI-03-02(01-03), RFI-03-Dup-33, RFI-83/84-11(00-02), RFI-05-19(0.8-2.8), RFI-05-19(6.8-8.8), and RFI-05-21(00-02)DL have been qualified as estimated. Note: Samples were spiked with twice the correct amount of acid surrogates and none of the base/neutral surrogates. The samples were re-extracted beyond the holding time to confirm the extraction error.

The LCS/LCSD %R was below the acceptable limit for 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2-Chloronaphthalene, 4-Chlorophenyl phenyl ether, Acenaphthene, Acenaphthylene, Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene, Fluorene, Indeno(1,2,3-cd)pyrene, Isophorone, and Nitrobenzene. Associated samples RFI-83/84-11(04-06), RFI-05-21(06-08), RFI-05-01(01-03), RFI-05-01(07-09), RFI-05-03(0.6-2.6), RFI-05-03(8.6-10.6) and RFI-05-21(00-02)DL have been qualified as estimated, based on these deviations.

The LCS/LCSD %R was above the acceptable limit for N-Nitrosodiphenylamine, associated sample RFI-10-14(0.9-2.9)DL. Data have been qualified as estimated for the compounds.

BEHP was detected in the rinse blank. Sample results less than the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	August 15, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 29, 2001

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %D was above the acceptable limit for Antimony. Soil sample results have been qualified as estimated when the analyte was detected.

The MS/MSD %R was below the acceptable limit for Antimony. Soil sample results have been qualified as estimated when the analyte was detected and rejected when the analyte was non-detect.

The MS/MSD %R was below the acceptable limit for Cobalt, Copper and Nickel. Soil sample results have been qualified as estimated for the analytes.

The RPD between sample RFI-03-02(05-07) and duplicate RFI-03-DUP-33 was above the acceptable limit for Cyanide. Data have been qualified as estimated, based on this deviation.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3012900 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-55-09(01-03)	3012900001	Soil	6/27/01	x	x	x	x	
RFI-05-08(0.7-2.7)	3012900002	Soil	6/27/01	x	x	x	x	
RFI-55-09(09-11)	3012900003	Soil	6/27/01	x	x	x	x	
RFI-55-Dup-35[1]	3012900004	Soil	6/27/01	x	x	x	x	
RFI-05-09(0.2-2.2)	3012900005	Soil	6/27/01	x	x	x	x	
RFI-05-09(6.2-8.2)	3012900006	Soil	6/27/01	x	x	x	x	
RFI-05-09(6.2-8.2)	3012900007	Soil	6/27/01	x	x	x	x	
RFI-05-Dup-34[2]	3012900008	Soil	6/27/01	x	x	x	x	
RFI-21-02	3012900009	Water	6/27/01	x	x	x	x	
RFI-21-02 Diss PCB	3012900010	Water	6/27/01			x		
RFI-21-TB-17	3012900011	Water	6/27/01	x				
RFI-10-08(00-02)	3012900012	Soil	6/28/01	x	x	x	x	
RFI-10-08(06-08)	3012900013	Soil	6/28/01	x	x	x	x	
RFI-36-34(0.9-2.9)	3012900014	Soil	6/28/01	x	x	x	x	
RFI-36-34(6.9-8.9)	3012900015	Soil	6/28/01	x	x	x	x	
RFI-36-RB-37	3012900016	Water	6/28/01	x	x	x	x	
RFI-36-RB-39	3012900017	Water	6/29/01	x	x	x	x	
RFI-36-33(01-03)	3012900018	Soil	6/29/01	x	x	x	x	
RFI-36-33(05-07)	3012900019	Soil	6/29/01	x	x	x	x	

[1] Duplicate of sample RFI-55-09(09-11)
[2] Duplicate of sample RFI-05-08(2.7-4.7)

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3012900

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

have been qualified as estimated for detected compounds, based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Bromomethane and Tetrachloroethene. Associated samples RFI-10-08(00-02) and RFI-36-34(0.9-2.9) have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Cyclohexane, associated samples RFI-55-09(01-03), RFI-05-09(0.2-2.2), RFI-05-08(2.7-4.7) and RFI-05-Dup-34; Acetone; associated samples RFI-10-08(00-02) and RFI-36-34(0.9-2.9); Methyl cyclohexane associated sample RFI-10-08(00-02). Data have been qualified as estimated for the compounds based on these deviations.

The MS/MSD %R was below the acceptable limit for Ethylbenzene. Associated sample RFI-21-02 has been qualified as estimated for the compound.

The field duplicate RPD between sample RFI-05-08(2.7-4.7) and duplicateRFI-05-DUP-34 was above the acceptable limit for Benzene, Methyl cyclohexane, o-Xylene, m&p-Xylene, and Toluene. Data

compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol; associated samples RFI-55-09(01-03), RFI-05-08(0.7-2.7), RFI-55-09(09-11), RFI-05-09(0.2-2.2), RFI-05-09(6.2-8.2), RFI-05-08(2.7-4.7), RFI-05-Dup-34, RFI-21-02, RFI-10-08(00-02), RFI-10-08(06-08), RFI-36-34(0.9-2.9), RFI-36-34(6.9-8.9), RFI-36-33(01-03), and RFI-36-33(05-07); Benzaldehyde associated sample RFI-05-09(6.2-8.2). Data have been qualified as estimated based on these deviations.

The LCS/LCSD RPD was above the acceptable limit for all compounds except the following: 3&4-Methylphenol, 3-Nitroaniline, Benzo(g,h,i)perylene, Di-n-butylphthalate, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, N-Nitrosodiphenylamine, and Phenol. Associated samples, RFI-55-09(01-03), RFI-05-08(0.7-2.7), RFI-55-09(09-11), RFI-55-Dup-35, RFI-05-09(0.2-2.2), RFI-05-09(6.2-8.2), RFI-05-08(2.7-4.7), RFI-05-Dup-34, RFI-10-08(06-08), RFI-36-34(0.9-2.9), RFI-36-34(6.9-8.9), RFI-36-33(01-03) and RFI-36-33(05-07), have been qualified as estimated for detected compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Chrysene-d12, associated samples RFI-05-09(0.2-2.2), RFI-05-08(2.7-4.7), RFI-10-08(00-02) and RFI-36-33(01-03) have been qualified as estimated for compounds associated with Chrysene-d12. Data from the confirmation run was used for sample RFI-05-09(0.2-2.2).

The internal standard response was below the acceptable limit for Perylene-d12, associated samples, RFI-55-09(01-03), RFI-05-09(0.2-2.2), RFI-05-09(6.2-8.2), RFI-05-08(2.7-4.7), RFI-05-Dup-34, RFI-10-08(00-02), and RFI-36-33(01-03) have been qualified as estimated for compounds associated with Perylene-d12. Data from the confirmation runs were used for samples RFI-55-09(01-03) and RFI-05-09(0.2-2.2).

The initial calibration %RSD was above the acceptable limit for Phenanthrene, Fluoranthene, and Benzo(k)fluoranthene. Associated sample RFI-10-08(00-02) has been qualified as estimated for the

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %R was above the acceptable limit for Antimony. Associated sample RFI-36-33(05-07) has been qualified as estimated for the analyte.

The MS/MSD %R was below the acceptable limit for Barium and Manganese. Associated sample RFI-21-02 has been qualified as estimated for the analytes.

The MS/MSD %R was below the acceptable limit for Antimony. Sample results for soil samples have been qualified as estimated for the analyte.

The MS/MSD %R was above the acceptable limit for Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Silver, Thallium, Vanadium and Zinc. Soil

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The field duplicate RPD between sample RFI-05-08(2.7-4.7) and duplicate RFI-05-DUP-34 was above the acceptable limit for Aroclor 1254. Data have been qualifies as estimated based on this deviation.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	August 3, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 27, 2001

sample results have been qualified as estimated for detected analytes based on these deviations.

The LCS %R was below the acceptable limit for Zinc. Soil sample results have been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3013198 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-04-2(071601)	3013198001	Water	07/16/01	X	X	X		X
RFI-04-2(071601)DI[2]	3013198002	Water	07/16/01			X	X	
RFI-36-14(00-02)	3013198003	Soil	07/16/01	X	X	X	X	X
RFI-36-14(06-08)	3013198004	Soil	07/17/01	X	X	X	X	X
RFI-36-08(01-03)	3013198005	Soil	07/17/01	X	X	X	X	X
RFI-36-08(6.5-8.5)	3013198006	Soil	07/17/01	X	X	X	X	X
RFI-36-09(01-03)	3013198007	Soil	07/17/01	X	X	X	X	X
RFI-36-09(05-07)	3013198008	Soil	07/17/01	X	X	X	X	X
RFI-36-DUP-36	3013198009	Soil	07/17/01	X	X	X	X	X
RFI-36-RB-40[2]	3013198010	Water	07/17/01	X	X	X	X	X
RFI-38-RB-41	3013198011	Water	07/18/01	X	X	X	X	X
RFI-38-03(01-03)[1]	3013198012	Soil	07/18/01	X	X	X	X	X
RFI-38-03(05-07)	3013198013	Soil	07/18/01	X	X	X	X	X
RFI-38-03(09-11)	3013198014	Soil	07/18/01	X	X	X	X	X
RFI-38-03(17-19)	3013198015	Soil	07/18/01	X	X	X	X	X
RFI-38-DUP-37	3013198016	Soil	07/18/01	X	X	X	X	X
RFI-36-10(01-03)	3013198017	Soil	07/18/01	X	X	X	X	X
RFI-36-10(07-09)	3013198018	Soil	07/18/01	X	X	X	X	X
RFI-38-02(05-07)	3013198019	Soil	07/19/01	X	X	X	X	X
RFI-10-04(03-4.7)	3013198020	Soil	07/19/01	X	X	X	X	X
RFI-10-11(03-05)	3013198021	Soil	07/19/01	X	X	X	X	X
RFI-38-02(01-03)	3013198022	Soil	07/19/01	X	X	X	X	X
RFI-38-02(15-17)	3013198023	Soil	07/19/01	X	X	X	X	X
RFI-38-RB-A2	3013198024	Water	07/19/01	X	X	X	X	X
RFI-36-08(6.5-8.5)DL	3013198025	Soil	07/17/01	X				
RFI-36-14(00-02)DL	3013198026	Soil	07/16/01		X			

[1] MS/MSD analysis performed on sample (except metals)
[2] MS/MSD analysis performed on sample for metals only

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013198

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The surrogate Toluene-d8 was below acceptance limits in sample RFI-36-08 (6.5-8.5). The sample results have been qualified as estimated.

Sample RFI-36-08 (6.5-8.5) contained Ethyl Benzene, Methyl Cyclohexane, O-Xylene, P&M-Xylene and Toluene above the linear range. The original sample results for those compounds have been replaced with the sample results from the dilution analysis.

The continuing calibration %D was outside the acceptance limit due to a decrease in response by Methylene Chloride and 1,2-Dibromo-3-chloropropane, associated samples RFI-36-14 (00-02), RFI-36-14 (06-08), RFI-36-08 (01-03), RFI-36-09 (05-07), RFI-36-DUP-36 and RFI-38-03 (05-07); Methylene Chloride, associated sample: RFI-04-02 (071601). Data have been qualified as estimated for the compounds.

Acetone was detected in the rinse blanks. Sample results less than the blank action level have been qualified as non-detected.

The LCS/LCSD RPD was outside acceptance limits for Benzo(a)anthracene, Benzo(a)pyrene, Benzo(k)fluoranthene, Chrysene, and bis(2-Ethylhexyl)phthalate. Associated samples RFI-36-09 (01-03) RFI-38-03 (05-07) have been qualified as estimated for the compounds based on the deviations.

The LCS/LCSD RPD was outside acceptance limits for Benzo(g,h,i)perylene and Benzo(k)fluoranthene. Associated sample: RFI-36-14 (00-02) has been qualified as estimated for the compounds.

The Sample RFI-36-14 (00-02) contained bis(2-Ethylhexyl)phthalate and Butylbenzylphthalate above the linear range. The original sample results for those compounds have been replaced with the sample results from the dilution analysis.

The internal standard response was below acceptance limits for Perylene-d12. Data from the dilution analysis was used for sample RFI-36-14 (00-02) and qualified as estimated for compounds associated with the internal standard. Data from the reanalysis run was used for sample RFI-36-08 (6.5-8.5) and qualified as estimated for compounds associated with Perylene-d12.

The continuing calibration %D was outside the acceptance limit due to a decrease in response by 3&4-Methylphenol; associated samples RFI-04-02 (071601), RFI-38-DUP-37, RFI-36-10 (01-03), RFI-36-10 (07-09), and RFI-38-02 (05-07); a decrease in response by Benzaldehyde and 3&4-Methylphenol, associated samples RFI-36-14 (00-02), RFI-36-14 (06-08), RFI-36-08 (01-03), RFI-36-08 (6.5-8.5), RFI-36-09 (01-03), RFI-38-03 (01-03), RFI-38-03 (05-07), RFI-38-03 (09-11), RFI-38-03 (17-19), and RFI-10-04 (03-4.7); a decrease in response by Benzaldehyde, 3&4-Methylphenol, and 2,4-Dinitrophenol; associated samples RFI-10-11 (03-05), RFI-38-02 (01-03), and RFI-38-02 (15-17). Data have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R was below acceptance limits in sample RFI-38-03 (01-03) for the compound 4-Chlorophenyl-phenylether. The sample result has been qualified as estimated for the compound.

The LCS %R was below acceptance limits for 4-Chlorophenyl-phenylether. Associated samples RFI-04-02 (071601), RFI-36-08 (01-03), RFI-36-08 (6.5-8.5), RFI-36-09 (01-03), RFI-36-09 (05-07), RFI-36-DUP-36, RFI-38-03 (01-03), RFI-38-03 (05-07), RFI-38-03 (09-11), RFI-38-03 (17-19), RFI-38-DUP-37, RFI-36-10 (01-03), RFI-36-10 (07-09), RFI-28-02 (05-07), RFI-10-04 (03-4.7), RFI-10-11 (03-05), RFI-38-02 (01-03), and RFI-38-02 (15-17) have been qualified as estimated for the compound.

The LCS/LCSD %R were above acceptance limits for Benzo(a)anthracene, Benzo(a)pyrene, Benzo(k)fluoranthene, Chrysene, Fluoranthene, Phenenthrene, bis(2-Ethylhexyl)phthalate, Diethylphthalate, and Di-n-Butyl phthalate. Associated samples RFI-36-08 (6.5-8.5), RFI-36-09 (01-03), RFI-38-03 (05-07), RFI-38-03 (09-11), RFI-38-03 (17-19), RFI-38-DUP-37, RFI-36-10 (01-03), RFI-36-10 (07-09), RFI-38-02 (05-07), RFI-10-04 (03-4.7), RFI-10-11 (03-05), RFI-38-02 (01-03), and RFI-38-02 (15-17) have been qualified as estimated for the compounds based on the deviations.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)			X
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %R was above control limits for Antimony. Associated sample RFI-04-02 (071601) has been qualified as estimated for the analyte.

Lead and Thallium were detected in the method blank. Sample results less than the blank action level have been qualified as non-detected.

The MS/MSD %R were less than 30 % for Antimony. Detected soil sample results have been qualified as estimated and non-detected sample results have been rejected.

The MS %R was above control limits for Manganese. The soil sample results have been qualified as estimated for the analyte.

The MS/MSD %R for Silver and Mercury were below acceptance limits in sample RFI-04-02

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	August 15, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	September 4,2001

(071601)DI. The sample results for those analytes have been qualified as estimated.

The Field Duplicate RPD values in sample RFI-04-02 (071601)DI for Copper, Zinc and Antimony were above acceptance limits. The sample results have been qualified as estimated for those analytes.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3013199 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
ACSP-B2B(071601)	3013199001	water	7/16/01	x	x			
ACSP-B2A(071601)	3013199002	water	7/16/01	x	x			
ACSP-TB-01	3013199003	water	7/16/01	x				

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013199

VOLATILE AND SEMIVOLATILE
ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for 2,4-Dinitrophenol. Associated samples ACSP-B2B(071601) and ACSP-B2A(071601) have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit for 3&4-Methylphenol. Associated samples ACSP-B2B(071601) and ACSP-B2A(071601) have been qualified as estimated for the compound.

The LCS/LCSD %R were below the acceptable limit for 4-Chlorophenyl phenyl ether. Associated samples ACSP-B2B(071601) and ACSP-B2A(071601) have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Acetone and Methylene chloride. Associated samples ACSP-B2B(071601) and ACSP-B2A(071601) have been qualified as estimated for these compounds.

The continuing calibration %D was above the acceptable limit due to an increase in response by Cyclohexane. Associated sample ACSP-B2A(071601) has been qualified as estimated for the compound.

The LCS %R was above the acceptable limit for Cyclohexane and Methyl cyclohexane. Associated sample ACSP-B2A(071601) has been qualified as estimated for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013309

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	August 1, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 5, 2001

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below the acceptable limit for three internal standards, associated sample RFI-86-08(072001). The original sample results have been replaced with the sample results from the dilution.

The initial calibration %RSD was above the acceptable limit for Methyl acetate. Associated samples RFI-07-06(0.5-2.5) and RFI-03-04(4.5-6.5) have been qualified as estimated for the compound based on this deviation.

The initial calibration %RSD was above the acceptable limit for Acetone. Soil sample results have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Methylene chloride; associated samples RFI-10-01(09-11) and 36-Basement(072301); a decrease in

Summary

The following is an assessment of data package 3013309 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-86-TB-19	3013303901	Water	7/20/01	x				
RFI-07-06(6.5-8.5)	3013309002	Soil	7/20/01	x	x	x	x	
RFI-07-07(14.5-16.5)	3013309003	Soil	7/20/01	x	x	x	x	
RFI-07-07(8.5-10.5)	3013309004	Soil	7/20/01	x	x	x	x	
RFI-07-07(0.5-2.5)	3013303905	Soil	7/20/01	x	x	x	x	
RFI-86-08(8.6-10.6)	3013309006	Soil	7/20/01	x	x	x	x	
RFI-86-08(0.6-2.6)	3013309007	Soil	7/20/01	x	x	x	x	
RFI-86-08(10.6-12.6)	3013309008	Soil	7/20/01	x	x	x	x	
RFI-10-06(06-08)	3013303909	Soil	7/20/01	x	x	x	x	
RFI-10-06(04-06)	3013309010	Soil	7/20/01	x	x	x	x	
RFI-10-01(0.7-2.5)	3013309011	Soil	7/20/01	x	x	x	x	
RFI-10-DUP-38[2]	3013309012	Soil	7/20/01	x	x	x	x	
RFI-10-RB-43	3013303913	Water	7/20/01	x	x	x	x	
RFI-86-08(072001)	3013309014	Water	7/20/01	x	x	x	x	
RFI-86-08(072001_DISS	3013309015	Water	7/20/01			x		
RFI-07-06(0.5-2.5)	3013309016	Soil	7/20/01	x	x	x	x	
RFI-10-01(09-11)	3013303917	Water	7/20/01	x	x	x	x	
36-Basement(072301)	3013309018	Water	7/23/01	x	x	x	x	
36-Basement(072301)DISS	3013309019	Water	7/23/01			x		
RFI-84-09(0.8-2.8)	3013309020	Soil	7/23/01	x	x	x	x	
RFI-84-09(6.8-8.8)	3013303921	Soil	7/23/01	x	x	x	x	
RFI-38-01(0.5-2.5)[1]	3013309022	Soil	7/23/01	x	x	x	x	
RFI-38-01(8.5-10.5)	3013309023	Soil	7/23/01	x	x	x	x	
RFI-38-01(18.5-20.5)	3013309024	Soil	7/23/01	x	x	x	x	
RFI-03-RB-44	3013303925	Water	7/23/01	x	x	x	x	
RFI-03-04(4.5-6.5)	3013309026	Soil	7/23/01	x	x	x	x	
RFI-03-04(0.5-2.5)	3013309027	Soil	7/23/01	x	x	x	x	
RFI-38-DUP-39[3]	3013309028	Soil		x	x	x	x	
36-Basement(072301)DL	3013309029	Water	7/23/01	x				
RFI-86-08(0.6-2.6)DL	3013303930	Soil	7/20/01	x				
RFI-86-08(072001)DL	3013309031	Water	7/20/01	x				
RFI-03-04(4.5-6.5)RE	3013309032	Soil	7/23/01		x			
RFI-03-04(4.5-6.5)RE	3013309033	Soil	7/23/01		x			

1 MS/MSD analysis performed on sample
2 Duplicate of sample RFI-10-06(06-08)
3 Duplicate of sample RFI-38-01(18.5-20.5)

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12 and Chrysene-d12. Associated samples RFI-10-01(0.7-2.5), RFI-84-09(0.8-2.8) and RFI-03-04(4.5-6.5)RE have been qualified as estimated for compounds associated with Perylene-d12 and Chrysene-d12. Data from the confirmation run was used for sample RFI-07-06(6.5-8.5).

The internal standard response was below the acceptable limit for Perylene-d12. Associated samples RFI-86-08(072001), RFI-10-01(09-11) and RFI-03-04(0.5-2.5) have been qualified as estimated for compounds associated with Perylene-d12.

The internal standard response was below the acceptable limit for Perylene-d12, Chrysene-d12, Acenapthene-d10 and Phenanthrene-d10. Associated sample RFI-07-07(14.5-16.5) has been qualified as estimated for compounds associated with the above internal standards.

response by 2-Butanone and Methyl acetate; associated samples RFI-07-06(6.5-8.5), RFI-86-08(10.6-12.6), RFI-07-06(0.5-2.5); a decrease in response by 1,2,4-Trichlorobenzene, associated sample RFI-86-08(072001)DL; a decrease in response by Acetone and 2-Butanone; associated sample RFI-10-01(09-11). Data have been qualified as estimated for the compounds based on these deviations.

One surrogate was above the acceptable limit, associated sample RFI-10-01(09-11), has been qualified as estimated for all detected compounds.

The MS/MSD %R was below the acceptable limit for Acetone, 2-Butanone and 2-Hexanone. Associated sample RFI-10-01(09-11) has been qualified as estimated, based on these deviations.

The LCS %R was above the acceptable limit for Tetrachloroethene. Associated sample RFI-86-08(0.6-2.6) has been qualified as estimated for the compound.

The LCS %R was below the acceptable limit for Cyclohexane. Associated sample RFI-10-01(09-11) has been qualified as estimated for the compound.

Acetone was detected in the rinse blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Sample 36-Basement(072301) contained cis-1,2-Dichloroethene, Tetrachloroethene, Trichloroethene and Vinyl chloride above the linear range. The original sample results for cis-1,2-Dichloroethene and Trichloroethene have been replaced with the results from the dilution. The original sample results for Tetrachloroethene and Vinyl chloride qualified as estimated due to inconsistent data between the original analysis and the diluted analysis.

Sample RFI-86-08(0.6-2.6) contained Trichloroethene above the linear range. The original sample results have been replaced with the results from the dilution, for this compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

specified limits and the data is acceptable for use as reported by the laboratory.

The internal standard response was below the acceptable limit for 1,4-Dichlorobenzene-d4. Data from the confirmation run, for associated sample RFI-86-08(8.6-10.6), have been qualified as estimated for compounds associated with 1,4-Dichlorobenzene-d4.

Sample RFI-03-04(4.5-6.5) was outside the acceptable limits for all surrogates and two internal standards. The original sample results have been replaced with the sample results from the first re-extraction (RFI-03-04(4.5-6.5)RE). Data from the second re-extraction are not being used because of deviations of internal standard responses and surrogates.

The initial calibration %RSD was above the acceptable limit for 2,4-Dichlorophenol and Biphenyl. Associated sample RFI-07-06(6.5-8.5) has been qualified as estimated, based on these deviations.

The initial calibration %RSD was above the acceptable limit for 4,6-Dinitro-2-methylphenol, Pyrene, Benzo(b)fluoranthene, Benzo(a)pyrene, Benzo(g,h,i)perylene and bis(2-Ethylhexyl)phthalate. Associated sample RFI-03-04(4.5-6.5)RE has been qualified as estimated, based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol; associated sample RFI-03-04(4.5-6.5)RE; a decrease in response by Benzaldehyde and 3&4-Methylphenol, associated samples RFI-07-06(6.5-8.5), RFI-07-07(8.5-10.5), RFI-86-08(8.6-10.6), RFI-86-08(10.6-12.6), RFI-07-07(14.5-16.5), RFI-07-07(0.5-2.5), RFI-10-06(06-08), RFI-10-01(0.7-2.5), RFI-10-DUP-38, RFI-07-06(0.5-2.5), RFI-84-09(6.8-8.8), RFI-38-01(8.5-10.5), RFI-86-08(072001), 36-Basement(072301), RFI-38-01(18.5-20.5), RFI-38-01(18.5-20.5), RFI-86-08(0.6-2.6), RFI-10-06(04-06), RFI-84-09(0.8-2.8), RFI-38-01(0.5-2.5), RFI-03-04(0.5-2.5) and RFI-10-01(09-11). Data have been qualified as estimated for the compounds, based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Acetophenone and Carbazole. Associated sample 36-Basement(072301); a decrease in response by 2,4-Dinitrophenol, 4,6-Dinitro-2-methylphenol, 4-Nitrophenol, associated samples RFI-07-07(14.5-16.5), RFI-07-07(0.5-2.5), RFI-10-06(06-08) and RFI-10-01(0.7-2.5); a decrease in response by 2,4-Dinitrophenol, 2-Methylphenol, Caprolactam and 4-Nitroaniline, associated samples), RFI-10-DUP-38, RFI-07-06(0.5-2.5), RFI-84-09(6.8-8.8), RFI-38-01(8.5-10.5), RFI-38-01(18.5-20.5), and RFI-38-01(18.5-20.5); a decrease in response by 2,4-Dinitrophenol, associated samples RFI-86-08(0.6-2.6), RFI-10-06(04-06), RFI-84-09(0.8-2.8), RFI-38-01(0.5-2.5) and RFI-03-04(0.5-2.5); a decrease in response by Caprolactam and 4-Nitrophenol; associated sample RFI-10-01(09-11). Data have been qualified as estimated for the compounds, based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Benzo (g,h,i)perylene. Associated samples, RFI-86-08(0.6-2.6), RFI-84-09(0.8-2.8), RFI-38-01(0.5-2.5) and RFI-03-04(0.5-2.5) have been qualified as estimated, based on this deviation.

The MS/MSD RPD was above the acceptable limit for 2-Methyl naphthalene, associated sample RFI-38-01(0.5-2.5) has been qualified as estimated, based on this deviations.

The LCS/LCSD %R were below the acceptable limit for 4-Chlorophenyl phenyl ether. Soil sample results, with the exception of sample RFI-03-04(4.5-6.5)RE, have been qualified as estimated for the compound.

The LCS/LCSD %R were below the acceptable limit for N-Nitrosodi-n-propylamine. Associated sample RFI-03-04(4.5-6.5)RE has been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %R was above the acceptable limit for Antimony. Associated sample RFI-86-08(8.6-10.6) has been qualified as estimated for the analyte.

The MS/MSD %R were below the acceptable limit for Antimony, Zinc, Vanadium, Arsenic, and Selenium, associated sample RFI-10-01(09-11). Antimony and Zinc were qualified as estimated for detected results and rejected for non-detected results. Vanadium, Arsenic and Selenium were qualified as estimated.

The MS/MSD %R were above the acceptable limit for Lead. Associated sample RFI-10-01(09-11) has been qualified as estimated for the analyte.

The MS/MSD %R were above the acceptable limit for Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Selenium, Thallium, Vanadium and Zinc. Detected water sample

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	August 27, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 5, 2001

results have been qualified as estimated.

The MS/MSD %R were below the acceptable limit for Silver and Mercury. Detected water sample results have been qualified as estimated for the analytes.

The MS/MSD %R were below the acceptable limit for Antimony and above the acceptable limit for Chromium. Soil sample results have been qualified as estimated for the analytes.

The MS/MSD %R were below the acceptable limit for Cyanide. Detected soil sample results and sample RFI-10-01(09-11) have been qualified as estimated and non-detected results have been qualified rejected for the analyte.

The serial dilution %D was above the acceptable limit for Zinc, Manganese, Lead, Copper, Barium and Chromium. Soil sample results have been qualified as estimated for the analytes.

Selenium was detected in the method blank. Associated samples, RFI-07-06(6.5-8.5), RFI-07-07(14.5-16.5), RFI-07-07(8.5-10.5), RFI-07-07(0.5-2.5), RFI-86-08(8.6-10.6), RFI-10-06(06-08), RFI-10-06(04-06), RFI-10-01(0.7-2.5), RFI-10-DUP-38, RFI-07-06(0.5-2.5), RFI-84-09(0.8-2.8), RFI-38-01(0.5-2.5), RFI-38-01(8.5-10.5), RFI-38-01(18.5-20.5), RFI-03-04(4.5-6.5), RFI-03-04(0.5-2.5) and RFI-38-DUP-39, have been qualified as non-detected for the analyte.

Lead and Thallium were detected in the instrument blank. Associated sample RFI-86-08(072001) has been qualified as non-detected, for the analytes.

The field duplicate RPD between sample RFI-38-01(18.5-20.5) and duplicate RFI-38-DUP-39 was above acceptable limits for Silver. Data have been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3013348 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-83/84-05(0.7-2.7)	3013348001	Soil	7/24/01	x	x	x	x	
RFI-83/84-05(6.7-8.7)	3013348002	Soil	7/24/01	x	x	x	x	
RFI-83/84-08(0.7-2.7)	3013348003	Soil	7/24/01	x	x	x	x	
RFI-83/84-08(8.7-10.7)	3013348004	Soil	7/24/01	x	x	x	x	
RFI-10-13(0.7-2.7)	3013348005	Soil	7/24/01	x	x	x	x	
RFI-10-13(8.7-10.7)	3013348006	Soil	7/24/01	x	x	x	x	
RFI-86-04(01-03)	3013348007	Soil	7/24/01	x	x	x	x	
RFI-86-04(03-05)	3013348008	Soil	7/24/01	x	x	x	x	
RFI-85-05(01-03)	3013348009	Soil	7/24/01	x	x	x	x	
RFI-85-DUP-40[2]	3013348010	Soil	7/24/01	x	x	x	x	
RFI-85-05(05-07)[1]	3013348011	Soil	7/24/01	x	x	x	x	
RFI-85-05(09-11)	3013348012	Soil	7/24/01	x	x	x	x	
RFI-85-05(17-19)	3013348013	Soil	7/24/01	x	x	x	x	
RFI-85-RB-45	3013348014	Water	7/24/01	x	x	x	x	
RFI-05-RB-46	3013348015	Water	7/26/01	x	x	x	x	
RFI-05-06(00-02)	3013348016	Soil	7/25/01	x	x	x	x	
RFI-05-06(08-10)	3013348017	Soil	7/25/01	x	x	x	x	
RFI-83/84-07(0.9-2.9)	3013348018	Soil	7/25/01	x	x	x	x	
RFI-83/84-07(8.9-10.9)	3013348019	Soil	7/25/01	x	x	x	x	
RFI-10-01(01-03)	3013348020	Soil	7/26/01	x	x	x	x	
RFI-10-01(05-07)	3013348021	Soil	7/26/01	x	x	x	x	
RFI-12-RB-47	3013348022	Water	7/26/01	x	x	x	x	
RFI-10-DUP-41[3]	3013348023	Soil	7/26/01	x	x	x	x	
RFI-83/84-05(0.7-2.7)DL	3013348024	Soil	7/24/01		x			
RFI-83/84-08(0.7-2.7)RE	3013348025	Soil	7/24/01		x			
RFI-86-04(01-03)RE	3013348026	Soil	7/24/01		x			
RFI-05-06(08-10)RE	3013348027	Soil	7/25/01		x			
RFI-83/84-07(8.9-10.9)RE	3013348028	Soil	7/25/01		x			
RFI-10-01(01-03)RE	3013348029	Soil	7/26/01		x			
RFI-10-01(05-07)RE	3013348030	Soil	7/26/01		x			
RFI-10-DUP-41-RE	3013348031	Soil	7/26/01		x			

1 MS/MSD analysis performed on sample
2 Duplicate analysis on sample RFI-85-05(01-03)
3 Duplicate analysis on sample RFI-10-01(01-03)

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013348

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

RFI-83/84-07(09-2.9), RFI-83/84-07(8.9-10.9) and RFI-10-01(05-07); a decrease in response by Methylene chloride, associated samples RFI-86-04(03-05) and RFI-05-06(00-02); a decrease in response by Acetone and 1,2,4-Trichlorobenzene, associated samples RFI-05-06(08-10), RFI-10-01(01-03) and RFI-10-01(01-03). Data have been qualified as estimated for the compounds based on these deviations.

Acetone was detected in the rinse blanks. Sample results which were less than the blank action level were qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above the acceptable limit for Acetone; associated samples RFI-83/84-05(0.7-2.7), RFI-83/84-05(6.7-8.7), RFI-83/84-08(0.7-2.7), RFI-83/84-08(8.7-10.7), RFI-10-13(0.7-2.7), RFI-10-13(8.7-10.7), RFI-86-04(01-03), RFI-86-04(03-05), RFI-85-05(01-03), RFI-85-DUP-40, RFI-85-05(05-07), RFI-85-05(09-11) and RFI-85-05(17-19); Methyl acetate; associated sample RFI-10-13(0.7-2.7); Chloroethane; associated sample RFI-10-01(05-07). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Methyl acetate, 2-Butanone, 4-Methyl-2-pentanone, 1,1,2,2-Tetrachloroethane, Acetone, Methylene chloride, 1,2-Dichloroethane, trans-1,3-Dichloropropene, 2-Hexanone, and 1,2,4-Trichlorobenzene; associated samples RFI-83/84-05(6.7-8.7), RFI-83/84-08(0.7-2.7), RFI-83/84-08(8.7-10.7), RFI-10-13(0.7-2.7), RFI-10-13(8.7-10.7), RFI-86-04(01-03), RFI-85-DUP-40, RFI-85-05(05-07), and RFI-85-05(09-11); a decrease in response by Methylene chloride and 2-Butanone, associated samples RFI-83/84-05(0.7-2.7), RFI-85-05(01-03), RFI-85-05(17-19), RFI-83/84-07(09-2.9), RFI-83/84-07(8.9-10.9) and RFI-10-01(05-07); a decrease in response by Acetone; associated samples RFI-05-06(00-02),

associated samples RFI-85-05(09-11), RFI-05-06(00-02) and RFI-83/84-07(0.9-2.9); Pyrene, associated samples RFI-10-13(0.7-2.7) and RFI-05-06(00-02); bis(2-Ethylhexyl)phthalate, associated samples RFI-85-05(05-07), RFI-85-05(09-11), RFI-85-05(17-19) and RFI-05-06(00-02); Benzo(a)pyrene, associated samples RFI-83/84-05(0.7-2.7) and RFI-86-04(01-03); 2,4-Dinitrophenol, associated samples RFI-83/84-05(0.7-2.7), RFI-83/84-08(0.7-2.7)RE, RFI-86-04(01-03), RFI-86-04(03-05), RFI-85-05(01-03), RFI-05-06(08-10), RFI-10-01(01-03) and RFI-10-DUP-41. Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, 3&4-Methylphenol, Hexachlorocyclopentadiene, 2,4-Dinitrophenol, 4-Nitroaniline, Carbazole, 4-Chloroaniline, 3-Nitroaniline, 4-Nitrophenol and 4,6-Dinitro-2-methylphenol, associated samples RFI-85-RB-45, RFI-05-RB-46 and RFI-12-RB-27; a decrease in response by 2,4-Dinitrophenol, 3&4-Methylphenol and 4,6-Dinitro-2-methylphenol, associated samples RFI-83/84-05(6.7-8.7), RFI-83/84-08(8.7-10.7), RFI-10-13(0.7-2.7), RFI-10-13(8.7-10.7), RFI-85-DUP-40, RFI-85-05(05-07), RFI-85-05(09-11), RFI-85-05(17-19), RFI-05-06(00-02), RFI-83/84-07(0.9-2.9) and RFI-83/84-07(8.9-10.9); a decrease in response by 3&4-Methylphenol and Caprolactam, associated samples RFI-83/84-05(0.7-2.7), RFI-83/84-08(0.7-2.7)RE, RFI-86-04(01-03), RFI-86-04(03-05), RFI-85-05(01-03), RFI-05-06(08-10), RFI-10-01(01-03) and RFI-10-DUP-41; a decrease in response by Benzaldehyde, Carbazole and 3&4-Methylphenol, associated sample RFI-10-01(05-07)RE. Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by bis(2-Ethylhexyl)phthalate, associated samples RFI-85-DUP-40, RFI-85-05(05-07), RFI-85-05(09-11), RFI-85-05(17-19) and RFI-05-06(00-02); an increase in response by Indeno(1,2,3-cd)pyrene, associated sample RFI-05-06(00-02). Data have been qualified as estimated for the compounds based on these deviations.

The %Rs for two base surrogates were above the acceptable limit. Associated sample RFI-86-04(03-05) has been qualified as estimated for detected compounds.

The MS/MSD %Rs were below the acceptable limits for 4-Chlorophenyl phenyl ether. Associated sample RFI-85-05(05-07) has been qualified as estimated for the compound.

The LCS/LCSD %R were above the acceptable limit for Acenaphthylene, Benzaldehyde, Benzo(a)anthracene, Benzo(k)fluoranthene, bis(2-Ethylhexyl)phthalate, Butyl benzylphthalate, Chrysene, Di-n-butylphthalate, Fluoranthene, Fluorene, and Pyrene. Detected soil sample results have been qualified as estimated for the compounds.

The field duplicate RPD between sample RFI-85-05(01-03) and duplicate RFI-85-DUP-40 was above the acceptable limit for Benzo(b)fluoranthene. Data have been qualified as estimated, based on this deviation.

Sample RFI-83/84-05(0.7-2.7) contained Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Chrysene and Fluoranthene above the linear range. The original sample results for these compounds have been replaced with the sample results from the dilution.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Chrysene-d12 and Perylene-d12. Associated samples RFI-83/84-08(0.7-2.7)RE, RFI-83/84-05(0.7-2.7), RFI-86-04(01-03), RFI-05-06(08-10), RFI-10-01(01-03) and RFI-10-DUP-41 have been qualified as estimated for compounds associated with Chrysene-d12 and Perylene-d12. For sample RFI-83/84-07(8.9-10.9), all compounds associated with Chrysene-d12 and detected compounds associated with Perylene-d12 have been qualified as estimated, non-detected compounds associated with Perylene-d12 have been qualified rejected.

The internal standard response was below the acceptable limit for Perylene-d12. Associated sample RFI-10-01(05-07)-RE has been qualified as estimated for compounds associated with Perylene-d12.

The initial calibration %RSD was above the acceptable limit for Benzo(b)fluoranthene, associated samples RFI-83/84-05(0.7-2.7), RFI-10-13(0.7-2.7), RFI-86-04(01-03), RFI-85-05(01-03), RFI-05-06(00-02), RFI-05-06(08-10), RFI-83/84-07(0.9-2.9) and RFI-10-01(01-03); Di-n-butylphthalate,

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
			X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %R was above the acceptable limit for Antimony. Detected soil sample results have been qualified as estimated, based on this deviation.

The MS/MSD %Rs were below the acceptable limit for Copper and Cyanide. Associated samples RFI-85-RB-45, RFI-05-RB-46 and RFI-12-RB-47 have been qualified as estimated for the analytes.

The MS/MSD %Rs were below the acceptable limit for Antimony. Soil sample results have been qualified as estimated for the analyte.

The serial dilution %D was above the acceptable limit for Lead, Manganese and Copper. Soil sample have been qualified as estimated for the analytes.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	August 24, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 17, 2001

Antimony and Selenium were detected in the method blank. Soil sample results for these analytes which were below the blank action level have been qualified as non-detected.

The field duplicate RPD was above the acceptable limit between sample RFI-10-01(01-03) and duplicate RFI-10-DUP-41 for Lead. Associated sample results have been qualified as estimated for the compound.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3013431 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-55-04(00-02)	3013431001	Soil	7/26/01	x	x	x	x	
RFI-55-04(06-08)	3013431002	Soil	7/26/01	x	x	x	x	
RFI-55-DUP-41[1]	3013431003	Soil	7/26/01	x	x	x	x	
RFI-55-06(00-02)	3013431004	Soil	7/26/01	x	x	x	x	
RFI-55-05(00-02)	3013431005	Soil	7/26/01	x	x	x	x	
RFI-55-05(08-10)	3013431006	Soil	7/26/01	x	x	x	x	
RFI-55-03(00-02)	3013431007	Soil	7/26/01	x	x	x	x	
36-Bsmnt(072601)	3013431008	Water	7/26/01	x	x	x	x	
36-Bsmnt(072601)DISS	3013431009	Water	7/26/01			x		
RFI-81-TB-21	3013431010	Water		x				
RFI-65-01(0.7-2.7)	3013431011	Soil	7/27/01	x	x	x	x	
RFI-65-01(4.7-6.7)	3013431012	Soil	7/27/01	x	x	x	x	
RFI-81-07(0.3-2.3)	3013431013	Soil	7/27/01	x	x	x	x	
RFI-81-07(4.3-6.3)	3013431014	Soil	7/27/01	x	x	x	x	
81-07(072701)	3013431015	Water	7/27/01	x	x	x	x	
81-07(072701)DISS	3013431016	Water	7/27/01			x		
RFI-81-TB-22	3013431017	Water	7/27/01	x				
RFI-55-02(01-03)[2]	3013431018	Soil	7/27/01	x	x	x	x	
RFI-55-02(08-10)	3013431019	Soil	7/27/01	x	x	x	x	
RFI-36-13(05-07)	3013431020	Soil	7/27/01	x	x	x	x	
RFI-36-13(09-11)	3013431021	Soil	7/27/01	x	x	x	x	
RFI-36-13(01-03)	3013431022	Soil	7/27/01	x	x	x	x	
RFI-55-RB-47	3013431023	Water	7/27/01	x	x	x	x	
16-10(072701)NL	3013431024	Oil	7/27/01	x	x	x	x	x
RFI-07-08(00-02)	3013431025	Soil	7/30/01	x	x	x	x	
RFI-07-08(08-10)	3013431026	Soil	7/30/01	x	x	x	x	
RFI-07-08(10-12)	3013431027	Soil	7/30/01	x	x	x	x	
RFI-85-04(0.5-2.5)	3013431028	Soil	7/30/01	x	x	x	x	
36-Bsmnt(072601)DL	3013431029	Water	7/26/01	x				
RFI-55-04(00-02)RE	3013431030	Soil	7/26/01		x			
RFI-DUP-41-RE	3013431031	Soil	7/26/01		x			
RFI-55-06(00-02)RE	3013431032	Soil	7/26/01		x			
RFI-55-05(00-02)RE	3013431033	Soil	7/26/01		x			
RFI-65-01(0.7-2.7)RE	3013431034	Soil	7/27/01		x			
RFI-81-07(0.3-2.3)RE	3013431035	Soil	7/24/01		x			
RFI-81-07(4.3-6.3)RE	3013431036	Soil	7/27/01		x			
RFI-55-02(01-03)RE	3013431037	Soil	7/27/01		x			
RFI-36-13(01-03)DL	3013431038	Soil	7/27/01		x			
16-10(072701)NLDL	3013431039	Non-Aq	7/27/01		x			

1 DUP analysis performed on sample RFI-55-04(00-02)
2 MS/MSD analysis performed on sample

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013431

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

response by Acetone and 1,2,4-Trichlorobenzene, associated samples RFI-36-13(09-11), RFI-36-13(01-03), RFI-07-08(00-02) and RFI-07-08(08-10); a decrease in response by Chloroethane, Tetrachloroethene and Bromomethane, associated samples RFI-55-04(00-02), RFI-55-04(06-08), RFI-55-DUP-41, RFI-55-06(00-02), RFI-55-05(00-02), RFI-55-05(08-10), RFI-55-03(00-02), RFI-62-01(0.7-2.7), RFI-65-01(4.7-6.7), RFI-81-07(0.3-2.3), RFI-81-07(4.3-6.3), RFI-55-02(08-10), RFI-36-13(05-07), RFI-07-08(10-12) and RFI-85-04(0.5-2.5); a decrease in response by Dichlorodifluoromethane (CFC-12), Methylene chloride and Bromomethane, associated sample 16-10(072701)NL. Data have been qualified as estimated for the compounds based on these deviations.

The %Rs for two surrogates were above the acceptable limit. Detected results in associated samples RFI-81-TB-21, 81-07(072701) and RFI-81-TB-22 have been qualified as estimated based on these deviations.

The %R for one surrogate was below the acceptable limit. Detected results in associated sample 16-10(072701)NL have been qualified as estimated.

The MS/MSD %Rs were below the acceptable limit for Ethylbenzene, Styrene and Tetrachloroethene. Associated sample 81-07(072701) has been qualified as estimated, based on these deviations.

Methylene chloride was detected in the trip blank. Sample results below the blank action level have been qualified as non-detected for the compound.

Acetone was detected in the rinse blank. Sample results below the blank action level have been qualified as non-detected for the compound.

Sample 36-Bsmnt(072601) contained cis-1,2-Dichloroethene, Tetrachloroethene, Trichloroethene and Vinyl chloride above the linear range. The original sample results for the listed compounds have been replaced with the sample results from the dilution.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below the acceptable limit for Pentafluorobenzene and 1,4-Dichlorobenzene-D4. Sample results for RFI-81-TB-22 has been qualified as estimated for compounds associated with the internal standards.

The initial calibration %RSD was above the acceptable limit for Acetone, associated sample 36-Bsmnt(072601), RFI-55-02(01-03), RFI-62-01(0.7-2.7) and RFI-36-13(05-07); Trichloroethene, associated samples RFI-55-04(00-02), RFI-55-04(06-08), RFI-55-DUP-41, RFI-55-03(00-02), RFI-62-01(0.7-2.7), RFI-81-07(0.3-2.3), RFI-81-07(4.3-6.3) and RFI-36-13(05-07). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,2,4-Trichlorobenzene, associated sample 36-Bsmnt(072601); a decrease in response by Methylene chloride, associated sample RFI-55-02(01-03); a decrease in response by 1,1,2,2-Tetrachloroethane, associated samples RFI-81-TB-21, 81-07(072701), RFI-81-TB-22 and RFI-55-RB-47; a decrease in

Sample RFI-36-13(01-03) contained Pyrene above the linear range. The original sample results for this compound have been replaced with the results from the dilution.

Sample 16-10(072701)NL contained 2-Methyl naphthalene, Naphthalene and Phenanthrene above the linear range. The original sample results for these compounds have been replaced with the results from the dilution.

The initial calibration %RSD was above the acceptable limit for 3-Nitroaniline, Benzo(b)fluoranthene, Benzo(k)fluoranthene and Phenanthrene, associated samples RFI-55-04(00-02), RFI-55-04(06-08), RFI-55-DUP-41, RFI-55-06(00-02), RFI-55-03(00-02) and RFI-55-02(01-03); Fluoranthene, Fluorene, Carbazole, Dibenzofuran and Benzo(a)pyrene, associated samples RFI-55-06(00-02) and RFI-55-02(01-03); Acenaphthylene, associated sample RFI-55-06(00-02); Biphenyl, associated sample RFI-55-02(01-03); Dibenzofuran, associated sample RFI-55-04(00-02); Fluoranthene and Benzo(a)pyrene, associated sample RFI-55-DUP-41; 3-Nitroaniline, associated sample RFI-65-01(4.7-6.7), 81-07(072701) and RFI-55-RB-47. Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, 3&4-Methylphenol, Biphenyl, 3-Nitroaniline, 4-Nitroaniline and Carbazole, associated samples RFI-55-04(00-02), RFI-55-04(06-08), RFI-55-DUP-41, RFI-55-06(00-02), RFI-55-03(00-02), RFI-65-01(4.7-6.7), 81-07(072701), RFI-55-02(01-03) and RFI-55-RB-47; a decrease in response by 3&4-Methylphenol, associated samples 36-Bsmnt-(072601), RFI-55-05(08-10), RFI-55-05(00-02)RE, RFI-65-01(0.7-2.7)RE, RFI-81-07(0.3-2.3), RFI-36-13(05-07), RFI-36-13(09-11), RFI-07-08(00-02), RFI-07-08(08-10), RFI-07-08(10-12), RFI-85-04(0.5-2.5), RFI-81-07(4.3-6.3)RE, RFI-55-02(08-10), RFI-36-13(01-03) and 16-10(072701)NL; a decrease in response by Benzaldehyde and Acetophenone, associated sample 36-Bsmnt-(072601); a decrease in response by Benzaldehyde and Atrazine, associated sample RFI-55-05(08-10). Data have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene, associated samples RFI-55-05(08-10), RFI-81-07(4.3-6.3)RE and RFI-36-13(01-03); an increase in response by Dibenzo(a,h)anthracene, associated sample RFI-55-05(08-10). Data have been qualified as estimated for the compounds based on these deviations.

The MS/MSD %Rs were below the acceptable limit for 4-Chlorophenyl phenyl ether. Associated sample 81-07(072701) has been qualified as estimated for the compound based on this deviation.

The LCS/LCSD %Rs were below the acceptable limit for 4-Chlorophenyl phenyl ether. Soil sample results have been qualified as estimated, based on this deviation.

The LCS/LCSD %R were above the acceptable limit for Pyrene, Phenanthrene, Naphthalene, Benzo(a)anthracene, Benzo(a)pyrene, bis(2-Ethylhexyl)phthalate, Chrysene and 2-Methyl naphthalene. Associated sample 16-10(072701)NL has been qualified as estimated for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Chrysene-d12 and Perylene-d12. Associated samples RFI-55-06(00-02) and RFI-81-07(0.3-2.3) have been qualified as estimated for compounds associated with the above internal standards.

The internal standard response was below the acceptable limit for Acenaphthene-d10 and Phenanthrene-d10. Associated sample 16-10(072701)NL has been qualified as estimated for compounds associated with the above internal standards.

The internal standard response was below the acceptable limit for Perylene-d12. Associated samples RFI-55-04(00-02), RFI-55-DUP-41, RFI-55-05(00-02)RE, RFI-65-01(0.7-2.7)RE, RFI-81-07(4.3-6.3)RE, RFI-55-02(01-03) and RFI-36-13(01-03) have been qualified as estimated for compounds associated with Perylene-d12. Data from the re-analysis runs have been used for samples RFI-55-05(00-02), RFI-65-01(0.7-2.7) and RFI-81-07(4.3-6.3).

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %R was above the acceptable limit for Antimony. Associated samples RFI-55-04(00-02), RFI-55-04(06-08), RFI-55-DUP-41, RFI-55-06(00-02), RFI-55-05(00-02), RFI-55-05(08-10), RFI-55-03(00-02), RFI-65-01(0.7-2.7), RFI-65-01(4.7-6.7), RFI-81-07(0.3-2.3), RFI-81-07(4.3-6.3), RFI-55-02(01-03), RFI-36-13(01-03) and RFI-07-08(00-02) have been qualified as estimated for the compounds based on this deviation.

The MS/MSD %R were below the acceptable limit for Silver, associated sample 36-Bsmnt(072601); Copper and Cyanide, associated sample RFI-55-RB-47; Silver and Cyanide, associated sample 81-07(072701); Chromium, Lead and Zinc, associated sample 16-10(072701)NL. Data have been qualified as estimated for the analytes based on these deviations.

The MS/MSD %Rs were below the acceptable limit for Antimony, Copper, Nickel and Chromium. Soil

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD RPD was above the acceptable limit for Aroclor 1260. Associated sample RFI-55-02(01-03) has been qualified as estimated for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	August 30, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 19, 2001

sample results have been qualified as estimated, based on these deviations.

The MS/MSD %Rs were above the acceptable limit for Barium and Manganese. Associated sample 36-Bsmnt(072601) has been qualified as estimated for the analytes.

The MS/MSD %Rs were above the acceptable limit for Barium. Soil sample have been qualified as estimated, based on this deviation.

Chromium was detected in the instrument blank, sample 81-07(072701) contained this analyte below the blank action level and has been qualified non-detected.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3013475 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-85-04(8.5-10.5)	3013475001	Soil	07/30/01	X	X	X	X	X
85-04(12.5-14.5)[1]	3013475002	Soil	07/30/01	X	X	X	X	X
RFI-85-DUP-42[4]	3013475030	Soil	07/30/01	X	X	X	X	X
RFI-EB-01(073101)	3013475004	Water	07/31/01	X	X	X	X	X
RFI-EB-02(073101)	3013475005	Water	07/31/01	X	X	X	X	X
RFI-86-02(01-03)	3013475006	Soil	07/31/01	X	X	X	X	X
RFI-86-02(07-09)	3013475007	Soil	07/31/01	X	X	X	X	X
RFI-86-DUP-43[5]	3013475008	Soil	07/31/01	X	X	X	X	X
RFI-86-RB-48[3]	3013475009	Water	07/31/01	X	X	X	X	X
RFI-86-RB-49	3013475010	Water	07/31/01	X	X	X	X	X
83/84-05(073101)	3013475011	Water	07/31/01	X	X	X	X	X
83/84-05(073101)DISS	3013475012	Water	07/31/01			X		
83/84-08(073101)	3013475013	Water	07/31/01	X	X	X	X	X
83/84-08(073101)DISS	3013475014	Water	07/31/01			X		
83/84-09(073101)	3013475015	Water	07/31/01	X	X	X	X	X
83/84-09(073101)DISS	3013475016	Water	07/31/01			X		
RFI-83/84-TB-20	3013475017	Water	07/31/01	X				
RFI-03-01(08-10)	3013475018	Soil	08/02/01	X	X	X	X	X
RFI-03-01(02-04)	3013475019	Soil	08/02/01	X	X	X	X	X
RFI-03-01(10-12)	3013475020	Soil	08/02/01	X	X	X	X	X
07-07(080101)[1]	3013475021	Water	08/01/01	X	X	X	X	X
07-07(080101)DISS[2]	3013475022	Water	08/01/01			X		
RFI-07DUP-21(080101)[6]	3013475023	Water	08/01/01	X	X	X	X	X
RFI-07-TB-21	3013475024	Water	08/01/01	X				
RFI-03-RB-50	3013475025	Water	08/03/01	X	X	X	X	X
RFI-55-RB-51	3013475026	Water	08/03/01	X	X	X	X	X
RFI-55-01(01-03)	3013475027	Soil	08/03/01	X	X	X	X	X
RFI-55-01(05-07)	3013475028	Soil	08/03/01	X	X	X	X	X
07-DUP-21(080101)DISS	3013475029	Water	08/03/01		X	X		
RFI-86-02(07-09)RE	3013475031	Soil	07/31/01		X			X
RFI-86-DUP-43-RE	3013475032	Soil	07/31/01		X			X
83/84-08(073101)RE	3013475033	Water	07/31/01		X			
RFI-03-01(08-10)RE	3013475034	Soil	08/02/01		X			X
RFI-03-01(10-12)RE	3013475035	Soil	08/02/01		X			X

1 MS/MSD analysis performed on sample
2 MS/MSD analysis performed on sample (PCB only)
3 MS/MSD analysis performed on sample (Metals only)
4 Field duplicate of sample RFI-85-04(8.5-10.5)
5 Field duplicate of sample RFI-86-02(07-09)
6 Field duplicate of sample 07-07(080101)

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013475

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
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engineers & scientists

04(8.5-10.5), RFI-85-DUP-42, RFI-86-02(01-03), RFI-03-01(08-10), RFI-03-01(02-04), and RFI-03-01(10-12)). The sample results have been qualified as estimated.

The continuing calibration %D was outside the 20% acceptance limit due to an increase in response for the following compounds: Acetone and 4-Methyl-2-Pentanone (affected sample: 83/84-08(073101)). The sample results have been qualified as estimated.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The Acetone MSD % recovery was above acceptance limits for sample 85-04(12.5-14.5). The sample result has been qualified as estimated.

The LCS % recovery was above control limits for 4-Methyl-2-Pentanone (affected sample: 83/84-08(073101). The sample result has been qualified as estimated.

Acetone and 2-Butanone were detected in the rinse blank and equipment blank samples. Sample results less than the blank action levels have been qualified as non-detected.

The initial calibration %RSD was greater than the acceptable limit for the following compounds: Chloroethane (affected samples: 85-04(8.5-10.5), RFI-86-02(07-09), RFI-55-01(01-03), and RFI-55-01(05-07)). The sample results have been qualified as estimated.

The continuing calibration %D was outside the 20% acceptance limit due to a decrease in response for the following compounds: Bromomethane and Methyene Chloride (affected samples: RFI-85-

bis(2-Ethylhexyl)phthalate and Diethylphthalate were detected in the equipment blank sample. Sample results less than the blank action levels have been qualified as non-detected.

The response was below acceptance limits for the following internal standards: Chrysene-d12 and Perylene-d12 (affected samples: RFI-86-02(07-09)RE, RFI-86-DUP-43, RFI-86-DUP-43RE), 84/83-08 (073101)RE, RFI- 03-01(08-10); Perylene-d12 (affected samples: 83/84-08(073101), RFI-03-01 (08-10)RE, RFI-03-01 (10-12), and RFI-03-01(10-12)RE). The samples were confirmed by re-analysis. The sample results have been qualified as estimated for the compounds quantitated from the internal standards that did not meet acceptance criteria.

The initial calibration %RSD was greater than the acceptable limit for Carbazole (affected sample:RFI-03-01(02-04)). The sample result has been qualified as estimated.

The continuing calibration %D was outside the 20% acceptance limit due to a decrease in response for the following compound: 3&4-Methylphenol (affected sample: RFI-07-DUP-21)); 3&4-Methylphenol, and 2,4-Dinitrophenol (affected samples: 83/84-05(073101), 83/84-08(073101), and 07-07(080101)); Benzaldehyde, 3&4-Methylphenol, Caprolactam, 4-Nitroaniline, and Carbazole (affected samples: RFI-8504 (8.5-10.5), RFI-85-DUP-42, RFI-86-02(01-03), RFI-86-02(07-09), RFI-86-DUP-43, RFI-03-01 (08-10), RFI-03-01 (02-04), RFI-03-01 (10-12), and RFI-55-01 (01-03)); Benzaldehyde, 3&4-methylphenol, 4-Chloroaniline, Hexachlorocyclopentadiene, 3-Nitroaniline, 4-Nitrophenol, 4-Nitroaniline, Atrazine, and Carbazole (affected samples: 85-04 (12.5-14.5), RFI-03-01 (08-10)RE, RFI-03-01 (10-12)RE)). The sample result has been qualified as estimated.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

One B/N surrogate was above control limits in samples 85-04(12.5-14.5), RFI-55-01(01-03) and RFI-55-01(05-07). One B/N and one Acid surrogate were above control limits in samples RFI-86-02(07-09) and RFI-86-DUP-43. No sample results were qualified for those deviations.

The MS and/or MSD % recoveries were below acceptance limits for 4-Chlorophenyl-phenylether (affected samples: 07-07(080101). The sample results have been qualified as estimated.

The LCS and/or LCSD % recoveries were above control limits for the following compounds: bis-(2-Ethylhexyl)phthalate (affected sample: 83/84-09(073101); Indeno(1,2,3-cd)pyrene (affected samples: RFI-03-01 (02-04)). The sample results have been qualified as estimated.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration verification and one continuing calibration verification were above control limits for Antimony (affected samples: 83/84-05 (073101), 83/84-08 (073101), 83/84-09 (073101), 07-07(080101), and RFI-07-DUP21(080101). The sample results have been qualified as estimated for this deviation.

The continuing calibration verification was below control limits for Beryllium (affected samples: RFI-85-04(8.5-10.5), RFI-85-DUP-42, RFI-86-02(01-03), RFI-86-02 (07-09), RFI-86-DUP-43, RFI-03-01 (02-04), RFI-03-01 (10-12), and RFI-55-01(01-03)). The samples have been qualified as estimated.

The MS/MSD %RPD for Barium was above control limits. Detected soil sample results have been qualified as estimated.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	May 7, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	September 19, 2001

The MS/MSD % recoveries were below control limits for the following analytes: Silver (affected samples: 83/84-05 (073101), 83/84-08 (073101), 83/84-09 (073101), 07-07 (080101), and RFI-07-DUP21(080101)); Antimony (affected samples: RFI-85-04 (8.5-10.5), 85-(12.5-14.5), RFI-85-DUP-42, RFI-86-02 (01-03), RFI-86-02 (07-09), RFI-86-DUP-43, RFI-03-01 (08-10), RFI-03-01 (02-04), RFI-03-01 (10-12), RFI-55-01 (01-03), and RFI-55-01 (05-07)). The sample results have been qualified as estimated.

The MS/MSD RPD values for Antimony, Barium and Manganese were above acceptance limits. Detected sample results have been qualified as estimated.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3013582 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-81-05(03-05)	3013582001	Solid	8/06/01	x	x	x	x	
RFI-81-05(09-11)	3013582002	Solid	8/06/01	x	x	x	x	
RFI-81-20(01-03)	3013582003	Solid	8/06/01	x	x	x	x	
RFI-81-20(03-05)	3013582004	Solid	8/06/01	x	x	x	x	
RFI-81-20(07-09)[1]	3013582005	Solid	8/06/01	x	x	x	x	
RFI-81-06(0.8-2.8)	3013582006	Solid	8/06/01	x	x	x	x	
RFI-81-06(2.8-4.8)	3013582007	Solid	8/06/01	x	x	x	x	
RFI-81-06(8.8-10.8)	3013582008	Solid	8/06/01	x	x	x	x	
RFI-81-06(12.8-14.8)	3013582009	Solid	8/06/01	x	x	x	x	
RFI-81-DUP-50[2]	3013582010	Solid	8/06/01	x	x	x	x	
Decon Water #1318	3013582011	Water	8/06/01	x	x	x	x	
16-09(081001)	3013582012	Water	8/10/01	x	x	x	x	
16-09(081001)DISS	3013582013	Water	8/10/01			x		
16-04(081001)	3013582014	Water	8/10/01	x	x	x	x	
16-07(081001)	3013582015	Water	8/10/01	x	x	x	x	
RFI-16-DUP-30[3]	3013582016	Water	8/10/01	x	x	x	x	
16-04(081001)DISS	3013582017	Water	8/10/01			x		
16-07(081001)DISS	3013582018	Water	8/10/01			x		
RFI-16-DUP-30DISS	3013582019	Water	8/10/01			x		
RFI-16-TB-25	3013582020	Water	8/10/01	x				
RFI-81-05(03-05)RE	3013582021	Solid	8/06/01		x			
RFI-81-20(01-03)RE	3013582022	Solid	8/06/01		x			
RFI-81-20(03-05)RE	3013582023	Solid	8/06/01		x			
RFI-84-DUP-50-RE	3013582026	Solid	8/06/01		x			

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample RFI-81-05(03-05)
3 Duplicate analysis performed on sample RFI-16-07(081001)

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TIER II
DATA VALIDATION REPORT

SDG# 3013582

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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The LCS %R was below the acceptable limit for Cyclohexane. Associated samples RFI-81-05(09-11), RFI-81-20(03-05), RFI-81-20(07-09), RFI-81-06(0.8-2.8), RFI-81-06(2.8-4.8), RFI-81-06(8.8-10.8), and RFI-81-06(12.8-14.8) have been qualified as estimated for the compound.

2-Butanone and Methylene chloride were detected in the method blank. Sample results for these compounds which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Bromomethane. Associated sample Decon Water #1318 has been qualified as estimated for the compound.

The initial calibration %RSD was above the acceptable limit for Acetone. Soil sample results have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Bromomethane, and Acetone. Associated samples Decon Water #1318, 16-09(081001), 16-04(081001), 16-07(081001), RFI-16-DUP-30, and RFI-16-TB-25 have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Chloromethane. Associated samples Decon Water #1318, and 16-09(081001) have been qualified as estimated for the compounds based on this deviation.

Benzaldehyde, Biphenyl, 3&4-Methylphenol, and Atrazine, associated samples RFI-81-20(07-09) and RFI-81-06(2.8-4.8). Sample results have been qualified as estimated based on these deviations.

The LCS/LCSD RPD was above the acceptable limit for all compounds. Detected sample results for associated samples have been qualified as estimated based on these deviations.

Diethyl phthalate was detected in the method blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated samples RFI-81-05(03-05), RFI-81-20(01-03), RFI-81-20(03-05), and RFI-81-DUP-50 have been qualified as estimated for compounds associated with Perylene-d12.

The initial calibration %RSD was above the acceptable limit for Caprolactam, associated sample RFI-81-05(09-11); Benzo(g,h,i)perylene, associated samples RFI-81-20(07-09) and RFI-81-06(2.8-4.8). Sample results have been qualified as estimated based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, Biphenyl, 4-Nitrophenol, 3&4-Methylphenol, 2,4-Dinitrophenol, and Atrazine, associated samples RFI-81-05(03-05), RFI-81-05(09-11), RFI-81-20(01-03), RFI-81-20(03-05), RFI-81-06(0.8-2.8), Decon Water #1318, 16-09(081001), 16-04(081001), 16-07(081001), and RFI-16-DUP-30; a decrease in response by Benzaldehyde, Atrazine, and 3&4-Methylphenol, associated samples RFI-81-06(8.8-10.8), RFI-81-06(12.8-14.8), and RFI-81-DUP-50; a decrease in response by

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below the acceptable limit for Copper and Silver. Associated samples 16-09(081001), 16-04(081001), 16-07(081001), and RFI-16-DUP-30 have been qualified as estimated based on these deviations.

The MS/MSD %Rs were above the acceptable limit for all analytes, with the exception of Mercury. Detected results for sample Decon Water #1318 have been qualified as estimated.

The field duplicate RPD between sample 16-07(081001) and duplicate RFI-16-DUP-30 was above the acceptable limit for Arsenic, Chromium, Cobalt and Zinc. Detected sample results for these analytes have been qualified as estimated in associated samples.

Antimony was detected in the method blank. Sample results for this analyte which were below the blank action level have been qualified as non-detected.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS/LCSD RPD was above the acceptable limit for Aroclor 1260. Associated sample RFI-81-05(03-05) has been qualified as estimated, based on this deviation.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	September 11, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 28, 2001

Arsenic was detected in the instrument blank. Sample results for this analyte which were below the blank action level have been qualified as non-detected.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3013651 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
ACSP-B3E(00-02)		Soil	8/6/2001			X		
ACSP-B3E(02-04)		Soil	8/6/2001			X		
ACSP-B3E(04-06)		Soil	8/6/2001			X		
ACSP-B3K(00-02)		Soil	8/6/2001			X		
ACSP-B3K(02-04)		Soil	8/6/2001			X		
ACSP-B3K(04-06)		Soil	8/6/2001			X		
ACSP-DUP-05		Soil	8/6/2001			X		

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TIER II
DATA VALIDATION REPORT

SDG# 3013651

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	AuMarch 23, 2001
Validation performed by:	(Dennis Capria)
Date of Validation:	April 28, 2001

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

No matrix spike/matrix spike duplicate analysis was performed on the samples in this data set.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3013769 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
16-11-(081301)	3013769001	Water	8/13/01	x	x	x	x	
16-11-(081301)Diss	3013769002	Water	8/13/01			x		
RFI-16-TB-40	3013769003	Water	8/13/01	x				
16-01(081401)	3013769004	Water	8/14/01	x	x	x	x	
16-01(081401)Diss	3013769005	Water	8/14/01			x		
RFI-16-TB-40	3013769006	Water	8/14/01	x				
EP94-02A(2.5-4.5)	3013769008	Solid	8/17/01	x	x	x		
EP94-02A(4.5-6.5)	3013769009	Solid	8/17/01	x	x	x		
EP94-02B(0.5-2.5)	3013769012	Solid	8/17/01	x	x	x		
EP94-02B(2.5-4.5)	3013769013	Solid	8/17/01	x	x	x		
EP94-02B(4.5-6.5)	3013769014	Solid	8/17/01	x	x	x		
ACSP-B2D(00-02)	3013769017	Solid	8/17/01	x	x			
ACSP-B2D(02-04)	3013769018	Solid	8/17/01	x	x			
ASCP-B2D(04-06)	3013769019	Solid	8/17/01	x	x			
16-01(081401)RE	3013769021	Water	8/14/01		x			
EP94-02B(0.5-2.5)RE	3013769027	Solid	8/17/01		x			
EP94-02A(2.5-4.5)RE	3013769036	Solid	8/17/01		x			

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TIER II
DATA VALIDATION REPORT

SDG# 3013769

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

The continuing calibration %D was above the acceptable limit due to an increase in response by Cyclohexane and Methyl cylohexane. Associated sample 16-11-(081301) has been qualified as estimated for the compounds based on these deviations.

The LCS %R was below the acceptable limit for Cyclohexane. Associated samples EP94-02A(2.5-4.5), EP94-02A(4.5-6.5), EP94-02B(0.5-2.5), EP94-02B(2.5-4.5) and EP94-02B(4.5-6.5) have been qualified as estimated for the compounds based on this deviation.

2-Butanone was detected in the trip blanks. Sample results for this compound which were below the blank action level have been qualified as non-detected.

1,2,4-Trichlorobenzene was detected in the method blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above the acceptable limit for Acetone. Associated samples EP94-02A(2.5-4.5), EP94-02A(4.5-6.5), EP94-02B(0.5-2.5), EP94-02B(2.5-4.5), EP94-02B(4.5-6.5), ACSP-B2D(00-02), ACSP-B2D(02-04) and ASCP-B2D(04-06) have been qualified as estimated for the compounds based on this deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Bromomethane, Acetone and Tetrachloroethene, associated samples 16-11-(081301), RFI-16-TB-40, 16-01(081401) and RFI-16-TB-40; a decrease in response by Chloromethane, Methylene chloride, Chloroethane and 2-Hexanone, associated samples EP94-02A(2.5-4.5), EP94-02A(4.5-6.5), EP94-02B(0.5-2.5), EP94-02B(2.5-4.5) and EP94-02B(4.5-6.5); a decrease in response by 2-Hexanone, Chloroethane and 1,1,1,2-Tetrachloroethane, associated samples ACSP-B2D(00-02), ACSP-B2D(02-04) and ASCP-B2D(04-06). Sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, 3&4-Methylphenol, and Atrazine, associated samples 16-11-(081301), 16-01(081401), EP94-02A(2.5-4.5), EP94-02A(4.5-6.5), EP94-02B(2.5-4.5), EP94-02B(4.5-6.5), ACSP-B2D(00-02), ACSP-B2D(02-04), and ASCP-B2D(04-06); a decrease in response by Hexachlorocyclopentadiene, 4-Nitrophenol, 4-Chloroaniline, 3-Nitroaniline, 4-Nitroaniline, and Carbazole, associated samples 16-11-(081301) and 16-01(081401); a decrease in response by Carbazole, associated sample ACSP-B2D(00-02); a decrease in response by Isophorone and Caprolactam, associated sample ASCP-B2D(04-06); a decrease in response by Caprolactam and bis(2-Chloroethyl)ether, associated sample EP94-02A(2.5-4.5); a decrease in response by 3&4-Methylphenol, associated sample EP94-02B(0.5-2.5). Sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene. Associated sample EP94-02B(0.5-2.5) has been qualified as estimated for these compounds.

Di-n-butylphthalate was detected in the method blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated sample 16-01(081401) has been qualified as estimated for compounds associated with Perylene-d12.

The internal standard response was below the acceptable limit for Chrysene-d12. Associated sample EP94-02B(0.5-2.5) has been qualified as estimated for compounds associated with Chrysene-d12.

The internal standard response was below the acceptable limit for Perylene-d12 and Chrysene-d12. Associated sample EP94-02A(2.5-4.5) has been qualified as estimated for compounds associated with the internal standards above.

The initial calibration %RSD was above the acceptable limit for Indeno(1,2,3-cd)pyrene. Associated sample EP94-02B(0.5-2.5) has been qualified as estimated for the compound.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below the acceptable limit for Manganese and Silver. Associated samples 16-11-(081301) and 16-01(081401) have been qualified as estimated for the analytes.

Antimony was detected in the instrument blank. Sample results for this analyte which were below the blank action level have been qualified as non-detected.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	September 14, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 21, 2001

Summary

The following is an assessment of data package 3013863 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
ACSP-B2D(14-16)[1]	3013863004	Solid	8/17/01	x	x			
ACSP-B2D(24-26)	3013863009	Solid	8/17/01	x	x			
ACSP-B30(00-02)	3013863010	Solid	8/17/01			x		
ACSP-B30(05-07)	3013863011	Solid	8/17/01			x		
ACSP-B30(07-09)	3013863012	Solid	8/17/01			x		
ACSP-B30(10-12)	3013863013	Solid	8/17/01			x		
ACSP-B30(12-14)	3013863014	Solid	8/17/01			x		
ACSP-B30-DUP-44[2]	3013863016	Solid	8/17/01			x		
ACSP-B2E(00-02)	3013863017	Solid	8/20/01	x	x			
ACSP-B2E(00-02)RE	3013863021	Solid	8/20/01		x			

1 MS/MSD/DUP analysis performed on sample
2 Duplicate analysis performed on sample ACSP-B2E(06-08)

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013863

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated sample ACSP-B2E(00-02) has been qualified as estimated for compounds associated with Perylene-d12.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, 3&4-Methylphenol and Atrazine, associated samples ACSP-B2D(14-16) and ACSP-B2D(24-26); 3&4-Methylphenol, associated sample ACSP-B2E(00-02). Sample results have been qualified as estimated for the compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above the acceptable limit for Acetone. Associated samples ACSP-B2D(14-16), ACSP-B2D(24-26) and ACSP-B2E(00-02) have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit for Chloroethane and 2-Hexanone. Associated samples ACSP-B2D(14-16), ACSP-B2D(24-26) and ACSP-B2E(00-02) have been qualified as estimated for the compounds.

Methylene chloride and 1,2,4-Trichlorobenzene were detected in the method blank. Sample results which were below the blank action level for these compounds have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	September 17, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 20, 2001

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Summary

The following is an assessment of data package 3013863 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
ACSP-B2D(14-16)[1]	3013863004	Solid	8/17/01	x	x			
ACSP-B2D(24-26)	3013863009	Solid	8/17/01	x	x			
ACSP-B30(00-02)	3013863010	Solid	8/17/01			x		
ACSP-B30(05-07)	3013863011	Solid	8/17/01			x		
ACSP-B30(07-09)	3013863012	Solid	8/17/01			x		
ACSP-B30(10-12)	3013863013	Solid	8/17/01			x		
ACSP-B30(12-14)	3013863014	Solid	8/17/01			x		
ACSP-B30-DUP-44[2]	3013863016	Solid	8/17/01			x		
ACSP-B2E(00-02)	3013863017	Solid	8/20/01	x	x			
ACSP-B2E(00-02)RE	3013863021	Solid	8/20/01		x			

1 MS/MSD/DUP analysis performed on sample
2 Duplicate analysis performed on sample ACSP-B2E(06-08)

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013863

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated sample ACSP-B2E(00-02) has been qualified as estimated for compounds associated with Perylene-d12.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, 3&4-Methylphenol and Atrazine, associated samples ACSP-B2D(14-16) and ACSP-B2D(24-26); 3&4-Methylphenol, associated sample ACSP-B2E(00-02). Sample results have been qualified as estimated for the compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above the acceptable limit for Acetone. Associated samples ACSP-B2D(14-16), ACSP-B2D(24-26) and ACSP-B2E(00-02) have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit for Chloroethane and 2-Hexanone. Associated samples ACSP-B2D(14-16), ACSP-B2D(24-26) and ACSP-B2E(00-02) have been qualified as estimated for the compounds.

Methylene chloride and 1,2,4-Trichlorobenzene were detected in the method blank. Sample results which were below the blank action level for these compounds have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	September 17, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 20, 2001

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013878

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3013878 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
ACSP-B2E(08-10)[7]	3013878001	Soil	08/20/01	X	X			X
ACSP-B2E(22-24)[6]	3013878008	Soil	08/20/01	X	X			
ACSP-B2-DUP-45[9]	3013878009	Soil	08/20/01	X	X			
ACSP-B2E-DUP-46	3013878010	Soil	08/20/01	X	X			
ACSP-B2E-RB-50[4]	3013878011	Water	08/20/01	X	X	X	X	X
LOT#1227	3013878012	Water	NS	X	X	X	X	X
RFI-36-01(0.5-2.5)	3013878013	Soil	08/21/01	X	X	X	X	X
RFI-36-DUP-47[8]	3013878014	Soil	08/21/01	X	X	X	X	X
RFI-36-01(8.5-10.5)	3013878015	Soil	08/21/01	X	X	X	X	X
RFI-36-01(12.5-14.5)	3013878016	Soil	08/21/01	X	X	X	X	X
RFI-36-0-RB-48[5]	3013878017	Water	08/21/01	X	X	X	X	X
RFI-36-04(8.2-10.2)[1]	3013878018	Soil	08/21/01	X	X	X	X	X
RFI-36-04(0.2-2.2)	3013878019	Soil	08/21/01	X	X	X	X	X
RFI-36-16.2-18.2)	3013878020	Soil	08/21/01	X	X	X	X	X
RFI-85-02(082101)NL[3]	3013878021	Soil	08/21/01	X	X	X	X	X
RFI-NORTH-PT-01[2]	3013878022	Soil	08/22/01	X	X	X	X	X
RFI-36-01(0.5-2.5)RE	3013878023	Soil	08/21/01		X			X
RFI-36-04(0.2-2.2)RE	3013878024	Soil	08/21/01		X			X
RFI-36-02(082101)NLRE	3013878025	Soil	08/21/01		X			

1 MS/MSD analysis performed on sample
2 MS/MSD analysis performed on sample (except PCB)
3 MS/MSD analysis performed on sample (Volatiles, PCBs and Metals only)
4 MS/MSD analysis performed on sample (Semi-Volatiles and Mercury only)
5 MS/MSD analysis performed on sample (PCBs only)
6 MS/MSD analysis performed on sample (Mercury only)
7 MS/MSD analysis performed on sample (TKN only)
8 Field duplicate of sample RFI-36-01 (8.5-10.5)
9 Sample ACSP-B2-DUP-45 is the field of sample ACSP-B2E (06-08) reported in SDG 3013769

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were above acceptance limits for 2-Butanone. Associated sample RFI-38-04 (8.2-10.2)has been qualified as estimated for the compound.

The MS/MSD %Rs were below acceptance limits for Chloroethane. Associated sample 85-02 (082101)NL has been qualified as estimated for the compound.

The LCS %R was above control limits for 2-Butanone. Associated samples ACSP-B2E(08-10), ACSP-B2E(22-24), ACSP-B2E-DUP-46, RFI-36-01 (0.5-2.5), RFI-36-DUP-47, RFI-36-01 (8.5-10.5), RFI-36-01 (12.5-14.5), RFI-38-04 (8.2-10.2), RFI-38-04 (0.2-2.2), RFI-38-04 (16.2-18.2) have been qualified as estimated for the compound.

The LCS % R was below acceptance limits for Cyclohexane. Associated sample 85-02 (082101)NL has been qualified as estimated for the compound.

Acetone, 2-Butanone, Bromodichloromethane, and Chloroform were detected in the rinse samples. Sample results less than the blank action levels have been qualified as non-detected.

The initial calibration %RSD was greater than the acceptable limit for Acetone. Associated samples ACSP-B2E(08-10), ACSP-B2E(22-24), ACSP-B2-DUP-45, ACSP-B2E-DUP-46, RFI-01-36 (0.5-2.5),

RFI-36-DUP-47, RFI-36-01 (8.5-10.5), RFI-36-01 (12.5-14.5), RFI-38-04 (8.2-10.2), RFI-38-04 (0.2-2.2), RFI-38-04 (16.2-18.2), and 85-02(082101)NL have been qualified as estimated for the compound.

The continuing calibration %D was outside the acceptance limit due to a decrease in response by Chloromethane and Bromomethane, associated samples ACSP-B2E(08-10), ACSP-B2E(22-24), ACSP-B2-DUP-45, ACSP-B2E-DUP-46, RFI-01-36 (0.5-2.5), RFI-36-DUP-47, RFI-36-01 (8.5-10.5), RFI-36-01 (12.5-14.5), RFI-38-04 (8.2-10.2); Chloromethane, Methyl Acetate, Methylene Chloride, 1,2-Dichloroethane, and Cyclohexane, associated samples 85-02(082101)NL. Data have been qualified as estimated for the compounds.

The continuing calibration %D was outside the acceptance limit due to an increase in response by 2-Butanone. Associated samples ACSP-B2E(08-10), ACSP-B2E(22-24), ACSP-B2-DUP-45, ACSP-B2E-DUP-46, RFI-01-36 (0.5-2.5), RFI-36-DUP-47, RFI-36-01 (8.5-10.5), RFI-36-01 (12.5-14.5), RFI-38-04 (8.2-10.2), RFI-38-04 (16.2-18.2), and 85-02 (082101)NL) have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The LCSD %R was above control limits for 2-Methylnaphthalene, Fluorene, and Naphthalene. Associated samples 85-02(082101)NL and 85-02(082101)NLRE have been qualified as estimated for the compounds.

The internal standard response was below acceptance limits for the following: Chrysene-d12 and Perylene-d12, associated samples RFI-36-01 (0.5-2.5), RFI-38-04 (0.2-2.2), and 85-02(082101)NL; Perylene-d12, associated samples RFI-36-01 (0.5-2.5)RE, RFI-38-04 (0.2-2.2)RE, and 85-02(082101)NLRE. The re-analysis samples only contained one deviant internal standard and those sample results have been reported. The reported sample results have been qualified as estimated for the compounds quantitated from the internal standards that did not meet acceptance criteria.

The continuing calibration %D was outside the acceptance limit due to a decrease in response by 3&4 Methylphenol, associated sample RFI-NORTH-PT-01; 2,4-Dinitrophenol, 2-methyl-4,6-dinitrophenol, 3&4-Methylphenol, Atrazine, Benzaldehyde, Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene,

Hexachlorocyclopentadiene, and Indeno(1,2,3-cd)pyrene, associated samples ACSP-B2E(08-10), ACSP-B2E(22-24), ACSP-B2-DUP-45, ACSP-B2E-DUP-46, RFI-36-DUP-47 and RFI-36-01 (8.5-10.5); 3&4-Methylphenol, Atrazine, Benzaldehyde, Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene, Hexachlorocyclopentadiene, and Indeno(1,2,3-cd)pyrene, associated sample: RFI-36-01 (12.5-14.5); Benzaldehyde, 3&4-methylphenol, Caprolactam, and Atrazine, associated samples RFI-38-04 (8.2-10.2) and RFI-38-04 (16.2-18.2); 3&4-methylphenol and Dibenzo(a,h)anthracene, associated samples RFI-36-01 (0.5-2.5)RE, RFI-38-04 (0.2-2.2)RE, and 85-02 (082101)NLRE). Data have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD RPD was above acceptance criteria for Aroclor-1260. Associated sample 85-02(082101)NL has been qualified as estimated for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration verification was above control limits for Antimony. Associated samples RFI-36-01 (0.5-2.5), RFI-36-DUP-47, RFI-36-01 (8.5-10.5), RFI-36-01 12.5-14.5), RFI-38-04 (8.2-10.2), RFI-38-04 (0.2-2.2), and RFI-38-04 (16.2-18.2)). (073101), 83/84-08 (073101), 83/84-09 (073101), 07-07(080101), and RFI-07-DUP21(080101) have been qualified as estimated for the analyte based on this deviation.

Copper, Nickel and Zinc were detected in the rinse blank. Sample results less than the blank action level have been qualified as non-detected.

TKN was detected in the method blank. Sample results less than the blank action level have been qualified as non-detected.

The MS/MSD %R were above acceptance limits for Lead and Manganese, associated samples RFI-36-01 (0.5-2.5), RFI-36-DUP-47, RFI-36-01 (8.5-10.5), RFI-36-01 12.5-14.5), RFI-38-04 (8.2-10.2), RFI-38-04 (0.2-2.2), and RFI-38-04 (16.2-18.2); Arsenic, Barium, Chromium, Copper, Lead, Manganese, Selenium, Silver and Vanadium, associated sample 85-02 (082101)NL). Data have been qualified as estimated for the analytes.

The MS/MSD %Rs were below acceptance limits for Antimony. Associated samples RFI-36-01 (0.5-2.5), RFI-36-DUP-47, RFI-36-01 (8.5-10.5), RFI-36-01 12.5-14.5), RFI-38-04 (8.2-10.2), RFI-38-04 (0.2-2.2), and RFI-38-04 (16.2-18.2) have been qualified as estimated for the analyte.

The MS/MSD %R was less than 10 % for Silver in sample RFI-North-PT-01. Data have been rejected for the analyte based on the deviation.

The Reactive Cyanide LCS recovery was less than 10 %. The sample result has been rejected for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	September 12, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	September 28, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3013982

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3013982 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-38-05(0.6-2.6)	3013982001	Solid	8/24/01	x	x	x	x	
RFI-38-05(8.6-10.6)	3013982002	Solid	8/24/01	x	x	x	x	
RFI-38-05(14.6-16.6)	3013982003	Solid	8/24/01	x	x	x	x	
RFI-38-06(0.5-2.5)	3013982004	Solid	8/24/01	x	x	x	x	
RFI-38-06(8.5-10.5)	3013982005	Solid	8/24/01	x	x	x	x	
RFI-38-06(12.5-14.5)[1]	3013982006	Solid	8/24/01	x	x	x	x	
RFI-38-DUP-49[2]	3013982007	Solid	8/24/01	x	x	x	x	
RFI-38-RB-50	3013982008	Water	8/24/01	x	x	x	x	
RFI-81-13(00-02)	3013982009	Solid	8/27/01	x	x	x	x	
RFI-81-13(06-08)	3013982010	Solid	8/27/01	x	x	x	x	
RFI-81-13(10-12)	3013982011	Solid	8/27/01		x	x	x	
RFI-10-05(00-02)	3013982012	Solid	8/27/01	x				
RFI-10-05(08-10)	3013982013	Solid	8/27/01	x				
RFI-10-05(10-12)	3013982014	Solid	8/27/01	x				
RFI-10-15(00-02)	3013982015	Solid	8/27/01	x				
RFI-10-15(08-10)	3013982016	Solid	8/27/01	x				
RFI-10-DUP-51[3]	3013982017	Solid	8/27/01	x	x	x	x	
RFI-36-20(00-02)	3013982018	Solid	8/28/01	x	x			
RFI-36-20(10-12)	3013982019	Solid	8/28/01	x	x			
RFI-36-19(10-12)	3013982020	Solid	8/28/01	x				
RFI-36-20(08-10)	3013982021	Solid	8/28/01	x	x			
RFI-38-05(8.6-10.6)RE	3013982022	Solid	8/24/01		x			
RFI-38-05(14.6-16.6)RE	3013982023	Solid	8/24/01		x			
RFI-38-06(12.5-14.5)RE	3013982024	Solid	8/24/01		x			
RFI-38-05(0.6-2.6)RE	3013982025	Solid	8/24/01		x			
RFI-38-06(0.5-2.5)RE	3013982026	Solid	8/24/01		x			
RFI-38-DUP-49-RE	3013982027	Solid	8/24/01		x			
RFI-81-13(00-02)RE	3013982028	Solid	8/27/01		x			
RFI-81-13(06-08)RE	3013982029	Solid	8/27/01		x			
RFI-81-13(10-12)RE	3013982030	Solid	8/27/01		x			

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample RFI-38-05(8.6-10.6)
3 Duplicate analysis performed on sample RFI-10-05(08-10)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above the acceptable limit for Acetone. Soil sample results have been qualified as estimated for the compound based on this deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Chloromethane, associated samples RFI-38-05(0.6-2.6) and RFI-38-05(8.6-10.6); a decrease in response by Chloroethane, associated samples RFI-38-05(14.6-16.6), RFI-38-06(0.5-2.5), RFI-38-06(8.5-10.5), RFI-38-06(12.5-14.5), RFI-38-DUP-49, RFI-81-13(00-02), RFI-81-13(06-08), RFI-10-05(00-02), RFI-10-05(08-10), and RFI-10-05(10-12); a decrease in response by 1,2,4-Trichlorobenzene, associated samples RFI-10-15(08-10), RFI-10-DUP-51, RFI-36-20(00-02), RFI-36-20(10-12), RFI-36-19(10-12), and RFI-36-20(08-10). Sample results have been qualified as estimated for the compounds based on these deviations.

The LCS %R was below the acceptable limit for Cyclohexane. Associated samples RFI-38-05(14.6-16.6), RFI-38-06(0.5-2.5), RFI-38-06(8.5-10.5), RFI-38-06(12.5-14.5), RFI-38-DUP-49, RFI-81-13(00-02), RFI-81-13(06-08), RFI-10-05(00-02), RFI-10-05(08-10), RFI-10-05(10-12), RFI-10-15(00-02), RFI-

10-15(08-10), RFI-10-DUP-51, RFI-36-20(00-02), RFI-36-20(10-12), RFI-36-19(10-12), and RFI-36-20(08-10) have been qualified as estimated for the compound based on this deviation.

The LCS %R was below the acceptable limit for Methyl cyclohexane. Associated samples RFI-10-15(00-02), RFI-10-15(08-10), RFI-10-DUP-51, RFI-36-20(00-02), RFI-36-20(10-12), RFI-36-19(10-12), and RFI-36-20(08-10) have been qualified as estimated for the compounds based on this deviation.

2-Butanone, 1,2,4-Trichlorobenzene and Methylene chloride were detected in the method blanks. Sample results for these compounds which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated samples RFI-38-05(0.6-2.6)RE, RFI-38-05(8.6-10.6), RFI-38-05(14.6-16.6), RFI-38-06(12.5-14.5), RFI-38-DUP-49, and RFI-81-13(06-08)RE have been qualified as estimated for compounds associated with Perylene-d12.

The internal standard response was below the acceptable limit for Chrysene-d12 and Perylene-d12. Associated samples RFI-81-13(00-02) and RFI-81-13(10-12) have been qualified as estimated for compounds associated with the above internal standards.

The internal standard response was below the acceptable limit for Chrysene-d12, Perylene-d12 and Phenanthrene-d10. Associated sample RFI-38-06(0.5-2.5) has been qualified as estimated for compounds associated with the above internal standards.

The initial calibration %RSD was above the acceptable limit for Di-n-octyl phthalate, associated sample RFI-10-DUP-51; 2,4-Dinitrophenol, associated samples RFI-38-05(0.6-2.6)RE and RFI-81-13(06-08)RE. Sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, N-Nitrosodi-n-propylamine, and Atrazine, associated sample RFI-38-RB-50; a decrease in response by Dibenzo(a,h)anthracene, associated samples RFI-38-06(0.5-2.5), RFI-38-06(8.5-10.5), RFI-81-13(10-12), RFI-36-20(10-12), and RFI-36-20(08-10); a decrease in response by 4-Nitroaniline and 4-Nitrophenol, associated samples RFI-38-05(0.6-2.6)RE and RFI-81-13(06-08)RE. Sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol. Soil sample results have been qualified as estimated for the compound based on this deviation.

The continuing calibration %D was above the acceptable limit due to an increase in response by Indeno(1,2,3-cd)pyrene. Associated sample RFI-38-05(0.6-2.6)RE has been qualified as estimated for the compound.

The %Rs for two base surrogates were above the acceptable limit. Associated sample RFI-38-DUP-49 has been qualified as estimated for detected compounds.

The LCS/LCSD %Rs were below the acceptable limit for Caprolactam. Associated sample RFI-38-RB-50 has been qualified as rejected for the compound.

The LCS/LCSD %Rs were above the acceptable limit for 2-Methyl naphthalene. Associated sample RFI-81-13(00-02) has been qualified as estimated for the compound.

The field duplicate RPD between sample RFI-38-05(8.6-10.6) and duplicate RFI-38-DUP-49 was above the acceptable limit for bis(2-Ethylhexyl)phthalate. Detected sample results for the compound have been qualified as estimated, in the associated samples

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %R was above the acceptable limit for Antimony. Associated sample RFI-38-RB-50 has been qualified as estimated for the analyte.

The MS/MSD %Rs were above the acceptable limit for all analytes. Detected sample results for sample RFI-38-RB-50 have been qualified as estimated, based on this deviation.

The MS/MSD %R was below the acceptable limit for Antimony. Soil sample results have been qualified as estimated for the analyte.

Antimony and Arsenic were detected in the instrument blanks. Sample results which were below the blank action level for these analytes have been qualified as non-detected.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	September 20, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	September 26, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014032

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014032 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-36-19(08-10)	3014032001	Solid	8/28/01	x				
RFI-36-19(00-02)	3014032002	Solid	8/28/01	x				
RFI-10-RB-51	3014032003	Water	8/28/01	x	x	x	x	
RFI-36-RB-52	3014032004	Water	8/28/01	x	x	x	x	
Decon Water Lot#1223	3014032005	Water		x	x	x	x	
RFI-36-17(00-02)	3014032006	Solid	8/29/01	x				
RFI-36-17(08-10)[1,2]	3014032007	Solid	8/29/01	x				
RFI-36-17(12-14)	3014032008	Solid	8/29/01	x				
RFI-36-DUP-52	3014032009	Solid	8/29/01	x				
RFI-94-02(00-02)	3014032010	Solid	8/30/01	x	x	x	x	
RFI-94-02(08-10)	3014032011	Solid	8/30/01	x	x	x	x	
RFI-94-02(12-14)	3014032012	Solid	8/30/01	x	x	x	x	
RFI-36-18(00-02)	3014032013	Solid	8/30/01	x				
RFI-36-18(08-10)	3014032014	Solid	8/30/01	x				
RFI-36-18(12-14)	3014032015	Solid	8/30/01	x				
RFI-36-RB-53	3014032016	Water	8/30/01	x	x	x	x	
RFI-EB-03	3014032017	Water	8/30/01		x			
RFI-EB-04	3014032018	Water	8/30/01		x			
RFI-EB-05(Tubing)	3014032019	Solid	8/30/01		x			
RFI-94-02(00-02)RE	3014032021	Solid	8/30/01		x			

1 MS/MSD analysis performed on sample
2 DUP analysis performed on sample RFI-36-17(08-10)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above the acceptable limit for Acetone. Soil sample results have been qualified as estimated for the compound based on this deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Chloroethane, associated sample RFI-36-17(08-10); a decrease in response by 1,2,4-Trichlorobenzene, associated samples RFI-36-19(00-02), RFI-36-17(00-02), RFI-36-17(12-14), RFI-36-DUP-52, RFI-94-02(00-02), RFI-94-02(08-10), RFI-94-02(12-14), RFI-36-18(00-02), RFI-36-18(08-10), and RFI-36-18(12-14). Sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by 2-Butanone, associated sample RFI-10-RB-51; an increase in response by Acetone, associated samples RFI-10-RB-51, RFI-36-RB-52, and RFI-36-RB-53. Sample results have been qualified as estimated for the compounds based on these deviations.

The %R for one surrogate was above the acceptable limit. Detected sample results in associated sample Decon Water Lot#1223 have been qualified as estimated.

The MS/MSD %R were below the acceptable limit for Chloroethane. Associated sample RFI-36-17(08-10) has been qualified as estimated for the compound.

The LCS %R was below the acceptable limit for Cyclohexane. Soil sample results have been qualified as estimated for the compound.

Chloroform, 2-Butanone, and Bromodichloromethane were detected in the rinse blanks. Sample results for these compounds which were below the blank action level have been qualified as non-detected.

1,2,4-Trichlorobenzene was detected in the method blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated sample RFI-94-02(00-02) has been qualified as estimated for compounds associated with Perylene-d12.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol and Dibenzo(a,h)anthracene, associated samples RFI-10-RB-51, RFI-36-RB-52, Decon Water Lot#1223, RFI-36-RB-53, RFI-EB-03, RFI-EB-04, and RFI-EB-05(Tubing); a decrease in response by 3&4-Methylphenol and 2,4-Dinitrophenol, associated samples RFI-36-DUP-52, RFI-94-02(08-10), and RFI-94-02(12-14); a decrease in response by Carbazole and 3&4-Methylphenol, associated sample RFI-94-02(00-02). Sample results have been qualified as estimated for the compounds based on these deviations.

The LCS/LCSD %R were below the acceptable limit for 4-Chlorophenyl phenyl ether. Associated samples RFI-36-DUP-52, RFI-94-02(00-02), RFI-94-02(08-10), and RFI-94-02(12-14) have been qualified as estimated for the compound.

The LCS/LCSD %R were above the acceptable limit for Butyl benzylphthalate. Associated sample RFI-94-02(00-02) has been qualified as estimated, based on this deviation.

Di-n-butylphthalate was detected in the rinse blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were below the acceptable limit for Zinc. Associated samples RFI-10-RB-51, RFI-36-RB-52, Decon Water Lot#1223, and RFI-36-RB-53 have been qualified as estimated for the analyte.

The MS/MSD %Rs were below the acceptable limit for Arsenic, Beryllium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Silver, Thallium, Vanadium, and Zinc. Associated samples , RFI-94-02(00-02), RFI-94-02(08-10), and RFI-94-02(12-14) have been qualified as estimated for the analytes.

Copper, Manganese, and Nickel were detected in the rinse blank. Sample results for these compounds which were below the blank action level have been qualified as non-detected.

Selenium was detected in the method blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Lead was detected in the instrument blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	September 25, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	October 2, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014149

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014149 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-09-27(0.7-2.7)	3014143001	Solid	9/04/01			x		
RFI-09-22(00-02)	3014149002	Solid	9/04/01					x
RFI-09-22(02-04)	3014149003	Solid	9/04/01					x
RFI-09-24(00-02)	3014149004	Solid	9/04/01					x
RFI-09-24(02-04)	3014149005	Solid	9/04/01					x
RFI-09-25(00-02)[1]	3014149006	Solid	9/04/01					x
RFI-09-25(02-04)	3014149007	Solid	9/04/01					x
RFI-09-23(00-02)	3014149008	Solid	9/04/01					x
RFI-09-23(02-04)	3014149009	Solid	9/04/01	x	x	x		x
RFI-09-DUP-53[2]	3014149010	Solid	9/04/01					x
RFI-09-20(0.5-2.5)	3014149011	Solid	9/04/01		x			
RFI-09-19(0.5-2.5)	3014149012	Solid	9/04/01		x			
RFI-09-21(0.5-2.5)	3014149013	Solid	9/04/01		x			
RFI-09-18(01-03)	3014149014	Solid	9/04/01			x		x
RFI-09-15(0.5-1.5)	3014149015	Solid	9/04/01	x	x	x		x
RFI-09-16(01-03)	3014149016	Solid	9/04/01			x		x
RFI-36-37(00-02)	3014149017	Solid	9/04/01	x	x			
RFI-36-37(06-08)	3014149018	Solid	9/04/01	x	x			
RFI-36-37(08-10)	3014149019	Solid	9/04/01	x	x			
RFI-36-37(14-16)	3014149020	Solid	9/04/01	x	x			
RFI-09-15(1.9-3.9)	3014149021	Solid	9/04/01	x	x	x		x
RFI-NORTH PT-02	3014149022	Solid	9/04/01	x	x	x		x
RFI-09-23(02-04)RE	3014149023	Solid	9/04/01		x			
RFI-09-20(0.5-2.5)RE	3014149024	Solid	9/04/01		x			
RFI-09-19(0.5-2.5)DL	3014149025	Solid	9/04/01		x			
RFI-09-21(0.5-2.5)RE	3014149026	Solid	9/04/01		x			
RFI-09-15(1.9-3.9)RE	3014149027	Solid	9/04/01		x			
RFI-09-15(0.5-1.5)DL	3014149028	Solid	9/04/01		x			

[1] MS/MSD analysis performed on sample
[2] DUP analysis performed on sample RFI-09-24(02-04)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Acetone and 1,2,4-Trichlorobenzene. Associated sample RFI-09-15(1.9-3.9) has been qualified as estimated for the compound, based on this deviation.

The initial calibration %RSD was above the acceptable limit for 1,2,4-Trichlorobenzene. Associated sample RFI-09-15(0.5-1.5) has been qualified as estimated for the compound, based on this deviation.

The LCS %R was below the acceptable limit for Methyl Cyclohexane. Associated samples RFI-36-37(08-10), RFI-36-37(14-16), and RFI-09-15(1.9-3.9) have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12, Chrysene-d12, and Phenanthrene-d10. Associated samples RFI-09-19(0.5-2.5), RFI-09-21(0.5-2.5)RE and RFI-09-23(02-04)RE have been qualified as estimated for compounds associated with the internal standards.

The internal standard response was below the acceptable limit for Acenaphthene-d10, Perylene-d12, Chrysene-d12, and Phenanthrene-d10. Associated sample RFI-09-15(1.9-3.9) has been qualified as estimated for compounds associated with the internal standards.

The internal standard response was below the acceptable limit for Phenanthrene-d10, Perylene-d12, and Chrysene-d12. Detected results for associated sample RFI-09-15(0.5-1.5) have been qualified as estimated and non-detected results have been qualified rejected, for compounds associated with Chrysene-d12 and Perylene-d12. Results for the sample have been qualified as estimated for all compounds associated with Phenanthrene-d10.

The internal standard response was below the acceptable limit for Perylene-d12. Associated sample RFI-09-20(0.5-2.5) has been qualified as estimated for compounds associated with Perylene-d12.

The re-analysis runs were used for samples RFI-09-21(0.5-2.5), RFI-09-15(0.5-1.5), and RFI-09-23(02-04).

The initial calibration %RSD was above acceptable limit for Indeno(1,2,3-cd)pyrene. Associated samples RFI-09-23(02-04)RE, RFI-09-19(0.5-2.5), RFI-09-21(0.5-2.5)RE, and RFI-09-15(1.9-3.9) have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol, associated samples RFI-09-23(02-04)RE, RFI-09-19(0.5-2.5), RFI-09-21(0.5-2.5)RE, RFI-09-15(1.9-3.9), RFI-09-15(0.5-1.5), and RFI-NORTH PT-02; a decrease in response by 3&4-Methylphenol and Carbazole, associated samples RFI-09-20(0.5-2.5), RFI-36-37(00-02), RFI-36-37(06-08), RFI-36-37(08-10), and RFI-36-37(14-16). Sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limits due to an increase in response by Benzo(g,h,i)perylene. Associated sample RFI-09-19(0.5-2.5) has been qualified as estimated for the compound.

The MS %R was below the acceptable limit for 4-Chlorophenyl phenyl ether. Associated sample RFI-36-37(08-10) has been qualified as estimated for the compound.

The LCS/LCSD %Rs were below the acceptable limit for 4-Chlorophenyl phenyl ether. Associated samples RFI-09-20(0.5-2.5), RFI-36-37(00-02), RFI-36-37(06-08), RFI-36-37(08-10), RFI-36-37(14-16), RFI-09-15(1.9-3.9), RFI-NORTH PT-02, RFI-09-23(02-04)RE, RFI-09-19(0.5-2.5), RFI-09-21(0.5-2.5), and RFI-09-15(0.5-1.5) have been qualified as estimated for the compound.

The LCS/LCSD %R were above the acceptable limit for Benzo(g,h,i)perylene. Associated sample RFI-36-37(00-02) has been qualified as estimated for the compound based on this deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were below the acceptable limit for Zinc. Associated sample RFI-NORTH PT-02 has been qualified as estimated for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 2, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 6, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014180

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014180 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-09-29(3-17)	301418001	Solid	09/05/01			X		X
RFI-09-26(7-27)	301418002	Solid	09/05/01			X		X
RFI-09-28(5-25)	301418003	Solid	09/05/01	X	X	X		X
RFI-44-06(13-33)[2]	301418004	Solid	09/05/01	X	X	X	X	X
RFI-44-06(33-53)	301418005	Solid	09/05/01				X	
RFI-44-06(53-73)[3]	301418006	Solid	09/05/01	X	X	X	X	X
RFI-44-06(73-93)	301418007	Solid	09/05/01	X	X	X	X	X
RFI-44-06(153-170)[1]	301418008	Solid	09/05/01					
RFI-29-02(1-3)	301418009	Solid	09/05/01					X
RFI-29-03(1-3)[4]	301418010	Solid	09/05/01					X
RFI-44-07(7-27)	301418011	Solid	09/05/01					X
RFI-44-09(2-35)	301418012	Solid	09/05/01					X
RB-LOT#1241RFI	301418013	Water	NS	X	X	X	X	X
RFI-81-23(9-17)	301418014	Solid	09/07/01	X	X	X	X	X
RFI-02-09(17-37)	301418015	Solid	09/07/01					X
RFI-02-11(17-37)	301418016	Solid	09/07/01					X
RFI-02-10(13-33)	301418017	Solid	09/07/01					X
RFI-12-17(1-3)	301418018	Solid	09/07/01					X
RFI-12-18(9-29)[1]	301418019	Solid	09/07/01					
RFI-44-RB-55[4]	301418020	Water	09/06/01	X	X	X	X	
RFI-81-23(090701)[2]	301418021	Solid	09/07/01	X	X	X	X	
RFI-81-24(090701)[5]	301418022	Solid	09/07/01	X	X	X	X	
81-23(090701)DISS	301418023	Solid	09/07/01			X		
81-24(090701)DISS	301418024	Solid	09/07/01			X		
RFI-81-TB-45	301418025	Water	09/07/01	X				
RFI-09-28(5-25)RE	301418026	Solid	09/05/01		X			X
RFI-44-06(13-33)RE	301418027	Solid	09/05/01		X			X
RFI-44-06(53-73)RE	301418028	Solid	09/05/01		X			X

1 On Hold
2 MS/MSD analysis performed on sample
3 MS/MSD analysis performed on sample (SVOC and PCB only)
4 MS/MSD analysis performed on sample (metals 0nly)
5 MS/MSD analysis performed on sample (Cyanide only)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The LSC %R was below acceptance limits for Methyl Cyclohexane. Associated samples RFI-09-28(0.5-2.5) and RFI-44-06(1.3-3.3) have been qualified as estimated for the compounds.

Acetone was detected in the rinse blanks. Sample results that were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)			
	Continuing calibration (%D, RF)			
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs for sample RFI-81-23(090701) were below acceptance limits for the following compounds: 2,4-Dichlorophenol, 2,6-Dinitrotoluene, 2-Chloronaphthalene, 2-Methylnaphthalene, 2-Nitroaniline, 4-Bromophenyl-phenylether, 4-Chloropenyl-phenylether, 4-Chloro-3-methylphenol, Acenaphthylene, Anthracene, Atrazine, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Biphenyl, bis(2-Ethylhexyl)phthalate, Butylbenzylphthalate, Carbazole, Chrysene, Di-n-butylphthalate, Dibenzofuran, Diethyl phthalate, Fluoranthene, Fluorene, N-Nitrosodiphenylamine, Phenanthrene, and Pyrene. The sample has been qualified as estimated for the compounds.

The MS/MSD RPD was above acceptance limits for Naphthalene. Associated sample RFI-81-23(090701) has been qualified as estimated for the compound.

The MS/MSD %R were below acceptance limits for 2,4,6-Trichlorophenol, 4-Chloropenyl-phenylether, Hexachlorocyclopentadiene, and Pentachlorophenol. Associated sample RFI-44-06(1.3-3.3) has been

qualified as estimated for the compounds.

The MS/MSD %R were above acceptance limits for Benzo(g,h,i)perylene, bis(2-Ethylhexyl)phthalate, Butylbenzylphthalate, Indeno(1,2,3-cd)pyrene and Pyrene. Associated sample RFI-44-06(1.3-3.3) has been qualified as estimated for the compounds.

The MS/MSD RPD was above acceptance limits for Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(g,h,i)perylene, bis(2-Ethylhexyl)phthalate, Butylbenzylphthalate, Chrysene, Fluoranthene, and Indeno(1,2,3-cd)pyrene. Associated sample RFI-44-06(1.3-3.3) has been qualified as estimated for the compounds.

The MS/MSD %s R were below acceptance limits for 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 4-Chloropenyl-phenylether, 4-Nitrophenol, Hexachlorocyclopentadiene, and Pentachlorophenol. Associated sample RFI-44-06(5.3-7.3) has been qualified as estimated for the compounds.

The MS/MSD %Rs were above acceptance limits for Benzo(g,h,i)perylene, Indeno(1,2,3-cd)pyrene, and Pyrene. Associated sample RFI-44-06(5.3-7.3) has been qualified as estimated for the compounds.

The MS/MSD RPD was above acceptance limits for Benzo(b)fluoranthene, Benzo(k)fluoranthene, and Pyrene. Associated sample RFI-44-06(5.3-73) has been qualified as estimated for the compound.

The LCS/LCSD %Rs were below acceptance limits for 4-Chlorophenyl-phenylether, Acenaphthylene, and Acenaphthene. Associated samples RFI-09-28(0.5-2.5) and RFI-44-06(1.3-3.3)RE have been qualified as estimated for the compounds.

The LCS/LCSD %Rs were below acceptance limits for 4-Chlorophenyl-phenylether. Associated samples RFI-81-23(090701), RFI-81-24(090701), RFI-81-23(0.9-1.7), RFI-44-06(7.3-9.3) and RFI-44-06(5.3-7.3)RE have been qualified as estimated for the compounds.

The LCS/LCSD %Rs were above acceptance limits for Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Butylbenzylphthalate, Chrysene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene. Detected results in associated samples RFI-44-06(5.3-7.3), RFI-44-06(7.3-9.3), and RFI-44-06(5.3-7.3)RE have been qualified as estimated for the compounds.

The following internal standards were below acceptance limits: Perylene-d12, Chrysene-d12, and Phenanthrene-d12, associated sample RFI-09-28(0.5-2.5); Perylene-d12 and Chrysene-d12, associated sample RFI-83/84-06(07-09); Perylene-d12, associated samples RFI-44-06(1.3-3.3)RE and RFI-44-06(5.3-7.3)RE. The samples were confirmed by re-analysis except for RFI-81-23(0.9-1.7), which had no sample extract remaining for re-analysis. The compounds quantitated with the deviant internal standards have been qualified as estimated.

The initial calibration %RSD was above the acceptable limit for Indeno(1,2,3-cd)pyrene. Associated samples RFI-09-28(0.5-2.5) and RFI-44-06(1.3-3.3)RE have been qualified as estimated for the compounds.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methyl Phenol, associated samples RFI-81-24(090701), RFI-09-28(0.5-2.5), RFI-44-06(1.3-3.3)RE), RFI-81-23(0.9-1.7), RFI-44-06(5.3-7.3)RE, and RFI-44-06(7.3-9.3); 3&4-Methyl Phenol and Carbazole, associated sample RFI-81-23(090701). Sample results have been qualified as estimated for the compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were below acceptance limits for Antimony, Barium, Chromium, Copper, Lead, Nickel, Vanadium and Zinc, associated sample RFI-44-06(1.3-3.3); Antimony and Zinc, associated samples RFI-44-06(5.3-7.3) and RFI-44-06(7.3-9.3); Silver and Zinc, associated samples RFI-81-23(090701) and RFI-81-24(09-701). The sample results for those analytes have been qualified as estimated.

The RPD value for Barium was above control limits. Associated sample RFI-44-06(1.3-3.3) has been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 3, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	October 19, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014224

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014224 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-05-15(0.9-2.9)	30142240001	Soil	09/08/01	X	X	X	X	X
RFI-05-15(6.9-8.9)	30142240002	Soil	09/08/01	X	X	X	X	X
RFI-05-16(0.8-2.8)	30142240003	Soil	09/08/01	X	X	X	X	X
RFI-05-16(8.8-10.8)	30142240004	Soil	09/08/01	X	X	X	X	X
RFI-05-16(10.8-12.8)	30142240005	Soil	09/08/01	X	X	X	X	X
RFI-05-18(0.9-2.9)	30142240006	Soil	09/08/01	X	X	X	X	X
RFI-05-18(6.9-8.9)	30142240007	Soil	09/08/01	X	X	X	X	X
RFI-05-18(8.9-10.9)	30142240008	Soil	09/08/01	X	X	X	X	X
RFI-05-17(0.9-2.9)	30142240009	Soil	09/08/01	X	X	X	X	X
RFI-05-17(8.9-10.9)[1]	30142240010	Soil	09/08/01	X	X	X	X	X
RFI-05-17(10.9-12.9)	30142240011	Soil	09/08/01	X	X	X	X	X
RFI-05-DUP-55[3]	30142240012	Soil	09/08/01	X	X	X	X	X
RFI-05-DUP-56[4]	30142240013	Soil	09/08/01	X	X	X	X	X
RFI-81-RB-56[2]	30142240014	Water	09/08/01	X	X	X	X	X
RFI-81-02(04-06)	30142240015	Soil	09/08/01	X	X	X	X	X
RFI-81-02(08-10)	30142240016	Soil	09/09/01	X	X	X	X	X
RFI-81-02(12-14)	30142240017	Soil	09/09/01	X	X	X	X	X
RFI-81-01(2.5-4.5)	30142240018	Soil	09/09/01	X	X	X	X	X
RFI-05-15(6.9-8.9)RE	30142240019	Soil	09/08/01		X			
RFI-05-18(6.9-8.9)RE	30142240020	Soil	09/08/01		X			
RFI-05-18(8.9-10.9)RE	30142240021	Soil	09/08/01		X			
RFI-05-17(0.9-2.9)RE	30142240022	Soil	09/08/01		X			
RFI-81-02(04-06)RE	30142240023	Soil	09/08/01		X			
RFI-81-02(08-10)DL	30142240024	Soil	09/09/01		X			
RFI-81-02(12-14)RE	30142240025	Soil	09/09/01		X			
RFI-81-01(2.5-4.5)RE	30142240026	Soil	09/09/01		X			

1 MS/MSD analysis performed on sample
2 MS/MSD analysis performed on sample (Mercury only)
3 Field duplicate of sample RFI-05-15(0.9-2.9)
4 Field duplicate of sample RFI-05-17(10.9-12.9)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The method blank contained Acetone. Sample results below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The following internal standards were below acceptance limits: Acenaphthene-d10, Perylene-d12, Chrysene-d12, and Phenanthrene-d12, associated sample RFI-81-02(08-10); Perylene-d12, Chrysene-d12, and Phenanthrene-d12, associated samples RFI-05-18(8.9-10.9), RFI-05-18(8.9-10.9), RFI-81-02(04-06), and RFI-81-01(2.5-4.5); Perylene-d12 and Chrysene-d12, associated samples RFI-05-15(6.9-8.9), RFI-05-17(0.9-2.9); Perylene-d12, associated sample RFI-81-02(12-14). The samples were confirmed by re-analysis and all compounds quantitated with the deviant internal standards have been qualified as estimated.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methyl Phenol, 4-Nitrophenol and Carbazole, associated samples RFI-05-18(8.9-10.9) and RFI-05-17(0.5-2.5); 3&4-Methyl Phenol, Carbazole, and Di-n-butylphthalate, associated samples RFI-05-15(6.9-8.9), RFI-81-02(12-14), RFI-81-01(2.5-4.5); 3&4-Methyl Phenol and Carbazole, associated sample RFI-05-18(0.9-2.9); 3&4-Methyl Phenol, associated samples RFI-05-15(0.9-2.9), RFI-05-16(0.8-2.8), RFI-05-16(8.8-10.8), RFI-05-16(10.8-12.8), RFI-05-17(8.9-10.9), RFI-05-17(10.9-12.9),

RFI-05-DUP-55, RFI-05-DUP-56, and RFI-81-02(08-10DL). Sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Benzo(g,h,i)perylene and Indeno(1,2,3-cd)pyrene. Associated sample RFI-05-17(0.9-2.9) has been qualified as estimated for the compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS/LCSD RPD for Aroclor-1248 was above acceptance limits. Associated sample RFI-05-18(6.9-8.9) has been qualified as estimated for the analyte based on the deviation.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MSD %R was below acceptance limits for Zinc. Detected soil sample results have been qualified as estimated for the analyte.

The MS/MSD %Rs were less than 10% for Antimony. Soil sample results have been rejected for the analyte.

The method blank contained Arsenic and Selenium. Soil sample results below the blank action level have been qualified as non-detected for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 8, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	October 22, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014258

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014258 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-12-17(06-08)	3014258001	Solid	9/10/01				X	
RFI-12-17(08-10)	3014258002	Solid	9/10/01				X	
RFI-12-16(01-03)	3014258003	Solid	9/10/01				X	
RFI-12-16(06-08)	3014258004	Solid	9/10/01				X	
RFI-12-16(08-10)	3014258005	Solid	9/10/01				X	
RFI-12-18(01-03)	3014258006	Solid	9/10/01				X	
RFI-12-18(06-08)	3014258007	Solid	9/10/01				X	
RFI-12-18(08-10)	3014258008	Solid	9/10/01				X	
RFI-12-DUP-57[3]	3014258009	Solid	9/10/01				X	
RFI-83/84-RB-58[2]	3014258010	Water	9/12/01	X	X	X	X	X
RFI-83/84-06(01-03)[1]	3014258011	Solid	9/12/01	X	X	X	X	X
RFI-83/84-06(07-09)	3014258012	Solid	9/12/01	X	X	X	X	X
RFI-83/84-06(09-11)	3014258013	Solid	9/12/01	X	X	X	X	X
RFI-09-RB-59	3014258014	Water	9/13/01	X	X	X	X	X
RFI-09-30(00-02)	3014258015	Solid	9/13/01	X	X	X	X	X
RFI-09-30(04-06)	3014258016	Solid	9/13/01	X	X	X	X	X
RFI-09-30(06-08)	3014258017	Solid	9/13/01	X	X	X	X	X
RFI-09-31(00-02)	3014258018	Solid	9/13/01	X	X	X	X	X
RFI-09-31(02-04)	3014258019	Solid	9/13/01	X	X	X	X	X
RFI-09-31(06-08)	3014258020	Solid	9/13/01	X	X	X	X	X
RFI-09-DUP-59[4]	3014258021	Solid	9/13/01	X	X	X	X	X
RFI-83/84-06(01-03)RE	3014258022	Solid	9/12/01		X			
RFI-83/84-06(07-09)RE	3014258023	Solid	9/12/01		X			
RFI-83/84-06(09-11)RE	3014258024	Solid	9/12/01		X			
RFI-09-30(00-02)DL	3014258025	Solid	9/13/01		X			

1 MS/MSD analysis performed on sample
2 MS/MSD analysis performed on sample (Cyanide and Mercury only)
3 DUP analysis performed on sample RFI-12-16(01-03)
4 DUP analysis performed on sample RFI-09-31(02-04)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Acetone and 2-Butanone (MEK) were detected in the rinse blanks. Sample results for the compounds which were below the blank action level have been qualified as non-detected.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 2-Butanone. Associated samples RFI-09-31(02-04), RFI-09-31(06-08), and RFI-09-DUP-59 have been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)			
	Continuing calibration (%D, RF)			
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The surrogate 2,4,6-Tribromophenol in sample RFI-83/84-06(01-03) had a %R less than 10. The sample values reported from that fraction have been rejected.

The MS/MSD %R was above acceptable limits for Pyrene. Associated sample RFI-83/84-06(01-03) has been qualified as estimated for the compound.

The LCS/LCSD %R were below control limits for 4-Chlorophenyl-phenylether. Soil samples have been qualified as estimated for the compound.

The following internal standards were below acceptance limits: Perylene-d12, associated samples RFI-83/84-06(01-03), RFI-83/84-06(09-11), and RFI-09-30(00-02); Perylene-d12 and Chrysene-d12, associated sample RFI-83/84-06(07-09). The samples were confirmed by re-analysis and all compounds quantitated with the deviant internal standards have been qualified as estimated.

Pyrene exceed the linear calibration range in the analyses of samples RFI-09-30(00-02) and RFI-09-30(00-02)RE. Because no sample extract remained, the primary analysis was reported and qualified as estimated.

The initial calibration %RSD was above the acceptable limit for Diethyl phthalate. Associated sample RFI-09-30(00-02) has been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methyl Phenol, di-n-Butylphthalate, Indeno(1,2,3-cd))Pyrene, Dibenzo[a,h]anthracene, and Benzo [g,h,i] perylene, associated samples RFI-09-30(04-06), RFI-09-30(06-08), and RFI-09-31(06-08); 3&4-Methyl Phenol, associated samples RFI-83/84-06(07-09), RFI-83-84-06(09-11), RFI-09-30(00-02), RFI-09-31(00-02), RFI-09-31(02-04), and RFI-09-DUP-59. Sample results have been qualified as estimated for the compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %R were above acceptance limits for Antimony, Copper, and Zinc. Detected results in associated samples RFI-83/84-06(01-03), RFI-83/84-06(07-09), RFI-83/84-06(09-11), RFI-83/84-06(01-03), RFI-09-30(00-02), RFI-09-30(04-06), RFI-09-30(06-08), RFI-09-31(00-02), RFI-09-31(02-04), RFI-09-31(06-08), and RFI-09-DUP-59) have been qualified as estimated for the listed analytes.

The field duplicate RPD was above acceptance limits for Arsenic, Cobalt, Copper, Nickel, and Vanadium, associated samples RFI-83/84-06(01-03), RFI-83/84-06(07-09), RFI-83/84-06(09-11), RFI-83/84-06(01-03), RFI-09-30(00-02), RFI-09-30(04-06), RFI-09-30(06-08), RFI-09-31(00-02), RFI-09-31(02-04), RFI-09-31(06-08), and RFI-09-DUP-59. The sample results have been qualified as estimated.

The MS/MSD %R were below acceptance limits for Antimony and Manganese. Associated samples

RFI-83/84-06(01-03), RFI-83/84-06(07-09), RFI-83/84-06(09-11), RFI-83/84-06(01-03), RFI-09-30(00-02), RFI-09-30(04-06), RFI-09-30(06-08), RFI-09-31(00-02), RFI-09-31(02-04), RFI-09-31(06-08), and RFI-09-DUP-59 have been qualified as estimated for the analytes.

The MSD %R was above control limits for Zinc. Associated samples RFI-83/84-06(01-03), RFI-83/84-06(07-09), RFI-83/84-06(09-11), RFI-83/84-06(01-03), RFI-09-30(00-02), RFI-09-30(04-06), RFI-09-30(06-08), RFI-09-31(00-02), RFI-09-31(02-04), RFI-09-31(06-08), and RFI-09-DUP-59) have been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 8, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	October 18, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014338

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014338 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-09-10(091301)[2]	3014338001	Water	9/13/01	x	x	x	x	x
RFI-09-06(091301)[1]	3014338002	Water	9/13/01	x	x	x	x	x
RFI-09-10d(091301)[3]	3014338003	Water	9/13/01			x	x	x
RFI-09-06d(091301)	3014338004	Water	9/13/01			x	x	x
RFI-09-TB-100	3014338005	Water	9/13/01	x				
Rinse Water Lot#0014	3014338006	Water	9/13/01	x	x	x	x	x
40-304(091401)	3014338007	Water	9/14/01	x	x	x		
40-304d(091401)	3014338008	Water	9/14/01			x	x	x
04-1(091401)	3014338009	Water	9/14/01	x	x	x		
04-1d(091401)	3014338010	Water	9/14/01			x	x	x
RFI-09-08(091401)	3014338011	Water	9/14/01	x	x	x		
RFI-09-08d(091401)	3014338012	Water	9/14/01			x	x	x
RFI-09-01(091401)	3014338013	Water	9/14/01	x	x	x		
RFI-09-01d(091401)	3014338014	Water	9/14/01			x	x	x
RFI-09-TB-101	3014338015	Water	9/14/01	x				
RFI-44-05(091401)	3014338016	Water	9/14/01	x	x	x		
RFI-44-05d(091401)	3014338017	Water	9/14/01			x	x	x
RFI-09-08(091401)DL	3014338011	Water	9/14/01	x		x		

[1] MS/MSD analysis performed on sample (VOC, SVOC and PCB's only).
[2] MS/MSD analysis performed on sample (Metals and Cyanide).
[3] MS/MSD analysis performed on sample (Metals only).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The LCS %R was above acceptance limits for Acetone and Dichlorodifluoromethane. Associated sample 04-1(091401) has been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to an increase in response by Dichlorodifluoromethane. Associated sample 04-1(091401) has been qualified as estimated for the analyte.

Acetone was detected in the rinse blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Benzene, Cyclohexane and P&M Xylene exceed the linear calibration range in the analyses of sample RFI-09-08(091401). The sample was diluted and re-analyzed. The values for those three analytes have been reported from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The LCS/LCSD %R were less than 10% for 4-Chlorophenyl-phenylether. Data have been rejected for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methyl Phenol. Soil samples have been qualified as estimated based for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Aroclor-1248 was detected in the rinse blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %R were above acceptance limits for Antimony and Zinc. Detected soil sample results for these analytes have been qualified as estimated.

Barium, Chromium, Copper, Lead, Manganese, Nickel, and Zinc were detected in the rinse blank. Sample results for these analytes which were below the blank action level have been qualified as non-detected.

The MS/MSD RPD was outside control limits for Silver. Associated sample RFI-09-10(091301) has been qualified as estimated for the analyte.

The MS/MSD %R were below control limits for Silver, associated samples RFI-09-10(091301); Barium and Silver, associated samples RFI-09-06d(091301) and RFI-09-08d(091401). The sample results for those analytes have been qualified as estimated.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 8, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	October 18, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014384

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014384 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-36-02(01-03)[1]	3014384001	Solid	09/17/01	x	x	x	x	
RFI-36-02(07-09)	3014384002	Solid	09/17/01	x	x	x	x	
RFI-36-02(09-11)	3014384003	Solid	09/17/01	x	x	x	x	
RFI-36-02(13-15)	3014384004	Solid	09/17/01	x	x	x	x	
RFI-81-21(00-02)	3014384005	Solid	09/17/01	x	x	x	x	
RFI-81-21(08-10)	3014384006	Solid	09/17/01	x	x	x	x	
RFI-81-DUP-60[2]	3014384007	Solid	09/17/01	x				
RFI-81-19(00-02)	3014384008	Solid	09/17/01	x	x	x	x	
RFI-36-RB-59	3014384009	Water	09/17/01	x	x	x	x	
RFI-36-02(01-03)RE	3014384011	Solid	09/17/01		x			
RFI-36-02(07-09)RE	3014381012	Solid	09/17/01		x			
RFI-36-02(09-11)RE	3014384013	Solid	09/17/01		x			
RFI-81-21(00-02)RE	3014384014	Solid	09/17/01		x			
RFI-81-19(00-02)RE	3014384016	Solid	09/17/01		x			

[1] MS/MSD analysis performed on sample
[2] Duplicate analysis performed on sample RFI-36-02(9-11)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Acetone and 2-Butanone. Associated samples RFI-36-02(01-03), RFI-36-02(07-09), RFI-36-02(09-11), RFI-36-02(13-15), RFI-81-21(00-02), RFI-81-21(08-10), RFI-81-DUP-60, and RFI-81-19(00-02) have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Acetone and 2-Butanone. Associated sample RFI-36-RB-59 has been qualified as estimated for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Chrysene-d12 and Perylene-d12. Associated samples RFI-36-02(01-03), RFI-36-02(07-09), and RFI-36-02(09-11) have been qualified as estimated for compounds associated with Chrysene-d12 and Perylene-d12.

The internal standard response was below the acceptable limit for Perylene-d12. Associated samples RFI-81-21(00-02), and RFI-81-19(00-02) have been qualified as estimated for compounds associated with Perylene-d12.

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol and 2,4-Dinitrophenol, associated samples RFI-36-02(07-09), RFI-36-02(09-11), RFI-36-02(13-15), RFI-81-21(00-02), and RFI-81-19(00-02); a decrease in response by Benzaldehyde, 3&4-Methylphenol and 2,4-Dinitrophenol, associated samples RFI-36-02(01-03) and RFI-36-RB-59; a decrease in response by 3&4-Methylphenol, associated samples RFI-81-21(08-10) and RFI-36-02(09-11)DUP. Sample results have been qualified as estimated for the compounds based on these

deviations.

The MS/MSD %R were below the acceptable limit for 4-Chlorophenyl phenyl ether. Associated sample RFI-36-02(01-03) has been qualified as rejected for the compound.

The LCS/LCSD %R were below 10% for 4-Chlorophenyl phenyl ether. Detected results in associated samples RFI-36-02(07-09), RFI-36-02(09-11), RFI-36-02(13-15), RFI-81-21(00-02), RFI-81-19(00-02), and RFI-36-RB-59 have been qualified as estimated and non-detected results have been qualified rejected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %R was above the acceptable limit for Antimony. Associated samples RFI-36-02(01-03), RFI-36-02(07-09), RFI-36-02(09-11), RFI-36-02(13-15), RFI-81-21(00-02), RFI-81-21(08-10), RFI-81-19(00-02), and RFI-36-02(09-11)DUP have been qualified as estimated for the analyte.

The MS/MSD %Rs were above the acceptable limits for Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc. Detected sample results for associated samples RFI-36-02(01-03), RFI-36-02(07-09), RFI-36-02(09-11), RFI-36-02(13-15), RFI-81-21(00-02), RFI-81-21(08-10), RFI-81-19(00-02), and RFI-36-02(09-11)DUP have been qualified as estimated for the analytes based on these deviations.

The MS/MSD %Rs were above the acceptable limits for all analytes. Detected results for associated sample RFI-36-RB-59 have been qualified as estimated.

The MS/MSD %Rs were below the acceptable limit for Cyanide. Associated samples RFI-36-02(01-03), RFI-36-02(07-09), RFI-36-02(09-11), RFI-36-02(13-15), RFI-81-21(00-02), RFI-81-21(08-10), and RFI-81-19(00-02) have been qualified as estimated for the analyte

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 19, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 7, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014387

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014387 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
04-2(091701)	3014387001	Water	9/17/01	X	X	X	X	
04-02d(091701)	3014387002	Water	9/17/01			X	X	
04-DUP-100[3]	3014387003	Water	9/17/01	X	X	X	X	
04-DUP-d100[4]	3014387004	Water	9/17/01			X	X	
RFI-09-11(091701)	3014387005	Water	9/17/01	X	X	X	X	
RFI-09-11d(091701)	3014387006	Water	9/17/01			X	X	
RFI-09-DUP-101[5]	3014387007	Water	9/17/01	X	X	X	X	
RFI-09-DUP-101d[6]	3014387008	Water	9/17/01			X	X	
31-5(091701)	3014387009	Water	9/17/01	X	X	X	X	
31-5d(091701)	3014387010	Water	9/17/01			X	X	
RFI-09-TB-102	3014387011	Water	9/17/01	X				
31-8(091701)	3014387012	Water	9/17/01	X	X	X	X	
31-8d(091701)	3014387013	Water	9/17/01			X	X	
RFI-09-09(091701)	3014387014	Water	9/17/01	X	X	X	X	
RFI-09-09d(091701)	3014387015	Water	9/17/01			X	X	
31-6(091701)	3014307016	Water	9/17/01	X	X	X	X	
31-6d(091701)	3014307017	Water	9/17/01			X	X	
40-301(091701)[1]	3014307018	Water	9/17/01	X	X	X	X	
40-301d(091701)[2]	3014307019	Water	9/17/01			X	X	
40-305(091701)	3014307020	Water	9/17/01	X	X	X	X	
RFI-09-11(091701)DL	3014307021	Water	9/17/01	X				
31-8(091701)DL	3014307022	Water	9/17/01	X				
RFI-09-DUP-101DL	3014307023	Water	9/17/01	X				

1 MS/MSD analysis performed on sample (VOC, SVOC, PCB, Mercury and Cyanide only).
2 MS/MSD analysis performed on sample (Metals and Cyanide).
3 Field Duplicate of sample 04-2(091701).
4 Field Duplicate of sample 04-2d(091701).
5 Field Duplicate of sample RFI-09-11(091701).
6 Field Duplicate of sample RFI-09-11d(091701).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS %R was above acceptance limits for Dichlorodifluoromethane, associated sample 31-5(091701); 2-Butanone and Acetone, associated sample RFI-09-DUP-101). Sample results for those compounds have been qualified as estimated.

The continuing calibration %D was above the acceptable limit due to an increase in response by 2-Butanone and Acetone, associated samples RFI-09-11(091701), RFI-0909(091701), RFI-09-DUP-101, RFI-09-11(091701)DL), 31-8(091701)DL; 2-Butanone, Acetone and 2-Hexanone, associated sample RFI-09-DUP-101; Dichlorodifluoromethane, associated sample 31-5(091701). Sample results have been qualified as estimated for the compounds.

The Acetone, Benzene, and Toluene exceeded the linear range in sample RFI-09-11(091701); Benzene and Toluene exceeded the linear range in sample RFI-09-DUP-101; 2-Butanone, Acetone, Benzene, Cyclohexane, Ethylbenzene, Methyl Cyclohexane, o-Xylene, P&M-Xylene and Toluene exceeded the linear range in sample 31-8(091701). The samples were diluted and re-analyzed. The

values for those analytes have been reported from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were less than 10% for 4-Chlorophenyl-phenylether. Data have been rejected for the compound based on the deviation.

The initial calibration %RSD was above the acceptable limit for 3&4 Methyl phenol. Associated sample 31-8(091701) has been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response 3&4-Methyl Phenol and Caprolactam. All water samples (with the exception of sample 31-8(091701) that had an acceptable %D for Caprolactam and was reported as non-detected) have been qualified as estimated for the compounds based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 8, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	October 18, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014389

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014389 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
40-305d(091701)	3014389001	Water	09/17/01			x	x	
04-4(091701)	3014389002	Water	09/17/01	x	x	x	x	
04-4d(091701)	3014389003	Water	09/17/01			x	x	
04-3(091701)	3014389004	Water	09/17/01	x	x	x	x	
04-3d(091701)	3014389005	Water	09/17/01			x	x	
04-120(091701)	3014389006	Water	09/17/01	x	x	x	x	
04-120d(091701)	3014389007	Water	09/17/01			x	x	
40-302(091701)	3014389008	Water	09/17/01	x	x	x	x	
40-302d(091701)	3014389009	Water	09/17/01			x	x	
RFI-23-01(091801)	3014389010	Water	09/17/01	x	x	x	x	
RFI-23-01d(091801)	3014389011	Water	09/18/01			x	x	
RFI-23-02(091801)	3014389012	Water	09/18/01	x	x	x	x	
RFI-23-02d(091801)	3014389013	Water	09/18/01			x	x	
40-3(091801)	3014389014	Water	09/18/01	x	x	x	x	
40-3d(091801)	3014389015	Water	09/18/01			x	x	
40-5(091801)	3014389016	Water	09/18/01	x	x	x	x	
40-5d(091801)	3014389017	Water	09/18/01			x	x	
RFI-23-TB-103	3014389018	Water	09/18/01	x				
TW(091801)[1]	3014389019	Water	09/18/01	x	x	x	x	
TWd(091801)[1]	3014389020	Water	09/18/01			x	x	
40-3(091801)DL	3014389021	Water	09/18/01	x				
TW(091801)RE	3014389022	Water	09/18/01		x			

[1] MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to an increase in response by Acetone and 2-Butanone. Associated sample 40-3(091801) has been qualified as estimated for the compound.

Sample 40-3(091801) contained Benzene and Cyclohexane above the linear range. The original sample results were replaced with results from the dilution run for these compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Chrysene-d12 and Perylene-d12. Associated sample TW(091801) has been qualified as estimated for compounds associated with Chrysene-d12 and Perylene-d12.

The initial calibration %RSD was above the acceptable limit for 2,4-Dinitrophenol. Associated samples 04-4(091701), 04-03(091701), and 04-120(091701) have been qualified as estimated for the compound.

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol, associated samples 40-302(091701), RFI-23-01(091801), RFI-23-02(091801), 40-3(091801), 40-5(091801), and TW(091801); a decrease in response by Caprolactam and 3&4-Methylphenol, associated samples 04-4(091701), 04-3(091701), and 04-120(091701). Sample results have been qualified as estimated for the compounds based on these deviations.

The MS/MSD %R were below 10% for 4-Chlorophenyl phenyl ether. Associated sample TW(091801) has been qualified as rejected for the compound.

The LCS/LCSD %Rs were below 10% for 4-Chlorophenyl phenyl ether. Associated samples 04-4(091701), 04-03(091701), 04-120(091701), 40-302(091701), RFI-23-01(091801), RFI-23-02(091801), 40-3(091801), and 40-5(091801) have been qualified rejected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 12, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 8, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014417

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014417 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
BsmntWater(091801)[3]	3014417001	Water	09/18/01	x	x	x		x[2]
BsmntWaterd(091801)	3014417002	Water	09/18/01			x	x	
RFI-12-DUP-102[4]	3014417003	Water	09/18/01	x	x	x		x[2]
RFI-12-DUP-102d[1,5]	3014417004	Water	09/18/01			x	x	
RFI-02-05(091801)	3014417005	Water	09/18/01	x	x	x		x[2]
RFI-02-05d(091801)	3014417006	Water	09/18/01			x	x	
RFI-02-DUP-103[6]	3014417007	Water	09/18/01	x	x	x		x[2]
RFI-02-DUP-103d[7]	3014417008	Water	09/18/01			x	x	
40-6(091801)	3014417009	Water	09/18/01	x	x	x		x[2]
40-6d(091801)	3014417010	Water	09/18/01			x	x	
RFI-02-07(091801)	3014417011	Water	09/18/01	x	x	x		x[2]
RFI-02-07d(091801)	3014417012	Water	09/18/01			x	x	
RFI-12-115(091901)	3014417013	Water	09/19/01	x	x	x		x[2]
RFI-12-115d(091901)	3014417014	Water	09/19/01			x	x	
RFI-12-15(091801)	3014417015	Water	09/18/01	x	x	x		x[2]
RFI-12-15d(091801)	3014417016	Water	09/18/01			x	x	
RFI-81-05(091901)	3014417017	Water	09/19/01	x	x	x		x[2]
RFI-81-05d(091901)	3014417018	Water	09/19/01			x		
RFI-81-20(091901)	3014417019	Water	09/19/01	x	x	x		x[2]
RFI-81-20d(091901)	3014417020	Water	09/19/01			x		
BsmntWater(091801)RE	3014417021	Water	09/18/01		x			

1 Metals MS/MSD analysis performed on sample
2 Hg and Cyanide analysis performed on sample
3 Hg/Cyanide MS/MSD analysis performed on sample
4 Duplicate analysis performed on sample BsmntWater(091801)
5 Duplicate analysis performed on sample BsmntWaterd(091801)
6 Duplicate analysis performed on sample RFI-02-05(091801)
7 Duplicate analysis performed on sample RFI-02-05d(091801)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Acetone was detected in the method blank. Samples results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12 and Chrysene-d12. Associated sample BsmntWater(091801) has been qualified as estimated for compounds associated with the above internal standards.

The initial calibration %RSD was above the acceptable limit for 2,4-Dinitrophenol. Associated sample RFI-12-DUP-102 has been qualified as estimated for the compound.

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol and 2,4-Dinitrophenol, associated samples BsmntWater(091801), RFI-02-05(091801), RFI-02-DUP-103, 40-6(091801), RFI-02-07(091801), RFI-12-115(091901), RFI-12-15(091801), RFI-81-05(091901), and RFI-81-20(091901); a decrease in response by Benzaldehyde, 3&4-Methylphenol and 4-Nitrophenol, associated sample RFI-12-DUP-102. Sample results have been qualified as estimated for the compounds.

The LCS/LCSD %Rs were below 10% for 4-Chlorophenyl phenyl ether. Sample results have been qualified rejected for the compound.

The LCS/LCSD %Rs were above the acceptable limit for bis(2-Ethylhexyl)phthalate. Associated sample FI-02-05(091801) has been qualified as estimated for the compound.

The LCS/LCSD %Rs were above the acceptable limit for Phenol. Associated sample RFI-12-15(091801) has been qualified as estimated for the compound.

Diethyl phthalate was detected in the method blank. Samples results for this compound which were below the blank action level have been qualified as non-detected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were below the acceptable limit for Silver and Cyanide. Associated samples BsmntWaterd(091801), RFI-12-DUP-102d, RFI-02-05(091801), RFI-02-DUP-103d, 40-6d(091801), RFI-02-07d(091801), RFI-12-115d(091901), and RFI-12-15d(091801) have been qualified as estimated for the analytes.

The field duplicate RPD was above the acceptable limit for Copper between sample RFI-02-05d(091801) and duplicate RFI-02-DUP-103d. Detected results for this analyte have been qualified as estimated in associated samples.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 15, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 13, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014478

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014478 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-04-5(091801)[1]	3014478001	Water	09/18/01	x	x	x		x[2]
RFI-04-5d(091801)	3014478002	Water	09/18/01			x	x	
RFI-05-04(091901)	3014478003	Water	09/19/01	x	x	x		x[2]
RFI-05-04d(091901)	3014478004	Water	09/19/01			x	x	
RFI-05-05(091901)	3014478005	Water	09/19/01	x	x	x		x[2]
RFI-05-05d(091901)	3014478006	Water	09/19/01			x	x	
RFI-05-10(091901)	3014478007	Water	09/19/01	x	x	x		x[2]
RFI-05-10d(091901)	3014478008	Water	09/19/01			x	x	
RFI-03-01(091901)	3014478009	Water	09/19/01	x	x	x		x[2]
RFI-03-01d(091901)	3014478010	Water	09/19/01			x	x	
RFI-02-08(091901)	3014478011	Water	09/19/01	x	x	x		x[2]
RFI-02-08d(091901)	3014478012	Water	09/19/01			x	x	
RFI-05-TB-104	3014478013	Water	09/19/01	x				
RFI-05-02(092001)	3014478014	Water	09/20/01	x	x	x		x[2]
RFI-05-02d(092001)	3014478015	Water	09/20/01			x	x	
RFI-05-DUP-105[3]	3014478016	Water	09/20/01	x	x	x		x[2]
RFI-05-DUP-105d[1,4]	3014478017	Water	09/20/01			x	x	
RFI-05-TB-105	3014478018	Water	09/20/01	x				
RFI-16-01(092001)	3014478019	Water	09/20/01					x[2]
RFI-16-04(091801)	3014478020	Water	09/18/01					x[2]

1 MS/MSD analysis performed on sample
2 Hg and Cyanide analysis performed on sample
3 Duplicate analysis performed on sample RFI-05-02(092001)
4 Duplicate analysis performed on sample RFI-05-02d(092001)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to an increase in response by Dichlorodifluoromethane (CFC-12). Associated sample RFI-04-5(091801) has been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to an increase in response by 2-Butanone. Associated sample RFI-05-02(092001) has been qualified as estimated for the compound

Acetone was detected in the trip blank. Samples results for this compound which were below the blank action level have been qualified as non-detected.

1,2,4-Trichlorobenzene was detected in the method blank. Sample results for this compound which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for 2,4-Dinitrophenol. Associated samples RFI-05-02(092001) and RFI-05-DUP-105 have been qualified as estimated for the compound.

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol and Benzaldehyde. Sample results have been qualified as estimated for the compounds.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, and 4,6-Dinitro-2-methylphenol. Associated samples RFI-04-5(091801), RFI-05-04(091901), RFI-05-05(091901), RFI-05-10(091901), RFI-03-01(091901), and RFI-02-08(091901) have been qualified as estimated for the compounds based on these deviations.

The LCS/LCSD %R were below 10% for 4-Chlorophenyl phenyl ether. Sample results have been

qualified rejected for the compound.

Diethyl phthalate was detected in the method blank. Samples results for this compound which were below the blank action level have been qualified as non-detected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R were below the acceptable limit for Manganese and Silver. Sample results have been qualified as estimated for the analytes.

The field duplicate RPD was above the acceptable limit for Arsenic between sample RFI-05-02d(092001) and duplicate RFI-05-DUP-105d. Detected results for this analyte have been qualified as estimated in associated samples.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 16, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 9, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014488

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014488 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-16-07(091801)	3014488001	Water	09/18/01					x[2]
RFI-16-09(091801)	3014488002	Water	09/18/01					x[2]
RFI-16-11(091801)	3014488003	Water	09/18/01					x[2]
88-9(092001)[1]	3014488004	Water	09/20/01	x	x	x		x[2]
88-9d(092001)[1]	3014488005	Water	09/20/01			x	x	
88-7(092001)	3014488006	Water	09/20/01	x	x	x		x[2]
88-7d(092001)	3014488007	Water	09/20/01			x	x	
88-2(092001)	3014488008	Water	09/20/01	x	x	x		x[2]
88-2d(092001)	3014488009	Water	09/20/01			x	x	
88-8(092001)	3014488010	Water	09/20/01	x	x	x		x[2]
88-8d(092001)	3014488011	Water	09/20/01			x	x	
07-02(092001)	3014488012	Water	09/20/01	x	x	x		x[2]
07-02d(092001)	3014488013	Water	09/20/01			x	x	
RFI-05-12(092001)	3014488014	Water	09/20/01	x	x	x		x[2]
RFI-05-12d(092001)	3014488015	Water	09/20/01			x	x	
RFI-05-07(092001)	3014488016	Water	09/20/01	x	x	x		x[2]
RFI-05-07d(092001)	3014488017	Water	09/20/01			x	x	
83/84-07(092001)NL	3014488018	Oil	09/20/01	x	x	x	x	x
RFI-07-08(092001)	3014488019	Water	09/20/01	x	x	x		x[2]
RFI-07-08d(092001)	3014488020	Water	09/20/01			x	x	
88-9(092001)DL	3014488021	Water	09/20/01	x				
83/84-07(092001)NLRE	3014488022	Oil	09/20/01		x			

[1] MS/MSD analysis performed on sample
[2] Hg and Cyanide analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Chloromethane and Methylene chloride. Associated sample 83/84-07(092001)NL has been qualified as estimated for the compounds.

The continuing calibration %D was above the acceptable limit due to an increase in response by 1,1,2-Trichloroethane-1,2,2-fluorethane. Associated sample 83/84-07(092001)NL has been qualified as estimated for the compound

The MS/MSD %Rs were below the acceptable limit for Dichlorodifluoromethane (CFC-12). Associated sample 83/84-07(092001)NL has been qualified as estimated for the compound.

The LCS %R was below the acceptable limit for Trichlorofluoromethane (CFC-11). Associated sample 88-9(092001) has been qualified as estimated for the compound.

Sample 88-9(092001) contained cis-1,2-Dichloroethene and Vinyl chloride above the linear range.

The original sample results for these compounds were replaced with the sample results from the dilution analysis.

1,2,4-Trichlorobenzene and Acetone were detected in the method blank. Sample results for these compounds which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Chrysene-d12 and Perylene-d12. Associated sample 83/84-07(092001)NL has been qualified as estimated for compounds associated with the internal standards.

The initial calibration %RSD was above the acceptable limit for 2,4-Dinitrophenol and Di-n-octyl phthalate. Associated samples 88-2(092001), RFI-05-12(092001), and RFI-05-07(092001) have been qualified as estimated for the compounds.

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol and Benzaldehyde, associated samples 88-9(092001), 88-7(092001), 88-2(092001), 88-8(092001), 07-02(092001), RFI-05-12(092001), and RFI-05-07(092001); a decrease in response by 3&4-Methylphenol, associated samples 83/84-07(092001)NL and RFI-07-08(092001); a decrease in response by 4-Nitrophenol, associated sample RFI-05-07(092001). Sample results have been

qualified as estimated for the compounds based on these deviations.

The MS/MSD %Rs were below 10% for 3,3-Dichlorobenzidine and 4-Chlorophenyl phenyl ether. Associated sample 88-9(092001) has been qualified as rejected for the compounds.

The MS/MSD RPD was above the acceptable limit for Diethyl phthalate. Associated sample 88-9(092001) has been qualified as estimated for the compound.

The LCS/LCSD %Rs were below 10% for 4-Chlorophenyl phenyl ether. Associated samples 88-7(092001), 88-2(092001), 88-8(092001), 07-02(092001), RFI-05-12(092001), RFI-05-07(092001), and RFI-07-08(092001) have been qualified rejected for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below the acceptable limit for Silver. All samples with the exception of 83/84-07(092001)NL have been qualified as estimated for the analyte.

Silver was detected in the instrument blank. Sample results for this analyte which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 18, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 14, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014489

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014489 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-07-DUP-104[1,3]	3014489001	Water	9/20/01	x	x	x	x	
RFI-07-DUP-104d[1,4]	3014489002	Water	9/20/01			x	x	
RFI-86-03(092001)[2]	3014489003	Water	9/20/01	x	x	x	x	
RFI-86-03d(092001)[2]	3014489004	Water	9/20/01			x	x	
07-01(092001)	3014489005	Water	9/20/01	x	x	x	x	
07-01d(092001)	3014489006	Water	9/20/01			x	x	
40-2(092001)	3014489007	Water	9/20/01	x	x	x	x	
40-2d(092001)	3014489008	Water	9/20/01			x	x	
03-02(092001)	3014489009	Water	9/20/01	x	x	x	x	
03-02d(092001)	3014489010	Water	9/20/01			x	x	
RFI-86-01(092001)	3014489011	Water	9/20/01	x	x	x	x	
RFI-86-01d(092001)	3014489012	Water	9/20/01			x	x	
RFI-36-TB-106	3014489013	Water	9/21/01	x				
RFI-36-DUP-106[5]	3014489014	Water	9/21/01	x	x	x	x	
RFI-36-DUP-106d[6]	3014489015	Water	9/21/01			x	x	
83/84-01(092101)	3014489016	Water	9/21/01	x	x	x	x	
83/84-01d(092101)	3014489017	Water	9/21/01			x	x	
RFI-36-05(092101)	3014489018	Water	9/21/01	x	x	x	x	
RFI-36-05d(092101)	3014489019	Water	9/21/01			x	x	
RFI-36-11(092101)	3014489020	Water	9/21/01	x	x	x	x	
40-2(092001)DL	3014489021	Water	9/20/01	x				
RFI-36-DUP-106REDL	3014489022	Water	9/21/01	x	x			
RFI-36-05(092101)DL	3014489023	Water	9/21/01	x				

1 MS/MSD analysis performed on sample (Mercury only).
2 MS/MSD analysis performed on sample (Cyanide only).
3 Field Duplicate of sample 07-08(092001).
4 Field Duplicate of sample 07-08d(092001).
5 Field Duplicate of sample RFI-36-05(092101) reported in SDG 3014488.
6 Field Duplicate of sample RFI-36-05(092101) reported in SDG 3014488.

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS %R was above acceptance limits for Methyl Tertiary Butyl Ether. Associated samples RFI-36-DUP-106 and RFI-36-05(092101)have been qualified as estimated for the compounds.

The LCS %R was below acceptance limits for Trichlorofluoromethane. Associated sample RFI-36-11(092101) has been qualified as estimated for the compound.

The continuing calibration %D was below the acceptable limit due to a decrease in response by Bromomethane, associated samples RFI-07-DUP-106, RFI-86-03(092001), 07-01(092001), 03-02(092001), RFI-86-01(092001), RFI-36-DUP-106, 83/84-01(092101), and RFI-36-05(092101); Bromomethane and 1,1,2,2-Tetrachloroethane, associated sample RFI-36-11(092101). The sample results for those compounds have been qualified as estimated.

The following compounds exceeded the linear range: Ethylbenzene, associated sample 40-2(092001); 1,1,1-Trichloroethane and 1,1-Dichloroethane, associated samples RFI-36-DUP-106 and RFI-36-

04(092101). The samples were diluted and re-analyzed and the values for those analytes have been reported from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS/LCSD %R were less than 10% for 4-Chlorophenyl-phenylether. Water sample results for the compound have been rejected.

The LCS/LCSD %Rs were above acceptance limits for bis(2-Ethylhexyl)phthalate. Associated sample 40-2(092001) has been qualified as estimated for the compound.

The internal standard response was below acceptance limits for Perylene-d12. Data from the re-analysis run was used for sample RFI-36-DUP-106 and have been qualified as estimated for compounds associated with Perylene-d12

The initial calibration %RSD was above the acceptable limit for 2,4-Dinitrophenol. Associated samples RFI-86-03(092001) and 03-02(092001) have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, 2,4-Dinitrophenol, and 4-Nitrophenol, associated samples RFI-86-03(092001) and 03-02(092001); Benzaldehyde and 3&4-Methyl Phenol, associated samples RFI-36-11(092101) and 07-01(092001); 3&4-Methyl Phenol, associated samples RFI-07-DUP-104, 40-2(092001), RFI-86-01(092001), 83/84-01(092101), and RFI-36-05(092101). Data have been qualified as estimated for the compounds based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The RPD value for Aroclor-1248 was above control limits in the LCS/LCSD. Associated samples RFI-07-DUP104 and RFI-86-01(092001) have been qualified as estimated for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R was below acceptance limits for Barium and Silver. Associated samples RFI-07-DUP-104d, RFI-86-03d(092001), RFI-07-01d(092001), 40-2d(092001), 03-02d(092001), RFI-86-01d(092001), RFI-36-DUP-106d, 83/84-01d(092101), and RFI-36-05d(092101) have been qualified as estimated for these analytes.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 19, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	November 15, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014498

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014498 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
20-103N(092101)[1]	3014498001	Water	09/21/01	x	x	x		x[2]
20-103Nd(092101)[1]	3014498002	Water	09/21/01			x	x	
20-100(092101)[1]	3014498003	Water	09/21/01	x	x	x		x[2]
20-100d(092101)[1]	3014498004	Water	09/21/01			x	x	
RFI-36-11d(092101)	3014498005	Water	09/21/01			x	x	
820-121(092101)	3014498006	Water	09/21/01	x	x	x		x[2]
20-121d(092101)	3014498007	Water	09/21/01			x	x	
20-504(092101)	3014498008	Water	09/21/01	x	x	x		x[2]
20-504d(092101)	3014498009	Water	09/21/01			x	x	
RFI-44-04(091801)[1]	3014498010	Water	09/18/01	x	x	x		x[2]
RFI-44-04d(091801)	3014498011	Water	09/18/01			x	x	
20-120(092101)	3014498012	Water	09/21/01	x	x	x		x[2]
20-120d(092101)	3014498013	Water	09/21/01			x	x	
RFI-03-03(092101)	3014498014	Water	09/21/01	x	x	x		x[2]
RFI-03-03d(092101)	3014498015	Water	09/21/01			x	x	
04-160(092101)	3014498016	Water	09/21/01	x	x	x		x[2]
04-160d(092101)	3014498017	Water	09/21/01			x	x	
20-500(092101)	3014498018	Water	09/21/01	x	x	x		x[2]
20-500d(092101)	3014498019	Water	09/21/01			x	x	
03-111(092101)	3014498020	Water	09/21/01	x	x	x		x[2]
20-121(092101)DL	3014498021	Water	09/21/01	x				

[1] Metals MS/MSD analysis performed on sample
[2] Hg and Cyanide analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,1,2,2-Tetrachloroethane. Associated samples 20-103N(092101), 20-100(092101), 820-121(092101), 20-504(092101), 20-120(092101), RFI-03-03(092101), 04-160(092101), 20-500(092101), and 03-111(092101) have been qualified as estimated for the compound.

Sample 820-121(092101) contained 1,1,1-Trichloroethane, 1,1-Dichloroethane, and cis-1,2-Dichloroethene above the linear range. The original sample results for these compounds have been replaced with results from the dilution analysis.

1,2,4-Trichlorobenzene and Acetone were detected in the method blank. Sample results for these compounds which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for 2,4-Dinitrophenol. Associated sample 20-103N(092101) has been qualified as estimated for the compound.

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol and Benzaldehyde. Sample results have been qualified as estimated based on these deviations.

The LCS/LCSD %R were below 10% for 4-Chlorophenyl phenyl ether. Sample results have been qualified rejected for the compound.

The LCS/LCSD %R were above the acceptable limit for bis(2-Ethylhexyl)phthalate, associated sample 03-111(092101); Diethyl phthalate, associated samples 820-121(092101) and RFI-44-04(091801). Sample results have been qualified as estimated for the compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %R was above the acceptable limit for Antimony. Associated sample 20-103Nd(092101) has been qualified as estimated for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 22, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 15, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014499

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014499 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
03-11d(092101)	3014499001	Water	09/21/01			x	x	
03-114(092101)	3014499002	Water	09/21/01	x	x	x		x[2]
03-114d(092101)	3014499003	Water	09/21/01			x	x	
30-100(092101)	3014499004	Water	09/21/01	x	x	x		x[2]
30-100d(092101)	3014499005	Water	09/21/01			x	x	
RFI-03-04(092101)	3014499006	Water	09/21/01	x	x	x		x[2]
RFI-03-04d(092101)	3014499007	Water	09/21/01			x	x	
70-109(092401)	3014499008	Water	09/24/01	x	x	x		x[2]
70-190d(092401)	3014499009	Water	09/24/01			x	x	
RFI-10-15(092401)	3014499010	Water	09/24/01	x				
RFI-10-01(092401)	3014499011	Water	09/24/01	x	x	x		x[2]
RFI-10-05(092401)	3014499012	Water	09/24/01	x				
RFI-10-01D(092401)	3014499013	Water	09/24/01			x	x	
RFI-65-01(092401)	3014499014	Water	09/24/01	x	x	x		x[2]
RFI-65-01d(092401)	3014499015	Water	09/24/01			x	x	
86-100(092401)[1]	3014499016	Water	09/24/01	x	x	x		x[2]
86-100d(092401)[1]	3014499017	Water	09/24/01			x	x	
83/84-11(092401)	3014499018	Water	09/24/01	x	x	x		x[2]
83/84-11d(092401)	3014499019	Water	09/24/01			x	x	
70-100(092401)	3014499020	Water	09/24/01	x	x	x		x[2]
RFI-10-01(092401)DL	3014499021	Water	09/24/01	x				
RFI-10-05(092401)DL	3014499022	Water	09/24/01	x				
83/84-11(092401)RE	3014499023	Water	09/24/01		x			

1 MS/MSD analysis performed on sample
2 Hg and Cyanide analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,1,2,2-Tetrachloroethane. Associated samples 03-114(092101), 30-100(092101), RFI-03-04(092101), 70-109(092401), and RFI-10-15(092401) have been qualified as estimated for the compound based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by 1,1,2-Trichloro-1,2,2-trifluoroethane. Associated sample RFI-10-05(092401) has been qualified as estimated based on this deviation.

Sample RFI-10-01(092401) contained Chloroethane above the linear range. The original sample result for that compound has been replaced with the result from the dilution analysis.

Sample RFI-10-05(092401) contained 1,1,1-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, and Chloroethane above the linear range. The original sample results for these compounds have been replaced with the results from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Benzaldehyde and 4,6-Dinitro-2-methylphenol. Associated samples 70-100(092401) and 83/84-11(092401) have been qualified as estimated for the compounds.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compound based on this deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, associated samples 30-100(092101), RFI-10-01(092401), and 86-100(092401); a decrease in response by 2,4-Dinitrophenol, associated samples 83/84-11(092401) and 70-100(092401). Sample results have been qualified as estimated for the compounds.

The MS/MSD %R were below 10% for 4-Chlorophenyl phenyl ether. Associated sample 86-100(092401) has been qualified rejected for the compound.

The LCS/LCSD %R were below 10% for 4-Chlorophenyl phenyl ether. Associated samples 03-114(092101), 30-100(092101), RFI-03-04(092101), 70-109(092401), RFI-10-01(092401), RFI-65-01(092401), 83/84-11(092401) and 70-100(092401) have been qualified rejected for the compound.

The LCS/LCSD %R were above the acceptable limit for bis(2-Ethylhexyl)phthalate. Associated sample 70-109(092401) has been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were below the acceptable limit for Beryllium, Copper and Silver. Sample results have been qualified as estimated for the analytes.

The MS/MSD %R were above the acceptable limit for Selenium. Detected sample results for this analyte have been qualified as estimated.

Arsenic was detected in the instrument blank. Sample results for this analyte which were below the blank action level have been qualified as non-detect.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 22, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 22, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014588

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014588 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
43-103(092501)[1]	3014588001	Water	09/25/01	x	x	x		x[2]
43-103d(092501)[1]	3014588002	Water	09/25/01			x	x	
20-145(092501)	3014588003	Water	09/25/01	x	x	x		x[2]
20-145d(092501)	3014588004	Water	09/25/01			x	x	
20-FP10(092501)	3014588005	Water	09/25/01	x	x	x		x[2]
20-FP10d(092501)	3014588006	Water	09/25/01			x	x	
43-141(092501)	3014588007	Water	09/25/01	x	x	x		x[2]
43-141d(092501)	3014588008	Water	09/25/01			x	x	
30-120(092501)	3014588009	Water	09/25/01	x	x	x		x[2]
30-120d(092501)	3014588010	Water	09/25/01			x	x	
30-140(092501)	3014588011	Water	09/25/01	x	x	x		x[2]
30-140d(092501)	3014588012	Water	09/25/01			x	x	
20-FP6(092501)	3014588013	Water	09/25/01	x	x	x		x[2]
20-FP6d(092501)	3014588014	Water	09/25/01			x	x	
20-FP11(092501)	3014588015	Water	09/25/01	x	x	x		x[2]
20-FP11d(092501)	3014588016	Water	09/25/01			x	x	
43-242(092501)	3014588017	Water	09/25/01	x	x	x		x[2]
43-242d(092501)	3014588018	Water	09/25/01			x	x	
43-220(092501)	3014588019	Water	09/25/01	x	x	x		x[2]
43-220d(092501)	3014588020	Water	09/25/01			x	x	

[1] Metals MS/MSD analysis performed on sample
[2] Hg and Cyanide analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by Bromomethane and 1,1,2,2-Tetrachloroethane, associated samples 20-145(092501) and 43-220(092501); a decrease in response by Trichlorofluoromethane (CFC-11), associated sample 20-145(092501); a decrease in response by Chloromethane, Chloroethane, Tetrachloroethene, and 1,1,2,2-Tetrachloroethane, associated samples 20-FP10(092501), 30-120(092501), 30-140(092501), 20-FP6(092501), and 20-FP11(092501). Sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Cyclohexane. Associated sample 20-FP10(092501) has been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compound based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The recovery for one surrogate was below 10% in sample 20-145d(092501). Sample results have been qualified as rejected in the associated sample.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were below the acceptable limit for Barium, Manganese and Silver. Sample results have been qualified as estimated for the analytes.

Selenium and Antimony were detected in the instrument blanks. Associated samples with results which were below the blank action level for these analytes have been qualified as non-detect.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 24, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 16, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014589

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014589 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-05-03(092501)[1]	3014589001	Water	9/25/01	x	x	x		x
RFI-05-03d(092501)[2]	3014589002	Water	9/25/01			x	x	x
RFI-05-o6(092501)	3014589003	Water	9/25/01	x	x	x		x
RFI-05-06d(092501)	3014589004	Water	9/25/01			x	x	x
RFI-05-20(092501)[3]	3014589005	Water	9/25/01	x	x	x		x
RFI-05-20d(092501)[3]	3014589006	Water	9/25/01			x	x	x
20-102(092501)	3014589007	Water	9/25/01	x	x	x		x
20-102d(092501)	3014589008	Water	9/25/01			x	x	x
RFI-05-195(092501)	3014589009	Water	9/25/01	x	x	x		x
RFI-05-195d(092501)	3014589010	Water	9/25/01			x	x	x
RFI-05-01(092501)	3014589011	Water	9/25/01	x	x	x		x
RFI-05-01d(092501)	3014589012	Water	9/25/01			x	x	x
RFI-05-TB-108	3014589013	Water	9/25/01	x	x			
11-120(092501)	3014589014	Water	9/25/01	x		x		x
11-120d(092501)	3014589015	Water	9/25/01			x	x	x
RFI-83/84-DUP-108[4]	3014589016	Water	9/25/01	x	x	x		x
RFI-83/84-DUP-108d[5]	3014589017	Water	9/25/01			x	x	x
RFI-05-21(092501)	3014589018	Water	9/25/01	x	x	x		x
RFI-05-21d(092501)	3014589019	Water	9/25/01			x	x	x
RFI-05-DUP-107[6]	3014589020	Water	9/25/01	x	x	x		x
RFI-05-DUP-107d[7]	3014589021	Water	9/25/01			x	x	x
RFI-05-20(092501)DL	3014589022	Water	9/25/01	x		x		x

1 MS/MSD analysis performed on sample (Mercury only).
2 MS/MSD analysis performed on sample (Metals only).
3 MS/MSD analysis performed on sample (Cyanide only).
4 Field Duplicate of sample 11-120(092501).
5 Field Duplicate of sample 11-120d(092501).
6 Field Duplicate of sample RFI-05-21(092501).
7 Field Duplicate of sample RFI-05-21d(092501).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was greater than the acceptable limit due to a decrease in response by 1,1,2,2-Tetrachloroethane. Associated samples RFI-05-03(092501), RFI-0506(092501), RFI-05-20(092501), 11-120(092501), RFI-83/84-DUP-108, RFI-05-21(092501), and RFI-05-DUP-107 have been qualified as estimated for the compounds.

The compound Trichloroethene exceeded the linear range in sample RFI-05-20(092501). The sample was diluted and re-analyzed. The value for that compound has been reported from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MSD %R for Manganese was below acceptance limits. Dissolved samples have been qualified as estimated for the analyte based on this deviation.

The MS/MSD RPD value was outside acceptance limits for Nickel. Dissolved samples have been qualified as estimated for the analyte based on this deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 24, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	November 16, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014623

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014623 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
55-3(0926-01)[1]	3014623001	Water	9/26/01	X	X	X		X
55-3d(092601)[2]	3014623002	Water	9/26/01			X	X	
55-2(092601)	3014623003	Water	9/26/01	X	X	X		X
55-2d(092601)	3014623004	Water	9/26/01			X	X	
70-160(092601)[1]	3014623005	Water	9/26/01	X	X	X		X
70-160d092601)[3]	3014623006	Water	9/26/01			X	X	
43-167(092601)	3014623007	Water	9/26/01	X	X	X		X
43-167(d(092601)	3014623008	Water	9/26/01			X	X	
43-166(092601)	3014623009	Water	9/26/01	X	X	X		X
43-166d(092601)	3014623010	Water	9/26/01			X	X	
RFI-10-08(092601)	3014623011	Water	9/26/01	X	X	X		X
RFI-10-08d(092601)	3014623012	Water	9/26/01			X	X	
RFI-10-03(092601)	3014623013	Water	9/26/01	X	X	X		X
RFI-10-03d(092601)	3014623014	Water	9/26/01			X	X	
03-109(092601)	3014623015	Water	9/26/01	X	X	X		X
03-109d(092601)	3014623016	Water	9/26/01			X	X	
55-5(092601)	3014623017	Water	9/26/01	X	X	X		X
55-5d(092601)	3014623018	Water	9/26/01			X	X	
86-3(092601)	3014623019	Water	9/26/01	X	X	X		X
86-3(092601)	3014623020	Water	9/26/01			X	X	
RFI-10-03(092601)DL	3014623021	Water	9/26/01	X				

1 MS/MSD analysis performed on sample (VOC, SVOC, PCB, Mercury and Cyanide only).
2 MS/MSD analysis performed on sample (Dissolved Metals, Dissolved PCB's and dissolved Cyanide).
3 MS/MSD analysis performed on sample (Dissolved PCB's and dissolved Cyanide).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS %R was above acceptance limits for Methyl Tertiary Butyl Ether. Associated sample RFI-10-03(092601) has been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to an increase in response by Bromomethane and 1,1,2,2-Tetrachloroethane, associated samples 55-3(092601), 43-167(092601), 43-166(092601, RFI-10-08(092601), RFI-10-03(092601), 03-109(092601), 55-5(092601), and 86-3(092601); 1,1,2,2-Tetrachloroethane, associated sample 70-160(092601). The sample results have been qualified as estimated for the compounds.

1,1,1-Trichloroethane, 1,1-Dichloroethane, Chloroethane, cis-1,2-Dichloroethene, and Trichloroethene exceeded the linear range in sample RFI-10-03(092601). The sample was diluted and re-analyzed. The values for those analytes have been reported from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for 4,6-Dinitrophenol-2-Methylphenol. Water samples have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methyl Phenol. Water samples have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 25, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	November 19, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014624

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014624 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
70-165(092601)	3014624001	Water	9/26/01	X	X	X		X
70-165d(092601)	3014624002	Water	9/26/01			X	X	
55-1(092601)	3014624003	Water	9/26/01	X	X	X		X
55-1d(092601)	3014624004	Water	9/26/01			X	X	
55-4(092601)	3014624005	Water	9/26/01	X	X	X		X
55-4d(092601)	3014624006	Water	9/26/01			X	X	
43-140(092601)	3014624007	Water	9/26/01	X	X	X		X
43-140d(092601)	3014624008	Water	9/26/01			X	X	
RFI-10-TB-109	3014624009	Water	9/26/01	X				
RFI-10-04(092601)	3014624010	Water	9/26/01	X	X	X		X
RFI-10-04d(092601)	3014624011	Water	9/26/01			X	X	
37-01(092601)	3014624012	Water	9/26/01	X	X	X		X
37-01d(092601)	3014624013	Water	9/26/01			X	X	
RFI-55-01(092601)	3014624014	Water	9/26/01	X	X	X		X
RFI-55-01d(092601)	3014624015	Water	9/26/01			X	X	
RFI-10-14(092601)	3014624016	Water	9/26/01	X	X	X		X
RFI-10-14d(092601)	3014624017	Water	9/26/01			X	X	
RFI-10-TB-109	3014624018	Water	9/27/01	X				
03-101(092701)[1]	3014624019	Water	9/27/01	X	X	X		X
03-101d(092701)[2]	3014624020	Water	9/27/01			X	X	
55-4(092601)DL	3014624021	Water	9/26/01	X				
RFI-10-14(092601)DL	3014624022	Water	9/26/01	X				

1 MS/MSD analysis performed on sample (VOC, SVOC, PCB, Mercury and Cyanide only).
2 MS/MSD analysis performed on sample (Dissolved Metals, Dissolved PCB's and dissolved Cyanide).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R were above acceptance limits for Trichloroethene. Associated sample 03-101(092701) has been qualified as estimated for the compound.

The LCS %R was above acceptance limits for Methyl Tert Butyl Ether. Associated sample 55-1(092601) has been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Bromomethane and 1,1,2,2-Tetrachloroethane, associated sample 70-165(092601); 1,1,2,2-Tetrachloroethane associated sample 55-1(092601). The sample results have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to an increase in response by Methyl Tert Butyl Ether. Associated sample 55-1(092601) has been qualified as estimated for the

compound.

The following compounds exceeded the linear range: 1,1-Dichloropropane, associated sample 55-4(092601); Chloroethane, associated sample RFI-10-12(092601). The samples were diluted and re-analyzed. The values for those analytes have been reported from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for 2-Methyl 4,6-Dinitrophenol. Water samples (with the exception of RFI-10-14(092601)) have been qualified as estimated for the compound based on the deviation.

The initial calibration %RSD was above the acceptable limit for 2,4-Dinitrophenol. Associated sample RFI-10-14(092601) has been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methyl Phenol. Water samples have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were above control limits for Manganese. Dissolved samples have been qualified as estimated for the analyte based on the deviations.

The MS %R was below control limits for Silver. Filtered samples have been qualified as estimated for the analytes based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 26, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	November 19, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014654

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014654 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
87-FP3(092701)[1]	3014654001	Water	09/27/01	x	x	x		x[2]
87-FP3d(092701)[1]	3014654002	Water	09/27/01			x	x	
36-FP8(092701)[1]	3014654003	Water	09/27/01	x	x	x		x[2]
36-FP8d(092701)[1]	3014654004	Water	09/27/01			x	x	
36-FP1(092701)	3014654005	Water	09/27/01	x	x	x		x[2]
36-FP1d(092701)	3014654006	Water	09/27/01			x	x	
RFI-36-DUP-109[3]	3014654007	Water	09/27/01	x	x	x		x[2]
RFI-36-DUP-109d[4]	3014654008	Water	09/27/01			x	x	
RFI-36-09(092701)	3014654009	Water	09/27/01	x	x	x		x[2]
RFI-36-09d(092701)	3014654010	Water	09/27/01			x	x	
RFI-36-08(092701)	3014654011	Water	09/27/01	x	x	x		x[2]
RFI-36-08d(092701)	3014654012	Water	09/27/01			x	x	
RFI-55-02(092701)	3014654013	Water	09/27/01	x	x	x		x[2]
RFI-55-02d(092701)	3014654014	Water	09/27/01			x	x	
36-120(092701)	3014654015	Water	09/27/01	x	x	x		x[2]
36-120d(092701)	3014654016	Water	09/27/01			x	x	
RFI-86-04(092701)	3014654017	Water	09/27/01	x	x	x		x[2]
RFI-86-04d(092701)	3014654018	Water	09/27/01			x	x	
70-102(092701)	3014654019	Water	09/27/01	x	x	x		x[2]
70-102d(092701)	3014654020	Water	09/27/01			x	x	
87-FP3(092701)DL	3014654021	Water	09/27/01	x				
36-FP1(092701)DL	3014654022	Water	09/27/01	x				
RFI-36-DUP-109DL	3014654023	Water	09/27/01	x				
RFI-36-08(092701)DL	3014654024	Water	09/27/01	x				
RFI-36-DUP-109-2DL	3014654025	Water	09/27/01	x				
RFI-36-08(092701)2DL	3014654026	Water	09/27/01	x				
70-102(092701)RE	3014654027	Water	09/27/01		x			

1 Hg and Cyanide MS/MSD analysis performed on sample
2 Hg and Cyanide analysis performed on sample
3 Duplicate analysis performed on sample 36-FP1(092701)
4 Duplicate analysis performed on sample 36-FP1d(092701)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Sample 87-FP3(092701) contained Chloroethane, cis-12-Dichloroethene, Trichloroethene, and Vinyl chloride above the linear range. The original results for these compounds have been replaced with the results from the dilution analysis (87-FP3(092701)DL).

Sample 36-FP1(092701) contained 1,1,1-Trichloroethane, 1,1-Dichloroethane, Benzene, and Trichloroethene above the linear range. The original results for these compounds have been replaced with the results from the dilution analysis (36-FP1(092701)DL).

Sample RFI-36-DUP-109 contained 1,1,1-Trichloroethane, 1,1-Dichloroethane, Benzene, and Trichloroethene above the linear range. The original results for these compounds, with the exception of Benzene, have been replaced with the results from the first dilution analysis (RFI-36-DUP-109-DL). The original results for Benzene have been replaced with the results from the second dilution analysis (RFI-36-DUP-109-2DL).

Sample RFI-36-08(092701) contained Benzene, Ethylbenzene, Methyl Cyclohexane, o-Xylene, m&p-

Xylene, and Toluene above the linear range. The original results for these compounds, with the exception of Toluene, have been replaced with the sample results from the first dilution analysis (RFI-36-08(092701)DL). The original results for Toluene have been replaced with the results from the second dilution analysis (RFI-36-08(092701)2DL).

The continuing calibration %D was above the acceptable limit due to an increase in response by Cyclohexane. Associated sample RFI-36-08(092701) has been qualified as estimated for the compound.

The recovery for one surrogate was below the acceptable limit in samples 36-FP1(092701) and RFI-36-DUP-109. Sample results have been qualified as estimated for these samples.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Chrysene-d12. Associated sample 70-102(092701) has been qualified as estimated for compounds associated with Chrysene-d12.

The initial calibration %RSD was above the acceptable limit for Benzaldehyde and 2,4-Dinitrophenol. Associated samples 87-FP3(092701), 36-FP1(092701), and RFI-36-09(092701) have been qualified as estimated for the compounds.

The initial calibration %RSD was above the acceptable limit for 2,4-Dinitrophenol. Associated samples 36-120(092701), and RFI-86-04(092701) have been qualified as estimated for the compound.

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Atrazine. Associated samples RFI-36-08(092701) and 70-102(092701) have been qualified as estimated for the compound.

Surrogate recoveries were below 10% for two acids. Detected acid results in associated sample 36-FP8(092701) have been qualified as estimated, and non-detected acid sample results have been qualified rejected, based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were below the acceptable limit for Silver. Sample results have been qualified as estimated for the analyte.

The MS/MSD %R were above the acceptable limit for Manganese. Detected sample results for this analyte have been qualified as estimated.

Antimony and Selenium were detected in the instrument blank. Sample results for these analytes which were below the blank action level have been qualified as non-detect.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 31, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 26, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014655

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014655 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-86-05(092701)[1]	3014655001	Water	9/27/01	X	X	X		X
RFI-86-05d(092701)[1]	3014655002	Water	9/27/01			X	X	
36-121(092701)	3014655003	Water	9/27/01	X	X	X		X
36-121d(092701)	3014655004	Water	9/27/01			X	X	
38-120(092701)	3014655005	Water	9/27/01	X	X	X		X
38-120d(092701)	3014655006	Water	9/27/01			X	X	
RFI-36-TB-110	3014655007	Water	9/27/01	X				
36-100(092701)	3014655008	Water	9/27/01	X	X	X		X
36-100d(092701)	3014655009	Water	9/27/01			X	X	
RFI-36-35(092701)	3014655010	Water	9/27/01	X	X	X		X
RFI-36-35d(092701)	3014655011	Water	9/27/01			X	X	
RFI-38-04(092701)	3014655012	Water	9/27/01	X	X	X		X
RFI-38-04d(092701)	3014655013	Water	9/27/01			X	X	
RFI-36-03(092701)	3014655014	Water	9/27/01	X	X	X		X
RFI-36-03d(092701)	3014655015	Water	9/27/01			X	X	
43-168(092701)	3014655016	Water	9/27/01	X	X	X		X
43-168d(092701)	3014655017	Water	9/27/01			X	X	
55-09(092701)	3014655018	Water	9/27/01	X	X	X		X
55-09d(092701)	3014655019	Water	9/27/01			X	X	
RFI-86-06D(092801)	3014655020	Water	9/28/01	X	X	X		X
RFI-86-06Dd(092801)	3014655021	Water	9/28/01			X	X	
36-100(092701)DL	3014655022	Water	9/28/01	X				

[1] MS/MSD analysis performed on sample (Mercury and Cyanide).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to an increase in response by Tetrachloroethene. Associated sample RFI-86-05(092701) has been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,1,2,2-Tetrachloroethane. Associated samples RFI-36-TB-110, 36-100(092701), and RFI-38-04(092701) have been qualified as estimated for the compounds.

1,1,1-Trichloroethane, 1,1-Dichloroethane, and 1,1-Dichloroethylene were detected above the linear range in sample 36-100(092701). The sample was diluted and re-analyzed. The values for those compounds have been reported from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCSD %R was above control limits for Diethyl phthalate. Associated sample 43-168(092701) has been qualified as estimated for the compound based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methyl Phenol, 4-Nitroanaline and Carbazole, associated samples 43-168(092701), 55-09(092701), and RFI-86-06D(092801); 3&4-Methyl Phenol, associated samples RFI-86-05(092701), 36-121(092701), 38-120(092701), and 36-100(092701); 3&4-Methylphenol and Atrazine, associated samples RFI-36-35(092701), RFI-38-04(092701), and RFI-36-03(0927801). Sample results have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MSD %R was above control limits for Manganese. Dissolved samples have been qualified as estimated for the analyte based on these deviations.

The MS/MSD RPD was above control limits for Zinc. Dissolved samples (with the exception of sample RFI-36-03d(092701) have been qualified as estimated for the analyte based on these deviations.

Other than for the deviations noted in this review, all of the data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 29, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	November 26, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014667

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014667 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
04-121(092801)	3014667001	Water	9/28/01	X	X	X		X
04-121d(092801)	3014667002	Water	9/28/01			X	X	
RFI-38-06(092801)	3014667003	Water	9/28/01	X	X	X		X
RFI-38-06d(092801)	3014667004	Water	9/28/01			X	X	
RFI-35-08(092801)	3014667005	Water	9/28/01	X	X	X		X
RFI-35-08d(092801)	3014667006	Water	9/28/01			X	X	
RFI-38-DUP-111[3]	3014667007	Water	9/28/01	X	X	X		X
RFI-38-DUP-111d[4]	3014667008	Water	9/28/01			X	X	
RFI-07-03(092801)	3014667009	Water	9/28/01	X	X	X		X
RFI-07-03d(092801)	3014667010	Water	9/28/01			X	X	
36-101(092801)[1]	3014667011	Water	9/28/01	X	X	X		X
36-101d(092801)[2]	3014667012	Water	9/28/01			X	X	
36-FP2(092801)	3014667013	Water	9/28/01	X	X	X		X
36-FP2d(092801)	3014667014	Water	9/28/01			X	X	
RFI-36-04(092801)	3014667015	Water	9/28/01	X	X	X		X
RFI-36-04d(092801)	3014667016	Water	9/28/01			X	X	
RFI-36-32(092801)	3014667017	Water	9/28/01	X	X	X		X
RFI-36-32d(092801)	3014667018	Water	9/28/01			X	X	
RFI-36-20(092801)	3014667019	Water	9/28/01	X	X			
RFI-36-19(092801)	3014667020	Water	9/28/01	X				
36-FP2(092801)DL	3014667021	Water	9/28/01	X				

1 MS/MSD analysis performed on sample (VOC, Mercury and Cyanide).
2 MS/MSD analysis performed on sample (Metals, Mercury and Cyanide).
3 Field duplicate of sample RFI-38-06(0902801).
4 Field duplicate of sample RFI-38-06d(0902801).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS %R was below acceptance limits for 1,1,1-Trichloroethane. Associated sample RFI-36-04(092801) has been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response for Tetrachloroethene. Associated sample RFI-36-04(092801) has been qualified as estimated for the compound.

Sample 36-FP2(092801) contained Benzene above the linear range. The sample was diluted and re-analyzed. The value for that analyte has been reported from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCSD %R was above control limits for Diethyl phthalate. Associated samples RFI-38-06(092801), RFI-38-05(092801), and 36-101(092801) have been qualified as estimated for the compounds based on the deviation.

The initial calibration %RSD was above the acceptable limit for Benzaldehyde. Associated samples RFI-36-04(092801), RFI-36-32(092801), and RFI-36-20(092801) have been qualified as estimated based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methyl Phenol, 4-Nitroanaline and Carbazole, associated samples 04-121(092801), RFI-38-06(092801), RFI-38-05(092801), and RFI-38-DUP-111; 3&4-Methyl Phenol and Atrazine, associated RFI-07-03(092801), 36-101(092801), and 36-FP2(092801); 3&4-Methylphenol, associated samples RFI-36-04(092801), RFI-36-32(092801), and RFI-36-20(092801). Sample results have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MSD %R was above control limits for Manganese. Dissolved samples have been qualified as estimated for the analyte based on the deviation.

The MS/MSD RPD was above control limits for Zinc. Dissolved samples have been qualified as estimated for the analyte based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 29, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	November 26, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014668

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014668 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-36-37(092801)[1]	3014668001	Water	09/28/01	x	x	x		x[2]
RFI-36-37d(092801)[1]	3014668002	Water	09/28/01			x	x	
RFI-36-17(092801)	3014668003	Water	09/28/01	x				
RFI-36-18(092801)	3014668004	Water	09/28/01	x				
36-FP5(092801)	3014668005	Water	09/28/01	x	x	x		x[2]
36-FP5d(092801)[1]	3014668006	Water	09/28/01			x	x	
RFI-36-12(092801)[1]	3014668007	Water	09/28/01	x	x	x		x[2]
RFI-36-12d(092801)	3014668008	Water	09/28/01			x	x	
R70-163(092801)	3014668009	Water	09/28/01	x	x	x		x[2]
70-163d(092801)	3014668010	Water	09/28/01			x	x	
RFI-36-10(092801)	3014668011	Water	09/28/01	x	x	x		x[2]
RFI-36-10d(092801)	3014668012	Water	09/28/01			x	x	
RFI-81-03(092501)	3014668013	Water	09/28/01	x	x	x		x[2]
RFI-81-03d(092501)	3014668014	Water	09/28/01			x	x	
RFI-36-TB-111	3014668015	Water	09/28/01	x				
87-FP5(092601)	3014668016	Water	09/28/01	x	x	x		x[2]
87-FP5d(092601)	3014668017	Water	09/28/01			x	x	
RFI-83/84-02(100101)	3014668018	Water	10/01/01	x	x	x		x[2]
83/84-02d(100101)	3014668019	Water	10/01/01			x	x	
83/84-02x(100101)	3014668020	Water	10/01/01					x[2]
RFI-36-37(092801)DL	3014668021	Water	09/28/01	x				
87-FP5(092601)RE	3014668022	Water	09/28/01		x			

[1] Hg and Cyanide MS/MSD analysis performed on sample
[2] Hg and Cyanide analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Sample RFI-36-37(092801) contained Chloroethane and 1,1-Dichloroethane above the linear range. The original results for these compounds have been replaced with the results from the dilution analysis (RFI-36-37(092801)DL).

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,1,2,2-Tetrachloroethane. Associated samples RFI-81-03(092501), 87-FP5(092601), and RFI-83/84-02(100101) have been qualified as estimated for the compound.

Acetone and Toluene were detected in the method blank. Sample results for these compounds which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below the acceptable limit for Perylene-d12. Associated sample 87-FP5(092601) has been qualified as estimated for compounds associated with Perylene-d12.

The initial calibration %RSD was above the acceptable limit for Benzaldehyde. Associated sample RFI-36-37(092801) has been qualified as estimated for the compound.

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated based on these deviations.

The LCS/LCSD RPD was above the acceptable limit for Benzo(a)anthracene, bis(2-Ethylhexyl)phthalate, and Pyrene. Associated sample RFI-81-03(092501) has been qualified as estimated for the compounds.

The LCS/LCSD RPD was above the acceptable limit for bis(2-Ethylhexyl)phthalate. Associated sample 87-FP5(092601) has been qualified as estimated for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Arsenic and Copper were detected in the method blank. Sample results for these analytes which were below the blank action level have been qualified as non-detect.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 30, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 27, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014718

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014718 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-10-11(100101)	3014718001	Water	10/01/01	x	x	x		x[2]
RFI-10-11d(100101)	3014718002	Water	10/01/01			x	x	
04-140(100101)	3014718003	Water	10/01/01	x	x	x		x[2]
04-140d(100101)	3014718004	Water	10/01/01			x	x	
04-140x(100101)	3014718005	Water	10/01/01				x	
RFI-04-TB-112	3014718006	Water	10/01/01	x				
RFI-10-11x(100101)	3014718007	Water	10/01/01				x	
RFI-85-03(092601)	3014718008	Water	09/26/01	x	x	x		x[2]
RFI-85-03d(092601)	3014718009	Water	09/26/01			x	x	
RFI-86-06S(100201)[1]	3014718010	Water	10/02/01	x	x	x		x[2]
RFI-86-06Sd(100201)[1]	3014718011	Water	10/02/01			x	x	
RFI-36-TB-113	3014718012	Water	10/02/01	x				
RFI-36-14(100201)	3014718013	Water	10/02/01	x	x	x		x[2]
RFI-36-14d(100201)	3014718014	Water	10/02/01			x	x	
RFI-36-14x(100201)	3014718015	Water	10/02/01				x	
RFI-36-DUP-110[3]	3014718016	Water	10/02/01	x	x	x		x[2]
RFI-36-DUP-110d[4]	3014718017	Water	10/02/01				x	
RFI-84-05(100201)	3014718018	Water	10/02/01	x	x	x		x[2]
RFI-84-05d(100201)	3014718019	Water	10/02/01			x	x	
RFI-36-29(100301)	3014718020	Water	10/03/01	x				

1 MS/MSD analysis performed on sample
2 Hg and Cyanide analysis performed on sample
3 Duplicate analysis performed on sample RFI-36-14(100201)
4 Duplicate analysis performed on sample RFI-36-14d(100201)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,1,2,2-Tetrachloroethane, associated samples RFI-10-11(100101), 04-140(100101), RFI-86-06S(100201), RFI-36-14(100201), RFI-36-DUP-110, RFI-84-05(100201), and RFI-36-29(100301); a decrease in response by Tetrachloroethene, associated samples RFI-04-TB-112 and RFI-36-TB-113. Sample results have been qualified as estimated for the compounds.

The LCS %R was below the acceptable limit for 1,1,1-Trichloroethane. Associated samples RFI-04-TB-112 and RFI-36-TB-113 have been qualified as estimated for the compound.

Acetone and Toluene were detected in the method blank. Sample results for these compounds which were below the blank action level have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above acceptable limit due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)		X	
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %R was above the acceptable limit for Antimony. Associated samples 04-140x(100101), RFI-10-11x(100101), and RFI-36-14x(100201) have been qualified as estimated for the analyte.

The MS/MSD %R were above the acceptable limit for Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc in associated samples 04-140x(100101), RFI-10-11x(100101), and RFI-36-14x(100201). Detected results for the above analytes have been qualified as estimated, in associated samples, based on the deviations.

Arsenic and Copper were detected in the method blank. Sample results for these analytes which were below the blank action level have been qualified as non-detect.

Antimony, Selenium, Silver, Arsenic, and Chromium were detected in the instrument blank. Sample results for these analytes which were below the blank action level have been qualified as non-detect.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 30, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	November 28, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3014784

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3014784 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-09-13(100301)	3014784001	Water	10/3/01	x				
RFI-09-13d(100301)[1]	3014784002	Water	10/3/01					x
RFI-09-14(100301)	3014784003	Water	10/3/01	x				
RFI-09-14d(100301)	3014784004	Water	10/3/01					x
RFI-10-11x(100301)	3014784005	Water	10/3/01					x
11-140(092801)	3014784006	Water	9/28/01	x	x	x		x
RFI-09-TB-114	3014784007	Water	10/3/01	x				
11-140d(092801)	3014784008	Water	9/28/01			x		x
RFI-17-02x(100301)	3014784009	Water	10/3/01				x	
RFI-17-02(100301)	3014784010	Water	10/3/01	x	x	x		x
RFI-17-02d(100301)	3014784011	Water	10/3/01					x
RFI-81-21(100401)	3014784012	Water	10/4/01	x				
RFI-36-02(100401)	3014784013	Water	10/4/01	x	x	x		x
RFI-36-02d(100401)	3014784014	Water	10/4/01					x
RFI-36-TB-115	3014784015	Water	10/4/01	x				
NORTH PT-03	3014784016	Water	10/4/01	x	x	x	x	x
RFI-36-24(100501)	3014784017	Water	10/5/01	x	x	x		x
RFI-36-24d(100501)	3014784018	Water	10/5/01					x
RFI-36-31(100501)	3014784019	Water	10/5/01	x	x	x		x
RFI-36-31d(100501)	3014784020	Water	10/5/01					x
RFI-36-TB-116	3014784021	Water	10/5/01	x				
RFI-09-13(100301)DL	3014784022	Water	10/5/01	x				
RFI-36-24(100501)DL	3014784022	Water	10/5/01	x				

[1] MS/MSD analysis performed on sample (metals only).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,1,2,2-Tetrachloroethane, associated sample 11-140(092801); Tetrachloroethene, associated samples RFI-09-13(100301), RFI-09-14(100301), RFI-17-02(100301), RFI-81-21(100401), RFI-36-02(100401), North PT-03, RFI-36-24(100501), and RFI-36-31(100501). The sample results have been qualified as estimated for the compounds.

Sample RFI-09-13(100301) contained Benzene and Cyclohexane above the linear range. Sample RFI-36-24(100501) contained cis-1,2-Dichloroethene above the linear range. The samples were diluted and re-analyzed. The values for those analytes have been reported from the dilution analyses.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Sample 11-140(092801) was analyzed outside of the prescribed holding time. The sample results have been qualified as estimated.

The continuing calibration %D was above the acceptable limit due to a decrease in response for 3&4-Methyl Phenol. Water samples have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)			X
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Samples 11-140(092801) and 11-140d(092801) were analyzed outside of the prescribed holding time. The sample results have been qualified as estimated.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration for the TKN analysis of sample North PT-03 was above control limit. The sample result has been qualified as estimated based on the deviation.

The MS/MSD %Rs for Barium were less than or equal to 25%. Dissolved samples have been rejected for the analyte based on the deviations.

The MS/MSD %Rs were below control limits for Beryllium, Chromium, Copper, Silver, and Zinc. Associated samples 11-140d(092801), RFI-17-02d(100301), RFI-36-02d(100401), RFI-36-24d(100501), and RFI-36-31d(100501) have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %R were above control limits. Detected results in associated samples RFI-17-02x(100301) and North PT-03 have been qualified as estimated based on these deviations.

Other than for the deviations noted in this review, the data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	October 29, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	November 29, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3015162

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3015162 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
81-02(101301)	3015162001	Water	10/13/01	x	x	x		x
81-02d(101301)	3015162002	Water	10/13/01			x	x	
84-2(101701)[1]	3015162003	Water	10/17/01	x	x	x		x
84-2d(101701)[2]	3015162004	Water	10/17/01			x	x	
84-6(101701)	3015162005	Water	10/17/01	x	x	x		x
84-6d(101701)	3015162006	Water	10/17/01			x	x	
RFI-85-05(101801)	3015162007	Water	10/18/01	x	x	x		x
RFI-85-05d(101801)	3015162008	Water	10/18/01				x	x
84-dup-112(101701)	3015162009	Water	10/17/01	x	x	x		x
84-dup-112d(101701)	3015162010	Water	10/17/01			x	x	
RFI-85-TB-117	3015162011	Water	NS	x				
83/84-06(101601)NL[3]	3015162012	Liquid	10/16/01	x	x	x	x	x

[1] MS/MSD analysis performed on sample (VOC, SVOC, PCB, Mercury and Cyanide).
[2] MS/MSD analysis performed on sample (PCB, Metals, Mercury and Cyanide).
[3] MS/MSD analysis performed on sample (VOC, PCB, Metals, Mercury and Cyanide).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,2,4-Trichlorobenzene and cis-1,2-Trichloroethene. Associated samples 81-02(10-1301), 84-2(101701), 84-6(101701), RFI-85-05(101801), and 84-dup-112(101701) have been qualified as estimated for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration RSD was above the acceptable limit for Naphthalene. Associated sample 83/84-06(101601)NL has been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde and 3&4-Methylphenol, associated samples 81-02(10-1301), 84-2(101701), 84-6(101701), RFI-85-05(101801), and 84-dup-112(101701); 3&4-Methylphenol, 2-4-Dinitrophenol, and Atrazine, associated sample 83/84-06(101601). The sample results have been qualified as estimated for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD RPD was outside acceptance limits for Aroclor-1248. Associated sample 83/84-06(101601)NL has been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD RPD values were outside acceptance limits for all analytes except Mercury and Zinc. Detected results in associated sample 83/84-06(101601)NL have been qualified as estimated for the analytes.

Other than for the deviations noted in this review, the data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	November 9, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	November 29, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3015453

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3015453 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
20-101R(00-1.2)	3015453001	Water	11/5/01	x	x	x	x	x
20-101R(07-09)	3015453002	Water	11/5/01	x	x	x	x	x
43-101R(0.5-02)	3015453003	Water	11/5/01	x	x	x	x	x
43-101R(08-10)[7]	3015453004	Water	11/5/01	x	x	x	x	x
RFI-21-RB-150[4]	3015453005	Water	11/6/01	x	x	x	x	x
RFI-21-04(0.7-2.7)[2]	3015453006	Water	11/6/01	x	x	x	x	x
RFI-21-04-(6.7-8.7)	3015453007	Water	11/6/01	x	x	x	x	x
RFI-21-04(10.7-12.7)[1]	3015453008	Water	11/6/01	x	x	x	x	x
RFI-85-07(0.5-2.5)	3015453009	Water	11/7/01	x	x	x	x	x
RFI-85-07(08-10)	3015453010	Water	11/7/01	x	x	x	x	x
RFI-85-07(11-13)	3015453011	Water	11/7/01	x	x	x	x	x
RFI-85-RB-151[3]	3015453012	Water	11/7/01	x	x	x	x	x
RFI-10-07(01-03)	3015453013	Water	11/9/01	x	x	x	x	x
RFI-10-07(07-09)	3015453014	Water	11/9/01	x	x	x	x	x
RFI-109-DUP-200[8]	3015453015	Water	11/9/01	x	x	x	x	x
RFI-36-13(110901)[5]	3015453016	Water	11/9/01	x	x	x	x	x
RFI-36-13d(110901)[6]	3015453017	Water	11/9/01			x	x	x
RFI-36-TB-120	3015453018	Water	11/9/01	x				
Rinse Water	3015453019	Water	11/9/01	x	x	x	x	x
RFI-101R(0.5-02)	3015453020	Water	11/5/01	x	x			
RFI-101R(08-10)	3015453022	Water	11/5/01		x			
RFI-21-04(0.7-2.7)	3015453023	Water	11/6/01		x			
RFI-85-07(0.5-2.5)	3015453024	Water	11/7/01		x			
RFI-85-07(11-13)	3015453025	Water	11/7/01		x			
RFI-109-DUP-200	3015453027	Water	11/9/01		x			

1 MS/MSD analysis performed on sample (VOC).
2 MS/MSD analysis performed on sample (SVOC, PCB, Metals, Cyanide).
3 MS/MSD analysis performed on sample (SVOC).
4 MS/MSD analysis performed on sample (SVOC).
5 MS/MSD analysis performed on sample (Metals, Cyanide).
6 MS/MSD analysis performed on sample (Metals).
7 MS/MSD analysis performed on sample (Cyanide).
8 Field duplicate of sample RFI-10-07(07-09).

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Toluene was detected in the rinse blank. Sample results less than the blank action level have been qualified as non-detected.

The continuing calibration %D was above the acceptable limit due to a decrease in by Chloroethane, Acetone, Methyl Acetate, and Tetrachloroethene, associated samples (20-101R(00-1.2), 20-101R(07-09), 20-101R(0.5-02), 20-101R(08-10), RFI-21-04(0.7-2.7), RFI-21-04(6.7-8.7), RFI-85-07(0.5-2.5), RFI-85-07(08-10), RFI-10-07(01-03), RFI-10-07(07-09), and RFI-109-Dup-200; Acetone, associated samples RFI-21-04 (10.7-12.7) and RFI-85-07(11-13); Tetrachloroethene, associated samples RFI-21-RB-150, RFI-36-13(110901) and RFT036-TB-120. The sample results have been qualified as estimated for the compounds.

Sample RFI-85-07(11-13) contained Cyclohexane, Methyl Cyclohexane and P&M-Xylene above the linear range. The sample was diluted and re-analyzed. The values for those analytes have been reported from the dilution analysis.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)			X
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)		X	
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R were below acceptance criteria for Carbazole. Associated sample RFI-21-04(0.7-2.7) has been qualified as estimated for the compound.

The MS/MSD RPD values were outside acceptance criteria for Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, bis(2-Ethylhexyl)phthalate, Carbazole, Chrysene, Dibenzofuran, Flouranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, and Pyrene. Detected results in associated sample RFI-21-04(07-2.7) have been qualified as estimated for the compounds.

The MS/MSD %R were 0% for 2,4-Dinitrophenol. 2-methyl-4,6-dinitrophenol and Hexachlorocyclopentadiene. The results for those compounds have been rejected based on the deviations.

The field duplicate RPD between sample RFI-10-07(07-09) and duplicate RFI-10-DUP-200 were

above acceptance criteria for Acenaphthene, Dibenzofuran, Fluorene, and Naphthalene. The sample results for those analytes have been qualified as estimated.

Fluoranthene and Pyrene exceeded the linear range in sample RFI-10-DUP-200. The sample was diluted and re-analyzed. The results for those compounds have been reported from the dilution analysis.

The following internal standards were below acceptance criteria: Perylene-d12, associated samples 43-101R(0.5-02), 43-101R(08-10), RFI-21-04(0.7-2.7), and RFI-10-DUP-200; Chrysene-d12 and Perylene-d12, associated sample RFI-85-07(0.5-2.5). The samples were confirmed by re-analysis with the primary analysis values being reported (with the exception of sample 43-101R(0.5-02)RE). Samples have been qualified as estimated for compounds associated with the internal standards.

The initial calibration %RSD was above acceptance criteria for Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, and Benzo(g,h,i)perylene. Associated sample RFI-10-DUP-200 has been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methyl Phenol and 4-Nitrophenol, associated samples Rinse Water, RFI-36-13(110901), RFI-21-RB-150, RFI-21-04(10.7-12.7), 20-101R(07-09), RFI-21-04(6.7-8.7), and RFI-85-07(11-13); 3&4-Methylphenol, associated samples 43-101R(08-10), RFI-85-07(0.5-2.5), RFI-85-07(08-10), RFI-85-RB-151, RFI-10-07(01-03), RFI-10-DUP-200, RFI-10-07(07-09), 20-101R(00-1.2), 43-101R(0.5-02)RE, and RFI-21-04(0.7-2.7). Sample results have been qualified as estimated for the compounds based on the deviations

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD RPD was outside acceptance criteria for Aroclor-1260 in sample RFI-21-04(0.7-2.7). The sample result has been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)			X
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %R were above acceptance criteria for Selenium, associated sample RFI-21-RB-150; Antimony, Cadmium, and Selenium, associated sample RFI-36-13(110901); Mercury, associated samples 20-101R(00-1.2), 20-101R(07-09), 20-101R(0.5-02), 20-101R(08-10), RFI-21-04(0.7-2.7), RFI-21-04(6.7-8.7), RFI-21-04(10.7-12.7), RFI-85-07(0.5-2.5), RFI-85-07(08-10), RFI-85-07(11-13), (RFI-10-07(01-03), RFI-10-07(01-03), RFI-10-07(07-09), and RFI-109-Dup-200. Detected results have been qualified as estimated for the analytes.

The MS/MSD %R were below control limits for Antimony, Barium, Chromium, Copper, Nickel, Silver, and Zinc. Associated samples 20-101R(00-1.2), 20-101R(07-09), 20-101R(0.5-02), 20-101R(08-10), RFI-21-04(0.7-2.7), RFI-21-04(6.7-8.7), RFI-21-04(10.7-12.7), RFI-85-07(0.5-2.5), RFI-85-07(08-10), RFI-85-07(08-10), RFI-85-07(08-10), RFI-10-07(01-03), RFI-10-07(01-03), RFI-10-07(07-09), and RFI-109-Dup-200) have been qualified as estimated for the analytes based on these deviations.

Other than for the deviations noted in this review, the data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	December 4, 2001
Validation performed by:	(Daniel Beacham)
Date of Validation:	January 22, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3015594

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3015594 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-40-RB-152	3015594001	Water	11/13/01	x	x	x	x	
Trip Blank	3015594002	Water	11/13/01	x				
RFI-40-303R (01-03)	3015594003	Solid	11/12/01	x	x	x	x	
RFI-40-303R (08-10)	3015594004	Solid	11/12/01	x	x	x	x	
RFI-40-30R (2.7-2.9)	3015594005	Solid	11/12/01	x	x	x	x	
RFI-40-04R (01-03)	3015594006	Solid	11/13/01	x	x	x	x	
RFI-40-04R (08-10)[1]	3015594007	Solid	11/13/01	x	x	x	x	
RFI-40-04R (13-15)	3015594008	Solid	11/13/01	x	x	x	x	
RFI-40-04R (15-17)	3015594009	Solid	11/13/01	x	x	x	x	
RFI-40-DUP-201[2]	3015594010	Solid	11/13/01	x	x	x	x	
RFI-40-04R (15-17)DL	3015594011	Solid	11/13/01	x				

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample RFI-40-04R (01-03)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Sample RFI-40-04R (15-17) contained P&M-Xylene above the linear range. Data for the compound has been replaced with data from the dilution analysis.

The initial calibration %RSD was above the acceptable limit for Acetone. Associated samples RFI-40-303R (01-03), RFI-40-04R (01-03), RFI-40-04R (13-15), RFI-40-04R (15-17), and RFI-40-DUP-201 have been qualified as estimated for the compound based on this deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 1,1,1,2-Tetrachloroethane, associated samples RFI-40-RB-152 and Trip Blank; a decrease in response by Bromomethane, Acetone, Methyl acetate, and Tetrachloroethene, associated samples RFI-40-303R (08-10), RFI-40-30R (2.7-2.9), RFI-40-04R (08-10), RFI-40-04R (13-15), and RFI-40-04R (15-17). Sample results have been qualified as estimated for the compounds based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above the acceptable limit for Indeno(1,2,3-cd)pyrene. Associated sample RFI-10-04R (13-15) has been qualified as estimated for the compound.

The initial calibration %RSD was above the acceptable limit for Benzo(g,h,i)perylene. Associated samples RFI-40-RB-152, RFI-40-04R (08-10), and RFI-40-04R (13-15) have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, associated sample RFI-40-RB-152; a decrease in response by Biphenyl and Atrazine, associated sample RFI-40-303R (01-03). Sample results have been qualified as estimated for the

compounds, based on these deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were below the acceptable limit for Manganese and Cyanide. Associated sample RFI-40-RB-152 has been qualified as estimated for the analytes.

The MS/MSD %Rs were below 30% for Antimony. Associated samples RFI-40-303R (01-03), RFI-40-303R (08-10), RFI-40-30R (2.7-2.9), RFI-40-04R (01-03), RFI-40-04R (08-10), RFI-40-04R (13-15), RFI-40-04R (15-17), and RFI-40-DUP-201 have been qualified as rejected for the analyte.

The MS/MSD %Rs were above the acceptable limit for Zinc. Associated samples RFI-40-303R (01-03), RFI-40-303R (08-10), RFI-40-30R (2.7-2.9), RFI-40-04R (01-03), RFI-40-04R (08-10), RFI-40-04R (13-15), RFI-40-04R (15-17), and RFI-40-DUP-201 have been qualified as estimated for the analyte.

The MS/MSD %Rs were above the acceptable limit for Barium. Associated sample RFI-40-RB-152

has been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	December 10, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	January 21, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3015666

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3015666 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-05-TB-121	3015666001	Water	11/15/01	x				
20-101R (111501)	3015666002	Water	11/15/01	x	x	x	x	
20-101Rd (111501)	3015666003	Water	11/15/01			x	x	
43-101R (111501)	3015666004	Water	11/15/01	x	x	x	x	
43-101Rd (111501)	3015666005	Water	11/15/01			x	x	
RFI-21-04 (111901)	3015666006	Water	11/19/01	x	x	x	x	
RFI-21-04d (111901)	3015666007	Water	11/19/01			x	x	
RFI-85-07 (111901)	3015666008	Water	11/19/01	x	x	x	x	
RFI-85-07d (111901)	3015666009	Water	11/19/01			x	x	
RFI-10-07 (11/20/01)	3015666010	Water	11/20/01	x	x	x	x	
RFI-10-07d (11/20/01)	3015666011	Water	11/20/01			x	x	
RFI-40-RB-153	3015666012	Water	11/20/01	x	x	x	x	
40-7R (00-02)	3015666013	Solid	11/20/01	x	x	x	x	
RFI-40-07R (02-04)	3015666014	Solid	11/20/01	x	x	x	x	
RFI-40-07R (08-10)	3015666015	Solid	11/20/01	x	x	x	x	
RFI-40-07R (12-14)	3015666016	Solid	11/20/01	x	x	x	x	
20-101R (111501)DL	3015666017	Water	11/15/01	x				
RFI-40-07R (12-14)DL	3015666018	Solid	11/20/01	x				
RFI-40-07R (00-02)RE	3015666019	Solid	11/20/01		x			

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Sample 20-101R (111501) contained 1,1,1-Trichloroethane, 1,1-Dichloroethane, Chloroethane, and Vinyl chloride above the linear range. Data for the compounds have been replaced with data from the dilution analysis.

Sample RFI-40-07R (12-14) contained Methyl Cyclohexane above the linear range. Data for the compound has been replaced with data from the dilution analysis.

The initial calibration %RSD was above the acceptable limit for Acetone, associated samples 40-7R (00-02), RFI-40-07R (02-04), RFI-40-07R (08-10), and RFI-40-07R (12-14); Chloroethane, associated sample 20-101R (111501); 1,1-Dichloroethene, associated samples 20-101R (111501), RFI-85-07 (111901), and RFI-10-07 (11/20/01); Bromomethane, Methyl Tert Butyl Ether, and trans-1,2-Dichloroethene, associated samples RFI-05-TB-121, 20-101R (111501), RFI-21-04 (111901), RFI-85-07 (111901), RFI-10-07 (11/20/01), and RFI-40-RB-153. Associated samples have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Bromomethane and Chloroethane. Water samples have been qualified as estimated for the compounds based on these deviations.

The continuing calibration %D was above the acceptable limit for 1,1,2,2-Tetrachloroethane. Associated sample 43-101R (111501) has been qualified as estimated for the compound based on the deviation.

One surrogate recovery was above control limits for sample RFI-40-07R (12-14). Detected results for the sample have been qualified as estimated based on the deviation.

The MS/MSD RPD was above control limits for Methyl Tert Butyl Ether and trans-1,2-Dichloroethene. Associated sample 20-101R (111501) has been qualified as estimated for the compounds based on the deviations.

The MS/MSD %R was below control limits for Chloroethane. Associated sample 20-101R (111501) has been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below control limits for Perylene-d12. Associated sample 40-7R (00-02) has been qualified as estimated for all compounds associated with Perylene-d12.

The initial calibration %RSD was above the acceptable limit for Benzo(g,h,i)perylene. Water samples have been qualified as estimated for the compound.

The initial calibration %RSD was above the acceptable limit for Indeno(1,2,3-cd)pyrene, associated samples RFI-21-04 (111901), RFI-85-07 (111901), RFI10-07 (11/20/01), and RFI-40-RB-153; Acenaphthene, associated samples 40-7R (00-02) and RFI-40-07R (12-14). Samples have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compound.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Benzaldehyde, associated samples 20-101R (111501) and 43-101R (111501); a decrease in response by Atrazine, associated samples 40-7R (00-02), RFI-40-07R (02-04), RFI-40-07R (08-10), and RFI-40-07R (12-14). Sample results have been qualified as estimated for the compounds, based on these deviations.

The MS/MSD %Rs were below 10% for 2,4-Dinitrophenol, 4,6-Dinitro-2-methylphenol, and Hexachlorocyclopentadiene. Data for sample 40-7R (00-02) has been qualified as rejected for the compounds, based on the deviations.

The MS/MSD %Rs were below control limits for Carbazole. Sample 40-7R (00-02) has been qualified as estimated for the compound, based on the deviation.

The MS/MSD RPD was above control limits for Naphthalene. Sample 40-7R (00-02) has been qualified as estimated for the compound, based on the deviation.

Di-n-butylphthalate and Diethyl phthalate were detected in the rinse blank. Sample results which contained the compounds below the blank action level have been qualified as non-detect for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD RPD was above control limits for Aroclor 1260. Associated sample 40-7R (00-02) has been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below control limits for Chromium and Lead. Associated samples 40-7R (00-02), RFI-40-07R (02-04), RFI-40-07R (08-10), and RFI-40-07R (12-14) have been qualified as estimated for the analytes.

The MS/MSD %Rs were below 30% for Antimony. Associated samples 40-7R (00-02), RFI-40-07R (02-04), RFI-40-07R (08-10), and RFI-40-07R (12-14) were non-detect for the analyte and have been qualified as rejected for the analyte.

The MS/MSD %Rs were above control limits for Barium. Associated samples 40-7R (00-02), RFI-40-07R (02-04), RFI-40-07R (08-10), and RFI-40-07R (12-14) have been qualified as estimated for the analyte.

The MS/MSD %Rs were below the acceptable limit for Antimony, Barium, Beryllium, Cadmium,

Chromium, Copper, Manganese, Silver, Thallium, and Zinc. Associated samples 20-101R (111501), 43-101R (111501), RFI-21-04 (111901), RFI-85-07 (111901), RFI-10-07 (11/20/01), and RFI-40-RB-153 have been qualified as estimated for the analytes.

The MS/MSD %Rs were below the acceptable limit for Manganese. Associated samples 20-101Rd (111501), 43-101Rd (111501), RFI-21-04d (111901), RFI-85-07d (111901), and RFI-10-07d (11/20/01) have been qualified as estimated for the analyte.

Chromium, Copper, Lead, Nickel, Selenium, and Zinc were detected in the rinse blank. Samples which contained these analytes below the blank action level have been qualified as non-detect for the analytes.

Arsenic was detected in the instrument blank. Samples which contained this analyte below the blank action level have been qualified as non-detect for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	December 17, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	January 23, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3015742

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3015742 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC[1]
40-4R (112101)	3015742001	Water	11/21/01	x	x	x	x	
40-4Rd (112101)	3015742002	Water	11/21/01			x	x	
RFI-40-TB-123	3015742003	Water	11/21/01	x				
RFI-86-10 (6.5-8.5)	3015742004	Soil	11/21/01					x
RFI-86-11 (0.7-2.7)	3015742005	Soil	11/21/01					x
RFI-86-11 (2.7-4.7)	3015742006	Soil	11/21/01					x
RFI-86-13 (0.8-2.8)	3015742007	Soil	11/21/01					x
RFI-86-13 (2.8-4.8)	3015742008	Soil	11/21/01					x
RFI-86-12 (0.8-2.8)	3015742009	Soil	11/21/01					x
RFI-86-12 (2.8-4.8)	3015742010	Soil	11/21/01					x
RFI-44-09 (0.9-2.9)	3015742011	Soil	11/21/01					x
RFI-44-RB-154	3015742012	Water	11/21/01	x	x	x	x	
20-105R (01-03)	3015742013	Soil	11/21/01	x	x	x	x	
20-105R (07-09)	3015742014	Soil	11/21/01	x	x	x	x	
RFI-20-DUP-202[2]	3015742015	Soil	11/21/01	x	x	x	x	
RFI-05-22 (04-06)	3015742016	Soil	11/26/01	x	x	x	x	
RFI-05-23 (04-06)	3015742017	Soil	11/26/01	x	x	x	x	
RFI-05-RB-155	3015742018	Water	11/26/01	x	x	x	x	
RFI-05-24 (01-03)	3015742019	Soil	11/26/01					x
RFI-05-24 (03-05)	3015742020	Soil	11/26/01					x
RFI-05-22 (0.5-2.5)	3015742021	Soil	11/26/01					x
RFI-05-23 (1.3-03)	3015742022	Soil	11/26/01					x
40-4R (112101) DL	3015742023	Soil	11/21/01	x				
RFI-05-22 (04-06) DL	3015742024	Soil	11/26/01		x			

1 Single metal analysis performed on sample
2 Duplicate analysis performed on sample 20-105R (07-09)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Sample 40-4R (112101) contained Benzene, Cyclohexane, Ethylbenzene, Methyl Cyclohexane, o-Xylene, and m&p-Xylene above the linear range. Data for the listed compounds have been replaced with data from the dilution analysis.

The initial calibration %RSD was above the acceptable limit for Acetone. Associated samples RFI-20-105 (01-03), RFI-20-105R (07-09), RFI-10-DUP-202, RFI-05-22 (04-06), and RFI-05-23 (04-06) have been qualified as estimated, based on the deviations.

Acetone and 2-Butanone were detected in the trip, rinse and method blanks. Sample results which were below the blank action level for these compounds have been qualified as non-detected.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below control limits for Perylene-d12. Associated samples 20-105R (01-03) and RFI-05-22 (04-06) have been qualified as estimated for all compounds associated with Perylene-d12.

The initial calibration %RSD was above the acceptable limit for Indeno(1,2,3-cd)pyrene and Benzo(g,h,i)perylene. Associated samples RFI-44-RB-154, 20-105R (01-03), RFI-05-RB-155, and RFI-05-22 (04-06) DL have been qualified as estimated for the compounds.

The initial calibration %RSD was above the acceptable limit for Dibenzo(a,h)anthracene. Associated samples 20-105R (01-03), RFI-05-23 (04-06), and RFI-05-22 (04-06) DL have been qualified as estimated for the compounds.

The continuing calibration %D was above the acceptable limit due to a decrease in response by

Benzaldehyde and Benzo(g,h,i)perylene, associated samples RFI-44-RB-154 and RFI-05-RB-155; a decrease in response by Atrazine, associated samples 40-4R (112101), 20-105R (07-09), and RFI-20-DUP-202; a decrease in response by 4-Chloroaniline, 2,4-Dinitrophenol, 3-Nitroaniline, 4-Nitroaniline, and Carbazole, associated samples 20-105R (07-09) and RFI-20-DUP-202. Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol. Data have been qualified as estimated for the compound based on the deviations.

Bis(2-Ethylhexyl)phthalate was detected in the rinse blanks. Sample results which were below the blank action level have been qualified as non-detect for the compound.

Retention times of internal standards for samples 20-105R (07-09), RFI-20-DUP-202, and RFI-05-22 (04-06) were not within the 30 second window of the associated initial midpoint calibration standard. None of the data was qualified due to this deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below control limits for Antimony, Beryllium, Barium, Cadmium, Manganese, Chromium, Copper, Silver, Thallium, and Zinc. Associated samples 40-4R (112101), RFI-44-RB-154, and RFI-05-RB-155 have been qualified as estimated for the listed analytes.

The MS/MSD %Rs were below control limits for Chromium, Beryllium, Nickel, and Antimony, associated samples 20-105R (01-03), 20-105R (07-09), RFI-20-DUP-202, RFI-05-22 (04-06), and RFI-05-23 (04-06). Positive data have been qualified as estimated for all analytes and non-detect data have been qualified as rejected for Antimony only.

The MS/MSD RPD was below control limits for Cadmium, Thallium, and Vanadium. Associated samples 20-105R (01-03), 20-105R (07-09), RFI-20-DUP-202, RFI-05-22 (04-06), and RFI-05-23 (04-06) have been qualified as estimated for the analytes.

The MS/MSD %R were below the acceptable limit for Manganese. Associated sample 40-4Rd (112101) has been qualified as estimated for the analyte.

The MS/MSD %Rs were below the acceptable limit for Cyanide. Associated samples 20-105R (01-03), 20-105R (07-09), RFI-20-DUP-202, and RFI-05-22 (04-06) have been qualified as estimated for the analyte.

Selenium was detected in the instrument blank and Chromium, Cobalt, Copper, Lead, Nickel, Vanadium, and Zinc were detected in the rinse blanks. Samples which contained these analytes below the blank action level have been qualified as non-detect for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	December 20, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	March 7, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3015823

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3015823 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC[1]
RFI-09-04R (112801)[4]	3015823001	Water	11/28/01	x	x	x	x	
RFI-09-04Rd (112801)[4]	3015823002	Water	11/28/01			x	x	
RFI-09-DUP-113[2]	3015823003	Water	11/28/01	x	x	x	x	
RFI-09-DUP-113d[3]	3015823004	Water	11/28/01			x	x	
RFI-09-TB-124	3015823005	Water	11/28/01	x				
RFI-12-21 (01-03)	3015823006	Water	11/28/01	x	x	x	x	
RFI-12-21 (09-11)	3015823007	Soil	11/28/01	x	x	x	x	
RFI-12-RB-156	3015823008	Water	11/28/01	x	x	x	x	
RFI-03-05 (0.5-2.5)	3015823009	Soil	11/29/01					x
RFI-03-07 (01-03)	3015823010	Soil	11/29/01					x
RFI-03-08 (0.5-2.5)	3015823011	Soil	11/29/01					x
RFI-03-06 (0.5-2.5)[4]	3015823012	Soil	11/29/01					x
RFI-10-20 (00-02)	3015823013	Soil	11/29/01					x
RFI-10-22 (00-02)	3015823014	Soil	11/29/01					x
RFI-10-21- (00-02)	3015823015	Soil	11/29/01					x
RFI-10-DUP-203	3015823016	Soil	11/29/01					x
BD01-02 (00-02)	3015823017	Soil	11/30/01	x	x	x	x	
BD01-02 (08-10)	3015823018	Soil	11/30/01	x	x	x	x	
BD01-02 (12-14)	3015823019	Soil	11/30/01	x	x	x	x	
BD01-02 (113001)	3015823020	Water	11/30/01	x	x	x	x	
BD01-02d (113001)	3015823021	Water	11/30/01			x	x	
BD01-TB-01	3015823022	Water	11/30/01	x				
RFI-10-RB-157	3015823023	Water	11/30/01	x	x	x	x	
RFI-10-17 (01-03)	3015823024	Soil	11/30/01					x
RFI-10-17 (03-05)	3015823025	Soil	11/30/01					x
RFI-10-19 (02-04)	3015823026	Soil	11/30/01					x
RFI-10-19 (04-06)	3015823027	Soil	11/30/01					x
RFI-10-18 (1.3-3.3)	3015823028	Soil	11/30/01	x	x	x	x	
RFI-10-18 (3.3-5.3)	3015823029	Soil	11/30/01	x	x	x	x	
RFI-10-23 (00-02)	3015823030	Soil	11/30/01					x
RFI-05-25 (00-02)	3015823031	Soil	11/30/01	x	x	x	x	
RFI-12-21 (01-03) RE	3015823032	Soil	11/28/01		x			
RFI-10-18 (1.3-3.3) RE	3015823033	Soil	11/30/01		x			
RFI-10-18 (3.3-5.3) RE	3015823034	Soil	11/30/01		x			
RFI-05-25 (00-02) RE	3015823035	Soil	11/30/01		x			

1 Single metal analysis performed on sample
2 Duplicate analysis performed on sample RFI-09-04R (112801)
3 Duplicate analysis performed on sample RFI-09-04Rd (112801)
4 MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to an increase in Acetone, associated samples RFI-09-04R (112801), RFI-09-DUP-113, RFI-09-TB-124, RFI-12-RB-156, BD01-02 (113001), BD01-TB-01, and RFI-10-RB-157; an increase in Dichlorodifluoromethane, associated sample RFI-12-21 (01-03). Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was below control limits due to a decrease in response by Acetone. Associated samples RFI-12-21 (01-03), RFI-12-21 (09-11), BD01-02 (00-02), BD01-02 (08-10), BD01-02 (12-14), RFI-10-18 (1.3-3.3), RFI-10-18 (3.3-3.5), and RFI-05-25 (00-02) have been qualified as estimated for the compound based on the deviations.

Acetone was detected in the trip, rinse and method blanks. Sample results which were below the blank action level have been qualified as non-detect for Acetone based on the blank contents.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below control limits for Chrysene-d12 and Perylene-d12. Associated samples RFI-10-18 (1.3-3.3) RE, RFI-10-18 (3.3-5.3) RE, and RFI-05-25 (00-02) RE have been qualified as estimated or rejected for all compounds associated with Perylene-d12 and Chrysene-d12, depending on the severity of the deviation.

The initial calibration %RSD was above the acceptable limit for Benzaldehyde. Associated samples RFI-12-RB-156, BD01-02 (08-10), BD01-02 (113001), and RFI-10-RB-157 have been qualified as estimated for the compounds.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol, associated samples RFI-09-04R (112801), RFI-09-DUP-113, RFI-12-21 (01-03), RFI-12-RB-156, BD01-02 (00-02), BD01-02 (12-14), BD01-02 (113001), RFI-10-RB-157, RFI-10-18 (1.3-3.3) RE, RFI-10-18 (3.3-5.3) RE, and RFI-05-25 (00-02) RE; a decrease in response by Benzaldehyde, associated samples RFI-12-21 (09-11) and BD01-02 (08-10). Data have been

qualified as estimated for the compounds based on the deviations.

Recoveries for two acid surrogates were below 10% in sample RFI-12-21 (01-03). Positive results have been qualified as estimated and non-detect results have been qualified as rejected for all acid compounds in the sample.

The LCS/LCSD %R were above control limits for 2-Methyl naphthalene, Acenaphthene, Acenaphthylene, Biphenyl, bis(2-Chloroethyl)ether, Diethyl phthalate, Dibenzofuran, Fluorene, Isophorone, and Nitrobenzene. Associated sample RFI-12-RB-156 has been qualified as estimated for the analytes.

The LCS/LCSD %R were above control limits for bis(2-Chloroethoxy)methane, N-Nitrosodi-n-propylamine, and Hexachlorobutadiene, associated sample RFI-12-RB-156; Naphthalene, associated sample RFI-09-DUP-113; Diethyl phthalate, associated sample RFI-10-RB-157; Caprolactam, associated sample BD01-02 (113001). Data have been qualified as estimated for the compounds.

The LCS/LCSD %R were below 10% for 3,3-Dichlorobenzidine. Associated samples RFI-09-04R (112801), RFI-09-DUP-113, RFI-12-RB-156, BD01-02 (113001), and RFI-10-RB-157 were non-detect and have been qualified as rejected for the compound.

2-Methyl naphthalene, Acenaphthene, Acenaphthylene, Biphenyl, bis(2-Chloroethyl)ether, Dibenzofuran, Diethyl phthalate, Fluorene, Hexachlorobutadiene, Isophorone, Naphthalene, and Nitrobenzene were detected in the rinse blanks. Sample results which were below the blank action level for the listed compounds have been qualified as non-detect.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS/LCSD RPD was above control limits for Aroclor 1248. Associated sample RFI-12-RB-156 has been qualified as estimated for the analyte.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %R was below control limits for Beryllium. Associated samples RFI-12-21 (01-03), RFI-12-21 (09-11), BD01-02 (00-02), BD01-02 (08-10), BD01-02 (12-14), and RFI-10-18 (1.3-3.3) have been qualified as estimated for the analyte based on the deviation.

The MS/MSD %Rs were below control limits for Beryllium, Selenium, Chromium, Nickel, and Zinc. Associated samples RFI-12-21 (01-03), RFI-12-21 (09-11), BD01-02 (00-02), BD01-02 (08-10), BD01-02 (12-14), RFI-10-18 (1.3-3.3), RFI-10-18 (3.3-5.3), and RFI-05-25 (00-02) have been qualified as estimated for the analytes.

The MS/MSD %Rs were below control limits for Antimony. Positive data have been qualified as estimated and non-detect data have been qualified as rejected in associated samples RFI-12-21 (01-03), RFI-12-21 (09-11), BD01-02 (00-02), BD01-02 (08-10), BD01-02 (12-14), RFI-10-18 (1.3-3.3), RFI-10-18 (3.3-5.3), and RFI-05-25 (00-02).

The MS/MSD %Rs were above control limits for Barium. Associated samples RFI-12-21 (01-03), RFI-12-21 (09-11), BD01-02 (00-02), BD01-02 (08-10), BD01-02 (12-14), RFI-10-18 (1.3-3.3), RFI-10-18 (3.3-5.3), and RFI-05-25 (00-02) have been qualified as estimated for the analyte.

Antimony, Silver, Chromium, Copper, and Zinc were detected in the instrument and rinse blanks. Samples which contained these analytes below the blank action level have been qualified as non-detect for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	December 31, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	March 8, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3015840

TOTAL CHROMIUM AND
HEXAVALENT CHROMIUM ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3015840 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC[1]
RFI-36-36R (01-03)	3015840001	Soil	11/29/01					x
RFI-36-41 (01-03)	3015840002	Soil	11/29/01					x
RFI-36-42 (0.1-1.5)	3015842003	Soil	11/29/01					x

1 Chromium and Hexavalent Chromium analysis performed on sample

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	December 18, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	March 11, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3015886

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
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Summary

The following is an assessment of data package 3015886 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC[1]
BD01-03 (0.4-2.4)	3015886001	Soil	12/03/01	x	x	x	x	x
BD01-03 (8.4-10.4)	3015886002	Soil	12/03/01	x	x	x	x	x
BD01-03 (18.4-20.4)	3015886003	Soil	12/03/01	x	x	x	x	x
BD01-01 (0.4-2.4)	3015886004	Soil	12/03/01	x	x	x	x	
BD01-01 (8.4-10.4)[4]	3015886005	Soil	12/03/01	x	x	x	x	
BD01-01 (22.4-24.4)	3015886006	Soil	12/03/01	x	x	x	x	
BD01-DUP-204[3]	3015886007	Soil	12/03/01	x	x	x	x	
RFI-BD01-01-RB-158	3015886008	Water	12/03/01	x	x	x	x	
RFI-16-20 (01-03)	3015886009	Soil	12/04/01	x	x	x	x	
RFI-16-20 (04-06)	3015886010	Soil	12/04/01	x	x	x	x	
RFI-16-13 (01-03)	3015886011	Soil	12/04/01	x	x	x	x	
RFI-16-13 (09-11)	3015886012	Soil	12/04/01	x	x	x	x	
RFI-16-RB-200	3015886013	Water	12/04/01	x	x	x	x	
83/84-25 (0.7-2.7)	3015886014	Soil	12/05/01	x	x	x	x	
83/84-25 (8.7-10.7)	3015886015	Soil	12/05/01	x	x	x	x	
83/84-25 (10.7-12.7)	3015886016	Soil	12/05/01	x	x	x	x	
RFI-81-25 (0.8-2.8)	3015886017	Soil	12/03/01				x[2]	
RFI-81-25 (08-10)	3015886018	Soil	12/03/01				x[2]	
RFI-85-RB-159	3015886019	Water	12/05/01	x	x	x	x	
20-105R (120601)	3015886020	Water	12/06/01	x	x	x	x	
20-105Rd (120601)	3015886021	Water	12/06/01			x	x	
RFI-12-21 (120601)	3015886022	Water	12/06/01	x	x	x	x	
RFI-12-21d (120601)	3015886023	Water	12/06/01			x	x	
RFI-12-TB-125	3015886024	Water	12/06/01	x				
BD01-03 (120501)	3015886025	Water	12/05/01	x	x	x	x	x
BD01-03d (120501)	3015886026	Water	12/05/01			x	x	
BD01-TB-02	3015886027	Water	12/05/01	x				
20-105R (120601) DL	3015886028	Water	12/06/01	x				
BD01-01 (0.4-2.4) RE	3015886029	Soil	12/03/01		x			
RFI-16-20 (01-03) RE	3015886030	Soil	12/04/01		x			

1 Gasoline and Diesel Range Organics analysis performed on sample
2 Lead analysis performed on sample
3 Duplicate analysis performed on sample BD01-01 (22.4-24.4)
4 MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Sample 20-105R (120601) contained 1,1,1-Trichloroethane and 1,1-Dichloroethane above the linear range. Data for the compounds have been replaced with data from the dilution analysis.

The continuing calibration $\%D_i$ was above the acceptable limit due to an increase in response by Acetone, associated samples RFI-BD01-01-RB-158, RFI-16-RB-200, RFI-85-RB-159, and RFI-12-21 (120601); an increase in Dichlorodifluoromethane, associated sample RFI-12-21 (120601). Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was below control limits due to a decrease in response by Acetone. Soil samples have been qualified as estimated based on the deviations.

The continuing calibration %D was below control limits due to a decrease in response by 2-Butanone and 2-Hexanone, associated samples 83/84-25 (8.7-10.7) and 83/84-25 (10.7-12.7). Data have been qualified as estimated based on the deviations.

The LCS %R was above control limits for Dichlorodifluoromethane. Associated sample RFI-12-21 (120601) has been qualified as estimated for the compound based on the deviation.

Acetone was detected in the rinse blanks. Sample results which were below the blank action level have been qualified as non-detect for Acetone based on the blank contents.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Volatile Gasoline Range Organics

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below control limits for Perylene-d12. Associated samples BD01-01 (0.4-2.4) and RFI-16-20 (01-03) have been qualified as estimated for all compounds associated with Perylene-d12 based on the deviations.

The initial calibration %RSD was above the acceptable limit for Benzaldehyde and Atrazine, associated samples BD01-03 (8.4-10.4), BD01-03 (18.4-20.4), BD01-01 (8.4-10.4), BD01-01 (22.4-24.4), BD01-DUP-204, RFI-BD01-01-RB-158, RFI-16-20 (04-06), RFI-16-13 (01-03), RFI-16-13 (09-11), and RFI-16-RB-200; Fluoranthene, associated samples RFI-16-13 (01-03) and 83/84-25 (07-2.7). Data have been qualified as estimated for the compounds.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above acceptable limits due to an increase in response by Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene. Associated sample 83/84-25 (10.7-12.7) has been qualified as estimated for the compounds based on the deviation.

The LCS/LCSD RPD were above control limits for Benzo(a)anthracene, Chrysene, Phenanthrene, and Pyrene, associated samples BD01-01 (0.4-2.4), RFI-16-20 (01-03), RFI-16-13 (01-03), 83/84-25 (07-2.7), and 83/84-25 (10.7-12.7); Anthracene, Benzo(a)pyrene, and Benzo(b)fluoranthene, associated samples RFI-16-13 (01-03) and 83/84-25 (10.7-12.7); 2-Methyl naphthalene, associated sample RFI-16-13 (01-03); Anthracene, associated sample BD01-01 (0.4-2.4); bis(2-Ethylhexyl)phthalate, associated samples RFI-16-20 (01-03), RFI-16-20 (04-06), and RFI-16-13 (01-03); Butyl benzylphthalate, associated samples RFI-16-20 (01-03), RFI-16-20 (04-06), and 83/84-25 (0.7-2.7); Fluoranthene, Phenanthrene, and Pyrene, associated sample BD01-03 (0.4-2.4); Fluoranthene, associated samples BD01-01 (0.4-2.4), RFI-16-20 (01-03), and 83/84-25 (10.7-12.7). Data have been qualified as estimated for the compounds based on the deviations.

The LCS/LCSD %R were below control limits for Carbazole. Soil sample results have been qualified as estimated for the compound based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semi volatile Diesel Range Organics

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS/LCSD %R was below control limits for TPH. Associated sample BD01-03 (120501) has been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)		X	
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were below control limits for Arsenic, Beryllium, Chromium, Cobalt, Copper, Lead, Manganese, Vanadium and Zinc. Soil samples have been qualified as estimated for the analytes.

The MS/MSD %R were below control limits for Antimony. Soil samples were non-detect for the analyte and have been qualified as rejected based on the deviations.

The MS/MSD %R were above control limits for Beryllium. Associated samples 20-105Rd (120601), RFI-12-21d (120601), and BD01-03d (120501) have been qualified as estimated for the analyte.

Antimony and Zinc were detected in the instrument and rinse blanks. Samples which contained these analytes below the blank action level have been qualified as non-detect for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	January 2, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	March 12, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3015995

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3015995 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC[1]
40-303R (120701)	3015995001	Water	12/07/01	x	x	x	x	
400-303Rd (120701)	3015995002	Water	12/07/01			x	x	
RFI-81-TB-126	3015995003	Water	12/07/01	x				
83/84-13 (1.1-3.1)	3015995004	Soil	12/07/01				x[2]	
83/84-13 (3.1-5.1)	3015995005	Soil	12/07/01				x[2]	
83/84-12 (0.7-2.7)	3015995006	Soil	12/07/01	x	x	x	x	
83/84-12 (2.7-4.7)	3015995007	Soil	12/07/01	x	x	x	x	
83/84-23 (01-03)	3015995008	Soil	12/07/01	x	x	x	x	
83/84-23 (05-07)	3015995009	Soil	12/07/01	x	x	x	x	
83/84-26 (0.8-2.8)	3015995010	Soil	12/07/01	x	x	x	x	
83/84-26 (6.8-8.8)	3015995011	Soil	12/07/01	x	x	x	x	
83/84-22 (1.1-3.1)	3015995012	Soil	12/07/01	x	x	x	x	
83/84-22 (7.1-9.1)	3015995013	Soil	12/07/01	x	x	x	x	
RFI-83/84-DUP-206[4]	3015995014	Soil	12/07/01	x	x	x	x	
83/84-22 (3.1-5.1)	3015995015	Soil	12/07/01	x	x	x	x	
83/84-24 (0.8-2.8)	3015995016	Soil	12/07/01	x	x	x	x	
83/84-24 (4.8-6.8)	3015995017	Soil	12/07/01	x	x	x	x	
83/84-24 (6.8-8.8)	3015995018	Soil	12/07/01	x	x	x	x	
83/84-21 (6.7-8.7)	3015995019	Soil	12/07/01	x	x	x	x	
83/84-21 (0.7-2.7)	3015995020	Soil	12/07/01	x	x	x	x	
RFI-81-12R (120701)	3015995021	Water	12/07/01	x	x	x	x	
RFI-81-12Rd (120701)	3015995022	Water	12/07/01			x	x	
RFI-83/84-DUP-205[3]	3015995023	Soil	12/07/01	x	x	x	x	
83/84-14 (0.8-01)	3015995024	Soil	12/10/01				x[2]	
83/84-15 (1.2-03)	3015995025	Soil	12/10/01				x[2]	
83/84-18 (0.8-2.8)	3015995026	Soil	12/10/01				x[2]	
83/84-18 (2.8-4.8)	3015995027	Soil	12/10/01				x[2]	
83/84-19 (0.8-2.8)	3015995028	Soil	12/10/01				x[2]	
83/84-19 (2.8-3.4)	3015995029	Soil	12/10/01				x[2]	
83/84-16 (0.8-2.8)	3015995030	Soil	12/10/01				x[2]	
83/84-16 (2.8-4.8)	3015995031	Soil	12/10/01				x[2]	
RFI-05-29 (07-09)	3015995032	Soil	12/10/01				x[2]	
RFI-05-27 (07-09)	3015995033	Soil	12/10/01				x[2]	
RFI-83/84-DUP-207[5]	3015995034	Soil	12/10/01				x[2]	
RFI-16-20 (121201)	3015995035	Water	12/12/01	x	x	x	x	
RFI-16-20d (121201)	3015995036	Water	12/12/01			x	x	
RFI-05-19DR (121101)	3015995037	Water	12/11/01	x	x	x	x	
RFI-05-19DRd (121101)	3015995038	Water	12/12/01			x	x	
RFI-05-TB-127	3015995039	Water	12/12/01	x				
RFI-10-16 (1.9-3.9)	3015995040	Soil	12/12/01				x[2]	
RFI-10-16 (3.9-5.9)	3015995041	Soil	12/12/01				x[2]	
RFI-81-28 (0.5-2.5)	3015995042	Soil	12/12/01					x
83/84-26 (0.8-2.8) RE	3015995043	Soil	12/07/01		x			

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC[1]
83/84-12 (0.7-2.7) RE	3015995044	Soil	12/07/01		x			
83/84-23 (05-07) RE	3015995045	Soil	12/07/01		x			
83/84-12 (2.7-4.7) RE	3015995046	Soil	12/07/01		x			
83/84-22 (1.1-3.1) DL	3015995047	Soil	12/07/01		x			
83/84-24 (6.8-8.8) DL	3015995048	Soil	12/07/01		x			
83/84-21 (6.7-8.7) DL	3015995049	Soil	12/07/01		x			
83/84-22 (3.1-5.1) DL	3015995050	Soil	12/07/01		x			
83/84-24 (4.8-6.8) RE	3015995051	Soil	12/07/01		x			
RFI-83/84-DUP-206 RE	3015995052	Soil	12/07/01		x			
83/84-21 (0.7-2.7) RE	3015995053	Soil	12/07/01		x			
83/84-23 (01-03) RE	3015995054	Soil	12/07/01		x			
83/84-26 (6.8-8.8) RE	3015995055	Soil	12/07/01		x			
83/84-22 (7.1-9.1) RE	3015995056	Soil	12/07/01		x			

1 Chromium and Hexavalent Chromium analysis performed on sample
2 Lead analysis performed on sample
3 Duplicate analysis performed on sample 83/84-24 (0.8-2.8)
4 Duplicate analysis performed on sample 83/84-23 (01-03)
5 Duplicate analysis performed on sample 83/84-16 (0.8-2.8)
6 MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above the acceptable limit due to an increase in response in Acetone. Associated sample 40-303R (120701) has been qualified as estimated for the compound.

The continuing calibration %D was below control limits due to a decrease in response by Acetone and 2-Butanone. Associated samples 83/84-12 (0.7-2.7), 83/84-12 (2.7-4.7), 83/84-23 (05-07), 83/84-26 (6.8-8.8), 83/84-22 (1.1-3.1), 83/84-22 (3.1-5.1), 83/84-24 (0.8-2.8), 83/84-21 (6.7-8.7), 83/84-21 (0.7-2.7), and RFI-83/84-DUP-205 have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was below control limits due to a decrease in response by 2-Hexanone. Associated samples 83/84-12 (0.7-2.7), 83/84-12 (2.7-4.7), 83/84-23 (05-07), 83/84-26 (6.8-8.8), 83/84-22 (1.1-3.1) have been qualified as estimated for the compound based on the deviations.

The recovery for one surrogate was above control limits in sample 83/84-24 (4.8-6.8). Positive data have been qualified as estimated in the sample.

Methylene Chloride was detected in the trip blank. Sample results which were below the blank action level have been qualified as non-detect for the compound based on the blank content.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below control limits for Perylene-d12. Associated samples RFI-83/84-DUP-206, 83-84-22 (3.1-5.1) DL, and 83/84-21 (6.7-8.7) DL have been qualified as estimated for all compounds associated with Perylene-d12.

The internal standard response was below control limits for Chrysene-d12 and Perylene-d12. Associated samples 83/84-26 (6.8-8.8) RE, 83/84-23 (01-03), 83/84-22 (7.1-9.1), 83/84-21 (0.7-2.7), 83/84-12 (0.7-2.7) RE, 83/84-12 (2.7-4.7), 83/84-23 (05-07) RE, 83/84-23 (0.8-2.8), and 83/84-22 (1.1-3.1) DL have been qualified as estimated for all compounds associated with Perylene-d12 and Chrysene-d12.

The internal standard response was below control limits for Phenanthrene-d10, Chrysene-d12 and Perylene-d12. Associated samples 83/84-24 (4.8-6.8) and 83/84-24 (6.8-8.8) DL have been qualified as estimated for all compounds associated with the above internal standards.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol. Data have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above acceptable limits due to a decrease in response by Benzaldehyde, associated samples 83/84-26 (0.8-2.8) and 83/84-26 (6.8-8.8) RE; a decrease in response by 2,4-Dinitrophenol, associated samples 83/84-22 (1.1-3.1) DL, 83/84-24 (6.8-8.8), 83/84-21 (6.7-8.7) DL, and 83/84-22 (3.1-5.1) DL. Data have been qualified as estimated for the compounds based on the deviations.

The recoveries for two acid surrogates were below control limits in sample 83/84-12 (2.7-4.7) RE. Positive data for acid compounds have been qualified as estimated and non-detect data for acid compounds have been qualified as rejected.

Diethyl phthalate and bis(2-Ethylhexyl)phthalate were detected in the method blanks. Sample results which were below the blank action level have been qualified as non-detect for the compounds based on the blank content.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below control limits for Mercury, Antimony, Arsenic, Beryllium, Cobalt, Nickel, Selenium, and Zinc. Associated samples 83/84-12 (0.7-2.7), 83/84-12 (2.7-4.7), 83/84-23 (05-07), 83/84-26 (0.8-2.8), 83/84-26 (6.8-8.8), 83/84-22 (1.1-3.1), 83/84-22 (7.1-9.1), 83/84-22 (3.1-5.1), 83/84-24 (4.8-6.8), 83/84-24 (6.8-8.8), 83/84-21 (6.7-8.7), 83/84-21 (0.7-2.7) 83/84-23 (01-03), RFI-83/84-DUP-206, 83/84-24 (0.8-2.8) and RFI-83/84-DUP-205 have been qualified as estimated for all analytes, with the exception of Antimony. Positive data have been qualified as estimated and non-detect results have been qualified as rejected for Antimony.

The MS/MSD %Rs were above control limits for Barium. Associated samples 83/84-12 (0.7-2.7), 83/84-12 (2.7-4.7), 83/84-23 (05-07), 83/84-26 (0.8-2.8), 83/84-26 (6.8-8.8), 83/84-22 (1.1-3.1), 83/84-22 (7.1-9.1), 83/84-22 (3.1-5.1), 83/84-24 (4.8-6.8), 83/84-24 (6.8-8.8), 83/84-21 (6.7-8.7), 83/84-21 (0.7-2.7) 83/84-23 (01-03), RFI-83/84-DUP-206, 83/84-24 (0.8-2.8) and RFI-83/84-DUP-205 have been qualified as estimated for the analytes.

The MS/MSD %Rs were below control limits for Beryllium. Associated samples 400-303Rd (120701), RFI-81-12Rd (120701), RFI-16-20 (120201) and RFI-05-19DR (121101) have been qualified as estimated for the analyte.

The MS/MSD %Rs were above control limits for Lead. Associated samples 83/84-15 (1.2-03), 83/84-18 (0.8-2.8), 83/84-18 (2.8-4.8), 83/84-19 (0.8-2.8), 83/84-19 (2.8-3.4), 83/84-16 (0.8-2.8), 83/84-16 (2.8-4.8), RFI-05-29 (07-09), RFI-05-27 (07-09), RFI-83/84-DUP-207, RFI-10-16 (1.9-3.9), and RFI-10-16 (3.9-5.9) have been qualified as estimated for the analyte.

The LCS %R was below control limits for Cyanide. Associated samples 83/84-12 (0.7-2.7), 83/84-12 (2.7-4.7), 83/84-23 (05-07), 83/84-26 (0.8-2.8), 83/84-26 (6.8-8.8), 83/84-22 (1.1-3.1), 83/84-22 (7.1-9.1), 83/84-22 (3.1-5.1), 83/84-24 (4.8-6.8), 83/84-24 (6.8-8.8), 83/84-21 (6.7-8.7), 83/84-21 (0.7-2.7) 83/84-23 (01-03), RFI-83/84-DUP-206, 83/84-24 (0.8-2.8) and RFI-83/84-DUP-205 have been qualified as estimated for the analyte.

Silver, Antimony, Lead, and Thallium were detected in the instrument blanks. Samples which contained these analytes below the blank action level have been qualified as non-detect for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	January 9, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	March 22, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3016099

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3016099 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC[1]
RFI-85-TB-128	3016099001	Water	12/13/01	x				
RFI-09-12 (121301)	3016099002	Water	12/13/01	x	x	x	x	
RFI-09-12d (121301)	3016099003	Water	12/13/01			x	x	
RFI-85-02R (121301)	3016099004	Water	12/13/01	x	x	x	x	
RFI-85-02Rd (121301)	3016099005	Water	12/13/01			x	x	
RFI-83/84-25 (121301)	3016099006	Water	12/13/01	x	x	x	x	
83/84-25d (121301)	3016099007	Water	12/13/01			x	x	
RFI-81-30 (1.2-3.2)	3016099008	Soil	12/13/01					x
RFI-81-30 (3.2-5.2)	3016099009	Soil	12/13/01					x
RFI-81-32 (01-03)	3016099010	Soil	12/13/01					x
RFI-81-32 (03-05)	3016099011	Soil	12/13/01					x
83/84-27 (8.7-10.7)	3016099012	Soil	12/13/01	x	x	x	x	
83/84-27 (0.7-2.7)	3016099013	Soil	12/13/01	x	x	x	x	
83/84-27 (6.7-8.7)	3016099014	Soil	12/13/01	x	x	x	x	
83/84-28 (0.7-2.7)	3016099015	Soil	12/13/01	x	x	x	x	
83/84-28 (2.7-4.7)	3016099016	Soil	12/13/01	x	x	x	x	
RFI-83/84-DUP-208[3]	3016099017	Soil	12/13/01	x	x	x	x	
RFI-36-38 (0.5-2.5)	3016099018	Soil	12/16/01	x				
RFI-36-38 (8.5-10.5)	3016099019	Soil	12/16/01	x				
RFI-36-38 (10.5-12.5)	3016099020	Soil	12/16/01	x				
RFI-36-39 (0.5-2.5)	3016099021	Soil	12/16/01	x				
RFI-36-39 (8.5-10.5)[4]	3016099022	Soil	12/16/01	x				
RFI-36-39 (10.5-12.5)	3016099023	Soil	12/16/01	x				
RFI-36-40 (0.5-2.5)	3016099024	Soil	12/16/01	x				
36-40 (8.5-10.5)	3016099025	Soil	12/16/01	x				
36-40 (12.5-14.5)	3016099026	Soil	12/16/01	x				
RFI-36-BTEX-DUP-1[2]	3016099027	Soil	12/16/01	x				
RFI-36-25R (01-03)	3016099028	Soil	12/15/01	x	x	x	x	
RFI-36-25R (07-09)	3016099029	Soil	12/15/01	x	x	x	x	
RFI-36-25R (11-13)	3016099030	Soil	12/15/01	x	x	x	x	
RFI-36-43 (0.9-2.9)	3016099031	Soil	12/15/01	x	x	x	x	
RFI-36-43 (6.9-8.9)	3016099032	Soil	12/15/01	x	x	x	x	
RFI-36-43 (10.9-12.9)	3016099033	Soil	12/15/01	x	x	x	x	
36-40 (8.5-10.5) DL	3016099034	Soil	12/16/01	x				
36-40 (12.5-14.5) DL	3016099035	Soil	12/16/01	x				
36-43 (10.9-12.9) DL	3016099036	Soil	12/15/01	x				
83/84-28 (0.7-2.7) DL	3016099037	Soil	12/13/01		x			
83/84-28 (2.7-4.7) RE	3016099038	Soil	12/13/01		x			
RFI-36-43 (0.9-2.9) RE	3016099039	Soil	12/15/01		x			

1 Lead and Manganese analysis performed on sample
2 Duplicate analysis performed on sample RFI-36/38 (10.5-12.5)
3 Duplicate analysis performed on sample RFI-83/84-27 (8.7-10.7)
4 MS/MSD analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

Sample 36-40 (8.5-10.5) contained Toluene above the linear range. Sample results for the compound have been replaced with data from the dilution analysis.

Sample 36-40 (12.5-14.5) contained Benzene, Ethylbenzene, o-Xylene, m&p-Xylene, and Toluene above the linear range. Sample results for the compounds have been replaced with data from the dilution analysis.

Sample 36-43 (10.9-12.9) contained Ethylbenzene, o-Xylene, m&p-Xylene, and Toluene above the linear range. Sample results for these compounds have been replaced with data from the dilution analyses.

The continuing calibration %D was above the acceptable limit due to an increase in response by Dichlorodifluoromethane. Associated sample RFI-09-12 (121301) has been qualified as estimated for the compound.

The LCS %R were below control limits for 1,2-Dichloroethane, 4-Methyl-2-pentanone, Dibromochloromethane, and Methyl acetate. Associated samples 83/84-27 (6.7-8.7), 83/84-28 (0.7-2.7), 83/84-28 (2.7-4.7), RFI-83/84-DUP-208, RFI-36-25R (01-03), RFI-36-25R (07-09), RFI-36-25R (11-13), RFI-36-43 (0.9-2.9), RFI-36-43 (6.9-8.9), and RFI-36-43 (10.9-12.9) have been qualified as estimated for the compounds.

The RPD between sample RFI-36-38 (10.5-12.5) and field duplicate RFI-36-BTEX-DUP-1 was above control limits for Toluene. Positive data for the compound have been qualified as estimated in the associated samples.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The internal standard response was below control limits for Perylene-d12. Associated sample RFI-36-43 (0.9-2.9) RE has been qualified as estimated for all compounds associated with Perylene-d12.

The internal standard response was below control limits for Chrysene-d12 and Perylene-d12. Associated sample 83/84-28 (2.7-4.7) has been qualified as estimated for all compounds associated with Perylene-d12 and Chrysene-d12.

The initial calibration %RSD was above control limits for Benzo(g,h,i)perylene. Associated samples RFI-85-02R, RFI-83/84-25 (121301), RFI-36-25R (07-09), RFI-36-25R (11-13), and RFI-36-43 (6.9-8.9) have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above acceptable limits due to a decrease in response by Benzaldehyde, associated samples RFI-85-02R (121301), RFI-83/84-25 (121301), RFI-36-25R (07-

09), RFI-36-25R, and RFI-36-43 (6.9-8.9); a decrease in response by Caprolactam associated sample RFI-85-02R (121301). Data have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above control limits due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compounds based on the deviations.

Diethyl phthalate and bis(2-Ethylhexyl)phthalate were detected in the method blanks. Sample results which were below the blank action level have been qualified as non-detect for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were outside control limits for Arsenic, Beryllium, Cadmium, Cobalt, Silver, Thallium, Chromium, Copper, Manganese, Lead and Zinc. Soil samples have been qualified as estimated for the listed analytes based on the deviations.

The MS/MSD %R were outside control limits for Manganese and Lead. Associated samples RFI-81-30 (1.2-3.2), RFI-81-30 (3.2-5.2), RFI-81-32 (01-03), and RFI-81-32 (03-05) have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %R were below control limits for Antimony. Positive data for soil samples have been qualified as estimated and non-detect data have been qualified as rejected for the analyte based on the deviations.

The MS/MSD %R were above control limits for Selenium. Associated samples 83/84-27 (8.7-10.7),

83/84-27 (0.7-2.7), 83/84-28 (0.7-2.7), 83/84-28 (2.7-4.7), 83/84-DUP-208, RFI-36-25R (01-03), and RFI-36-25R (07-09) have been qualified as estimated for the analyte.

The MS/MSD %R were below control limits for Silver. Water samples have been qualified as estimated for the analyte based on the deviation.

The MS/MSD %R were above control limits for Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, and Thallium. Associated samples RFI-09-12 (121301), RFI-85-02R (121301), and RFI-83/84-25 (121301) have been qualified as estimated for the analytes based on the deviations.

Zinc was detected in the method blank and Arsenic, Selenium, and Antimony were detected in the instrument blanks. Samples which contained these analytes below the blank action level have been qualified as non-detect for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	January 16, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	March 25, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020153

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020153 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-86-14 (0.5-2.5)	3020153001	Soil	01/09/01	x	x	x	x	
RFI-86-14 (4.5-6.5)	3020153002	Soil	01/09/01	x	x	x	x	
RFI-05-30 (00-02)	3020153003	Soil	01/10/01	x	x	x	x	
RFI-05-30 (06-08)	3020153004	Soil	01/10/01	x	x	x	x	
RFI-36-46 (00-02)	3020153005	Soil	01/10/01	x	x	x	x	
RFI-36-46 (08-10)	3020153006	Soil	01/10/01	x	x	x	x	
RFI-36-46 (10-12)	3020153007	Soil	01/10/01	x	x	x	x	
RFI-36-DUP-209[1]	3020153008	Soil	01/10/01	x	x	x	x	
TB-129	3020153009	Water	01/09/01	x				
RFI-36-RB-201	3020153010	Water	01/11/01	x	x	x	x	
RFI-10-26 (04-06)	3020153011	Soil	01/11/01	x	x	x	x	
TB-130	3020153012	Water	01/11/01	x				
Rinse Blank P18-23	3020153013	Water	01/11/01	x	x	x	x	
Rinse Blank P18-24	3020153014	Water	01/11/01	x	x	x	x	
RFI-86-15 (0.3-2.3)	3020153015	Soil	01/14/01	x	x	x	x	
RFI-86-RB-202	3020153016	Water	01/15/01	x	x	x	x	
RFI-10-27 (01-03)	3020153017	Soil	01/15/01	x	x	x	x	
RFI-10-27 (07-09)	3020153018	Soil	01/15/01	x	x	x	x	
RFI-10-27 (09-11)	3020153019	Soil	01/15/01	x	x	x	x	
RFI-TB-131	3020153020	Water	01/15/01	x				
RFI-36-46 (00-02) DL	3020153021	Soil	01/10/01		x			

1 Duplicate analysis performed on sample RFI-36-46 (08-10)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above control limits for Chloromethane. Associated samples RFI-36-46 (00-02), RFI-36-46 (08-10), RFI-36-46 (10-12), RFI-36-DUP-209, RFI-10-26 (04-06), Rinse Blank P18-23, RFI-86-15 (0.3-2.3), RFI-10-27 (01-03), RFI-10-27 (07-09), and RFI-10-27 (09-11) have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to an increase in response by Acetone, associated samples TB-129, RFI-36-RB-201, TB-130, Rinse Blank P18-23, Rinse Blank P18-24, RFI-86-RB-202, and RFI-TB-131; an increase in response by 2-Butanone, associated samples Rinse Blank P18-23, Rinse Blank P18-24. Data have been qualified as estimated for the compounds based on the deviations.

Acetone and 2-Butanone were detected in the blanks. Sample results which were below the blank action level have been qualified as non-detect for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below control limits for Perylene-d12. Associated samples RFI-10-27 (01-03) and RFI-36-46 (00-02) DL have been qualified as estimated for all compounds associated with Perylene-d12.

The initial calibration %RSD was above control limits for Di-n-octyl phthalate. Associated sample RFI-36-RB-201 has been qualified as estimated for the compound based on the deviation.

The initial calibration %RSD was above control limits for 2,4-Dinitrophenol and Benzo(g,h,i)perylene. Associated samples RFI-86-RB-202, RFI-10-27 (01-03), RFI-10-27 (09-11), and RFI-36-46 (00-02) DL have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above acceptable limits due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compound based on the

deviation.

The continuing calibration %D was above control limits due to a decrease in response by Benzaldehyde. Associated samples RFI-86-14 (0.5-2.5), RFI-86-14 (4.5-6.5), RFI-05-30 (00-02), RFI-05-30 (06-08), RFI-36-46 (08-10), RFI-36-46 (10-12), and RFI-36-DUP-209 have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The LCS/LCSD RPD was above control limits for Aroclor 1260. Associated sample RFI-05-30 (00-02) has been qualified as estimated for the analyte based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below control limits for Antimony and Zinc. Soil samples have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %Rs were above control limits for Copper, Nickel, and Silver. Associated samples RFI-36-RB-201, Rinse Blank P18-23, Rinse Blank P18-24, and RFI-86-15 (0.3-2.3) have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %R were above control limits for Arsenic, associated samples Rinse Blank P18-24 and RFI-86-15 (0.3-2.3); Cobalt, associated sample Rinse Blank P18-24; Zinc, associated samples RFI-36-RB-201 and Rinse Blank P18-24. Data have been qualified as estimated for the analytes.

Other than for the deviation noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	January 30, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	March 27, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020221

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020221 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-40-04 (0.5-2.5)	3020221001	Soil	01/16/02	x	x	x	x	
RFI-40-04 (8.5-10.5)	3020221002	Soil	01/16/02	x	x	x	x	
RFI-40-04 (22.5-24.5)[1]	3020221003	Soil	01/16/01	x	x	x	x	
RFI-40-05 (0.8-2.8)	3020221004	Soil	01/17/02	x	x	x	x	
RFI-40-05 (8.8-10.8)	3020221005	Soil	01/17/02	x	x	x	x	
RFI-40-05 (10.8-12.8)	3020221006	Soil	01/17/02	x	x	x	x	
RFI-40-06 (01-03)	3020221007	Soil	01/17/02	x	x	x	x	
RFI-40-06 (09-11)	3020221008	Soil	01/17/02	x	x	x	x	
RFI-40-06 (11-13)	3020221009	Soil	01/17/02	x	x	x	x	
RFI-40-06 (15-17)	3020221010	Soil	01/17/02	x	x	x	x	
RFI-40-RB-203	3020221011	Soil	01/17/02	x	x	x	x	
83/84-29 (01-03)	3020221012	Soil	01/17/02	x	x	x	x	
RFI-83/84-29 (09-11)	3020221013	Soil	01/17/02	x	x	x	x	
TB-140	3020221014	Water	01/17/02	x				
RFI-81-33 (00-02)	3020221015	Soil	01/18/02	x	x	x	x	
RFI-81-33 (08-10)	3020221016	Soil	01/18/02	x	x	x	x	
RFI-81-33 (10-12)	3020221017	Soil	01/18/02	x	x	x	x	
RFI-40-07 (0.7-2.7)	3020221018	Soil	01/18/02	x	x	x	x	
RFI-40-07 (8.7-10.7)	3020221019	Soil	01/18/02	x	x	x	x	
RFI-40-DUP-204[2]	3020221020	Soil	01/18/01	x	x	x	x	
RFI-40-04 (0.5-2.5) RE	3020221021	Soil	01/16/02		x			
RFI-40-06 (01-03) RE	3020221022	Soil	01/17/02		x			
RFI-40-06 (09-11) RE	3020221023	Soil	01/17/02		x			
RFI-40-06 (15-17) RE	3020221024	Soil	01/17/02		x			
83/84-29 (01-03) RE	3020221025	Soil	01/17/02		x			
RFI-81-33 (00-02) RE	3020221026	Soil	01/18/02		x			
RFI-40-07 (0.7-2.7) RE	3020221027	Soil	01/18/02		x			

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample RFI-40-07 (0.7-2.7)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above control limits for Methyl Acetate. Associated samples RFI-40-06 (01-03), 83/84-29 (01-03), RFI-83/84-29 (09-11), and RFI-81-33 (08-10) have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to a decrease in response by Acetone. Soil samples have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to a decrease in response by Chloroethane. Associated samples RFI-83/84-29 (09-11), RFI-81-33 (00-02), RFI-81-33 (08-10), RFI-81-33 (10-12), RFI-40-07 (0.7-2.7), RFI-40-07 (8.7-10.7), and RFI-40-DUP-204 have been qualified as estimated for the compound based on the deviation.

The LCS %R was above control limits for o-Xylene. Associated samples RFI-40-06 (11-13) and 83/84-29 (01-03) have been qualified as estimated for the compound based on the deviation.

Acetone was detected in the rinse and trip blanks. Sample results which were below the blank action level have been qualified as non-detect for the compound based on the blank contents.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below control limits for Perylene-d12 and Chrysene-d12. Associated samples RFI-40-06 (01-03) and 83/84-29 (01-03) have been qualified as estimated for all compounds associated with Perylene-d12 and Chrysene-d12.

The internal standard response was below control limits for Perylene-d12. Associated samples RFI-40-04 (0.5-2.5), RFI-40-06 (09-11), RFI-40-06 (15-17), RFI-81-33 (00-02), and RFI-40-07 (0.7-2.7) have been qualified as estimated for all compounds associated with Perylene-d12.

The continuing calibration %D was above acceptable limits due to a decrease in response by 3&4-Methylphenol and Benzaldehyde. Soil sample results have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rx were below control limits for Antimony. Positive soil sample results have been qualified as estimated and non-detect results have been qualified as rejected for the analyte based on the deviation.

The MS/MSD %Rx were below control limits for Cyanide. Associated samples RFI-81-33 (10-12), RFI-40-07 (0.7-2.7), RFI-40-07 (8.7-10.7), and RFI-40-DUP-204 have been qualified as rejected for the analyte based on the deviation.

The serial dilution RPD was above acceptable limits for Manganese and Barium. Soil sample results have been qualified as estimated for the analytes based on the deviations.

Antimony was detected in the method blank. Sample results which were below the blank action level have been qualified as non-detect for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	February 6, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	March 28, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020223

INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020223 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
38-120 (092701)[1]	3020223001	Water	09/27/01				x	
RFI-38-06 (092801)	3020223002	Water	09/28/01				x	
RFI-38-05 (092801)	3020223003	Water	09/28/01				x	
RFI-38-04 (092701)	3020223004	Water	09/27/01				x	
36-101 (092801)	3020223005	Water	09/28/01				x	
RFI-36-02 (100401)	3020223006	Water	10/04/01				x	
RFI-36-35 (092701)	3020223007	Water	09/27/01				x	
36-100 (092701)	3020223008	Water	09/27/01				x	
RFI-36-03 (092701)	3020223009	Water	09/27/01				x	
36-FP1 (092701)	3020223010	Water	09/27/01				x	
36-FP2 (092801)	3020223011	Water	09/28/01				x	
36-FP8 (092701)	3020223012	Water	09/27/01				x	
RFI-36-09 (092701)	3020223013	Water	09/27/01				x	
20-100 (092101)	3020223014	Water	09/21/01				x	
RFI-36-14 (100201)	3020223015	Water	10/02/01				x	
20-103N (092101)	3020223016	Water	09/21/01				x	
RFI-10-06 (092401)[1]	3020223017	Water	09/24/01				x	
RFI-10-04 (092601)	3020223018	Water	09/26/01				x	
RFI-10-11 (100101)	3020223019	Water	10/01/01				x	
70-163 (092801)	3020223020	Water	09/28/01				x	
70-102 (092701)	3020223021	Water	09/27/01				x	
RFI-07-08 (092001)	3020223022	Water	09/20/01				x	
RFI-86-06D (092801)	3020223023	Water	09/28/01				x	
RFI-86-01 (092001)	3020223024	Water	09/20/01				x	
RFI-02-08 (091901)	3020223025	Water	09/19/01				x	
RFI-02-07 (091801)	3020223026	Water	09/18/01				x	
RFI-02-05 (091801)	3020223027	Water	09/18/01				x	

1 MS/MSD analysis performed on sample

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were outside control limits for Barium, Manganese, and Zinc. Sample results have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %Rs were above control limits for Thallium and Arsenic, associated samples 38-120 (092701), RFI-38-06 (092801), RFI-38-05 (092801), RFI-38-04 (092701), and 36-101 (092801); Arsenic, associated samples RFI-36-02 (100401), RFI-36-35 (092701), 36-100 (092701), 36-FP1 (092701), 36-FP2 (092801), 36-FP8 (092701), RFI-36-09 (092701), RFI-10-06 (092401), RFI-10-04 (092601), 70-163 (092801), 70102 (092701), RFI-07-08 (092001), RFI-86-01 (092001), RFI-02-08 (091901), RFI-02-07 (091801), and RFI-02-05 (091801). Data have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %Rs were above control limits for Beryllium and Cadmium. Associated samples 38-120 (092701), RFI-38-06 (092801), RFI-38-05 (092801), RFI-38-04 (092701), 36-101 (092801), RFI-36-35

(092701), 36-100 (092701), RFI-36-03 (092701), 36-FP1 (092701), 36-FP2 (092801), 36-FP8 (092701), and RFI-36-09 (092701) have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %R were above control limits for Beryllium, associated samples RFI-36-02 (100401) and RFI-36-14 (100201); Cadmium, associated sample 20-100 (092101); Selenium, associated samples RFI-38-05 (092801), RFI-16-14 (100201), and 20-103N (092101); Silver, associated samples 38-120 (092701), RFI-38-06 (092801), RFI-36-35 (092701), RFI-36-09 (092701) and RFI-10-04 (092601); Antimony, associated sample 30-120 (092701). Data have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %Rs were above control limits for Cobalt, Copper, Lead, and Nickel. Associated samples RFI-10-06 (092401), RFI-10-04 (092601), RFI-10-11 (100101), 70-163 (092801), 70-102 (092701), RFI-07-08 (092001), RFI-86-06D (092801), RFI-86-01 (092001), RFI-02-08 (091901), RFI-02-07 (091801), and RFI-02-05 (901801) have been qualified as estimated for the analytes based on the deviations.

The MS/SMD %Rs were above control limits for Cadmium and Selenium, associated samples RFI-10-06 (092401), RFI-10-11 (100101), 70-163 (092801), RFI-07-08 (092001), RFI-86-06D (092801), and RFI-86-01 (092001); Cadmium, associated samples RFI-10-04 (092601), RFI-02-07 (091801), and RFI-02-05 (091801); Selenium, associated sample 70-102 (092701); Vanadium associated samples RFI-10-04 (092601), RFI-10-11 (100101), RFI-86-01 (092001), and RFI-02-08 (091901). Data have been qualified as estimated for the analytes based on the deviations.

Arsenic, Silver, Thallium, and Antimony were detected in the instrument blanks. Sample results which were below the blank action level have been qualified as non-detect for the analytes based on the deviations.

Other than for the deviation noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	January 29, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	April 03, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020268

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020268 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-40-RB-204	3020268001	Water	01/22/02	x	x	x	x	
RFI-81-35 (0.8-2.8)	3020268002	Soil	01/22/02	x	x	x	x	
RFI-81-35 (08-10)	3020268003	Soil	01/22/01	x	x	x	x	
RFI-81-35 (12-14)	3020268004	Soil	01/22/02	x	x	x	x	
TB-141	3020268005	Water	01/22/02	x				
RFI-10-24 (00-02)	3020268006	Soil	01/23/02	x				
RFI-10-24 (06-08)	3020268007	Soil	01/23/02	x				
RFI-10-25 (00-02)	3020268008	Soil	01/23/02	x				
RFI-10-25 (06-08)[2]	3020268009	Soil	01/23/02	x				
RFI-10-DUP-206[3]	3020268010	Soil	01/23/02	x				
RFI-55-10 (01-03)	3020268011	Soil	01/23/02	x	x	x	x	
RFI-55-10 (07-09)	3020268012	Soil	01/23/02	x	x	x	x	
RFI-55-RB-207	3020268013	Water	01/23/02	x	x	x	x	
TB-142	3020268014	Water	01/23/02	x				
RFI-36-45 (00-02)	3020268015	Soil	01/24/02	x			x[1]	
RFI-36-45 (10-12)	3020268016	Soil	01/24/02	x			x[1]	
RFI-36-45 (08-10)	3020268017	Soil	01/24/02	x			x[1]	
RFI-36-44 (01-03)	3020268018	Soil	01/24/02	x			x[1]	
RFI-36-44 (07-09)	3020268019	Soil	01/24/02	x			x[1]	
RFI-36-44 (09-11)	3020268020	Soil	01/24/01	x			x[1]	
RFI-36-RB-206	3020268021	Water	01/24/02	x	x	x	x	
TB-143	3020268022	Water	01/24/02	x				
RFI-40-08 (01-03)	3020268023	Soil	01/24/02	x	x	x	x	
RFI-81-35 (12-14) RE	3020268024	Soil	01/22/02		x			
RFI-55-10 (01-03) RE	3020268025	Soil	01/23/02		x			

1 Arsenic analysis performed on sample
2 MS/MSD analysis performed on sample
3 Duplicate analysis performed on sample RFI-10-24 (06-08)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The continuing calibration %D was above control limits due to a decrease in response by Bromomethane and Tetrachloroethene. Associated samples RFI-81-35 (0.8-2.8), RFI-81-35 (08-10), RFI-81-35 (12-14), RFI-10-24 (00-02), RFI-10-24 (06-08), RFI-10-25 (00-02), RFI-10-25 (06-08), RFI-10-DUP-206, RFI-55-10 (01-03), RFI-55-10 (07-09), and RFI-36-45 (00-02) have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above control limits due to an increase in response by Acetone. Water samples have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to an increase in response by 2-Butanone. Associated samples RFI-40-RB-204, RFI-55-RB-207, and RFI-36-RB-206 have been qualified as estimated for the compound based on the deviation.

2-Butanone and Acetone were detected in the rinse blanks and Acetone was detected in the trip blanks. Sample results which were below the blank action level have been qualified as estimated for

the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below control limits for Perylene-d12. Associated samples RFI-81-35 (12-14) and RFI-55-10 (01-03) have been qualified as estimated for all compounds associated with Perylene-d12.

The continuing calibration %D was above acceptable limits due to a decrease in response by 3&4-Methylphenol and Benzaldehyde. Sample results have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above control limits due to an increase in response by Indeno(1,2,3-cd)pyrene. Associated sample RFI-81-35 (0.8-2.8) has been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below control limits for Antimony, Arsenic, Nickel, Zinc, and Manganese. Associated samples RFI-81-35 (0.8-2.8), RFI-81-35 (08-10), RFI-81-35 (12-14), RFI-55-10 (01-03), RFI-55-10 (07-09), RFI-36-44 (09-11), and RFI-40-08 (01-03) have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %Rs were below control limits for Arsenic. Associated samples RFI-36-45 (00-02), RFI-36-45 (10-12), RFI-36-45 (08-10), RFI-36-44 (01-03), and RFI-36-44 (07-09) have been qualified as estimated for the analyte based on the deviation.

The MS/MSD %Rs were above control limits for Antimony, Cadmium, Chromium, Copper, Manganese, Nickel, Silver, Vanadium, and Zinc. Water samples have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %Rs were above control limits for Barium, Cobalt, and Lead, associated samples RFI-40-RB-204 and RFI-55-RB-207; Selenium, associated samples RFI-40-RB-204 and RFI-36-RB-206; Cyanide, associated samples RFI-40-RB-204, RFI-81-35 (08-10), and RFI-81-35 (12-14). Data have been qualified as estimated for the analytes based on the deviations.

The MS/MSD RPD was above control limits for Selenium. Associated sample RFI-81-35 (12-14) has been qualified as estimated for the analyte based on the deviation.

The LCS %R was above control limits for Cyanide. Associated sample RFI-40-08 (01-03) has been qualified as estimated for the analyte based on the deviation.

The serial dilution RPD was above acceptable limits for Lead. Associated samples RFI-81-35 (08-10) and RFI-40-08 (01-03) have been qualified as estimated for the analyte based on the deviation.

Selenium was detected in the method blank. Sample results which were below the blank action level have been qualified as non-detect for the analyte.

Other than for the deviation noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	February 12, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	March 29, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020323

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020323 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-40-08 (09-11)	3020323001	Soil	01/24/02	x	x	x	x	
RFI-40-08 (13-15)	3020323002	Soil	01/25/02	x	x	x	x	
RFI-40-09 (0.7-2.7)	3020323003	Soil	01/25/02	x	x	x	x	
RFI-40-09 (8.7-10.7)	3020323004	Soil	01/25/02	x	x	x	x	
RFI-40-02 (0.9-2.9)	3020323005	Soil	01/25/02	x	x	x	x	
40-02 (8.9-10.9)	3020323006	Soil	01/25/02	x	x	x	x	
TB-144	3020323007	Water	01/25/02	x				
RFI-40-RB-209	3020323008	Water	01/28/02	x	x	x	x	
RFI-12-22 (1.1-3.1)	3020323009	Soil	01/30/02	x	x	x	x	
RFI-12-22 (9.1-11.1)	3020323010	Soil	01/30/02	x	x	x	x	
RFI-12-22 (13.1-15.1)	3020323311	Soil	01/30/02	x	x	x	x	
RFI-12-RB-210	3020323312	Water	01/30/02	x	x	x	x	
TB-145	3020323013	Water	01/30/02	x				
RFI-40-10 (0.7-2.7)	3020323014	Soil	01/30/02	x	x	x	x	
RFI-40-10 (4.7-6.7)	3020323015	Soil	01/30/02	x	x	x	x	
RFI-40-03 (0.7-2.7)	3020323016	Soil	01/30/02	x	x	x	x	
RFI-40-03 (6.7-8.7)	3020323017	Soil	01/30/02	x	x	x	x	
RFI-40-DUP-207[1]	3020323018	Soil	01/30/02	x	x	x	x	
RFI-16-12 (0.9-2.9)	3020323019	Soil	01/31/02	x	x	x	x	
RFI-16-12 (8.9-10.9)	3020323020	Soil	01/31/01	x	x	x	x	
40-02 (8.9-10.9) RE	3020323021	Soil	01/25/02		x			
RFI-16-12 (0.9-2.9) RE	3020323022	Soil	01/31/02		x			

1 Duplicate analysis performed on sample RFI-40-03 (0.7-2.7)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above control limits for Acetone. Associated sample RFI-40-02 (0.9-2.9) has been qualified as estimated for the compound based on the deviation.

The initial calibration %RSD was above control limits for Bromomethane. Soil sample results have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to an increase in response by Acetone and 2-Butanone. Associated samples RFI-40-RB-209 and RFI-12-RB-210 have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above control limits due to a decrease in response by Tetrachloroethene. Associated samples RFI-40-08 (09-11), RFI-40-08 (13-15), RFI-40-09 (8.7-10.7), RFI-40-02 (0.9-2.9), and RFI-40-02 (8.9-10.9) have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to a decrease in response by 1,2-Dibromo-3-chloropropane. Associated samples RFI-40-09 (0.7-2.7), RFI-12-22 (1.1-3.1), RFI-12-22 (9.1-11.1), RFI-12-22 (13.1-15.1), RFI-40-10 (0.7-2.7), RFI-40-10 (4.7-6.7), RFI-40-03 (0.7-2.7), RFI-40-03 (6.7-8.7), RFI-40-DUP-207, RFI-16-12 (0.9-2.9), and RFI-16-12 (8.9-10.9) have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below control limits for Phenanthrene-d10, Chrysene-d12, and Perylene-d12. Associated sample RFI-40-02 (8.9-10.9) has been qualified as estimated for all compounds associated with the listed internal standards.

The internal standard response was below control limits for Chrysene-d12 and Perylene-d12. Associated sample RFI-16-12 (0.9-2.9) has been qualified as estimated for all compounds associated with the listed internal standards.

The initial calibration %RSD was above control limits for Acenaphthene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, and Benzo(g,h,i)perylene. Associated sample RFI-40-02 (0.9-2.9) has been qualified as estimated for the compounds based on the deviations.

The initial calibration %RSD was above control limits for Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene, and Indeno(1,2,3-cd)pyrene. Associated sample RFI-40-03 (6.7-8.7) has

been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above acceptable limits due to a decrease in response by 3&4-Methylphenol and Benzaldehyde. Sample results have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above control limits due to a decrease in response by Benzo(k)fluoranthene. Associated samples RFI-40-08 (09-11) and RFI-40-09 (8.7-10.7) have been qualified as estimated for the compound based on the deviation.

The LCS/LCSD %Rs were above control limits for Benzo(g,h,i)perylene and Indeno(1,2,3-cd)pyrene. Associated samples RFI-40-09 (0.7-2.7), RFI-40-10 (0.7-2.7), and RFI-40-03 (0.7-2.7) have been qualified as estimated for the compounds based on the deviations.

The LCS/LCSD %R were above control limits for Indeno(1,2,3-cd)pyrene, associated sample RFI-40-02 (0.9-2.9); Dibenzo(a,h)anthracene, associated sample RFI-40-10 (0.7-2.7). Data have been qualified as estimated for the compounds based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)		X	
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were above limits for Copper and Nickel. Associated samples RFI-40-RB-209 and RFI-12-RB-210 have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %Rs were below control limits for Antimony, Barium, Beryllium, Chromium, Copper, and Nickel. Soil sample results have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %Rs were above control limits for Arsenic. Soil sample results have been qualified as estimated for the analyte based on the deviation.

The MS/MSD %Rs were above control limits for Cyanide. Associated samples RFI-40-09 (0.7-2.7), RFI-40-02 (0.9-2.9), and RFI-12-22 (1.1-3.1) have been qualified as estimated for the analyte based on the deviation.

The MS/MSD RPD was above control limits for Selenium. Associated samples RFI-40-08 (09-11), RFI-40-08 (13-15), RFI-40-09 (0.7-2.7), RFI-40-09 (8.7-10.7), RFI-40-02 (0.9-2.9), RFI-12-22 (1.1-3.1), RFI-12-22 (9.1-11.1), RFI-12-22 (13.1-15.1), RFI-40-10 (0.7-2.7), RFI-40-03 (0.7-2.7), RFI-40-03 (6.7-8.7), RFI-40-DUP-207, RFI-16-12 (0.9-2.9), and RFI-16-12 (8.9-10.9) have been qualified as estimated for the analyte based on the deviation.

The MS/MSD RPD was above control limits for Cadmium, Lead, Manganese, Silver, and Thallium. Soil sample results have been qualified as estimated for the analytes based on the deviations.

Other than for the deviation noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	February 21, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	April 01, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020438

INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020438 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-02-DUP-103[2]	3020438001	Water	09/18/01				x	
RFI-07-DUP-104[3]	3020438002	Water	09/20/01				x	
RFI-36-DUP-109[4]	3020438003	Water	09/27/01				x	
RFI-36-DUP-110[1,5]	3020438004	Water	10/02/01				x	
RFI-38-DUP-111[6]	3020438005	Water	09/28/01				x	

1 MS/MSD analysis performed on sample
2 Duplicate analysis performed on sample RFI-02-05 (091801) from SDG 3014417
3 Duplicate analysis performed on sample RFI-07-08 (092001) from SDG 3014489
4 Duplicate analysis performed on sample 36-FP1 (092701) from SDG 3014654
5 Duplicate analysis performed on sample RFI-36-14 (100201) from SDG 3014718
6 Duplicate analysis performed on sample RFI-38-06 (092801) from SDG 3014667

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were above control limits for Arsenic. Sample results have been qualified as estimated for the analyte based on the deviation.

The MS/MSD %R were above control limits for Vanadium. Associated sample RFI-38-DUP-111 has been qualified as estimated for the analyte based on the deviation.

Silver, Thallium, and Antimony were detected in the instrument blanks. Sample results which were below the blank action level have been qualified as non-detect for the analytes.

Other than for the deviation noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	February 12, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	April 03, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020688

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020688 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-86-15 (021902)	3020688001	Water	02/19/02	x				
RFI-81-35 (021902	3020688002	Water	02/19/02	x				
RFI-05-30 (021902)	3020688003	Water	02/19/02	x				
RFI-10-24 (022002)	3020688004	Water	02/20/02	x				
RFI-36-45 (022002)	3020688005	Water	02/20/02	x				
RFI-36-45d (022002)	3020688006	Water	02/20/02				x	
RFI-36-44 (022002)	3020688007	Water	02/20/02	x				
RFI-36-44d (022002)	3020688008	Water	02/20/02				x	
RFI-81-33 (021902)	3020688009	Water	02/19/02	x				
RFI-36-23 (022002)	3020688010	Water	02/20/02	x	x	x	x	
RFI-36-23d (022002)	3020688011	Water	02/20/02			x	x	
RFI-10-25 (022002)	3020688312	Water	02/20/02	x				
RFI-36-27 (022002)	3020688013	Water	02/20/02	x	x	x	x	
RFI-36-TB-300	3020688014	Water	02/20/02	x				
RFI-36-27d (022002)	3020688015	Water	02/20/02			x	x	
RFI-36-14 (022002)	3020688016	Water	02/20/02				x	
RFI-36-14d (022002)	3020686017	Water	02/20/02				x	
20-FP6 (022002)	3020688018	Water	02/20/02	x				
RFI-38-06d (022102)	3020688020	Water	02/21/02				x	
RFI-10-26 (022102)	3020688021	Water	02/21/02	x				
RFI-10-26d (022102)	3020688022	Water	02/21/02				x	
83/84-27 (022102)	3020688023	Water	02/21/02	x	x	x	x	
83/84-27d (022102)	3020688024	Water	02/21/02			x	x	
83/84-29 (022102)	3020688025	Water	02/21/02	x	x	x	x	
83/84-29d (022102)	3020688026	Water	02/21/02			x	x	
RFI-40-10 (022102)	3020688027	Water	02/21/02	x	x	x	x	
RFI-40-10d (022102)	3020688028	Water	02/21/02			x	x	
RFI-04-TB-301	3020688029	Water	02/21/02	x				
86-08R (022102)	3020688030	Water	02/21/02	x	x	x	x	
86-08Rd (022102)	3020688031	Water	02/21/02			x	x	
86-DUP-300[1]	3020688032	Water	02/21/02	x	x	x	x	
86-DUP-300d[2]	3020688033	Water	02/21/02			x	x	
RFI-36-45 (022002) DL	3020688034	Water	02/20/02	x				
86-08R (022102) DL	3020688035	Water	02/21/02	x				
86-DUP-300 DL	3020688036	Water	02/21/02	x				
86-08R (022102) DL2	3020688037	Water	02/21/02	x				
86-DUP-300 DL2	3020688038	Water	02/21/02	x				

1 Duplicate analysis performed on sample RFI-86-08R (022102)
2 Duplicate analysis performed on sample RFI-86-08Rd (022102)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Sample RFI-36-45 (022002) contained 1,1,1-Trichloroethane and 1,1-Dichloroethane above the linear range. Data for the listed compounds have been replaced with data from the dilution analysis.

Sample 86-08R (022102) contained 1,1-Dichloroethane and Chloroethane above the linear range. Data for the listed compounds have been replaced with data from the dilution analyses.

Sample 86-DUP-300 contained 1,1-Dichloroethane and Chloroethane above the linear range. Data for the listed compounds have been replaced with data from the dilution analyses.

The continuing calibration %D was above control limits due to an increase in response by Tetrachloroethene. Associated sample RFI-40-10 (022102) has been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to an increase in response by 2-Hexanone. Associated sample RFI-36-44 (022002) has been qualified as estimated for the compound

based on the deviation.

The continuing calibration %D was above control limits due to a decrease in response by Bromomethane. Associated samples RFI-36-44 (022002), RFI-36-TB-300, and RFI-04-TB-301 have been qualified as estimated for the compound based on the deviation.

Acetone was detected in the trip blank. Sample results which were below the blank action level have been qualified as non-detect for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The initial calibration %RSD was above control limits for Benzaldehyde. Associated samples RFI-36-23 (022002), RFI-36-27 (022002), 83/84-27 (022102), 83/84-29 (022102), and RFI-40-10 (022102) have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above acceptable limits due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compound based on the deviation.

The MS/MSD %Rs were below 10% for Hexachlorocyclopentadiene. Associated sample RFI-36-23 (022002) has been qualified as rejected for the compound based on the deviations.

Di-n-butylphthalate was detected in the method blank. Sample results which were below the blank action level have been qualified as non-detect for the compound.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %Rs were below control limits for Silver. Associated samples RFI-36-23d (022002), RFI-36-27d (022002), 83/84-27d (022102), 83/84-29d (022102), RFI-40-10d (022102), 86-08Rd (022102) and 86-DUP-300d have been qualified as estimated for the analyte based on the deviations.

Selenium and Thallium were detected in the method blanks. Sample results which were below the blank action level have been qualified as non-detect for the analytes.

Antimony and Arsenic were detected in the instrument blanks. Sample results which were below the blank action level have been qualified as non-detect for the analytes.

Other than for the deviations noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	March 15, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	April 02, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020739

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020739 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
83/84-20 (022202) [2]	3020739001	Water	02/22/02	x	x	x	x	
83/84-20d (022202) [2]	3020739002	Water	02/22/02			x	x	
20-FP10 (022202)	3020739003	Water	02/22/02	x				
RFI-83/84-TB-302	3020739004	Water	02/22/02	x				
RFI-10-01d (022202)	3020739006	Water	02/22/02					x [1]
20-144 (022202)	3020739007	Water	02/22/02	x				
RFI-81-09 (022202)	3020739008	Water	02/22/02	x				
20-140 (022202)	3020739009	Water	02/22/02	x	x	x	x	
20-140d (022202)	3020739010	Water	02/22/02			x	x	
RFI-40-03 (022502)	3020739011	Water	02/25/02	x	x	x	x	
RFI-40-03d (022502)	3020739012	Water	02/25/02			x	x	
RFI-40-04 (022502)	3020739313	Water	02/25/02	x				
RFI-36-46 (022502)	3020739014	Water	02/25/02	x				
RFI-40-TB-303	3020739015	Water	02/25/02	x				
RFI-36-25R (022602)	3020739016	Water	02/26/02	x	x	x	x	
RFI-36-25Rd (022602)	3020739017	Water	02/26/02			x	x	
RFI-36-43 (022602)	3020739018	Water	02/26/02	x				
RFI-55-10 (022602)	3020739019	Water	02/26/02	x				
RFI-40-09 (022602)	3020739020	Water	02/26/02	x	x	x	x	
RFI-40-09d (022602)	3020739021	Water	02/26/02			x	x	
RFI-36-29R (022602) [2]	3020739022	Water	02/26/02	x	x	x	x	
RFI-36-29Rd (022602) [2]	3020739023	Water	02/26/02			x	x	
RFI-36-DUP-301 [3]	3020739024	Water	02/26/02	x	x	x	x	
RFI-36-DUP-301d [4]	3020739025	Water	02/26/02			x	x	
RFI-36-TB-304	3020739026	Water	02/26/02	x				
RFI-40-07 (022502)	3020739027	Water	02/25/02	x	x	x	x	
RFI-40-07d (022502)	3020739028	Water	02/25/02			x	x	
RFI-40-09 (022602) DL	3020739031	Water	02/26/02	x				
RFI-36-43 (022602) DL	3020739032	Water	02/26/02	x				

1 Barium analysis performed on sample
2 MS/MSD analysis performed on sample
3 Duplicate analysis performed on sample RFI-36-29R (022602)
4 Duplicate analysis performed on sample RFI-36-29Rd (022602)

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

Sample RFI-36-43 (022602) contained several compounds above the linear range and surrogate recoveries below control limits. Data for the sample have been replaced with data from the dilution analysis based on the deviations.

Sample RFI-40-09 (022602) contained Benzene, Cyclohexane and Methyl Cyclohexane above the linear range. Data for the listed compounds have been replaced with data from the dilution analysis.

The initial calibration %RSD was above control limits for Acetone. Associated samples RFI-40-TB-303 and RFI-36-TB-304 have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to an increase in response by Tetrachloroethene. Associated sample RFI-81-09 (022202) has been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to a decrease in response by 1,2-Dibromo-

3-chloropropane. Associated samples RFI-83/84-TB-302, RFI-55-10 (022602), and RFI-40-07 (022502) have been qualified as estimated for the compound based on the deviation.

Recoveries for one surrogate were above control limits in samples RFI-40-09 (022602) and RFI-40-07 (022502). Positive data in the listed samples have been qualified as estimated based on the deviations.

The MS/MSD %R were outside control limits for 1,1,2-Trichloroethane, cis-1,2-Dichloroethene, Methyl Tert Butyl Ether, Benzene, and Toluene. Associated sample RFI-36-29R (022602) has been qualified as estimated for the compounds based on the deviations.

The LCS %R was below control limits for cis-1,2-Dichloroethene. Associated samples RFI-83/84-TB-302, 20-140 (022202), RFI-40-TB-303, RFI-55-10 (022602), RFI-40-09 (022602), RFI-36-DUP-301, RFI-36-TB-304, and RFI-36-43 (022602) DL have been qualified as estimated for the compound based on the deviation.

Acetone, Benzene, and Trichlorofluoromethane were detected in the trip blanks. Sample results which were below the blank action level have been qualified as non-detect for the compounds.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)		X	
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)		X	
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The internal standard response was below control limits for Perylene-d12. Associated sample 83/84-20 (022202) has been qualified as estimated for all compounds associated with Perylene-d12.

The internal standard response was below control limits for Perylene-d12 and Chrysene-d12. Associated sample RFI-36-29R (022602) has been qualified as estimated for all compounds associated with the listed internal standards.

The initial calibration %RSD was above control limits for Benzaldehyde. Associated samples 83/84-20 (022202), 20-140 (022202), and RFI-40-03 (022502) have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above acceptable limits due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compound based on the

deviation.

The continuing calibration %D was above control limits due to a decrease in response by 4-Nitrophenol and 2,4-Dinitrophenol. Associated samples RFI-36-25R (022602), RFI-40-09 (022602), and RFI-40-07 (022502) have been qualified as estimated for the compounds based on the deviations.

The MS/MSD %R were below 10% for 3,3-Dichlorobenzidine. Associated sample 83/84-20 (022202) has been qualified as rejected for the compound based on the deviation.

The LCS/LCSD RPD was above control limits for bis(2-Ethylhexyl)phthalate. Associated sample RFI-40-07 (022502) has been qualified as estimated for the compound based on the deviation.

The LCS/LCSD RPD was above control limits for Diethyl phthalate. Associated samples RFI-40-09 (022602) and RFI-36-DUP-301 have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)	X		
8.	Target analyte concentrations below detection limit in all blank samples		X	

Notes

The MS/MSD %R were below control limits for Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Silver, Thallium, Vanadium, and Zinc. Associated samples 83/84-20d (022202), 20-140d (022202), RFI-40-03d (022502), RFI-36-25Rd (022602), and RFI-40-09d (022602) have been qualified as estimated for the analytes based on the deviations.

The MS/MSD %R were below control limits for Barium. Associated sample RFI-10-01d (022202) has been qualified as estimated for the analyte based on the deviation.

The MS/MSD %R were below control limits for Silver. Associated samples RFI-36-29Rd (022602), RFI-36-DUP-301d, and RFI-40-07d (022502) have been qualified as estimated for the analyte based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	March 20, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	April 04, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020803

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020803 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC[1]
MW-23 (022702)	3020803001	Water	02/27/02	x				
MW-22 (022702)	3020803002	Water	02/27/02	x				x
Tank 37 N (022702) NL	3020803003	Oil	02/27/02	x	x			
03-03 (022702) NL	3020803004	Oil	02/27/02	x	x			x
70-101 (022702) NL	3020803005	Oil	02/27/02	x	x			x
RFI-03-02 (022602)	3020803006	Water	02/26/02	x	x	x	x	
RFI-03-02d (022602)	3020803007	Water	02/26/02			x	x	
RFI-03-TB-305	3020803008	Water	02/27/02	x				
RFI-16-12 (022802)	3020803009	Water	02/28/02	x	x	x	x	
RFI-16-12d (022802)	3020803010	Water	02/28/02			x	x	
RFI-85-04R (022802)	3020803011	Water	02/28/02	x	x	x	x	
RFI-85-04Rd (022802)	3020803312	Water	02/28/02			x	x	
MW-24 (022802)	3020803013	Water	02/28/02	x				
RFI-85-TB-306	3020803014	Water	02/28/02	x				
03-03 (022702) NL-RE	3020803015	Oil	02/27/02	x				

1 Specific Gravity, Interfacial Tension, and Viscosity analysis performed on sample

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)		X	
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above control limits for Acetone. Associated samples Tank 37 N (022702) NL, 03-03 (022702) NL, 70-101 (022702) NL, RFI-03-02 (022602), and RFI-16-12 (022802) have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to an increase in response by 2-Butanone. Associated sample RFI-16-12 (022802) has been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to a decrease in response by Bromomethane. Data have been qualified as estimated for the compound based on the deviation.

The continuing calibration %D was above control limits due to a decrease in response by Methylene Chloride and Chloroethane. Oil samples have been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above control limits due to a decrease in response by Methyl Tert Butyl Ether and Cyclohexane. Water samples have been qualified as estimated for the compounds based on the deviations.

Recovery for one surrogate was above control limits in sample 03-03 (022702) NL. Positive data have been qualified as estimated based on the deviation.

The LCS %R was below control limits for Trichlorofluoromethane. Oil samples have been qualified as estimated for the compound based on the deviation.

The LCS %R was below control limits for 1,1,1-Trichloroethane. Water samples have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Semivolatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)		X	
	Surrogate (%Recovery)		X	
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above control limits for Benzaldehyde, 4-Nitroaniline, 4,6-Dinitro-2-methylphenol, and Pentachlorophenol. Associated samples Tank 37 N (022702) NL, 03-03 (022702) NL, 70-101 (022702) NL, RFI-16-12 (022802), and RFI-85-04R (022802) have been qualified as estimated for the compounds based on the deviations.

The initial calibration %RSD was above control limits for Fluoranthene, Chrysene, Benzo(a)pyrene, and Benzo(b)fluoranthene. Associated sample 03-03 (022702) NL has been qualified as estimated for the compounds based on the deviations.

The continuing calibration %D was above acceptable limits due to a decrease in response by 3&4-Methylphenol. Sample results have been qualified as estimated for the compound based on the deviation.

Recoveries for all surrogates were above control limits in sample RFI-03-02 (022602). Positive data have been qualified as estimated in the sample based on the deviations.

Recoveries were below control limits for two acid surrogates in sample RFI-16-12 (022802). All acid data have been qualified as estimated in the sample based on the deviations.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: PCBs

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)	X		
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)	X		
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

All data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)		X	
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were below control limits for Barium, Cobalt, Nickel, Silver, Zinc, Beryllium, and Chromium. Sample results have been qualified as estimated for the analytes based on the deviations.

The serial dilution RPD was above control limits for Manganese. Sample results have been qualified as estimated for the analyte based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	March 27, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	April 03, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3020908

VOLATILE AND INORGANIC ANALYSES

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Summary

The following is an assessment of data package 3020908 for sampling in support of the RCRA Facility Investigation at the GM-NAO Flint Operations Site in Flint, Michigan. Included in this assessment are checklists used in the review of the samples and a summary of non-conformances and their impact on the reported data. Analyses were performed on the following samples:

Sample ID	Laboratory ID	Matrix	Sample Date	Analyses				
				VOC	SVOC	PCB	TAL	MISC
RFI-09-32 (030602)	3020908001	Soil	03/06/02	x			x	

Sample Analysis: Volatiles

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%RSD, R2, RF)		X	
	Continuing calibration (%D, RF)	X		
	Surrogate (%Recovery)	X		
	Matrix spike (%Recovery)	X		
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	Internal standard (Response, RT)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The initial calibration %RSD was above control limits for Acetone. Data have been qualified as estimated for the compound based on the deviation.

Other than for the deviations noted in this review, all data quality parameters were within method-specified limits and the data is acceptable for use as reported by the laboratory.

Sample Analysis: Metals

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%R, R2)	X		
	Continuing calibration (%D)	X		
	Matrix spike (%Recovery)		X	
	Blank spike (%Recovery)			X
	Control sample (%Recovery)	X		
	CRDL standard (%R)			X
	Serial dilution (%D)	X		
	Internal standard (Response)	X		
7.	Precision maintained within established ranges for the following:			
	Matrix spike (RPD)	X		
	Laboratory duplicate (RPD)			X
	Field duplicate (RPD)			X
8.	Target analyte concentrations below detection limit in all blank samples	X		

Notes

The MS/MSD %Rs were below control limits for Antimony. Data have been qualified as estimated for the analyte based on the deviation.

Other than for the deviation noted in this review, all data quality parameters were within method specified limits and the data is acceptable for use as reported by the laboratory.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	March 25, 2002
Validation performed by:	(Melissa Cash)
Date of Validation:	April 09, 2002