Appendix E

Analytical Data Review and Validation Report Summaries

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3022872

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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engineers & scientists

Summary

The following is an assessment of data package 3022872 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	MI
4-8(062702)	3022872001	Water	6/27/2002	X		X		
4-13(062702)	3022872002	Water	6/27/2002	X		X		
4-17(062702)	3022872003	Water	6/27/2002	X		X		
4-20(062702)	3022872004	Water	6/27/2002	X		X		
4-23(062702)	3022872005	Water	6/27/2002	X		X		
5-4(062702)	3022872006	Water	6/27/2002	X		X		
5-5(062702)	3022872007	Water	6/27/2002	X		X		
5-10(062702)	3022872008	Water	6/27/2002	X		X		
5-13A(062702)	3022872009	Water	6/27/2002	X		X		
3-15(062702)	3022872010	Water	6/27/2002	X		X		
3-20(062702)	3022872011	Water	6/27/2002	X		X		
3-22-1(062702)	3022872012	Water	6/27/2002	X		X		
3-23(062702)	3022872013	Water	6/27/2002	X		X		
3-65(062802)	3022872014	Water	6/28/2002	X		X		
3-76-8(062802)	3022872015	Water	6/28/2002	X		X		
2-29(062802)	3022872016	Water	6/28/2002	X		X		
2-20(062802)	3022872017	Water	6/28/2002	X		X		
2-20(062802)RE	3022872019	Water	6/28/2002	X		X		
3-26(062702)	3022872018	Water	6/27/2002	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		
	[illegible]			
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%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 increase in response by Methyl acetate, Tetrachloroethene, Acetone, Cyclohexane, Dichlorodifluoromethane (CFC-12), Methyl Cyclohexane, Bromomethane, and Tetrachloroethene. Detected compounds in the associated sample were qualified as estimated due to these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Acetone and 2-Butanone. These compounds were qualified as estimated due to these deviations.

Samples -20(062702), 4-23(062702), 5-4(062702), 5-5(062702), 5-10(062702), 3-15(062702), 3-20(062702), 3-22-1(062702), and 3-65(062802) exhibited surrogate recoveries above the control limit. Detected sample results were qualified as estimated.

Sample 2-20(062802) exhibited low internal standard recover of 1,4-Dichlorobenzene-d4. All associated sample results were 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.	Primary methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%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:	7/22/02
Validation performed by:	(Dennis Capria)
Date of Validation:	12/24/2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3023019

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
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Summary

The following is an assessment of data package 3023019 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
4-8(070902)	3023019001	Water	7/9/2002	X		X		
4-23(070902)	3023019002	Water	7/9/2002	X		X		
4-13(070902)	3023019003	Water	7/9/2002	X		X		
3-65(070902)	3023019004	Water	7/9/2002	X		X		
3-20(070902)	3023019005	Water	7/9/2002	X		X		
3-15(070902)	3023019006	Water	7/9/2002	X		X		
3-22-1(070902)	3023019007	Water	7/9/2002	X		X		
3-23(070902)	3023019008	Water	7/9/2002	X		X		
3-26(070902)	3023019009	Water	7/9/2002	X		X		
5-4(070902)	3023019010	Water	7/9/2002	X		X		
5-5(070902)	3023019011	Water	7/9/2002	X		X		
5-10(070902)	3023019012	Water	7/9/2002	X		X		
5-13A(070902)	3023019013	Water	7/9/2002	X		X		
11-3(070902)	3023019014	Water	7/9/2002	X				
11-6(070902)	3023019015	Water	7/9/2002	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 increase in response by Dichlorodifluoromethane (CFC-12), Bromomethane, 4-Methyl-2-pentanone, Tetrachloroethene, and Acetone. Associated sample detected results were qualified due to these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Chloromethane associated samples data have been qualified as estimated for the compounds based on these deviations.

MEK was detected in the method blanks. All samples results less than the blank action level were qualified as non-detected.

Sample 4-8(070902) exhibited MS recoveries of a Methylene chloride, 1,2,4-Trichlorobenzene, Carbon tetrachloride, Ethylbenzene, Methyl cylohexane, and m&p-Xylene below the control limit. Sample results were 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 continuing calibration %D for aroclor-1016 above the acceptable limit due to a increase in response. None of the associated sample contained detected results of the lighter aroclors therefore none of the data were qualified due to these deviations.

MS recovery of sample 3-65(070902) was less than ten percent. Non-detected sample results were qualified as rejected and detected sample results were qualified as estimated.

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 31 2002
Validation performed by:	(Dennis Capria)
Date of Validation:	12/26/2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3023410

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

BBL
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engineers & scientists

Summary

The following is an assessment of data package 3023701 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
4-23(072902)	3023410001	Water	7/29/2002					
4-13(072902)	3023410002	Water	7/29/2002					
3-65(072902)	3023410003	Water	7/29/2002					
3-20(072902)	3023410004	Water	7/29/2002					
3-15(072902)	3023410005	Water	7/29/2002					
3-22-1(072902)	3023410006	Water	7/29/2002					
3-23(072902)	3023410007	Water	7/29/2002					
3-26(072902)	3023410008	Water	7/29/2002					
5-4(072902)	3023410009	Water	7/29/2002					
5-5(072902)	3023410010	Water	7/29/2002					
5-10(072902)	3023410011	Water	7/29/2002					
5-13A(072902)	3023410012	Water	7/29/2002					
11-3(072902)	3023410013	Water	7/29/2002					
11-6(072902)	3023410014	Water	7/29/2002					
2-41-4(072902)	3023410015	Water	7/29/2002					
2-41(072902)	3023410016	Water	7/29/2002					
2-39(072902)	3023410017	Water	7/29/2002					
2-38(072902)	3023410018	Water	7/29/2002					
2-35(072902)	3023410019	Water	7/29/2002					
2-31(072902)	3023410020	Water	7/29/2002					
2-22(072902)	3023410021	Water	7/29/2002					
2-20(072902)	3023410022	Water	7/29/2002					
2-33(072902)	3023410023	Water	7/29/2002					
3-69(072902)	3023410024	Water	7/29/2002					
4-17(072902)	3023410025	Water	7/29/2002					
3-76-8(072902)	3023410026	Water	7/29/2002					

[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 increase in response by Methyl acetate, Tetrachloroethene, Acetone, 2-Hexanone, and trans-1,3-Dichloropropene. None of these compounds were detected in the associated sample therefore there was no data were qualified due to these deviations.

Sample RFI-09-41(4.7-6.6) exhibited surrogate recoveries above the control limit. Detected sample results were 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

The initial calibration %RSD was above the acceptable limit for Benzaldehyde, Biphenyl, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene associated sample RFI-81-18(00-02); Benzaldehyde; associated sample 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 3&4-Methylphenol associated samples data have been qualified as estimated for the compounds based on these deviations.

Responses for internal standards were reported outside of acceptable limits in Perylene-d12 and Chrysene-d12. reanalysis of these samples was performed to demonstrate matrix inference. Samples RFI-09-41(4.7-6.6)RE, RFI--09-41(4.7-6.6)RE, RFI-09-42(0.7-2.7)REDL, RFI-09-43(0.7-2.7)RE, RFI-09-44(0.7-2.7)RE, RFI-09-40(0.7-1.9)RE replaced the original analysis due superior internal standard recovery. Compounds associated with deficient internal standard recoveries 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 RPD of sample RFI-09-44(2.7-4.7) was greater than the control limits. All aroclor results for this sample were non-detected therefore the data was not qualified.

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 Barium, and Beryllium. All soil sample data have been qualified as estimated.

The MS/MSD %Rs were below the acceptable limit for Antimony. All soil sample data have been qualified as rejected.

The laboratory duplicate percent difference was above the acceptable limit for Chromium. All soil sample data have been qualified as estimated.

The serial percent difference was above the acceptable limit for Arsenic, Nickel, Manganese, and Zinc. All soil sample data 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 18, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 22, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3023510

VOLATILE ANALYSIS

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

Summary

The following is an assessment of data package 3023510 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
11-3(080202)	3203510001	Water	8/2/2002	X				
11-6-2(080202)	3203510002	Water	8/2/2002	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 above the acceptable limit due to a increase in response by Dichlorodifluoromethane and Acetone. None of these compounds were detected in the associated sample therefore there was no data were qualified due to these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by bromomethane and carbon disulfide. The associated samples 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.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	August 20, 2002
Validation performed by:	(Dennis Capria)
Date of Validation:	December 24, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3023701

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3023701 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-09-40(0.7-1.9)	3023701001	Soil	8/15/2002	X	X	X	X	
RFI-09-40(0.7-1.9)RE	3023701008	Soil	8/15/2002		X			
RFI-09-41(0.7-2.7)	3023679005	Soil	8/16/2002	X	X	X	X	
RFI-09-41(2.7-4.7)	3023679006	Soil	8/16/2002	X	X	X	X	
RFI-09-41(2.7-4.7)RE	3023701005	Soil	8/16/2002		X			
RFI-09-41(4.7-6.6)	3023679007	Soil	8/16/2002	X	X	X	X	
RFI-09-41(4.7-6.6)DL	3023701002	Soil	8/16/2002	X				
RFI-09-41(4.7-6.6)RE	3023701007	Soil	8/16/2002		X			
RFI-09-42(0.7-2.7)	3023679008	Soil	8/16/2002	X	X	X	X	
RFI-09-42(0.7-2.7)REDL	3023701006	Soil	8/16/2002		X			
RFI-09-42(2.7-4.7)	3023679009	Soil	8/16/2002	X	X	X	X	
RFI-09-42(4.7-6.7)	3023679010	Soil	8/16/2002	X	X	X	X	
RFI-09-43(0.7-2.7)	3023679011	Soil	8/16/2002	X	X	X	X	
RFI-09-43(0.7-2.7)RE	3023701003	Soil	8/16/2002		X			
RFI-09-43(2.7-4.7)	3023679012	Soil	8/16/2002	X	X	X	X	
RFI-09-43(4.7-6.7)	3023679013	Soil	8/16/2002	X	X	X	X	
RFI-09-44(0.7-2.7)	3023679014	Soil	8/16/2002	X	X	X	X	
RFI-09-44(0.7-2.7)RE	3023701004	Soil	8/16/2002		X			
RFI-09-44(2.7-4.7)	3023679015	Soil	8/16/2002	X	X	X	X	
RFI-09-DUP-411	3023679016	Soil	8/16/2002	X	X	X	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 increase in response by Methyl acetate, Tetrachloroethene, Acetone, 2-Hexanone, and trans-1,3-Dichloropropene. None of these compounds were detected in the associated sample therefore there was no data were qualified due to these deviations.

Sample RFI-09-41(4.7-6.6) exhibited surrogate recoveries above the control limit. Detected sample results were 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

The initial calibration %RSD was above the acceptable limit for Benzaldehyde, Biphenyl, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene associated sample RFI-81-18(00-02); Benzaldehyde; associated sample 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 3&4-Methylphenol associated samples data have been qualified as estimated for the compounds based on these deviations.

Responses for internal standards were reported outside of acceptable limits in Perylene-d12 and Chrysene-d12. reanalysis of these samples was performed to demonstrate matrix inference. Samples RFI-09-41(4.7-6.6)RE, RFI--09-41(4.7-6.6)RE, RFI-09-42(0.7-2.7)REDL, RFI-09-43(0.7-2.7)RE, RFI-09-44(0.7-2.7)RE, RFI-09-40(0.7-1.9)RE replaced the original analysis due superior internal standard recovery. Compounds associated with deficient internal standard recoveries 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.

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 of sample RFI-09-44(2.7-4.7) was greater than the control limits. All aroclor results for this sample were non-detected therefore the data was not qualified.

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 Barium, and Beryllium. All soil sample data have been qualified as estimated.

The MS/MSD %Rs were below the acceptable limit for Antimony. All soil sample data have been qualified as rejected.

The laboratory duplicate percent difference was above the acceptable limit for Chromium. All soil sample data have been qualified as estimated.

The serial percent difference was above the acceptable limit for Arsenic, Nickel, Manganese, and Zinc. All soil sample data 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.

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

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3023726

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3023726 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-211	3023726001	Water	8/19/2002	X	X	X	X	
RFI-09-TB-411	3023726002	Water	8/19/2002	X				
RFI-09-39(0.5-2.5)	3023726003	Soil	8/20/2002				X	
RFI-09-39(2.5-4.5)	3023726004	Soil	8/20/2002				X	
RFI-09-33(0.5-2.0)	3023726005	Soil	8/20/2002				X	
RFI-09-33(03-05)	3023726006	Soil	8/20/2002				X	
RFI-09-36R(0.3-2.3)	3023726007	Soil	8/20/2002	X	X	X	X	
RFI-09-36R(0.3-2.3)RE	3023726032	Soil	8/20/2002		X			
RFI-09-36R(2.3-4.3)	3023726008	Soil	8/20/2002	X	X	X	X	
RFI-09-36R(2.3-4.3)RE	3023726031	Soil	8/20/2002		X			
RFI-09-45(0.5-2.5)	3023726009	Soil	8/20/2002	X	X	X	X	
RFI-09-45(0.5-2.5)RE	3023726030	Soil	8/20/2002		X			
RFI-09-45(2.5-4.5)	3023726010	Soil	8/20/2002	X	X	X	X	
RFI-09-33(05-6.8)	3023726011	Soil	8/20/2002				X	
RFI-09-34(00-02)	3023726012	Soil	8/20/2002				X	
RFI-09-34(02-04)	3023726013	Soil	8/20/2002				X	
RFI-09-35(00-02)	3023726014	Soil	8/20/2002				X	
RFI-09-35(02-04)	3023726015	Soil	8/20/2002				X	
RFI-94-EP-RB-212	3023726016	Water	8/21/2002	X	X	X	X	
RFI-TB-412	3023726017	Water	8/21/2002	X				
RFI-09-46(03-05)	3023726018	Soil	8/21/2002	X	X	X	X	
RFI-09-46(05-07)	3023726019	Soil	8/21/2002	X	X	X	X	
RFI-09-46(00-0.5)	3023726020	Soil	8/21/2002	X	X	X	X	
RFI-09-38(0.7-2.7)	3023726021	Soil	8/21/2002				X	
RFI-09-38(2.7-4.7)	3023726022	Soil	8/21/2002				X	
RFI-09-DUP-412[1]	3023726023	Soil	8/21/2002	X	X	X	X	
RFI-94-EP-02D(0.5-2.5)	3023726024	Soil	8/21/2002			X		
RFI-94-EP-02D(2.5-4.5)	3023726025	Soil	8/21/2002			X		
RFI-94-EP-02C(0.5-2.5)	3023726026	Soil	8/21/2002			X		
RFI-94-EP-02C(2.5-4.5)	3023726027	Soil	8/21/2002			X		
RFI-94-07(02-04)	3023726028	Soil	8/21/2002	X	X	X	X	
RFI-94-07(04-06)	3023726029	Soil	8/21/2002	X	X	X	X	

[1] DUP for sample RFI-09-46(03-05)

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 continuing calibration %D was above the acceptable limit due to a increase in response by, Acetone, and Bromomethane. Associated sample detected results were qualified due to these deviations.

Samples RFI-09-46(03-05), RFI-09-46(05-07), RFI-09-46(00-0.5), RFI-09-DUP-412, RFI-94-07(02-04), and RFI-94-07(04-06) exhibited surrogate recoveries above the control limit. Detected sample results were qualified as estimated.

Methyl acetate was detected in the method blank. Associated sample results less than the blank action level were qualified as non-detected.

Sample RFI-09-46(05-07) exhibited MS/MSD recoveries for Tetrachloroethene above the control limits. Tetrachloroethene was not detected in the sample therefore no sample data were qualified.

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 coefficient was below the acceptable limit for Benzaldehyde and Biphenyl associated sample results have been qualified as estimated based on these deviations.

The continuing calibration %D was below the acceptable limit due to a decrease in response by Benzaldehyde, 4,6-Dinitro-2-methylphenol, and 3&4-Methylphenol associated samples 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 increase in response by 4-Chloroaniline, 2,4-Dinitrophenol, 4,6-Dinitro-2-methylphenol, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene detected associated sample results have been qualified as estimated for the compounds based on these deviations

Responses for internal standard was reported outside of acceptable limits in Perylene-d12 for samples RFI-09-36R(2.3-4.3) and RFI-09-45(0.5-2.5). Reanalysis of these samples was performed to demonstrate matrix inference. The original analysis due of these samples were reported. Compounds

associated with deficient internal standard recoveries have been qualified as estimated.

Responses for internal standard was reported outside of acceptable limits in Perylene-d12 for sample RFI-09-36R(0.3-2.3). Reanalysis of these samples was performed to demonstrate matrix inference. The reanalysis of this sample was reported. Compounds associated with deficient internal standard recoveries 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 for RFI-09-46(05-07) were above the acceptable limit for Barium, Cadmium, Chromium, Lead, Thallium, Vanadium, and Zinc. All positive soil sample data have been qualified as estimated.

The MS/MSD %Rs for RFI-94-07(04-06) were below the acceptable limit for Barium and Zinc. All soil sample data have been qualified as estimated.

The MS/MSD %Rs were above the acceptable limit for Arsenic, Cadmium, Chromium, Manganese, Selenium, Thallium, Vanadium, and Zinc. All positive water sample data have been qualified as estimated.

The MS/MSD %Rs were less than 10 percent the acceptable limit for Antimony. All non-detected

sample results were qualified as rejected. Detected sample results were qualified as estimated.

The laboratory duplicate percent difference was above the acceptable limit for Barium, Chromium, and Manganese. All detected soil sample data have been qualified as estimated.

The serial percent difference was above the acceptable limit for Lead. All soil sample data have been qualified as estimated.

The LCSs for Cyanide were below the acceptable limit. All associated soil cyanide data has 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 18, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 22, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3023819

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3023819 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-85-08(6.5-8.5)	3023819001	Soil	8/22/2002	X	X		X	
RFI-03-10(00-02)	3023819002	Soil	8/23/2002				X	
RFI-03-09(00-02)	3023819003	Soil	8/23/2002				X	
RFI-85-RB-213	3023819004	Water	8/23/2002	X	X		X	
RFI-TB-414	3023819005	Water	8/23/2002	X				
RFI-85-08(0.5-2.5)	3023819006	Soil	8/22/2002	X	X		X	
RFI-TB-413	3023819007	Water	8/22/2002	X				
RFI-TB-415	3023819008	Water	8/26/2002	X				
RFI-09-47(0.7-2.7)	3023819009	Soil	8/26/2002	X	X		X	
RFI-09-47(0.7-2.7)RE	3023819015	Soil	8/26/2002		X			
RFI-09-47(2.7-4.7)[1]	3023819010	Soil	8/26/2002	X	X		X	
RFI-09-47(4.7-6.7)	3023819011	Soil	8/26/2002	X	X		X	
RFI-09-47(4.7-6.7)DL	3023819017	Soil	8/26/2002	X			X	
RFI-09-DUP-413	3023819012	Soil	8/26/2002	X	X		X	
RFI-09-DUP-413RE	3023819016	Soil	8/26/2002		X			
RFI-09-RB-214	3023819013	Water	8/26/2002	X	X		X	
Rinse Water(082702)	3023819014	Water	8/27/2002	X	X		X	

[1] DUP for sample RFI-09-47(2.7-4.7)

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 continuing calibration %D was above the acceptable limit due to a increase in response by Acetone, 2-Butanone, 2-Hexanone, Methyl acetate, Tetrachloroethene, and Styrene. Associated sample detected results were qualified due to these deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by Chloromethane associated samples data have been qualified as estimated for the compounds based on these deviations.

Samples RFI-85-08(6.5-8.5) and RFI-85-08(0.5-2.5) were received and preserved more than 48 hours after collection of the VOC samples. Sample results were qualified as estimated.

Samples RFI-09-47(2.7-4.7) and RFI-09-47(4.7-6.7) exhibited surrogate recoveries above the control limit. Detected sample results were qualified as estimated.

Sample RFI-09-47(4.7-6.7) exhibited MS recoveries of a Ethylbenzene, o-Xylene, and Toluene above

the control limit. Sample results were qualified as estimated.

Field duplicate RPD between samples RFI-09-47(2.7-4.7) and RFI-09-DUP-413 were greater than the control limit for Methyl cylohexane. Sample results for these sample 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: 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 coefficient was below the acceptable limit for Benzaldehyde and Biphenyl associated sample results have been qualified as estimated based on these deviations.

The continuing calibration %D was below the acceptable limit due to a decrease in response by N-Nitrosodi-n-propylamine, Benzaldehyde, and 3&4-Methylphenol associated samples 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 increase in response by 4-Chloroaniline, 2,4-Dinitrophenol, 4,6-Dinitro-2-methylphenol, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene detected associated sample results have been qualified as estimated for the compounds based on these deviations

Responses for internal standards were reported outside of acceptable limits in Perylene-d12 and Chrysene-d12 for samples RFI-09-47(0.7-2.7) and RFI-09-DUP-413. Reanalysis of these samples was performed to demonstrate matrix inference. The original analysis of these samples was reported.

Compounds associated with deficient internal standard recoveries have been qualified as estimated.

Samples RFI-85-08(0.5-2.5), RFI-09-47(0.7-2.7), RFI-09-47(0.7-2.7)RE, and RFI-09-47(2.7-4.7) demonstrated surrogate recoveries which were greater than the control limits. Any positive data associated with these samples were 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 surrogate recoveries for sample RFI-09-47(0.7-2.7) were both above control limits. No aroclor were detected therefore no data were qualified.

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 for RFI-85-08(6.5-8.5) were above the acceptable limit for Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Selenium, Silver, Vanadium, and Zinc. All positive soil sample data have been qualified as estimated.

The MS/MSD %Rs were less than 10 percent the acceptable limit for Antimony. All soil sample data have been qualified as rejected.

The laboratory duplicate percent difference was above the acceptable limit for Arsenic. All soil sample data have been qualified as estimated.

The Cyanide LSC associated with sample RFI-85-08(6.5-8.5) was below the control limits. This sample result was qualified as estimated.

Field duplicate RPD between samples RFI-09-47(2.7-4.7) and RFI-09-DUP-413 were greater than the control limit for Barium, Copper, Lead, Manganese, and Zinc. Sample results for these analytes have been qualified as estimated.

The serial percent difference was above the acceptable limit for Zinc. All soil sample data 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:	September 19, 02
Validation performed by:	(Dennis Capria)
Date of Validation:	December 30, 2002

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3023924

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3023924 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-BG-01(00-02)	3023924001	Soil	8/29/2002				X	
RFI-BG-02(00-02)	3023924002	Soil	8/29/2002				X	
RFI-BG-03(00-02)	3023924003	Soil	8/29/2002				X	
RFI-BG-04(00-02)	3023924004	Soil	8/29/2002				X	
RFI-BG-05(00-02)	3023924005	Soil	8/29/2002				X	
RFI-BG-06(00-02)	3023924006	Soil	8/29/2002				X	
RFI-BG-07(00-02)	3023924007	Soil	8/29/2002				X	
RFI-BG-08(00-02)	3023924008	Soil	8/29/2002				X	
RFI-BG-09(00-02)	3023924009	Soil	8/29/2002				X	
RFI-BG-10(00-02)	3023924010	Soil	8/29/2002				X	
RFI-BG-DUP-414	3023924011	Soil	8/29/2002				X	

[1] **DUP for sample RFI-BG-06(00-02)**

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 %Rs were above the acceptable limit for Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc All detected sample results have been qualified as estimated.

The MS/MSD %Rs were below the acceptable limit for Antimony. All soil sample data have been qualified as rejected.

The laboratory duplicate percent difference was above the acceptable limit for Arsenic. All soil sample data 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 18, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 22, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3024032

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3024032 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-83/84-31(07-09)	3024032001	Soil	9/4/2002				X	
RFI-83/84-31(01-03)	3024032002	Soil	9/4/2002				X	
RFI-83/84-30(8.7-10.7)	3024032003	Soil	9/4/2002				X	
RFI-83/84-30(0.7-2.7)	3024032004	Soil	9/4/2002				X	
RFI-83/84-DUP-415[1]	3024032005	Soil	9/4/2002				X	
RFI-83/84-33(7.2-9.2)	3024032006	Soil	9/4/2002				X	
RFI-83/84-36(0.7-2.7)	3024032007	Soil	9/4/2002				X	
RFI-83/84-34(0.7-2.7)	3024032008	Soil	9/4/2002				X	
RFI-83/84-35(0.7-2.7)	3024032009	Soil	9/4/2002				X	
RFI-83/84-37(0.7-2.7)	3024032010	Soil	9/4/2002				X	
RFI-83/84-33(1.2-3.2)	3024032011	Soil	9/4/2002				X	
RFI-83/84-32(0.7-1.5)	3024032012	Soil	9/4/2002				X	

[1] DUP for sample RFI-83/84-33(1.2-3.2)

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 Chromium and Zinc. All soil sample data have been qualified as estimated.

The MS/MSD %Rs were below the acceptable limit for Antimony. All non-detected soil sample data have been qualified as rejected. All detected soil sample data has been qualified an estimate.

The serial dilution percent difference was above the acceptable limit for Selenium. All soil sample data have been qualified as estimated.

The field duplicate percent difference was above the acceptable limit for Manganese. All soil sample data 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 18, 2001
Validation performed by:	(Melissa Cash)
Date of Validation:	August 22, 2001

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3024763

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3024763 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
Composite-36 RFI-36-49-52	3024763001	Soil	10/11/2002					X
Composite-05 RFI-05-29-31	3024763002	Soil	10/11/2002					X
RFI-09-37(0.5-2.5)	3024763003	Soil	10/11/2002				X	
RFI-09-37(2.5-4.5)	3024763004	Soil	10/11/2002				X	
RFI-10-29(00-02)	3024763005	Soil	10/14/2002	X				
RFI-10-29(06-08)	3024763006	Soil	10/14/2002	X				
RFI-10-28(00-02)	3024763007	Soil	10/14/2002	X				
RFI-10-28(08-10)	3024763008	Soil	10/14/2002	X				
RFI-DUP-416[1]	3024763009	Soil	10/14/2002	X				
RFI-36-48(00-02)	3024763010	Soil	10/15/2002	X			X	
RFI-36-48(06-08)	3024763011	Soil	10/15/2002	X			X	
RFI-36-48(08-10)	3024763012	Soil	10/15/2002	X			X	
RFI-36-48(14-16)	3024763013	Soil	10/15/2002	X			X	
RFI-36-47(00-02)	3024763014	Soil	10/15/2002	X			X	
RFI-36-47(08-10)	3024763015	Soil	10/15/2002	X			X	
RFI-36-47(10-12)	3024763016	Soil	10/15/2002	X			X	
RFI-81-13R(00-02)	3024763017	Soil	10/16/2002					X
RFI-02-13(0.5-2.5)	3024763018	Soil	10/16/2002	X	X	X	X	

[1] DUP for sample RFI-10-28(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 continuing calibration %D was above the acceptable limit due to a increase in response by Bromomethane, Acetone, 2-Hexanone, and Trichlorofluoromethane (CFC-11). None of these compounds were detected in the associated sample therefore there was no data were qualified due to these deviations.

Samples RFI-DUP-416, RFI-36-48(00-02), RFI-36-48(06-08), RFI-36-48(08-10), RFI-36-48(14-16), and RFI-36-47(00-02) exhibited surrogate recoveries above the control limit. Detected sample results were qualified as estimated.

Sample RFI-10-29(00-02) exhibited MS recoveries of Acetone, 2-Hexanone, Bromomethane, and 2-Butanone above the control limit. All sample results for these compounds were non-detected therefore none of the data was qualified due to these deviations.

The LCSs recoveries were below limits for Ethylbenzene, Methylene chloride, and Carbon disulfide

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	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 below the acceptable limit due to a decrease in response by 3&4-Methylphenol associated samples 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 increase in response by bis(2-Chloroethyl)ether detected associated 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 Barium, Arsenic, Chromium, Copper, Lead, Nickel, Vanadium, and Zinc . All soil sample data have been qualified as estimated.

The MS/MSD %Rs were below the acceptable limit for Antimony. All soil sample data have been qualified as rejected.

The laboratory duplicate percent difference was above the acceptable limit for Beryllium. All soil sample data have been qualified as estimated.

The serial percent difference was above the acceptable limit for Copper, Vanadium, Silver, Nickel, Chromium, Lead, Barium, Arsenic, and Zinc. All soil sample data 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:	11/14/03
Validation performed by:	(Dennis Capria)
Date of Validation:	1/8/2003

GENERAL MOTORS CORPORATION
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3025393

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3025393 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
Build 23 Basement NE Corner	3025393001	NAPL	11/13/2002	X	X	X	X	X
MH 6-24	3025393002	NAPL	11/13/2002	X	X	X	X	X

[1] DUP for sample RFI-10-28(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 continuing calibration %D was above the acceptable limit due to a increase in response by, Acetone and 2-Hexanone. Associated sample detected results were qualified due to 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 Benzaldehyde. Associated sample associated sample 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 3&4-Methylphenol, Benzaldehyde, and 4-Bromophenyl phenyl ether associated samples 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 and DRO

Quality Control Checks

		YES	NO	NA
1.	Field Chain-of-Custody complete	X		
2.	Proper methods for analysis used	X		
3.	All documentation supplied	X		
4.	Samples analyzed within specified holding times	X		
5.	The minimum number of field and laboratory QC samples analyzed	X		
6.	Accuracy maintained within established ranges for the following:			
	Initial calibration (%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	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 Barium, and Beryllium. All soil sample data have been qualified as estimated.

The serial dilution RPDs were above the acceptable limit for Manganese, Barium, Copper, Vanadium, Lead, Zinc, and Chromium. All soil sample data 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:	12/13/02
Validation performed by:	(Dennis Capria)
Date of Validation:	1/8/2003

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3025518

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3025518 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[2]
02-20 (111902)	3025518001	Water	11/19/02	X				
Build 23 Trench (112002)	3025518002	NAPL	11/20/02	X	X	X	X	X

1 DUP for sample RFI-10-28(08-10)
2 Miscellaneous parameters include: TPH (Diesel Range Organics)

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. Associated sample 02-20 (111902) has been qualified as estimated for acetone 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 continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol and benzaldehyde. Sample Build 23 Trench (112002) has been qualified as estimated for the listed 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

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 acceptable limits for antimony and lead. All soil sample data have been qualified as estimated for the listed analytes based on the deviations.

The MS/MSD %Rs were above acceptable limits for barium, copper and manganese. All positive data for the listed analytes have been qualified as estimated based on the deviations.

The MS/MSD relative percent difference between recoveries were above the acceptable limit for all analytes with the exception of zinc. All positive data have been qualified as estimated 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 6, 2003
Validation performed by:	(Melissa Cash)
Date of Validation:	March 11, 2003

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3025519

VOLATILE ANALYSES

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

Summary

The following is an assessment of data package 3025519 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
4-8 (112002)	3025519001	Water	11/20/02	X				
4-11 (112002)	3025519002	Water	11/20/02	X				
4-13 (112002)	3025519003	Water	11/20/02	X				
4-17 (112002)	3025519004	Water	11/20/02	X				
4-20 (112002)	3025519005	Water	11/20/02	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 above the acceptable limit due to an increase in response by acetone. Associated samples 4-8 (112002), 4-17 (112002) and 4-20 (112002) have been qualified as estimate 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:	January 20, 2003
Validation performed by:	(Melissa Cash)
Date of Validation:	March 10, 2003

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3025578

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3025578 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
4-8 (112102)	3025578001	Water	11/21/02	X				
4-11 (112102)	3025578002	Water	11/21/02	X				
4-13 (112102)	3025578003	Water	11/21/02	X				
4-17 (112102)	3025578004	Water	11/21/02	X				
4-20 (112102)	3025578005	Water	11/21/02	X				
Build 23 Basement	3025578006	Water	11/22/02	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 above the acceptable limit due to an increase in response by acetone and 2-butanone. All samples have been qualified as estimated for acetone and 2-butanone 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 was above control limits for benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene and dibenzo(a,h)anthracene. Data for the listed compounds have been qualified as estimated in the sample based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol, benzaldehyde, 3-nitroaniline, atrazine, carbazole and 3,3'-dichlorobenzidine. Data for the listed compounds have been qualified as estimated in the sample based on the %D.

One or more internal standard responses were below control limits in sample Build 23 Basement. Data have been qualified as estimated for all compounds associated with the deviant internal standard.

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 silver, manganese and zinc. Data have been qualified as estimated for the listed analytes based on the deviations.

Arsenic was detected in the instrument blank. Based on the blank content, data for arsenic has been qualified as undetected.

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 6, 2003
Validation performed by:	(Melissa Cash)
Date of Validation:	March 11, 2003

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3025933

VOLATILE AND PCB ANALYSES

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

Summary

The following is an assessment of data package 3025933 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]
RFI10-28 (121202)	3025933001	Water	12/12/02	X				
RFI10-29 (121202)	3025933002	Water	12/12/02	X				
RFI36-47 (121202)	3025933003	Water	12/13/02	X				
RFI36-48 (121202)	3025933004	Water	12/13/02	X				
BD01-02R (121302)	3025933005	Water	12/13/02	X				
ACSP-B2AR (121302)	3025933006	Water	12/13/02	X				
Build 32-Oil	3025933007	Oil	12/13/02			X		X
Build 32-Pipe	3025933008	Solid	12/13/02					X

[1] Miscellaneous parameters include: Asbestos

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, all samples were associated, 2-butanone, associated samples RFI10-29 (121202) and BD01-02R (121302), 4-methyl-2-pentanone, associated sample BD01-02R (121302); a decrease in response by bromomethane, all samples were associated, chloromethane, associated samples RFI36-47 (121202), RFI36-48 (121202), BD01-02R (121302) and ACSP-B2AR (121302). Samples were qualified as estimate based on the deviations.

Sample RFI10-28 (121202) contained acetone above the linear range. Data for acetone has been replaced with data from the dilution analysis. Sample BD01-02R (121302) contained benzene above the linear range. Data for benzene has 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.

Analyses performed by:	CT&E, Inc. Luddington, Michigan
Date of Report:	January 20, 2003
Validation performed by:	(Melissa Cash)
Date of Validation:	March 10, 2003

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
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FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3025985

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3025985 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-02-05 (121602)	3025985006	Water	12/16/02				X	
RFI-12-15 (121602)	3025985007	Water	12/16/02	X				
40-304 (121702)	3025985001	Water	12/17/02	X				
40-3 (121702)	3025985002	Water	12/17/02	X			X	
RFI-84-05 (121702)	3025985003	Water	12/17/02	X			X	
40-2 (121702)	3025985004	Water	12/17/02	X				
43-168 (121702)	3025985005	Water	12/17/02				X	
RFI-94-7 (121702)	3025985008	Water	12/17/02		X			
RFI-94-05 (121702)	3025985009	Water	12/17/02	X	X	X	X	
RFI-94-05d (121702)	3025985010	Water	12/17/02			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 above the acceptable limit due to a increase in response by 2-butanone. Data for 2-butanone have been qualified as estimated in samples 40-304 (121702), 40-3 (121702) and RFI-12-15 (121602) based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by carbon tetrachloride, dibromochloromethane, bromoform and 1,2-dibromo-3-chloropropane. Data for the listed compounds have been qualified as estimated in all samples based on the deviations.

Sample RFI-12-15 (121602) contained acetone above the linear range. Data for acetone in sample RFI-12-15 (121602) has been replaced with data from the dilution analysis.

Acetone and methylene chloride were detected in the method blanks. Based on the blank content data for acetone and methylene chloride have been qualified as undetected in samples 40-304 (121702), 40-3 (121702), RFI-84-05 (121702), 40-2 (121702) and RFI-94-05 (121702) and data for

methylene chloride has been qualified as undetected in sample RFI-12-15 (121602).

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-dinitro-2-methylphenol. Data have been qualified as estimated for the listed compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by benzaldehyde, 3&4-Methylphenol, 4-nitroaniline and carbazole. Data have been qualified as estimated for the listed 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 below the acceptable limit for barium, beryllium, cadmium, cobalt, copper, lead, nickel, silver, thallium and zinc. Data have been qualified as estimated for the listed analytes based on the deviations.

The continuing calibration %R was above control limits for manganese. Positive data for manganese have been qualified as estimated in samples 40-3 (121702), RFI-84-05 (121702) and 43-168 (121702) based on the deviation.

Antimony was detected in the instrument blank. Based on the blank content, data for antimony has been qualified as undetected in samples RFI-02-05 (121602) and RFI-94-05 (121702).

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, 2003
Validation performed by:	(Melissa Cash)
Date of Validation:	March 18, 2003

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3026005

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3026005 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
36-105 (121802)	3026005005	Water	12/16/02	X			X	
36-FP-5	3026005006	Water	12/16/02	X				
RFI 83/84-02 (121802)	3026005001	Water	12/18/02				X	
37-01 (121802)	3026005002	Water	12/18/02				X	
RFI 85-08 (121802)[1]	3026005003	Water	12/18/02	X	X	X	X	
RFI 85-08d (121802)	3026005004	Water	12/18/02			X		
RFI 10-12 (121802)	3026005007	Water	12/18/02				X	
RFI 10-12d (121802)	3026005008	Water	12/18/02				X	
RFI 86-08R (121802)	3026005009	Water	12/18/02	X			X	
RFI 05-19DR (121802)[1]	3026005010	Water	12/18/02	X			X	

1 MS/MSD analyses 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 2-butanone. Data for 2-butanone has been qualified as estimated in sample RFI 86-08R (121802) based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by chloromethane, bromomethane, carbon tetrachloride, dibromochloromethane, bromoform and 1,2-dibromo-3-chloropropane. Based on the deviations, data have been qualified as estimated for the following: chloromethane and bromomethane in sample RFI 85-08 (121802); carbon tetrachloride, dibromochloromethane, bromoform and 1,2-dibromo-3-chloropropane in samples 36-105 (121802), RFI 86-08R (121802) and RFI 05-19DR (121802); bromomethane and carbon tetrachloride in sample 36-FP-5.

Sample 36-105 (121802) contained 1,1,1-trichloroethane and 1,1-dichloroethane above the linear range and sample RFI 86-08R (121802) contained chloroethene above the linear range. Data for the

listed compounds have been replaced with data from the dilution analyses.

The MS/MSD %R were below control limits for carbon tetrachloride. Data for carbon tetrachloride has been qualified as estimated in associated sample RFI 05-19DR (121802) based on the deviation.

Acetone and methylene chloride were detected in the method blanks. Based on the blank content data for acetone have been qualified as non-detect in samples 36-105 (121802), 36-FP-5 and RFI 05-19DR (121802) and data for methylene chloride have been qualified as non-detect in samples 36-105 (121802), RFI-86-08R (121802) and RFI 05-19DR (121802).

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-dinitro-2-methylphenol. Data have been qualified as estimated for the listed compound based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by benzaldehyde, 3&4-Methylphenol, 4-nitroaniline and carbazole. Data have been qualified as estimated for the listed compounds based on the deviations.

The MS %R was below control limits for atrazine. Data for atrazine has been qualified as estimated absed 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 the acceptable limit for barium, beryllium, cadmium, cobalt, copper, lead, nickel, silver, thallium and zinc. Based on the deviations, data have been qualified as estimated for the listed analytes in samples RFI 83/84-02 (121802), 37-01 (121802), RFI 85-08 (121802), 36-105 (121802), RFI 10-12 (121802) and RFI 86-08R (121802).

The MS %R were below control limits for nickel and silver. Data for nickel and silver have been qualified as estimated in sample RFI 05-19DR (121802) based on the deviation.

The MS/MSD RPD were above control limits for antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, silver, thallium, vanadium and zinc. Positive data for the listed analytes have been qualified as estimated in sample RFI 05-19DR (121802) based on the deviations.

The MS %R were below 30% for all analytes except mercury. Positive data have been qualified as

estimated and undetected data have been rejected for all analytes except mercury in sample RFI 10-12d(121802)

The continuing calibration %R was above control limits for manganese and thallium. Positive data for manganese have been qualified as estimated in samples RFI 85-08 (121802), 36-105 (121802), RFI 10-12 (121802) and RFI 86-08R (121802) and positive data for thallium has been qualified as estimated in sample RFI-05-19DR (121802) based on the deviation.

Antimony was detected in the instrument blank. Based on the blank content, data for antimony has been qualified as undetected in sample RFI 10-12d (121802).

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, 2003
Validation performed by:	(Melissa Cash)
Date of Validation:	March 19, 2003

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3026017

VOLATILE AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3026017 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 36-32 (121902)	3026017001	Water	12/19/02				X	
RFI 02-17 (121902)	3026017002	Water	12/19/02				X	
86-3 (121902)	3026017003	Water	12/19/02				X	
RFI 40-04	3026017004	Water	12/18/02	X				
RFI 09-46 (121902)[1]	3026017005	Water	12/19/02	X			X	
DUP-1 (121902)	3026017006	Water	12/19/02	X			X	

1 Original sample of DUP-1 (121902)

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. Data for acetone has been qualified as estimated in sample DUP-1 (121902) based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by bromomethane, carbon tetrachloride, dibromochloromethane, bromoform and 1,2-dibromo-3-chloropropane. Data for bromomethane and carbon tetrachloride have been qualified as estimated in sample RFI 40-04 (121802), and data for carbon tetrachloride, dibromochloromethane, bromoform and 1,2-dibromo-3-chloropropane have been qualified as estimated in samples RFI 09-46 (121902) and DUP-1 (121902) based on the deviations.

Samples RFI 09-46 (121902) and DUP-1 (121902) contained benzene and cyclohexane above the linear range. Data for benzene and cyclohexane have been replaced with data from the dilution analyses for the listed samples.

Acetone was detected in the method blanks. Based on the blank content data for acetone has been qualified as undetected in sample RFI 40-04 (121802).

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 above the acceptable limit for barium and manganese and below the acceptable limit for nickel and silver. Positive data for barium and manganese and all data for nickel and silver have been qualified as estimated for the based on the deviations.

The MS/MSD RPD was above control limits for antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, silver, thallium, vanadium and zinc. Based on the deviations data have been qualified as estimated for the following: all listed analytes in sample RFI 36-32 (121902); arsenic, barium, cobalt, copper, nickel and zinc in samples RFI 02-17 (121902), 86-3 (121902), RFI 09-46 (121902) and DUP-1 (121902); cadmium and chromium in samples RFI 02-17 (121902) and 86-3 (121902); lead, thallium and vanadium in sample RFI 02-17 (121902); lead in sample RFI 09-46 (121902).

Lead and thallium were detected in the instrument blanks. Based on the blank content, data for lead

has been qualified as undetected in sample 86-3 (121902) and data for thallium have been qualified as undetected in samples 86-3 (121902),RFI 09-46 (121902) and DUP-1 (121902).

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 30, 2003
Validation performed by:	(Melissa Cash)
Date of Validation:	March 18, 2003

GENERAL MOTORS CORPORATION
NORTH AMERICAN OPERATIONS
FLINT OPERATIONS SITE

FLINT, MICHIGAN

TIER II
DATA VALIDATION REPORT

SDG# 3026048

VOLATILE, SEMIVOLATILE,
PCB AND INORGANIC ANALYSES

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

Summary

The following is an assessment of data package 3026048 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
31-FP6	3026048001	Oil	12/20/02	X	X	X	X	
20-162	3026048002	Oil	12/20/02		X	X	X	
31-7	3026048003	Oil	12/20/02	X	X	X	X	
20-FP8	3026048004	Oil	12/20/02	X	X	X	X	
86-03	3026078005	Oil	12/20/02	X	X	X	X	
DUP2 (122002)	3026048006	Water	12/20/02			X		
Diss. DUP2	3026048007	Water	12/20/02			X		
RFI 44-04 (122002)	3026048008	Water	12/20/02			X	X	
RFI 44-04d (122002)	3026048009	Water	12/20/02			X		
RFI 44-05 (122002)	3026048010	Water	12/20/02			X	X	
RFI 44-05d (122002)	3026048011	Water	12/20/02			X	X	
DUP3 (122002)	3026048012	Water	12/20/02	X			X	
RFI 09-45 (122002)	3026048013	Water	12/20/02	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 o-xylene. Data for o-xylene have been qualified as estimated in samples 31-FP6, 31-7, 20-FP8 and 86-03 based on the deviation.

The continuing calibration %D was above the acceptable limit due to a decrease in response by bromomethane and carbon tetrachloride. Data for the listed compounds have been qualified as estimated in samples DUP3 (122002) and RFI-09-45 (122002) based on the deviations.

The LCS %R was above control limits for isopropylbenzene. Data for isopropylbenzene have been qualified as estimated in samples 31-7, 20-FP8 and 86-03 based on the deviation.

Acetone was detected in the method blank. Based on the blank content, data for acetone have been qualified as undetected in samples DUP3 (122002) and RFI-09-45 (122002).

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 4,6-dinitro-2-methylphenol and benzaldehyde. Data for 4,6-dinitro-2-methylphenol has been qualified as estimated in sample 36-FP6 and data for benzaldehyde have been qualified as estimated in samples 20-162, 31-7, 20-FP8 and 86-03 based on the deviations.

The continuing calibration %D was above the acceptable limit due to a decrease in response by 3&4-Methylphenol and 4-nitroaniline. Data have been qualified as estimated for 3&4-methylphenol in samples 36-FP6, 20-162, 31-7, 20-FP8 and 86-03 and data for 4-nitroaniline has been qualified as estimated in sample 36-FP6 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 the acceptable limit for mercury and silver. Data for mercury have been qualified as estimated in samples 31-FP6, 20-162, 31-7, 20-FP8 and 86-03 and data for silver have been qualified as estimated in samples RFI 44-04 (122002), RFI 44-05 (122002), DUP3 (122002) and RFI 09-45 (122002) based on the deviations.

The MS %R were above control limits for antimony, arsenic, chromium, copper and selenium. Data for antimony have been qualified as estimated in samples 20-FP8 and 86-03 and data for arsenic, chromium, copper and selenium have been qualified as estimated in samples 31-FP6, 20-162, 31-7, 20-FP8 and 86-03 based on the deviation.

The MS/MSD RPD was above control limits for antimony, arsenic, chromium, cobalt, copper, lead, manganese, selenium and vanadium. Positive data for the listed analytes have been qualified as estimated in samples 31-FP6, 20-162, 31-7, 20-FP8 and 86-03 based on the deviations.

The MS/MSD RPD was above control limits for antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, silver, thallium, vanadium and zinc. Positive data for the listed analytes have been qualified as estimated in samples RFI 44-04 (122002), RFI 44-05 (122002), DUP3 (122002) and RFI 09-45 (122002) based on the deviations.

The MS %R were below 30% for all analytes associated with sample RFI 44-05d (122002). All positive data have been qualified as estimated and all undetected data have been rejected in the listed sample based on the deviations.

The LCS %R was above control limits for cyanide. Data for cyanide has been qualified as estimated in sample 86-03 based on the deviations.

Silver and thallium were detected in the method blank. Based on the blank content data for silver and thallium have been qualified as undetected in sample RFI 44-05d (122002).

Thallium was detected in the instrument blank. Based on the blank content, data for thallium have been qualified as undetected in samples RFI 44-04 (122002), RFI 44-05 (122002), DUP3 (122002) and RFI 09-45 (122002)

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 3, 2003
Validation performed by:	(Melissa Cash)
Date of Validation:	March 21, 2003