

**DATA MANAGEMENT SUMMARY REPORT, ADDENDUM 2**  
**FOX RIVER REMEDIAL INVESTIGATION/FEASIBILITY STUDY**

***This Document has been Prepared by***

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for the

Wisconsin Department of Natural Resources

Madison, Wisconsin

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## ADDENDUM 2 TO THE DATA MANAGEMENT SUMMARY REPORT

*Note: As data are collected, reviewed (or validated), and appended to the Fox River Database (FRDB), the Data Management Summary Report will also be appended. A description of the data set, along with results of data review/validation and determination of usability will be discussed in consecutively numbered sections. Addendum 1 was included as part of the Final Lower Fox River and Green Bay Remedial Investigation Report issued in December of 2002.*

*As supporting tables (Table 3-1: Data Set Analysis and Table 3-2: QC Elements for Data Sets Supporting the Fox River Remedial Investigation [RI]/Feasibility Study [FS] and Risk Assessment [RA]) are appended, the tables will be resubmitted (with each Addendum) in their entirety. With the addition of these data sets, this brings the number of individual data records to 586,000 now in the FRDB.*

### 3.2.35 2002 RETEC GREEN BAY SEDIMENT DATA

The RETEC Group, Inc. (RETEC) collected sediment samples in July 2002 for the Wisconsin Department of Natural Resources (WDNR). The samples were collected as part of the Green Bay Sediment Sampling event. En Chem, of Madison, Wisconsin, analyzed samples for polychlorinated biphenyl (PCB) Aroclors and total organic carbon (TOC).

EcoChem performed a review of the data validation conducted October 2002 by MAKuehl Company; the data set consisted of 99 samples. EcoChem evaluated the validation worksheets and reports for completeness and technical agreement. The samples were analyzed by United States Environmental Protection Agency (EPA) SW-846 methodology and other miscellaneous EPA methods. The validation report states that the data reviewer used both *National Functional Guidelines for Organic Data Review* (1999) and the EPA Region 5 *Standard Operating Procedure for Validation of CLP Organic Data* (1997). The sample result summary forms are initialed and dated.

MAKuehl Company estimated (J) 27 Aroclor values and four (4) TOC values between the limit of detection (LOD) and limit of quantitation (LOQ). Although EcoChem would not have estimated these values, the usability of the data is not affected either way. Forty (40) TOC sample results were estimated (J) because the relative standard deviation (RSD) for the 4 replicates was greater than 20 percent. Also, the TOC result for sample GB02-12-0010 was estimated (J) (biased low) due to poor spike recovery in the matrix spike/matrix spike duplicate (MS/MSD) samples, indicating a matrix interference.

Overall, the data are of acceptable quality. The samples appear to have been analyzed as per the cited methods, and the validation of MAKuehl Company follows the guidelines specified in EPA *National Functional Guidelines for Organic Data Review* (February 1999). As determined by this review, the data, as qualified, are usable for the intended purpose.

### **3.2.36 2002 FOTH AND VAN DYKE LITTLE LAKE BUTTE DES MORTS DATA**

Foth and Van Dyke collected sediment samples (at Deposit A/B) in May and June 2002 for P.H. Glatfelter. En Chem, of Madison, Wisconsin, analyzed samples for PCB Aroclors and TOC.

EcoChem performed a review of the data validation conducted in February 2003 by MAKuehl Company. The data set consisted of 47 samples analyzed for PCBs and TOC. This number of samples differs from the number of sample records loaded into the FRDB because the PCB analyses occasionally used different sediment core intervals than the other physical analyses (e.g., there were 47 samples actually analyzed for PCBs and 28 physical samples, of which about 11 had different (or additional) sample intervals than the PCBs).

EcoChem evaluated the validation worksheets and reports for completeness and technical agreement. The samples were analyzed by EPA SW-846 methodologies. The validation report states that the evaluation was based on *National Functional Guidelines for Organic Data Review* (1999) and *National Functional Guidelines for Inorganic Data Review* (1994). The sample result summary forms are initialed and dated. No sample recalculations were reproduced during the EcoChem review.

MAKuehl Company estimated (J) 31 Aroclor sample values between the LOD and LOQ. Although EcoChem may not have estimated these values, the usability of the data is not affected either way. Three (3) samples were estimated (J) due to low recovery of PCB surrogates (DCB and TCX) on both columns. These samples are potentially biased low. Eighteen (18) TOC sample results were estimated (J) because the RSD for replicates was greater than the 20 percent criteria.

Overall the data are of acceptable quality. The samples appear to have been analyzed as per the cited methods, and the validation of MAKuehl Company follows the guidelines specified in EPA *National Functional Guidelines for Organic Data Review* (February 1999). As determined by this review, the data, as qualified, are usable for the intended purpose.

## **3.3 DATA USABILITY**

### **3.3.1 FULLY VALIDATED DATA**

The following data sets have been validated by an independent party and are considered useable, as qualified:

- 1994 GAS/SAIC Sediment Collection
- 1994 Woodward-Clyde Deposit A Sediment Collection
- 1995 WDNR Sediment Data Collection

- 1996 USFWS NRDA Fish Tissue Data Collection
- 1996 WDNR Fish Tissue Data Collection
- 1998 Demonstration Project Data – SMU 56/57
- 1998 RETEC RI/FS Supplemental Data Collection
- 1996 FRG/BBL Sediment/Tissue Data Collection
- 1997 Demonstration Project Data – Deposit N
- 1992/93 BBL Deposit A Sediment Data Collection
- 1998 FRG/Exponent Data Collection
- 1998 FRG/Blasland, Bouck, and Lee, Inc. Sediment/Tissue Data Collection
- 1998 Deposit N Pilot Remediation – Pre-Dredge, Post-Dredge, Operation Monitoring, and Environmental Monitoring Data
- 1999 Demonstration Project Data – SMU 56/57
- State of Michigan Fish Consumption Advisory Data
- Lake Michigan Tributary Monitoring Data
- 1999 Demonstration Project Data – SMU 56/57
- Minergy EPA SITE Program Data
- 2000/2001 FRG/CH2M HILL Sediment and Wood Chip Data
- 2000 FRG/BBL Supplemental Monitoring Program Data: Surface Water
- 2000/2001 FRG/BBL Supplemental Monitoring Program Data: Sediment Data
- 2001 FRG/BBL Green Bay Sediment Sampling Data
- 2001 FRG/BBL Water Column-High Flow Data
- 2002 RETEC Green Bay Sediment Data
- 2002 Foth and Van Dyke/Glatfelter Deposit A/B (Little Lake Butte des Morts) Sediment Data

Although the data sets (listed above) were found to be validated and usable, it must be stressed that there were individual data points that were rejected. These rejected data points have not been used in support of the RI/FS or RA.

### **3.3.2 SUPPORTING DATA**

The following data sets have not been validated and, in general, should be used only as supporting data. The data have been collected within different programs and with different data quality objectives therefore, varying degrees of supporting documentation may be available.

- 1989/90 Fox River Mass Balance Study
- 1989/90 Green Bay Mass Balance Study (GLNPO)
- 1993 Triad Assessment
- 1993–1996 USFWS Tree Swallow Data Collection
- 1994–1995 Cormorant Data Collection
- 1997 USFWS NRDA Waterfowl Tissue Data Collection
- 1997 WDNR Caged Fish Bioaccumulation Study Data
- Fox River Fish Consumption Advisory Data
- Stromberg Eagle Data Collection
- USGS NAWQA Data
- WDNR Wildlife Tissue Data
- WPDES Permit Influent Data
- Lake Michigan Mass Balance Data
- Minergy Mineralogical Data
- Lower Fox River Background Metals Assessment
- FoxView Data

### **3.3.3 INDETERMINATE DATA**

The following data sets have not been validated and have not been subjected to a data quality review. This is due to complete lack of supporting quality assurance/quality control documentation; or, EcoChem did not receive the hard copy data and documents by the date of this report. At this time the overall quality of these data sets is unknown and the data should be used with that fact in mind.

- Ankley and Call

**Table 3-1 Data Set Analysis**

Data Source	Number of Samples	Matrices <sup>1</sup>	Analyses Conducted <sup>2</sup>	Number of Records	Number of Files in Delivery	File Type	Report Section	Earliest Year of Collection	Latest Year of Collection	Event of Incorporation into FRDB <sup>3</sup>
1989–1990 Fox River Mass Balance Study	1,967	S, W	PCB-A, PCB-C, W	25,457	6	Spreadsheet	3.2.01	1989	1990	1
1989–1990 Green Bay Mass Balance Study (GLNPO)	2,069	S, T, W	B, PCB-C, W	201,701	92	Database	3.2.01	1987	1990	1
1992–1993 BBL Deposit A Sediment Data	117	S, W	M, P/H, PCB-A, SVOA, V, W	1,094	1	Spreadsheet	3.2.02	1992	1993	1
1993 Triad Assessment	27	S	B, M, P/H, PCB-A, SVOA, W	631	11	Spreadsheet	3.2.03	1992	1993	1
1994 GAS/SAIC Sediment Collection	253	S	DXN, M, P/H, PCB-A, SVOA, V, W	5,654	6	Spreadsheet	3.2.04	1994	1994	1
1995 WDNR Sediment Data	488	S	M, PCB-A, W	6,433	8	Spreadsheet	3.2.05	1995	1995	1
1996 FRG/BBL Sediment/Tissue Data	25	S, T	B, PCB-C, W	2,771	6	Spreadsheet	3.2.06	1996	1996	1
1995–1996 WDNR Tissue Data	200	T	B, PCB-A, W	1,673	1	Spreadsheet	3.2.07	1995	1996	1
1996–USFWS NRDA Tissue Data	376	T	DXN, P/H, PCB-A, PCB-C, W	16,017	5	Spreadsheet	3.2.08	1996	1999	1
1993–1996 Tree Swallow Data	200	T	B, DXN, P/H, V, W	5,429	2	Database	3.2.09	1993	1993	1
1994–1995 Cormorant Data	193	T	B, DXN, P/H, PCB-C, W	6,178	2	Database	3.2.09	1994	1995	1
1997 USFWS NRDA Waterfowl Tissue	70	T	B, P/H, PCB, V, W	1,680	2	Database	3.2.09	1997	1997	1
Fox River Fish Consumption Advisory Data: 1998 WDNR Fish Consumption Data	130	T	B, M, PCB-A, W	777	1	ASCII	3.2.10	1998	1998	2
Fox River Fish Consumption Advisory Data	1,766	S, T	B, DXN, M, P/H, PCB-A, PCB-C, SVOA, V, W	11,620	2	ASCII	3.2.10	1971	1996	1
WDNR Wildlife Tissue Data	417	T	B, M, P/H, PCB-A	2,532	3	Database	3.2.11	1984	1996	1
Lake Michigan Tributary Monitoring Data	88	W	M, P/H, PCB-C, V	5,722	5	Spreadsheet	3.2.12	1994	1995	1
Stromberg Eagle Data	31	T	B, DXN, P/H, PCB-A, PCB-C, SVOA, V, W	954	1	ASCII	3.2.13	1991	1996	1
USGS NAWQA Data	441	S, T, W	B, M, P/H, PCB, SVOA, V, W	11,879	21	Spreadsheet	3.2.14	1992	1997	1
1994 Woodward-Clyde Deposit A Sediment Data	66	S	PCB-A, W	585	12	Spreadsheet	3.2.15	1994	1994	1
WPDES Permit Influent Data	8	W	B, DXN, M, P/H, PCB-A, RAD, SVOA, V, W	847	1	Spreadsheet	3.2.16	1993	1997	1
Lower Fox River Background Metals Assessment Data	14	W	M	78	1	Spreadsheet	3.2.17	1991	1993	1
1997 WDNR Caged Fish Bioaccumulation Study Data	25	S, T	B, PCB-C, W	1,672	2	Spreadsheet	3.2.18	1997	1997	1
1997 Demonstration Project Data – Deposit N	10	S	M, PCB, W	83	1	Spreadsheet	3.2.19	1997	1997	1
1997 Demonstration Project Data – SMU 56/57	295	S, W	DXN, M, P/H, PCB-A, SVOA, V, W	3,114	12	Spreadsheet	3.2.20	1997	1998	1
1998 RETEC RI/FS Supplemental Data	252	S, T	B, DXN, M, P/H, PCB-A, PCB-C, SVOA, V, W	10,781	1	ASCII	3.2.21	1998	1998	1
Lake Michigan Mass Balance Data	6,987	A, S, T, W	M, P/H, PCB-C, V, W	91,621	211	Database	3.2.22	1993	1996	2
Minergy Mineralogical Data	15	S	W	219	1	Spreadsheet	3.2.23	1995	1999	2
1998 FRG/Exponent Data	225	T	B, M, P/H, PCB-A, PCB-C, W	17,708	3	Database	3.2.24	1998	1998	2
1998 FRG/BBL Sediment/Tissue Data	1,315	S, T, W	B, M, P/H, PCB-A, PCB-C, RAD, SVOA, W	18,824	1	Database	3.2.25	1998	1998	2
1998–1999 Deposit N Data: Post-Dredge	43	S	PCB-A, PCB-C, W	690	8	Spreadsheet	3.2.26	1999	1999	2
1998 Deposit N Data: Pre-Dredge	53	S	PCB-A, PCB-C, W	1,437	6	Spreadsheet	3.2.26	1998	1998	2

**Table 3-1 Data Set Analysis**

Data Source	Number of Samples	Matrices <sup>1</sup>	Analyses Conducted <sup>2</sup>	Number of Records	Number of Files in Delivery	File Type	Report Section	Earliest Year of Collection	Latest Year of Collection	Event of Incorporation into FRDB <sup>3</sup>
1998/1999 Deposit N Data: Remediation	197	T, W	PCB-C, W	10,264	1	Spreadsheet	3.2.26	1998	1999	2
1998–1999 Deposit N Data: Operational Monitoring	12	S	M, PCB-A, W	123	1	Spreadsheet	3.2.26	1998	1998	2
Ankley and Call Data	62	PW, S, T, W	DXN, M, P/H, PCB, SVOA, W	1,607	0	Hardcopy	3.2.27	1989	1989	2
State of Michigan Fish Consumption Advisory Data	434	T	B, DXN, M, P/H, PCB-A, W	6,979	1	Database	3.2.28	1983	1999	2
1999 FRG Demonstration Project Data – Deposit N and SMU 56/57	2,408	A, O, S, W	PCB-A, PCB-C, M, W, V, SVOA, P/H, DXN	46,389	28	Database/Spreadsheet	3.2.29	1999	1999	3
2000–2001 FRG/CH2M HILL Sediment/Woodchip Data	428 <sup>a</sup>	S, WC	PCB-A, GRO, DRO, M, V, SVOA, CN	6,428	1	Database	3.2.30	2000	2001	3
2000 FRG/BBL Supplemental Monitoring Program Data: Surface Water <sup>b</sup>	219	W, XAD	PCB-A, PCB-C, W, P/H	10,511	1	Database	3.2.31	2000	2000	4
2000–2001 FRG/BBL Supplemental Monitoring Program Data: Sediment <sup>b</sup>	145	S	PCB-A, W	2,445	1	Database	3.2.32	2000	2001	4
2001 FRG/BBL Green Bay Sediment Sampling Data <sup>b</sup>	30	S	PCB-A, W	507	1	Database	3.2.33	2001	2001	4
2001 FRG/BBL Water Quality High Flow Data <sup>b</sup>	444	W, XAD	PCB-A, PCB-C, W, P/H	24,138	1	Database	3.2.34	2001	2001	4
Minergy EPA SITE Data	90	A, O, S, W	PCB-C, M, W, V, SVOA, DXN	8,053	5	Spreadsheet	na	2001	2001	3
2002 Green Bay Sediment Data – RETEC Group, Inc.	99	S	PCB-A, W	1,792	1	Database	3.2.35	2002	2002	4
May 2002 Little Lake Butte des Morts Sampling - Foth & Van Dyke	68	S	PCB-A, W	676	2	Excel, Word	3.2.36	2002	2002	4
2000 – SMU 56/57 During/Post-Dredge Sampling	198	S, W	PCB-A, W, M	1,148	1	Database	na	2000	2000	4
2000 – SMU 56/57 Post-Dredge Sampling	90	S, W	PCB, W, M	225	1	Database	na	2000	2000	4
2000–2001 Radio-Isotopes for BDP/LW to DP	903	S	W, R	5,838	1	Database	na	2000	2001	4
<b>Total: 46 Data Sets</b>	<b>23,565</b>			<b>582,984</b>	<b>482</b>					

<sup>1</sup> **Matrices**

A – Ambient Air  
O – Other Solid Matrix  
PW – Sediment Pore Water  
S – Sediment  
T – Tissue  
W – Water  
WC – Wood Chip  
XAD – Filters

<sup>2</sup> **Analyses**

B – Biological  
CN – Cyanide  
DRO – Diesel-range Organics  
DXN – Dioxins  
GRO – Gas-range Organics  
M – Metals  
PCB – Total PCB Only

<sup>3</sup> **Event of Incorporation into FRDB**

1 – February 1999 RI/FS  
2 – 1999–2001 RI/FS  
3 – December 2002 Addendum 1  
4 – June 2003 Addendum 2

<sup>a</sup> There is a discrepancy between the data assessed during the data validation review and that included in the FRDB. Only a portion of the data provided by Wisconsin Tissue electronically for inclusion into the FRDB was actually provided via hardcopy for review. Whereas 428 samples were reviewed, 801 samples were added to the FRDB. The number of records identified (6,428) also is indicative of the number of records added to the FRDB.

<sup>b</sup> These four data sets are currently not included in the FRDB. They have been reviewed and were identified in Technical Memorandum 14 as potentially important data with the recommendation to include these data sets in future updates to the FRDB.

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		1989-1990 Fox River and Green Bay Mass Balance Study DMR Section 3.2.01	1992/1993 BBL Deposit A Sediment Data DMR Section 3.2.02				
Parameter & Matrix:		PCBs  Sediments	VOA  Soil	SVOCs  Soil	PCBs  Soil	Pesticides  Soil	Metals/CN  Soil
<b>QA Elements</b>	<b>SDG #'s:</b>	University of Minnesota - Data groups; IN0042, IN0047, IN0052, IN0057, IN0061, IN0070, IN0076, IN0078, IN0037, and IN0041	Hazleton 104116 203257	Hazleton 104116 203242	Hazleton SDG-1, SDG-2, SDG-3, SDG-4, SDG-5	Hazleton 104135 203256	Hazleton BASD34 SD01 BASD08
<b>Data Review</b>	1) Third-Party Validation Performed	Verification Only Deborah Swackhamer, Ph.D.	EcoChem	EcoChem	EcoChem	EcoChem	EcoChem
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Some – Not sure if this is a complete set	Yes	Yes	Yes	Yes	Yes
<b>Data Review Details</b>	1) Package Completeness	Not determined	Yes	Yes	Yes	Yes	Yes
	2) Chain of Custody Procedures	Not determined	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
	3) Holding Times	Not summarized on the QA/QC Summary Report Sheet	Yes	Yes	Yes	Yes	Yes
	4) Initial Calibration Curve – Number of standards	Not summarized on the QA/QC Summary Report Sheet	Yes	Yes	Yes	Yes	Yes
		Not summarized on the QA/QC Summary Report Sheet	Yes – As required by method	Yes – As required by method	Yes – As required by method	Yes – As required by method	Yes – As required by method
	5) Calibration Verification Secondary Column	Not summarized on the QA/QC Summary Report Sheet	20%	20%	20%	20%	10%
		Not summarized on the QA/QC Summary Report Sheet	NA	NA	Yes	Yes	NA
	6) Laboratory Blanks	Not clear	Yes – Tics rejected due to contamination	Yes – Tics rejected due to contamination	Yes	Yes	Yes
	7) Surrogate Recoveries, Number Required	Yes – 50%-120%	Yes	Yes	Yes	Yes	Yes
	8) Matrix Spike, Number Required	Yes – 50%-120%	Yes – No MS/MSD for SDG 203257 J/UJ	Yes – No MS/MSD for SDG 203242 J/UJ	Yes	Yes	Yes
	9) Lab Duplicate or Replicate Lab Control Sample (SRM Results?)	Yes – Not clear what limits are	Yes – No MS/MSD for SDG 203257 J/UJ	Yes – No MS/MSD for SDG 203242 J/UJ	Yes	Yes	Yes
		None – QAPP says that a series of blindly coded QA samples will be analyzed	Yes – No LCS for SDG 203257 J/UJ	Yes – No LCS for SDG 203242 J/UJ	Yes	Yes	Yes
	10) Gel Permeation/Florasil Cleanup	Not provided	NA	NA	NA	NA	NA
11) Detection Limit	Not provided	NA	NA	NA	NA	NA	
12) Calc and Transposition Verification Qualitative Verification?	Not able to determine if this was done	Yes	Yes	Yes	Yes	Yes	
13) Field QC Results	Not apparent	None identified	None identified	Yes	Yes	None identified	
14) Usability Usable/Supporting Qualifiers	Yes  Qualifiers mentioned but not defined.	Usable – Tics rejected due to contamination  Yes – Blank contamination U, lcal RSD, CCAL%D, no LCS MS/MSD TICs rejected due to blank contamination	Usable – Tics rejected due to contamination  Yes – Blank contamination, CCAL %D, Internal std %R, NO LCS MS/MSD, TICs rejected due to blank contamination	Usable  Yes – Surrogate %R, LCS %R, Field Dup RPD 1242	Usable  Yes – RPD between main and confirmation columns NJ	Usable  Yes – Blank contamination, ICV %R CN, MS %R, GFAA post spike %R	
<b>SAP</b>	No – Study Plan						
<b>QAPP</b>	Yes						
<b>Lab QAM</b>	Answer Pending/U of M SOPs?						

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:	1993 Triad Assessment DMR Section 3.2.03	1994 SAIC/GAS RI/FS Data Sets DMR Section 3.2.04					
	Parameter & Matrix:	PCBs Sediments	PCBs Sediments	PCBs Sediments	PCBs Sediments	PCBs Sediments	
<b>QA Elements</b>	<b>SDG #s:</b> SLOH Multiple SDGs	ARI M172	ARI M174	ARI M176	ARI M177	ARI M365	
<b>Data Review</b>	1) Third-Party Validation Performed	None	SAIC	SAIC	SAIC	SAIC	
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes	
	2) Hard Copy	Not Available	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed	
<b>Data Review Details</b>	1) Package Completeness	Not Available	Yes	Yes	Yes	Yes	
	2) Chain of Custody Procedures	Not determined	Not determined	Not determined	Not determined	Not determined	
	3) Holding Times	Not determined	Yes (Frozen)	Yes – Some exceedances	Yes	Yes	Yes – Exceedances, several samples qualified J for gross exceedances (M365)
	Initial Calibration	Not Available	Yes	Yes	Yes	Yes	Yes
	4) Curve – Number of standards	Not Available	3-5 pt	3-5 pt	5 pt	5 pt	5 pt
	5) Calibration Verification	Not Available	15% D but Ave was higher; results flagged (J/UJ)	15% D but Ave was higher; results flagged (J/UJ)	15% D but Ave was higher; results flagged (J/UJ)	15% D but Ave was higher; results flagged (J/UJ)	15% D but Ave was higher; results flagged (J/UJ)
	Secondary Column	Not Available	Not indicated	Not indicated	Not indicated	Not indicated	Not indicated
	6) Laboratory Blanks	Not Available	Yes	Yes	Yes	Yes	Yes
	7) Surrogate Recoveries, Number Required	Not Available	TCMX 55%-115%/DCB 70%-125%	TCMX 55%-115%/DCB 70%-125%	TCMX 55%-115%/DCB 70%-125%	TCMX 55%-115%/DCB 70%-125%	TCMX 55%-115%/DCB 70%-125%
	8) Matrix Spike, Number Required	Not Available	35% min–130% max	35% min–130% max	35% min–130% max	35% min–130% max	35% min–130% max
	9) Lab Duplicate or Replicate	Not Available	No	Not mentioned	Not mentioned	Not mentioned	Not mentioned
	Lab Control Sample (SRM Results?)	Not Available	Yes	Yes	Yes	Yes	Yes
	10) Gel Permeation/Florisil Cleanup	Not Available	Yes – If necess.	Yes – If necess.	Not sure	Not sure	Not sure
	11) Detection Limit	Not Available	50 ppb wet wt	NA	NA	NA	NA
12) Calc and Transposition Verification Qualitative Verification?	Not Available	Yes, 10%?	No, No chros	ID and Quants could not be verified. Raw data not provided	ID and Quants could not be verified. Raw data not provided	Data verified	
13) Field QC Results	Not Available	None	None	None	Not identified	Not identified	
14) Usability Usable/Supporting	Yes – Supporting	Usable	Usable	Usable	Usable	Usable	
Qualifiers	Not Available	Yes – Minor quals assigned due to CCV (J/UJ)	Yes – Minor quals assigned due to CCV (J/UJ)	Yes – Minor quals assigned due to CCV, surrogate recoveries J/UJ	Yes – Minor quals assigned due to CCV, surrogate recoveries J/UJ	Yes – Minor quals assigned due to CCV, surrogate recoveries J/UJ	
<b>SAP</b>	NA	Yes					
<b>QAPP</b>	NA	Yes					
<b>Lab QAM</b>	NA						

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		1994 SAIC/GAS RI/FS Data Sets (continued) DMR Section 3.2.04				
Parameter & Matrix:	PCBs	PCBs	Dioxins	CLP Pesticides/PCBs	CLP SVOCs	
	Sediments	Sediments	Sediments	Sediments	Sediments	
<b>QA Elements</b>	<b>SDG #s:</b>	ARI M367/M368	ARI M370	Triangle Lab SDG # 35589	Swanson/SDG 948521	Swanson/SDG 948521
<b>Data Review</b>	1) Third-Party Validation Performed	SAIC	SAIC	SAIC	SAIC	SAIC
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes	No – Form 1s not supplied by lab
	2) Chain of Custody Procedures	Not determined	Not determined	Not determined	Not determined	Not determined
	3) Holding Times	Yes – Minor violations	Yes – Minor violations	Yes – Minor violations	No – Samples sent to TL 10 days after collection	No – All samples exceeded HT and are qualified as estimated (J,UJ)
	4) Initial Calibration	Yes	Yes	Yes	Yes – Not consistent with CLP protocol	Yes – Not consistent with CLP protocol
	Curve – Number of standards	5 pt	5 pt	5 pt	5 pt	5 pt
	5) Calibration Verification	15% D but Ave was higher; results flagged (J,UJ)	15%	20% RSD	No – Correct concentration not used; certain analytes outside RT window	15% D – Some exceedances qualified samples as estimated J/UJ
	Secondary Column	Not indicated	Not indicated	NA	Not indicated	Not indicated
	6) Laboratory Blanks	Yes	Yes	Yes	Yes	Yes
	7) Surrogate Recoveries, Number Required	TCMX 55%-115%/DCB 70%-125%	TCMX 55%-115%/DCB 70%-125%	TCFD 25%-150%/TCDD 25%-150%	TCMX 55%-115%/DCB 70%-125%	8 Required/18% min–137% max
	8) Matrix Spike, Number Required	35% min–130% max	35% min–130% max	TCDD/TCDF 54–162	18/9 Required 29 min–152 max	11 Required/11% min–142% max
	9) Lab Duplicate or Replicate	Not mentioned	Not mentioned	Not mentioned	Not mentioned	Not mentioned
	Lab Control Sample (SRM Results?)	Yes	Yes	Yes	Yes	Yes – Acenaphthene fell outside at 53%
	10) Gel Permeation/Florisil Cleanup	Not sure	Not sure	Not sure	Not sure	Not sure
	11) Detection Limit	NA	NA	Elevated in some samples due to blank cont. and noise	Elevated in some samples due to blank cont. and noise	NA
12) Calc and Transposition Verification Qualitative Verification?	No	Not verified	Yes. Sample Identifications. Sample Quant not reviewed.	Not Verifiable	Yes	
13) Field QC Results	Not identified	Not identified	Not identified	Not identified	Not identified	
14) Usability Usable/Supporting	Usable	Usable	Usable	Third party validation considers it unusable.	Usable	
Qualifiers	Yes – Minor quals assigned due to CCV, surrogate recoveries J/UJ	Yes – Minor quals assigned due to surrogate recoveries J/UJ	Yes – Due to blank cont. and elevated matrix spike recovery sample results may be biased positive (J+)	Yes – Major issues about overall quality of data. Associated with RT drift, quality of work poor.	Yes – Minor qualifications due to HT exceedances and low surr and spike recoveries (J/UJ)	
<b>SAP</b>						
<b>QAPP</b>						
<b>Lab QAM</b>						

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		1994 SAIC/GAS RI/FS Data Sets (continued) DMR Section 3.2.04					
Parameter & Matrix:	CLP Metals	TCLP Metals	Mercury	Mercury	Mercury	Mercury	
	Sediments	Sediments	Sediments	Sediments	Sediments	Sediments	
<b>QA Elements</b>	<b>SDG #s:</b>	Swanson/SDGs 12718, 12724, 12745, 12806, 12816, 12941	Swanson/SDGs 12718, 12724, 12730, 12827, 12718, 12802, 12833, 12844	Swanson WL12941	Swanson WL12745	Swanson WL12806	Swanson WL12812/12724/12718
<b>Data Review</b>	1) Third-Party Validation Performed	SAIC	SAIC	SAIC	SAIC	SAIC	SAIC
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	No – Form 1s not supplied by lab	Yes	Yes	Yes
	2) Chain of Custody Procedures	Not determined	Not determined	Not determined	Not determined	Not determined	Not determined
	3) Holding Times	Yes – Hg results are flagged for exceeding HT by 27 to 42 days (J/UJ)	Yes	No – All samples exceeded HT and are qualified as estimated (J, UJ)	Yes	Yes	Yes
	4) Initial Calibration	Yes (Validator recalc HG results)	Yes	Yes – Exceedance	Yes – Exceedance	Yes – Exceedance	Yes (Validator recalc results)
	Curve – Number of standards	Lin Reg	Lin Reg	5 pt	5 pt	5 pt	5 pt
	5) Calibration Verification	10% D	10% D	Yes – 15%	Yes – 15%	Yes – 15%	Yes – 15%
	Secondary Column	NA	NA	NA	NA	NA	NA
	6) Laboratory Blanks	Yes	Yes	Yes	Yes	Yes	Yes
	7) Surrogate Recoveries, Number Required	NA	NA	NA	NA	NA	NA
	8) Matrix Spike, Number Required	75%–125%	75%–125%	75%–125%	75%–125%	75%–125%	75%–125%
	9) Lab Duplicate or Replicate	Yes (20%) – Some exceedances qualified J/UJ	Yes	Yes	Yes	Yes	Used MS/MSD
	Lab Control Sample (SRM Results?)	Yes	Yes	Yes	Yes	Yes	Yes (not always performed) CLs were 75%–125%
	10) Gel Permeation/Florisil Cleanup	NA	NA	NA	NA	NA	NA
	11) Detection Limit	NA	NA	NA	NA	NA	NA
12) Calc and Transposition Verification Qualitative Verification?	Yes, Some calc errors.	Yes	No	No	No	Yes	
13) Field QC Results	None	No	Yes – Field Duplicate >	No	No	Yes – OK on rinsate/FD (12812) failed No Action	
14) Usability Usable/Supporting	Usable – 1 data point rejected for Zn	Usable	Usable	Usable	Usable	Usable	
Qualifiers	Yes – Minor and Major qualifications due poor spike recoveries (J/UJ) and (R) on Zinc	No Qualifications	Yes – Minor J Flags	Yes – Minor UJ/J Flags	Yes – Minor UJ/J Flags	Yes – Minor qualifications due to incorrect ICB calc.	
<b>SAP</b>							
<b>QAPP</b>							
<b>Lab QAM</b>							

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		1994 SAIC/GAS RI/FS Data Sets (continued) DMR Section 3.2.04			1995 WDNR Sediment Data (Below De Pere) DMR Section 3.2.05		
Parameter & Matrix:		Mercury Sediments	Mercury Sediments	Mercury Sediments	PCBs Sediments	TOC Sediments	Metals Sediments
<b>QA Elements</b>	<b>SDG #'s:</b>	Swanson WL12816/12882/12929/ 12922/12853/12852/ 12851	Swanson WL12688/12725/12783/ 12777	Swanson WL12693	Hazleton SDG #'s TBD2,10, 1 and 20	Hazleton SDG #'s TBD2,10, 1 and 20	Hazleton SDG #'s TBD2, and 20
<b>Data Review</b>	1) Third-Party Validation Performed	SAIC	SAIC	SAIC	MAKuehl	MAKuehl	MAKuehl
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes but not easily accessed	Yes but not easily accessed	Yes but not easily accessed	Some	Some	Some
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes	Yes	Yes
	2) Chain of Custody Procedures	Not determined	Not determined	Not determined	Not determined	Not determined	Not determined
	3) Holding Times	No – Qualifiers J/UJ	Yes	Yes	Yes	Yes	Yes
	4) Initial Calibration	Yes (Validator recalc results)	Yes (Validator recalc results)	Yes (Validator recalc results)	25%	Yes	Yes
	4) Curve – Number of standards	5 pt	5 pt	5 pt	5 pt	Daily 1 pt	1 pt/6 pt for Hg
	5) Calibration Verification	Yes – 15%	Yes – 15%	Yes – 15%	15%	20%	10% for metals and 20% for Hg
	Secondary Column	NA	NA	NA	25% D for CC on 2 <sup>nd</sup> column	NA	NA
	6) Laboratory Blanks	Yes	Yes	Yes	Yes	Yes	Yes
	7) Surrogate Recoveries, Number Required	NA	NA	NA	60%-150%	NA	NA
	8) Matrix Spike, Number Required	75%–125%	75%–125%	75%–125%	65%–125%	75%–125%	75%–125%
	9) Lab Duplicate or Replicate	Yes – Occ. Used MS/MSD SDG 12922 >35%	Yes – Used MS/MSD	Yes	26%	20%	20%
	Lab Control Sample (SRM Results?)	Used MS/MSD (75%–125%)	Used MS/MSD (80%–120%)	Yes	NA	NA	Yes – EPA
	10) Gel Permeation/Florisil Cleanup	NA	NA	NA	Yes	NA	NA
	11) Detection Limit	NA	NA	NA	50 ppb	NA	CRDL
12) Calc and Transposition Verification Qualitative Verification?	Yes, Recalc	Yes, Recalc	Yes, Recalc	Yes, Recalc performed >10% frequency	NA	10%	
13) Field QC Results	Yes – OK on rinsate/<35% on FD	Yes – OK on rinsate/<20% on FD	Yes – OK on rinsate/OK on FD	None	None	None	
14) Usability Usable/Supporting	Usable	Usable	Usable	Usable	Usable	Usable	
Qualifiers	Yes – Minor J/UJ Flags due to HT exceedances/SDG 12853 also qualified on poor FD values.	No Qualifications	Not apparent if no or some minor qualifications	Yes – Minor J Flags due to low surrogate recovery or below PQL and above MDL.	Yes – Minor J Flags due to poor lab RPD	None	
<b>SAP</b>				Yes			
<b>QAPP</b>				Yes			
<b>Lab QAM</b>				Yes – Hazleton SOPs			

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:	1995–1996 WDNR Tissue DMR Section 3.2.07	1996 USFWS NRDA Tissue Data (Hagler Bailly) DMR Section 3.2.08	1992–1995 USGS NAWQA Data DMR Section 3.2.14	1994 Woodward-Clyde Deposit A Data DMR Section 3.2.15		
Parameter & Matrix:	PCBs Fish Tissue	PCBs Fish Tissue	Multiple Parameters Multiple Matrices	PCBs Sediments	TOC Sediments	
QA Elements	SDG #s: SLOH Fish SDG-1	Battelle Laboratory Multiple SDGs	USGS NWQL Multiple SDGs	Hazleton Laboratory Multiple SDGs	Hazleton Laboratory Multiple SDGs	
Data Review	1) Third-Party Validation Performed	MAKuehl	EcoChem	NAWQA Program	Limited by EcoChem	Limited by EcoChem
Deliverables	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes	Yes	Not Available	No – Summary Data Only	No – Summary Data Only
Data Review Details	1) Package Completeness	Yes	Yes	Summary review of QC sample results	No – Chain of Custody not provided	No – Chain of Custody not provided
	2) Chain of Custody Procedures	Not determined	Yes – Minor issues	Not determined	Not determined	Not determined
	3) Holding Times	Yes	Yes	Not determined	Unable to document	Unable to document
	4) Initial Calibration	Yes (25%)	Yes (35%)	Not Available	NA – Data not provided	NA – Data not provided
		Curve – Number of standards	5 pt	5 pt	Not Available	QAPP/SOP indicates 3 pt
	5) Calibration Verification	15% D	Varies between GC/ECD and GC/MS; <25% for 75% analytes	Not Available	QAPP/SOP indicates 15% RSD	20%
		Secondary Column	25% D	Yes, data not used	Not Available	QAPP/SOP indicates Optional/15%
	6) Laboratory Blanks	Yes	Yes	Not Available	Yes	Yes
	7) Surrogate Recoveries, Number Required	Yes – 70%-120%	Yes – 50%-125%	Not Available	62%-125%	NA
	8) Matrix Spike, Number Required	Yes – 65%–125%	Yes – 50%–125% tri and deca 30%–125% for mono and dichloro	Not Available	46%–145%	75%–125%
	9) Lab Duplicate or Replicate	Yes (26% Limit)	Yes (50%)	Not Available	Yes – Not clear if field or lab dups were performed	20%
		Lab Control Sample (SRM Results?)	No	SRM NRC %D Carp-1 <35%	No	NA
	10) Gel Permeation/Florisil Cleanup	Yes	Not mentioned	Not Available	Not Documented	NA
	11) Detection Limit	50 µg/kg	Results reported to zero	Not Available	50 µg/kg	NA
12) Calc and Transposition Verification Qualitative Verification?	Yes, Recalc	Yes, Recalc and Verification	Not discussed	Not performed	NA	
13) Field QC Results	NA	None	Yes – 15% on all matrices. Evaluated in summary and table format.	Yes	None	
14) Usability Usable/Supporting	Usable	Usable	Supporting	Yes – As qualified	Yes – As qualified	
	Qualifiers	Yes – Minor J Quals due to detections below PQL.	Yes – Qualifiers due to CCV %D outliers, BS results, surrogate outliers, lab dups, SRM results and interferences	Data not qualified but summaries infer low and high bias in QC Results Summary.	Yes – Minor J Quals due to spike outliers	No – No qualifiers based on review
SAP		No	NA	Yes	Yes	
QAPP		Yes – Tech Memo	NA	Yes	Yes	
Lab QAM	Yes	Yes – Tech Memo	NA	Yes – SOPs only	Yes – Hazleton SOPs	

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:	1997 Demonstration Project Data – Deposit N DMR Section 3.2.19			1997–1998 Demonstration Project Data – SMU 56/57 DMR Section 3.2.20		
Parameter & Matrix:	PCBs Sediments/Water	Mercury Sediments/Water	TOC Sediments	PCBs Sediments	Mercury Sediments	
<b>QA Elements</b>	SDG #s: En Chem Laboratory Multiple SDGs	En Chem Laboratory Multiple SDGs	En Chem Laboratory Multiple SDGs	En Chem Laboratory Multiple SDGs	En Chem Laboratory Multiple SDGs	
<b>Data Review</b>	1) Third-Party Validation Performed	MAKuehl	MAKuehl	MAKuehl	Montgomery Watson Montgomery Watson	
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	
	2) Hard Copy	Not Available	Not Available	Not Available	No – Summary Data Only No – Summary Data Only	
<b>Data Review Details</b>	1) Package Completeness	No – Chain of Custody not provided	No – Chain of Custody not provided	No – Chain of Custody not provided	No – Chain of Custody not provided	No – Chain of Custody not provided
	2) Chain of Custody Procedures	Acceptable	Acceptable	Acceptable	Not determined	Not determined
	3) Holding Times	Yes – One qualifier applied due to holding time exceedance	Yes	Yes	Yes – Some qualifiers applied due to reextractions	Yes – Only 1 of 282 exceeded HT
	4) Initial Calibration	Yes	Yes	Yes	Yes	Yes
	Curve – Number of standards	5 pt	3 pt	3 replicates	5 pt	6 pt
	5) Calibration Verification	15% D	Yes – 90-110	Yes – 90-110	15% RSD	Yes
	Secondary Column	Yes – 25%	NA	NA	Yes	NA
	6) Laboratory Blanks	Yes	Yes	Yes	Yes	Yes
	7) Surrogate Recoveries, Number Required	60%-150%	NA	NA	60%-150%	NA
	8) Matrix Spike, Number Required	65%–125%. One exceedance. No action due to high conc.	60%–135%	75%–125%. All w/in 20% RPD	65%–125%	75%–125%. One exceedance
	9) Lab Duplicate or Replicate	20%	Yes (35%)	Yes (20%)	Yes (20%)	Yes (20%) – Several exceedances
	Lab Control Sample (SRM Results?)	No	No	No	No	Yes (80–120)
	10) Gel Permeation/Florasil Cleanup	No	NA	NA	Not noted	NA
	11) Detection Limit	50 µg/kg Aroclor 1242 for sediment and 0.05 µg/L Aroclor 1242 for water	0.40 mg/kg or 0.25 µg/L	110 µg/kg	20 µg/kg dw	0.04 mg/kg dry wt per QAPP
12) Calc and Transposition Verification Qualitative Verification?	Yes, 10%	Yes, 10%	Not discussed	Yes	Yes	
13) Field QC Results	Yes – <20% QAPP for sediment. Not enough volume for H <sub>2</sub> O	Yes – Field blank OK; field water and sediment duplicates acceptable	Yes – Field duplicate	Not specified in DV report	Not specified in DV report	
14) Usability Usable/Supporting	Yes – As qualified	Yes – As qualified	Yes – As qualified	Yes – As qualified	Yes – As qualified	
Qualifiers	Yes – Minor qualifiers	No – No qualifiers based on review	No – No qualifiers based on review	Yes – Minor qualifiers assigned due to holding time exceedances	Yes – Qualifiers due to ht exceedances, lab dups, and spike recoveries.	
<b>SAP</b>	Yes	Yes	Yes	Yes	Yes	
<b>QAPP</b>	Yes	Yes	Yes	No – QAPP tables only	No – QAPP tables only	
<b>Lab QAM</b>	No	No	No	No	No	

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:	1998 RETEC RI/FS Supplemental Data DMR Section 3.2.21		Lake Michigan Mass Balance Data DMR Section 3.2.22	1998 FRG/Exponent Data (NRDA) DMR Section 3.2.24			
Parameter & Matrix:	PCBs  Sediments	Metals  Sediments	Asst. Conventionals, Pesticides/PCBs, Hg, Atrazine, DEA, DIA Water (Open Lake, Tributary), Air, Sediments, Phytoplankton	PCBs  Fish Tissue	PCB Congeners  Fish Tissue	PCB Congeners  Fish Tissue	
QA Elements	SDG #s:	ARI Multiple SDGs	ARI Multiple SDGs	En Chem Multiple SDGs	Michigan State University	Quanterra	
<b>Data Review</b>	1) Third-Party Validation Performed	Yes	Yes	No – data reviewed by QC Coordinators	Exponent	Exponent	Exponent
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes	Yes	Unknown	Yes	Yes	Yes
<b>Data Review Details</b>	1) Package Completeness	Yes – Minor qualifiers applied	Yes	Not addressed	Yes	Yes	Yes
	2) Chain of Custody Procedures	Yes – Minor issues	Acceptable	Not addressed	Acceptable	Acceptable	Acceptable
	3) Holding Times	Yes – Minor qualifiers	Yes	No DV reports provided	Yes	Some exceedances samples J/UJ	Yes
	4) Initial Calibration	Yes – Minor qualifiers	Yes	No DV reports provided	Yes	Yes	Yes
		Curve – Number of standards	5 pt	Blank plus 5 pt	No DV reports provided	Yes	Yes
	5) Calibration Verification	Yes <20%	90-110 every 10 samples	No DV reports provided	20%	20%	20%
		Secondary Column	Yes – Qualifiers applied	NA	No DV reports provided	Yes	Yes
	6) Laboratory Blanks	Yes	Yes	No DV reports provided	Yes	Yes – U based on blank contamination	Yes
	7) Surrogate Recoveries, Number Required	Yes – 65%-125%	NA	No DV reports provided	Yes	Yes	Yes
	8) Matrix Spike, Number Required	Yes – 65%–125%	70%–130%	No DV reports provided	Yes – No quals for %R outliers	Yes – No quals for %R outliers	Yes – No quals for %R outliers
	9) Lab Duplicate or Replicate	Yes – RPD <30%	NA	No DV reports provided	Yes – MS/MSD	Yes – MS/MSD	Yes – MS/MSD
	Lab Control Sample (SRM Results?)	w/in 35% of certified value	Yes – w/in 35% of certified value	No DV reports provided	Yes	Yes	Yes
	10) Gel Permeation/Florisil Cleanup	Not determined	NA	No DV reports provided	Not mentioned	Not mentioned	Not mentioned
	11) Detection Limit	1.0–2.0 µg/kg	0.1–50 mg/kg	No DV reports provided	NA	NA	NA
	12) Calc and Transposition Verification Qualitative Verification?	Yes, 10%	Yes, 10%	No recalculations were provided unable to determine if transcription checks were done	No recalculations were provided unable to determine if transcription checks were done	No recalculations were provided unable to determine if transcription checks were done	No recalculations were provided unable to determine if transcription checks were done
	13) Field QC Results	Yes – Some exceedances. No action taken on this basis.	Yes – Some exceedances of 50%. No action taken.	Not addressed	None identified	None identified	None identified
Usability Usable/Supporting	Yes – As qualified	Yes – As qualified	Supporting	Usable	Usable – Some results rejected for low surrogate %R	Usable	
14) Qualifiers	Yes – Data qualified due to ht exceedance, calibration, surrogate, internal standard outliers etc.	Yes – Minor qualifiers assigned due to lab RPD exceedances.	Yes – Specific LLMB 3 character Qual codes	Yes – Holdtimes, surrogate %R, LCS %R	Yes – Surr %R, blank contamination – U, coplanars – J/UJ diff between GC and HRGCMS, interference, coelutions	Yes – Coelutions, greater than calibration range	
<b>SAP</b>	NA	NA					
<b>QAPP</b>	Yes	Yes					
<b>Lab QAM</b>	Yes	Yes					

Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA

Study Name:		1998 FRG/BBL NRDA Data DMR Section 3.2.25					
Parameter & Matrix:	Pesticides	Mercury	PCBs	Conventionals	PCBs	PCB Congeners	
	Fish Tissue	Fish Tissue	Surface Water	Surface Water	Sediments	Sediments	
<b>QA Elements</b>	<b>SDG #'s:</b>	En Chem Multiple SDGs	En Chem Multiple SDGs	En Chem Multiple SDGs	En Chem Multiple SDGs	En Chem Multiple SDGs	En Chem Multiple SDGs
<b>Data Review</b>	1) Third-Party Validation Performed	Exponent	Exponent	BBL	BBL	BBL	BBL
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes	Yes	Yes	Yes	Yes	Yes
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes	Yes	Yes
	2) Chain of Custody Procedures	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
	3) Holding Times	Some exceedances samples J/UJ	Yes	Yes	Yes – TSS samples J flagged	Yes – Dilutions done out of hold, diluted Aroclors J	Yes
	4) Initial Calibration	Yes	Yes	Yes	Yes	Yes	Yes
	4) Curve – Number of standards	Yes	Yes				NA
	5) Calibration Verification	20%	10%	20%	10%	20%	30% Target analytes 40% Internal stds
	Secondary Column	Yes	NA	20% qualitative only	NA	20% qualitative only	NA
	6) Laboratory Blanks	Yes	Yes	Yes	Yes	Yes	Yes
	7) Surrogate Recoveries, Number Required	Yes	Yes	Yes – Control limits not provided	Yes – Control limits not provided	Yes – Control limits not provided	Yes – Control limits not provided
	8) Matrix Spike, Number Required	Yes	Yes	Yes – Control limits not provided	Yes – Control limits not provided	Yes – Control limits not provided	Yes – Control limits not provided
	9) Lab Duplicate or Replicate	Yes – MS/MSD	Yes	Yes – MS/MSD control limits not provided	Yes – Control limits not provided	Yes – MS/MSD control limits not provided	Yes – MS/MSD control limits not provided
	Lab Control Sample (SRM Results?)	Yes	Yes	Yes	Yes	Yes – Not addressed	Yes
	10) Gel Permeation/Florisil Cleanup	Not mentioned	NA	Not mentioned	NA	Not mentioned	Not mentioned
	11) Detection Limit	NA	NA	NA	NA	NA	NA
12) Calc and Transposition Verification Qualitative Verification?	No recalculations were provided unable to determine if transcription checks were done	No recalculations were provided unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	
13) Field QC Results	None identified	None identified	Field Duplicates OK. Rinsates had contamination	Field Duplicates OK. Rinsates had contamination	Field Duplicates OK	None identified	
Usability Usable/Supporting	Usable	Usable	Usable	Usable – Except some TOC/DOC rejected	Usable	Usable	
14) Qualifiers	Yes – Holdtimes, MS/MSD %R, Surr %R, PCB interference – all + J	Yes – Duplicate RPD	Yes – Aroclor 1242 ND based on rinsate cont./ UJ extraction errors/ J/UJ low surrogate %R	Yes – TOC/DOC R DOC > TOC, All parameters U rinsate, TSS J hold time	Yes – Aroclor 1242 and 1254 J spectral overlap/ J dilutions out of hold time/ minor CCAL %D	Yes – 1 compound J/UJ CCAL D, MS/MSD/LCS low %R, poor peak resolution	
<b>SAP</b>							
<b>QAAPP</b>							
<b>Lab QAM</b>							

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		1998 FRG/BBL NRDA Data (continued) DMR Section 3.2.25				
Parameter & Matrix:	Pesticides	SVOCs	Metals	TOC/Ammonia	PCBs	
	Sediments	Sediments	Sediments	Sediments	Fish Tissue	
<b>QA Elements</b>	<b>SDG #'s:</b>	Quanterra Multiple SDGs	En Chem Multiple SDGs	En Chem Multiple SDGs	En Chem Multiple SDGs	En Chem Multiple SDGs
<b>Data Review</b>	1) Third-Party Validation Performed	BBL	BBL	BBL	BBL	BBL
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes	Yes	Yes	Yes	Yes
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes	Yes
	2) Chain of Custody Procedures	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
	3) Holding Times	Yes	Yes – 1 missed hold time sample J/UJ	Yes	Yes – Some TOC and ammonia samples J	Yes
	4) Initial Calibration	Yes	Yes	Yes	Yes	Yes
	4) Curve – Number of standards	NA	NA	NA	NA	NA
	5) Calibration Verification	20%	20%	10%	10%	20%
	5) Secondary Column	20% qualitative only	NA	NA	NA	20% qualitative only
	6) Laboratory Blanks	Yes	Yes	Yes	Yes	Yes
	7) Surrogate Recoveries, Number Required	Yes – Control limits not provided	Yes – Control limits not provided			
	8) Matrix Spike, Number Required	Yes – Control limits not provided	Yes – Control limits not provided			
	9) Lab Duplicate or Replicate	Yes – MS/MSD control limits not provided	Yes – MS/MSD control limits not provided	Yes – Control limits not provided	Yes – Control limits not provided	Yes – MS/MSD control limits not provided
	9) Lab Control Sample (SRM Results?)	Yes	Yes	Yes	Yes	Yes
	10) Gel Permeation/Florasil Cleanup	Not mentioned	Not mentioned	NA	NA	Not mentioned
	11) Detection Limit	NA	NA	NA	NA	NA
12) Calc and Transposition Verification Qualitative Verification?	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	
13) Field QC Results	Field Duplicates OK	Field Duplicates OK	Field Duplicates OK	Field Duplicates OK	None identified	
14) Usability Usable/Supporting	Usable	Usable – Except hexachlorocyclopentadiene rejected	Usable	Usable	Usable	
14) Qualifiers	No	Yes – HCCP R 0% MS/MSD, minor CCAL %D, low surr %R, and missed hold time	Yes – Blank contamination, low MS %R, RPD	Yes – Holdtimes	Yes – Aroclor 1242 and 1254 J spectral overlap, J/UJ due to extraction error	
<b>SAP</b>						
<b>QAPP</b>						
<b>Lab QAM</b>						

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		1998 Deposit N Demonstration Pilot Remediation Data DMR Section 3.2.26					
Parameter & Matrix:	PCBs	PCB Congeners	TOC/DOC/TSS	PCBs	PCB Congeners	TOC	
	Slurry, Soil, Liquid	Slurry, Soil, Liquid	Slurry, Soil, Liquid	Sludge	Sludge	Sludge	
<b>QA Elements</b>	<b>SDG #s:</b>	Severn Trent VT. Fox9, Fox10, Fox11, Fox12, Fox13, Fox14, Fox16	Severn Trent VT. Fox9, Fox10, Fox11, Fox12, Fox13, Fox14, Fox16	WSLH	Severn Trent VT. Fox17 and Fox18	Severn Trent VT. Fox17 and Fox18	Severn Trent VT. Fox17 and Fox18
<b>Data Review</b>	1) Third-Party Validation Performed	MAKuehl	MAKuehl	MAKuehl	MAKuehl	MAKuehl	MAKuehl
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes	Yes	Yes	Yes	Yes	Yes
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes	Yes	Yes
	2) Chain of Custody Procedures	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
	3) Holding Times	Yes – Some exceedances	Yes – Some results J/UJ, some results rejected (greater than 14 days)	Yes – Some exceedances	Yes	Yes	Yes
	Initial Calibration	Yes	Yes	Yes	Yes	Yes	Yes
	4) Curve – Number of standards	NA	NA	NA	NA	NA	Yes
	5) Calibration Verification	15%	Yes	Yes	Yes	Yes	Yes
	Secondary Column	Yes – Some %D exceedances	Yes	NA	Yes – %D outliers	Yes	NA
	6) Laboratory Blanks	Yes	Yes – Some results U based on MB cont.	Yes	Yes	Yes	Yes
	7) Surrogate Recoveries, Number Required	Yes	Yes	Yes	Yes	Yes	Yes
	8) Matrix Spike, Number Required	Yes	Yes	Yes	Yes	Yes – Some %R and RPD outliers	Yes
	9) Lab Duplicate or Replicate	Yes	Yes	Yes	Yes	Yes	Yes – Some RPD outliers
	Lab Control Sample (SRM Results?)	Yes – Some %R outliers	Yes – Some %R outliers	Yes	Yes – Some %R outliers	Yes	Yes – One outlier
	10) Gel Permeation/Florisil Cleanup	Not addressed	Not Addressed	NA	Not Addressed	Not addressed	NA
	11) Detection Limit	NA	NA	NA	NA	NA	NA
12) Calc and Transposition Verification Qualitative Verification?	Yes	Yes	Yes	Yes	Yes	Yes	
13) Field QC Results	Yes	Yes – Some outliers, no quals assigned	Yes – DOC RPD outlier	Yes	Yes – Some outliers, no quals assigned	Yes – Some RPD outliers	
Usability Usable/Supporting	Usable – Some results rejected due to possible cross contamination	Usable – Some results rejected due to exceeded holding times	Usable	Usable	Usable	Usable	
14) Qualifiers	Yes – Cooler temps, CCAL %D, holding time, LCS %R, Dual Column %D	Yes – Hold times, cooler temps, CCAI %D, method blank contamination, LCS %R, over cal	Yes – Holding times, cooler temps, Field Dup RPD, DOC>TOC	Yes – Dual column %D outliers	Yes – CCAL %D outliers, MS/MSD %R and RPD outliers, LCS %R, over cal	Yes – LCS %R, Dup RPD, Field Dup RPD	
<b>SAP</b>							
<b>QAPP</b>							
<b>Lab QAM</b>							

Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA

Study Name:	1998 Deposit N Demonstration Pilot Remediation Data (continued) DMR Section 3.2.26			1999 FRG Demonstration Project, Deposit N and SMU 56/57 DMR Section 3.2.29	2000/2001 FRG/CH2M HILL (Little Lake Butte des Morts) DMR Section 3.2.30		
Parameter & Matrix:	PCB Congeners Surface Water	PCBs Fish	PCB Congeners Minnow	PCB-A, PCB-C, Conventional Chemistry Sediments, Surface Water, PUF, Slurry and Influent/Effluent	VOCs Woodchips	Cyanide Sediments	
QA Elements SDG #s:	WSLH	Severn Trent VT. Fox7	WSLH	En Chem and WSLH (Northern Lakes and Triangle)	En Chem 913915	En Chem 913915	
<b>Data Review</b>	1) Third-Party Validation Performed	MAKuehl	MAKuehl	MAKuehl	MAKuehl	CH2M HILL	CH2M HILL
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes	Yes	Yes	Yes – but only validation reports with Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes	Yes	Yes
	2) Chain of Custody Procedures	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
	3) Holding Times	Yes	Yes	Yes	Several Hg, DOC, TOC and PCB-A results were estimated due to inadequate preservation and/or holding time exceedance	Yes	Yes
	4) Initial Calibration	Yes	Yes	Yes	Yes	Yes	Yes
	4) Curve – Number of standards	Yes	Yes	Yes	Yes, as per method One set of PCB-A estimated due to lack of initial cal.	5 pt	Yes – Criteria met
	5) Calibration Verification	Yes	Yes	Yes	Yes	unknown	Yes
	5) Secondary Column	Yes	Yes	Yes	Yes, when required by method	NA	NA
	6) Laboratory Blanks	Yes – Some results U because of MB cont.	Yes	Yes	Yes – Some contaminants	Yes	Yes
	7) Surrogate Recoveries, Number Required	Yes	Yes	Yes	Yes – Some exceedance	Yes – Low recoveries	NA
	8) Matrix Spike, Number Required	No – Not enough sample	No	Yes	Yes	No	Yes – Lab limits
	9) Lab Duplicate or Replicate	Yes	Yes	Yes	Yes	No	Yes – Criteria met
	9) Lab Control Sample (SRM Results?)	Yes	Yes	Yes	Not Addressed	Yes – Some low recoveries	Yes – Criteria met
	10) Gel Permeation/Florisil Cleanup	Not addressed	Not Addressed	Not Addressed	Not Addressed	NA	NA
	11) Detection Limit	NA	NA	NA	Varies by method and compound	ppb – Varies by sample and compound	ppm – Varies by sample
12) Calc and Transposition Verification Qualitative Verification?	Yes	Yes	Yes	Yes, at 10% frequency	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	
13) Field QC Results	Yes – Some outliers, no quals assigned	Yes	Yes	Yes	Field Dups and Trip Blanks OK	Field Duplicates OK	
14) Usability Usable/Supporting	Usable	Usable	Usable	Usable, except acrolein.	Usable	Usable	
14) Qualifiers	Yes – Blank contamination, results < LOQ,	No	Yes – Reported results < LOQ	Yes – Various data were estimated due to blank contamination, preservation, holding time, precision and accuracy outliers. Also, some data estimated that were between the LOD and LOQ. Acrolein data rejected due to extremely low matrix spike recovery.	Yes – All results U/UJ for low surrogate %R	No	
<b>SAP</b>				Yes – But not provided	Not provided	Not provided	
<b>QAPP</b>				Yes – But not provided	Not provided	Not provided	
<b>Lab QAM</b>				Yes – But not provided	Not provided	Not provided	

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		2000/2001 FRG/CH2M HILL (Little Lake Butte des Morts) DMR Section 3.2.30				
Parameter & Matrix:		PCB Aroclors	Metals	SVOCs	Fuels (GRO/DRO)	
		Sediments	Sediments	Sediments	Sediments	
<b>QA Elements</b>	<b>SDG #'s:</b>	En Chem Multiple SDGs	En Chem 913426/913915	En Chem 913426/913904	En Chem 913426/913904	
<b>Data Review</b>	1) Third-Party Validation Performed	CH2M HILL	CH2M HILL	CH2M HILL	CH2M HILL	
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	
	2) Hard Copy	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes	
	2) Chain of Custody Procedures	Acceptable	Acceptable	Acceptable	Acceptable	
	3) Holding Times	Yes	Yes	Yes	Yes	
	4) Curve – Number of standards	Initial Calibration	Yes	Yes	Yes	Yes
		Curve – Number of standards	Yes – Criteria met	Lin Reg	5 pt	Lin Reg
	5) Calibration Verification	Calibration Verification	Yes	Yes	Yes	Yes
		Secondary Column	Qualitative only	NA	NA	NA
	6) Laboratory Blanks	Yes	Yes	Yes	Yes	
	7) Surrogate Recoveries, Number Required	Yes	NA	Yes – 2 samples J/UJ for low %R	Yes	
	8) Matrix Spike, Number Required	Yes – MS/MSD	Yes	Yes – MS/MSD – 1 sample J for high %R	No	
	9) Lab Duplicate or Replicate	Lab Duplicate or Replicate	No	Yes	No	No
		Lab Control Sample (SRM Results?)	Yes – Acceptable	Yes – Acceptable	Yes – Acceptable	Yes – Acceptable
	10) Gel Permeation/Florisil Cleanup	Not mentioned	NA	Not mentioned	Not mentioned	
	11) Detection Limit	ppb – Varies by sample	ppm – Varies by sample and analyte	ppb – Varies by sample and compound	ppm – Varies by sample	
12) Calc and Transposition Verification Qualitative Verification?	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done		
13) Field QC Results	Field Duplicates some high RPD with no qualifiers	Field Dup for Hg only	Field Duplicates OK	Field Duplicates – All DRO results J due to high RPD		
Usability Usable/Supporting	Usable	Usable	Usable	Usable		
14) Qualifiers	Yes – Many Aroclor 1254 and some 1260 qualified J due to spectral overlap	No	Yes – Due to surrogate and MS %R outliers	Yes – All DRO results J due to high RPD		
<b>SAP</b>		Not provided	Not provided	Not provided	Not provided	
<b>QAPP</b>		Not provided	Not provided	Not provided	Not provided	
<b>Lab QAM</b>		Not provided	Not provided	Not provided	Not provided	

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		2000 FRG/BBL Supplemental Monitoring Program Data – Surface Water DMR Section 3.2.31			2000/2001 FRG/BBL Supplemental Monitoring Program Data – Sediments DMR Section 3.2.32			
Parameter & Matrix:	Conventionals	PCB Aroclors	PCB Congeners	Conventionals	PCB Aroclors	PCB Congeners		
	Water and XAD Resins	Water and XAD Resins	Water and XAD Resins	Sediments	Sediments	Sediments		
<b>QA Elements</b>	SDG #'s:	En Chem Multiple SDGs	En Chem Multiple SDGs	En Chem & STL Multiple SDGs	En Chem & CQM Multiple SDGs	En Chem Multiple SDGs	STL GOL020161	
<b>Data Review</b>	1) Third-Party Validation Performed	BBL	BBL	BBL	BBL	BBL	BBL	
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes	Yes	
	2) Hard Copy	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes	Yes	Yes	
	2) Chain of Custody Procedures	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
	3) Holding Times	Yes	Yes	Yes	Yes	Yes	Yes	
	4) Curve – Number of standards	Initial Calibration	Yes	Yes	Yes	Yes	Yes	Yes
			Per method	Lin Reg	5 pt	Per method	Lin Reg	5 pt
	5) Calibration Verification		Yes	Yes	Yes – All samples in 3 SDG qualified 1+ congeners J/UJ	Per method	Yes	Yes
		Secondary Column	NA	Qualitative only	NA	NA	Qualitative only	NA
	6) Laboratory Blanks	Yes	Yes	Yes – Several congeners in several samples qualified U	Yes – TOC only	Yes	Yes	
	7) Surrogate Recoveries, Number Required	NA	Yes	Yes	NA	Yes	Yes	
	8) Matrix Spike, Number Required	Yes – TOC only	Yes – MS/MSD	No	Yes – TOC only; 20 samples J for high %R	Yes – MS/MSD	No	
	9) Lab Duplicate or Replicate		Yes – Criteria met	No	No	No duplicates for grain size and % moisture	No	No
		Lab Control Sample (SRM Results?)	Yes – Criteria met	Yes – Acceptable	Yes – Acceptable	Yes – TOC only	Yes – Acceptable	No
	10) Gel Permeation/Florisil Cleanup	NA	Not mentioned	NA	NA	Not mentioned	NA	
	11) Detection Limit	ppm – Varies by sample	ppb – Varies by sample	ppb – Varies by sample and congener	TOC – ppm – Varies by sample	ppb – Varies by sample	ppt – Varies by sample and congener	
12) Calc and Transposition Verification Qualitative Verification?	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done		
13) Field QC Results	Field Duplicates OK	Field Duplicates – Some high RPD with no qualifiers	Field Dup for Hg only	Field Duplicates TOC only	Field Duplicates acceptable	No		
Usability Usable/Supporting	Usable	Usable	Usable	Usable	Usable	Usable		
14) Qualifiers	No	No	Yes – Due to blank cont., cal, IS %R, and linear range exceed.	Yes – TOC 20 samples J for high %R	No	No		
<b>SAP</b>		Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	
<b>QAPP</b>		Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	
<b>Lab QAM</b>		Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		2001 FRG/BBL Green Bay Sediment Data DMR Section 3.2.33		2001 FRG/BBL Water Quality High-Flow Data DMR Section 3.2.34		
Parameter & Matrix:		Conventionals  Sediments	PCB Aroclors  Sediments	Conventionals  Water and XAD Resins	PCB Aroclors  Water and XAD Resins	PCB Congeners  Water and XAD Resins
<b>QA Elements</b>	<b>SDG #'s:</b>	En Chem & CQM 914351, 914390	En Chem 914351, 914390	En Chem Multiple SDGs	En Chem Multiple SDGs	En Chem & STL Multiple SDGs
<b>Data Review</b>	1) Third-Party Validation Performed	EcoChem & BBL	EcoChem & BBL	BBL	BBL	BBL
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes	Yes	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem	Yes – but only Form 1s reviewed by EcoChem
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes	Yes
	2) Chain of Custody Procedures	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
	3) Holding Times	Yes	Yes	Yes – Several TVS samples J/UJ	Yes	Yes
	4) Initial Calibration Curve – Number of standards	Yes	Yes	Yes	Yes	Yes
		Per method	Lin Reg	Per method	Lin Reg	5 pt
	5) Calibration Verification Secondary Column	Per method	Yes	Per method	Yes	Yes – All samples in 1 SDG qualified 1+ congeners J/UJ
		NA	Qualitative only	NA	Qualitative only	NA
	6) Laboratory Blanks	Yes – TOC only	Yes	Yes – TOC only	Yes	Yes – 10 SDG had mult. congeners qualified U
	7) Surrogate Recoveries, Number Required	NA	Yes – 1 sample J due to high %R	NA	Yes – 1 sample J/UJ & 1 sample J/R due to low %R	Yes – Several results R due to low %R; several SDG J/UJ due to low %R
	8) Matrix Spike, Number Required	Yes – TOC only MS/MSD	Yes – MS/MSD	Yes – TOC only; 20 samples J for high %R	Yes – MS/MSD	No
	9) Lab Duplicate or Replicate Lab Control Sample (SRM Results?)	No duplicates for grain size and % moisture	No	No duplicates for grain size and % moisture	No	No
		Yes – TOC only	Yes – Acceptable	Yes – TOC only	Yes – Acceptable	Yes – Results in 16 samples J/UJ due to low %R
	10) Gel Permeation/Florisil Cleanup	NA	Not mentioned	NA	Not mentioned	NA
	11) Detection Limit	TOC – ppm – Varies by sample	ppb – Varies by sample	TOC – ppm – Varies by sample	ppb – Varies by sample	ppt – Varies by sample and congener
12) Calc and Transposition Verification Qualitative Verification?	EcoChem performed recalcs and transcription checks	EcoChem performed recalcs and transcription checks	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; unable to determine if transcription checks were done	
13) Field QC Results	No	No	Field Duplicates acceptable; Rinse blank (TOC only) contamination	Field Duplicates acceptable	Yes – High RPD, no action taken	
14) Usability Usable/Supporting Qualifiers	Usable	Usable	Usable	Usable	Rejected (R) data not usable; all other data usable	
	Yes – TOC data estimated due to high RSD between injections	No	Yes – Several TOC samples U due to rinse blank contamination. Several TVS samples J/UJ due to HT exceedance.	Yes – 1 sample J/UJ and 1 sample J/R due to low %R	Yes – Several results R due to low %R. Results J/UJ due to surrogate, LCS, CCAL, coelution and ion ratio outliers. Results U due to blank contamination.	
<b>SAP</b>	Not provided	Not provided	Not provided	Not provided	Not provided	
<b>QAPP</b>	Not provided	Not provided	Not provided	Not provided	Not provided	
<b>Lab QAM</b>	Not provided	Not provided	Not provided	Not provided	Not provided	

**Table 3-2 QC Elements for Data Sets Supporting the Fox River RI/FS and RA**

Study Name:		2002 RETEC Green Bay Sediment Data DMR Section 3.2.35		2002 Foth and Van Dyke Little Lake Butte des Morts Sediment Data DMR Section 3.2.36	
Parameter & Matrix:		TOC/Conventionals  Sediments	PCB Aroclors  Sediments	TOC/Conventionals  Sediments	PCB Aroclors  Sediments
QA Elements	SDG #'s:	En Chem 922546A	En Chem 922546A	En Chem 921796A, B, C	En Chem 921796A, B, C
<b>Data Review</b>	1) Third-Party Validation Performed	MAKuehl	MAKuehl	MAKuehl	MAKuehl
<b>Deliverables</b>	1) Electronic Deliverables	Yes	Yes	Yes	Yes
	2) Hard Copy	Yes	Yes	Yes	Yes
<b>Data Review Details</b>	1) Package Completeness	Yes	Yes	Yes	Yes
	2) Chain of Custody Procedures	Acceptable	Acceptable	Acceptable	Acceptable
	3) Holding Times	Yes	Yes	Yes	Yes
	4) Initial Calibration Curve – Number of standards	Yes	Yes	Yes	Yes
		Per method	Lin Reg	Per method	Lin Reg
	5) Calibration Verification Secondary Column	Per method	Yes	Per method	Yes
		NA	Qualitative only	NA	Qualitative only
	6) Laboratory Blanks	Yes – TOC only	Yes	Yes – TOC only	Yes
	7) Surrogate Recoveries, Number Required	NA	Yes – 1 sample J/UJ & 1 sample J/R due to low %R	NA	Yes – 3 samples qualified J due to low %R
	8) Matrix Spike, Number Required	TOC – One sample estimated for low recovery	Yes – MS/MSD	Yes – TOC only	Yes – MS/MSD
	9) Lab Duplicate or Replicate Lab Control Sample (SRM Results?)	TOC – Replicate RSD >20% and 40 samples qualified J	No	TOC – Replicate RSD >20% and several samples qualified J	No
		Yes – Acceptable	Yes – Acceptable	Yes – Acceptable	Yes – Acceptable
	10) Gel Permeation/Florisil Cleanup	NA	Hg used for sulphur removal	NA	Hg used for sulphur removal
	11) Detection Limit	TOC – ppm – Varies by sample. Note that MAKuehl estimates values (J) between the LOD and LOQ.	ppb – Varies by sample. Note that MAKuehl estimates values (J) between the LOD and LOQ.	TOC – ppm – Varies by sample. Note that MAKuehl estimates values (J) between the LOD and LOQ.	ppb – Varies by sample. Note that MAKuehl estimates values (J) between the LOD and LOQ.
12) Calc and Transposition Verification Qualitative Verification?	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; peak matching was reviewed by MAKuehl	No recalculations were provided; unable to determine if transcription checks were done	No recalculations were provided; peak matching was reviewed by MAKuehl	
13) Field QC Results	Field Duplicates acceptable	Field Duplicates acceptable	Field Duplicates acceptable	Field Duplicates acceptable	
Usability Usable/Supporting	Usable	Usable	Usable	Usable	
14) Qualifiers	Yes – 40 TOC samples J due to RSD >20%; one TOC sample J due to low spike recovery.	No	Yes – 18 TOC samples J due to RSD >20%	Yes – 3 samples qualified J due to low surrogate %R	
<b>SAP</b>		Not provided	Not provided	Not provided	Not provided
<b>QAPP</b>		Not provided	Not provided	Not provided	Not provided
<b>Lab QAM</b>		Not provided	Not provided	Not provided	Not provided