MAKuehl CO. LLC

Data Validation

Lab/Field Audits

QA Plans

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Scope 04G007 Section 10,500
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TECHNICAL MEMORANDUM

DATE: June 22, 2006

TO: Janis Kesy
Project Manager
Foth & Van Dyke

FROM: Marcia A. Kuehl
President/Owner
MAKuehl Company

SUBJECT: Data Validation for Lower Fox River OU 1 2005 Remedial Action Sampling Events of April 24, 26, 28, May 1, 3-6, 8-17, 2006
Foth & Van Dyke Project # : 04G007, 02G005

1.0 OVERVIEW

Analytical results for samples listed in Table 1 and their associated laboratory QC samples collected from the Lower Fox River OU 1 have been evaluated using the EPA guidance documents "National Functional Guidelines for Organic Data Review", dated October 1999, EPA-540/R-99/008, and the "National Functional Guidelines for Inorganic Data Review", dated July, 2002, EPA-540/R-01-008.

The specific calibration and laboratory QC check requirements contained in the "Lower Fox River Operable Unit 1 Remedial Action-2004 Remedial Action Work Plan" dated May, 2004 (RAWP) were the primary criteria used in the assessment of the data for compliance with the project data quality objectives. The review was based on the data packages supplied by the analytical laboratory, Pace, located in Kimberly, Wisconsin.

All PCB data were usable as reported. No detectable PCBs were present in any of the samples.

The undetected BOD result in IRA-06-DEWT-EF-05 was estimated from a holding time exceedance. BOD results in IRA-06-DEWT-EF14 and EF-15 were estimated from a method non-compliance. TSS results in sample POG3-SW03-902 and its field duplicate was estimated from matrix variability as exhibited by field duplicate imprecision.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

All qualifiers assigned during the data validation process are discussed in detail below. The validated data sheets are attached, and the checklist used during the validation are in Appendix A.

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2.0 PCB AS AROCLORS DATA

Pace utilized the EPA SW846 reference methods 3510C and 8082 as specified in their Standard Operating Procedure SVO-52, Revision No. 3 dated January, 2000 for water samples . No significant deviations from this SOP were apparent from the documentation reviewed. No action was needed to qualify sample data.

2.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for PCB analysis did not require any follow-up with Pace to enable data validation.

2.2 Compliance Assessment

2.2.1 Holding Times/Preservation

All samples for PCBs were received on ice. No notation of receipt temperature in exceedance of 2-6°C and no intact ice was noted for any samples analyzed for PCBs. None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

Water samples were extracted within 7 days after collection. After extraction all samples were analyzed within 14 days. No action was needed to qualify sample data.

2.2.2 Initial Calibration (ICAL)

Five point initial calibration curves ranging from 0.1-1.0 ug/ml for Aroclor 1016/1260, 1242 and 1254 were analyzed on both columns, RTX-CLP (primary quantitation column) and RTX-CLP2 (confirmation column) on 4/10/06 and 4/17/06. The rsd values measured for each peak were less than the 20 % data validation criteria. No action was taken to qualify sample data based on initial calibration results.

2.2.3 Calibration Verification (CCAL)

The required method frequency of calibration verification was every 10 samples and at the end of the instrument run was met for every SDG. In all of the SDGs reviewed in Table 1, the CCALs consisted of a 0.3 ug/ml solution of Aroclor 1242 alternating with a 0.3 ug/ml solution of Aroclor 1254. The mean percent difference between the CCAL and ICAL calibration factors for the 5-10 peaks used for identification and quantitation were all less than the 15 % data validation criteria on the primary quantitation column. No action was needed to qualify sample data.

2.2.4 Laboratory Blanks

At least one laboratory blank was prepared and extracted with every 20 project samples or less analyzed. No laboratory blanks contained detectable Aroclors above the Limit of Detection (LOD).

2.2.5 Surrogate Recoveries

Decachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) recoveries in all project water samples were all within the Pace limits of 7 - 113 % (DCB) and 49 - 112 % (TCX). No action was needed to qualify sample data.

2.2.6 Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD)

At least one Laboratory Control Sample (LCS)and Laboratory Control Sample Duplicate (LCSD) at 5 ug/L Aroclor 1242 was prepared and analyzed with each SDG, or 20 water samples. All recoveries measured in the LCS were within the Pace limits of 47 - 138 % and < 20 % RPD, except for 140 % recovery in one LCSD. Pace qualified associated sample results with a "&" qualifier.. No action was needed to qualify sample data, as all associated samples did not contain any detetable PCBs and no high bias was possible.

2.2.7 Detection Limit Attainment

The RAWP Reporting Limit of 1.0 ug/L was attained in all samples when accounting for the actual sample volume extracted. No action was needed to qualify sample data.

2.2.8 Verification of Reported Results

No detectable Aroclors were present in the project water samples analyzed. No discrepancies or false negatives were detected. QC sample results such as RPD, recovery and % difference were also recalculated, but at a 10 % frequency. No discrepancies that were not due to differences in lab instrument software and the validator's calculator significant figure/rounding protocols were found in QC sample results. All detected Aroclor values reported for QC sample results are from the primary column. The analysis on the secondary column was reviewed to assess if the Aroclor pattern(s) were confirmed, and all were.

All reported Aroclors in QC samples were quantified on at least an 4 peak match. Peaks with obvious interferences were not included in the quantitation. The method retention time window criteria of ± 0.03 minutes for a minimum of a 4 peak match for Aroclor identification was met in all QC samples.

2.3 Field QC Results

No field equipment rinsates associated with the project samples in Table 1 were analyzed for PCBs. No action was needed to qualify sample data.

A field duplicate was collected for IRA-06-DEWT-EF11. No detectable PCBs were present in the field sample or the field duplicate. Acceptable field precision was achieved and no action was needed to qualify sample data.

.2.4 Data Usability

All PCB data were usable as reported. No detectable PCBs were present in any of the samples.

3.0 AMMONIA, BOD and TSS DATA

Pace utilized EPA reference methods 160.2 and 350.1 as specified in their Standard Operating Procedure G2-WCM-01, Revision No. 2 dated January 1, 2003 and G2-WCM-58, Revision No. 0 dated January 16, 2004. No significant deviations from this SOP was apparent from the documentation reviewed. No action was needed to qualify sample data.

BOD analysis was not a requirement in the RAWP. Pace utilized Standard Methods 5210B for BOD analysis. No significant deviations from this reference method was apparent from the documentation reviewed. No action was needed to qualify sample data.

3.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for ammonia, BOD and TSS analysis did not require any follow-up with Pace. No action was needed to qualify sample data.

3.2 Compliance Assessment

3.2.1 Holding Time/Preservation

Documentation of adequate acid preservation for ammonia was present. All EPA recommended holding times for the methods cited above were met except for IRA-06-DEWT-EF-05. The BOD holding time in this sample was exceeded by 3 hours and Pace qualified the BOD result with a "H" qualifier. Action taken was to qualify the undetected BOD result in IRA-06-DEWT-EF-05 as estimated with a J code from this holding time exceedance.

None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

3.2.2 Calibration

All ammonia initial instrument calibrations for ammonia were properly performed using at least five standards and met the correlation coefficient criteria of greater than 0.995. Continuing calibration checks were performed at least once every 10 samples and all checks met performance criteria of 90-110%.

3.2.3 Laboratory Blanks

Laboratory blanks did not contain any TSS or ammonia above the Limit of Detection (LOD). Samples IRA-06-DEWT-EF-14 and EF-15 did not exhibit enought oxygen depletion in the seeded dilutions. Pace qualified the sample data with an "X" qualifier. Action taken was to qualify the BOD results in IRA-06-DEWT-EF14 and EF-15 as estimated with a J code from this method non-compliance.

3.2.4 Reference Standards/Lab Control Standards (LCS/LCSD)

Recovery of reference (EPA/ERA/APG) standards were all within Pace and RAWP accuracy limits. No action was needed to qualify sample data.

3.2.5 Laboratory Duplicate Sample Analysis

All laboratory duplicate and LCS/LCSD RPD results were within the Pace and RAWP precision limits. No action was needed to qualify sample data.

3.2.6 Matrix Spike Samples

All matrix spike sample recoveries were within the Pace and RAWP accuracy limits of 90 - 110 %. No action was needed to qualify sample data.

3.3 Field QC Results

One field equipment rinsate (IRA-06-C/D2S-SW-30-912) collected with the project samples in Table 1 contained 0.30 mg/L. No action was needed to qualify associated sample data as all sample concentrations exceeded the field blank by more than a factor of five.

Field duplicates for TSS were collected with the project samples listed in Table 1 and the Relative Percent Difference (RPD) calculated below:

Sample ID (IRA-06-)	TSS (mg/L)	TSS (mg/L) DUP	RPD
POG3-SW03-902	8.1	7.2	14 %
C/D2S-SW17-902	23	23	0 %
DEWT-EF-11	3.2	3.1	3 %
POG3-SW32-902	12	12	0 %

The RPD values were not within the RAWP precision limit of 5 % for POG3-SW03-902. Action taken was to qualify TSS results in sample POG3-SW03-902 and its field duplicate as estimated with a J code from this matrix variability.

Field duplicates were collected with the project samples listed in Table 1 for ammonia and BOD for IRA-05-DEWT-EF11. No detectable BOD was present in these samples. Ammonia was present at 2.0 mg/L and 1.9 mg/L for a calculated RPD value of 5 %. As the RPD value for EF11 was within the RAWP precision limit of 20 %, no action was needed to qualify sample data.

3.4 Data Usability

The undetected BOD result in IRA-06-DEWT-EF-05 was estimated from a holding time exceedance. BOD results in IRA-06-DEWT-EF14 and EF-15 were estimated from a method non-compliance. TSS results in sample POG3-SW03-902 and its field duplicate was estimated from matrix variability as exhibited by field duplicate imprecision.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region

of quantitation associated with less precision.

If you have any questions regarding the qualification of data or the data validation process/criteria used, please contact me at (920) 469-9113.

Attachments:

Table 1
Validated hard copy Data Sheets
Appendix A: Data Validation Checklist

Table 1 Data Validated - Lower Fox River Foth Van Dyke

LAB(S)	SDG#	Date Rec'd by Kuehl	Matrix	Field Sample ID	Field Collection Date	Lab sample ID	Analytes
Pace	871111	6-Jun-06	water	IRA-06-C/D2S-S.W.-01-912	24-Apr-06	871111-001	TSS
Pace	871111	6-Jun-06	field blank	IRA-06-C/D2S-S.W.-04-RINSE-912	24-Apr-06	871111-002	TSS
Pace	871111	6-Jun-06	water	IRA-06-C/D2S-S.W.-02-905	24-Apr-06	871111-003	TSS
Pace	871111	6-Jun-06	water	IRA-06-POG3-S.W.-03-902	24-Apr-06	871111-003	TSS
Pace	871111	6-Jun-06	water field duplicate	IRA-06-POG3-S.W.-03-902 DUP	24-Apr-06	871111-003	TSS
Pace	871343	6-Jun-06	water	IRA-06-C/D2S-S.W.-08-912	28-Apr-06	871343-001	TSS
Pace	871343	6-Jun-06	water	IRA-06-C/D2S-S.W.-09-905	28-Apr-06	871343-002	TSS
Pace	871343	6-Jun-06	water	IRA-06-POG3-S.W.-10-902	28-Apr-06	871343-003	TSS
Pace	871213	6-Jun-06	water	IRA-06-C/D2S-S.W.-05-912	26-Apr-06	871213-001	TSS
Pace	871213	6-Jun-06	water	IRA-06-C/D2S-S.W.-06-905	26-Apr-06	871213-002	TSS
Pace	871213	6-Jun-06	water	IRA-06-POG3-S.W.-07-902	26-Apr-06	871213-003	TSS
Pace	871421	6-Jun-06	water	IRA-06-DEWT-EF-01	1-May-06	871421-004	PCBs, TSS, BOD, NH3
Pace	871421	6-Jun-06	water	IRA-06-DEWT-EF-02	3-May-06	87483-0011	PCBs, TSS, BOD, NH3
Pace	871421	6-Jun-06	water	IRA-06-DEWT-EF-03	4-May-06	871521-001	PCBs, TSS, BOD, NH3
Pace	871421	6-Jun-06	water	IRA-06-C/D2S-S.W.-12-905	1-May-06	871421-002	TSS
Pace	871421	6-Jun-06	water	IRA-06-POG3-S.W.-13-902	1-May-06	871421-003	TSS
Pace	871421	6-Jun-06	water	IRA-06-C/D2S-S.W.-11-912	1-May-06	871421-004	TSS
Pace	871579	6-Jun-06	water	IRA-06-DEWT-EF-04	5-May-06	871579-001	PCBs, TSS, BOD, NH3
Pace	871579	6-Jun-06	water	IRA-06-C/D2S-S.W.-14-912	3-May-06	871581-001	TSS
Pace	871579	6-Jun-06	water	IRA-06-C/D2S-S.W.-15-905	3-May-06	871581-002	TSS
Pace	871579	6-Jun-06	water	IRA-06-C/D2S-S.W.-16-902	3-May-06	871581-003	TSS
Pace	871579	6-Jun-06	water	IRA-06-DEWT-EF-05	6-May-06	871638-001	PCBs, TSS, BOD, NH3
Pace	871579	6-Jun-06	water	IRA-06-C/D2S-S.W.-17-912	5-May-06	871639-001	TSS
Pace	871579	6-Jun-06	water field duplicate	IRA-06-C/D2S-S.W.-17-912-DUP	5-May-06	871639-002	TSS
Pace	871579	6-Jun-06	water	IRA-06-C/D2S-S.W.-18-905	5-May-06	871639-003	TSS
Pace	871579	6-Jun-06	water	IRA-06-C/D2S-S.W.-19-902	5-May-06	871639-004	TSS
Pace	871579	6-Jun-06	field blank	IRA-06-C/D2S-S.W.-20-905-RINSE	5-May-06	871639-005	TSS
Pace	871642	6-Jun-06	water	IRA-06-DEWT-EF-06	8-May-06	871642-001	PCBs, TSS, BOD, NH3
Pace	871642	6-Jun-06	water	IRA-06-DEWT-EF-07	9-May-06	871671-001	PCBs, TSS, BOD, NH3
Pace	871642	6-Jun-06	water	IRA-06-DEWT-EF-08	10-May-06	871759-001	PCBs, TSS, BOD, NH3
Pace	871642	6-Jun-06	water	IRA-06-C/D2S-S.W.-21-912	8-May-06	871717-001	TSS
Pace	871642	6-Jun-06	water	IRA-06-C/D2S-S.W.-22-905	8-May-06	871717-002	TSS
Pace	871642	6-Jun-06	water	IRA-06-POG3-S.W.-23-902	8-May-06	871717-003	TSS
Pace	871820	6-Jun-06	water	IRA-06-DEWT-EF-09	11-May-06	871820-001	PCBs, TSS, BOD, NH3
Pace	871820	6-Jun-06	water	IRA-06-DEWT-EF-10	12-May-06	871891-001	PCBs, TSS, BOD, NH3
Pace	871820	6-Jun-06	water	IRA-06-DEWT-EF-11	13-May-06	871922-001	PCBs, TSS, BOD, NH3
Pace	871820	6-Jun-06	water field duplicate	IRA-06-DEWT-EF-11-DUP	13-May-06	871922-001	PCBs, TSS, BOD, NH3
Pace	871820	6-Jun-06	water	IRA-06-C/D2S-S.W.-24-912	10-May-06	871852-001	TSS
Pace	871820	6-Jun-06	water	IRA-06-C/D2S-S.W.-25-905	10-May-06	871852-002	TSS
Pace	871820	6-Jun-06	water	IRA-06-POG3-S.W.-26-902	10-May-06	871852-003	TSS
Pace	871963	6-Jun-06	water	IRA-06-DEWT-EF-12	14-May-06	871965-001	PCBs, TSS, BOD, NH3
Pace	871963	6-Jun-06	water	IRA-06-DEWT-EF-13	15-May-06	871964-001	PCBs, TSS, BOD, NH3
Pace	871963	6-Jun-06	water	IRA-06-DEWT-EF-14	16-May-06	872007-001	PCBs, TSS, BOD, NH3
Pace	871963	6-Jun-06	water	IRA-06-DEWT-EF-15	17-May-06	872041-001	PCBs, TSS, BOD, NH3
Pace	871963	6-Jun-06	water	IRA-06-C/D2S-S.W.-27-912	15-May-06	871963-001	TSS
Pace	871963	6-Jun-06	water	IRA-06-C/D2S-S.W.-28-905	15-May-06	871963-002	TSS
Pace	871963	6-Jun-06	water	IRA-06-POG3-S.W.-29-902	15-May-06	871963-003	TSS
Pace	871963	6-Jun-06	water	IRA-06-C/D2S-S.W.-33-912	17-May-06	872041-001	TSS
Pace	871963	6-Jun-06	field blank	IRA-06-C/D2S-S.W.-30-912-RINSE	17-May-06	872041-002	TSS
Pace	871963	6-Jun-06	water	IRA-06-C/D2S-S.W.-31-905	17-May-06	872041-003	TSS
Pace	871963	6-Jun-06	water	IRA-06-POG3-S.W.32-902	17-May-06	872041-004	TSS
Pace	871963	6-Jun-06	water field duplicate	IRA-06-POG3-S.W.32-902-DUP	17-May-06	872041-005	TSS

MAKuehl Co.

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TECHNICAL MEMORANDUM

DATE: August 10, 2006

TO: Janis Kesy
Project Manager
Foth & Van Dyke

FROM: Marcia A. Kuehl
President/Owner
MAKuehl Company

SUBJECT: Data Validation for Lower Fox River OU 1 2005 Remedial Action Sampling Events of May - July, 2006
Foth & Van Dyke Project # : 04G007

1.0 OVERVIEW

Analytical results for samples listed in Table 1 and their associated laboratory QC samples collected from the Lower Fox River OU 1 have been evaluated using the EPA guidance documents "National Functional Guidelines for Organic Data Review", dated October 1999, EPA-540/R-99/008, and the "National Functional Guidelines for Inorganic Data Review", dated July, 2002, EPA-540/R-01-008.

The specific calibration and laboratory QC check requirements contained in the "Lower Fox River Operable Unit 1 Remedial Action-2004 Remedial Action Work Plan" dated May, 2004 (RAWP) were the primary criteria used in the assessment of the data for compliance with the project data quality objectives. The review was based on the data packages supplied by the analytical laboratory, Pace, located in Kimberly, Wisconsin.

Aroclor 1254 in POG3-PS10P (0-4), Aroclor 1260 in POG3-PS-6AB(0-4) amd total PCBs in POG3-PS-6AB(0-4) and POG3-PS10P (0-4) as estimated with a J code indicating greater imprecision than the DQO. Aroclor 1242 in OOOC-PS-29P(0-4) (35 %) and POG3PS4P was estimated from greater than expected field matrix and analytical variability. Aroclor 1260 and 1268 results quantified against the single point calibration standard in OD2S-PS-5P (4-8) and OO2S-PS-5ACD (4-8) and the undetected Aroclor 1268 in OD2SPS1BC and OD2SPS5A were qualified as estimated with a J code from a less than multiple point calibration curve.

All BOD, ammonia and TSS data was usable as reported without qualification.

Mercury in sample DEWT-EF-LLHG-05 was undetected as the concentration was less than 5 X the associated field and lab blanks.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

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All qualifiers assigned during the data validation process are discussed in detail below. The validated data sheets are attached, and the checklist used during the validation are in Appendix A.

2.0 PCB AS AROCLORS DATA

Pace utilized the EPA SW846 reference methods 3510C and 8082 as specified in their Standard Operating Procedure SVO-52, Revision No. 3 dated January, 2000 for water samples and EPA SW846 reference methods 35141 and 8082, automated soxhlet extraction on the air dried sample, acid clean-up and sulfur clean-up using copper for solid samples as specified in their Standard Operating Procedure K-SVO-77, Revision No. 3 dated June 24, 2004. No significant deviations from these SOPs were apparent from the documentation reviewed. No action was needed to qualify sample data.

2.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for PCB analysis did not require any follow-up with Pace to enable data validation.

2.2 Compliance Assessment

2.2.1 Holding Times/Preservation

All samples for PCBs were received on ice. No notation of receipt temperature in exceedance of 2-6°C and no intact ice was noted for any samples analyzed for PCBs. None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

Water samples were extracted within 7 days after collection. After extraction all samples were analyzed within 14 days. No action was needed to qualify sample data.

2.2.2 Initial Calibration (ICAL)

Five point initial calibration curves ranging from 0.1-1.0 ug/ml for Aroclor 1016/1260, 1242 and 1254 were analyzed on both columns, RTX-CLP (primary quantitation column) and RTX-CLP2 (confirmation column) on 4/10/06, 5/17/06, 6/8/06, 6/15/06 and 7/11/06. The rsd values measured for each peak were less than the 20 % data validation criteria. No action was taken to qualify sample data based on initial calibration results.

Aroclor 1268 was reported detected in two samples: OD2S-PS-5P (4-8) and OO2S-PS-5ACD (4-8). Aroclor 1268 was quantified based on a one point calibration standard at 0.5 ug/mL analyzed with the samples. Pace qualified the Aroclor 1268 results quantified against the single point standard of Aroclor 1268 with an "X" qualifier. These samples contained both Aroclor 1260 and 1268. Aroclor 1260 was quantified against peaks in the Aroclor 1268 standard that are indicative of Aroclor 1260. Pace qualified the Aroclor 1260 and Aroclor 1268 results quantified against Aroclor 1268 with an "X" qualifier. Aroclor 1260 and 1268 results quantified against the single point calibration standard in OD2S-PS-5P (4-8) and OO2S-PS-5ACD (4-8) and the undetected Aroclor 1268 in OD2SPS1BC

and OD2SPS5A were qualified as estimated with a J code from this less than multiple point calibration curve.

2.2.3 Calibration Verification (CCAL)

The required method frequency of calibration verification was every 10 samples and at the end of the instrument run was met for every SDG. In all of the SDGs reviewed in Table 1, the CCALs consisted of a 0.3 ug/ml solution of Aroclor 1242 alternating with a 0.3 ug/ml solution of Aroclor 1254. The mean percent difference between the CCAL and ICAL calibration factors for the 5-10 peaks used for identification and quantitation were all less than the 15 % data validation criteria on the primary quantitation column. No action was needed to qualify sample data.

2.2.4 Laboratory Blanks

At least one laboratory blank was prepared and extracted with every 20 project samples or less analyzed. No laboratory blanks contained detectable Aroclors above the Limit of Detection (LOD).

2.2.5 Surrogate Recoveries

Decachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) recoveries in all project water samples were all within the Pace limits of 7 - 113 % (DCB) and 49 - 112 % (TCX). No action was needed to qualify sample data.

Decachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) recoveries in some sediment samples were was not useful (i.e. 0 %) , as these samples required dilution. Dilution factors greater than ten result in the surrogate concentration being too low to be detected. No action was taken to qualify sample data in samples with dilution factors greater than or equal to ten.

For sediment samples with dilution factors of less than ten, surrogate recoveries were within the data validation limits of 60 -140 %, except for decachlorobiphenyl recoveries in OD2SPS18BC (49 %), POG3-PS2A(54 %), OD2SPS5A (57 %), POG3-PS10P (48 %), OD2S-PS-7ABC(0-4) (54 %),OOOC-PS-23A-D(0-4) DUP (50 %), OOOC-PS32P (0-4) (58 %), OD2S-PS8-ABC(0-4) (48 %), OOOC-PS-33P (59%), POG3-PS3P (57 %), POG3-PS3A (56 %), POG3-PS12AD(0-4) (48 %), POG3-PS-13A (0-4) (50 %) and TCX recovery in OOOC-PS-31P(0-4) (54 %). Pace qualified these recoveries with a "F" qualifier. In accordance with EPA National Functional Guidelines for Organic Data Validation PEST Section VI. E 1(a), no action was taken was to qualify detected and undetected Aroclor results in these samples, as no recoveries were less than 30 %.

Both surrogates were low in sample OOOC-PS-31A-D(0-4) at 56 % and 48 %. This sample was re-extracted with similar low out of limit surrogate recoveries. . In accordance with EPA National Functional Guidelines for Organic Data Validation PEST Section VI. E 1(a), no action was taken was to qualify detected and undetected Aroclor results in these samples, as no recoveries were less than 30 %.

2.2.6 Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD)

At least one Laboratory Control Sample (LCS)and Laboratory Control Sample Duplicate (LCSD) at 5 ug/L Aroclor 1242 was prepared and analyzed with each SDG, or 20 water samples. All recoveries measured in the LCS were within the Pace limits of 47 - 138 % and < 20 % RPD, except for 141 %

recovery in one LCS. Pace qualified associated sample results with a "&" qualifier.. No action was needed to qualify sample data, as all associated samples did not contain any detectable PCBs and no high bias was possible.

2.2.7 Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery

Aroclor 1242 recovery of a 2 ppm spike in project sediment samples were all within the 65 - 135 % recovery limits, except for STOCKPILE-03 MSD (138 %), POG3-PS4P MS (55 %) AND OOOCPS-29P MS (34 %). Pace qualified the associated sample results with an "N" qualifier. No further action was taken to qualify sample data, as the corresponding MS or MSD was within limit, and no consistent bias was present.

RPD values for the MS/MSD samples of OOOC-PS-29P(0-4) (35 %) and POG3PS4P (0-4) (41 %) exceeded the lab limit of 30 %. Pace qualified the associated sample results with an "*" qualifier. Action taken was to qualify Aroclor 1242 in OOOC-PS-29P(0-4) (35 %) and POG3PS4P as estimated from greater than expected field matrix and analytical variability.

2.2.8 Detection Limit Attainment

The RAWP Reporting Limit of 1.0 ug/L was attained in all samples when accounting for the actual sample volume extracted. No action was needed to qualify sample data.

2.2.9 Verification of Reported Results

No detectable Aroclors were present in the project water samples analyzed. No discrepancies or false negatives were detected. QC sample results such as RPD, recovery and % difference were also recalculated, but at a 10 % frequency. No discrepancies that were not due to differences in lab instrument software and the validator's calculator significant figure/rounding protocols were found in QC sample results. All detected Aroclor values reported for QC sample results are from the primary column. The analysis on the secondary column was reviewed to assess if the Aroclor pattern(s) were confirmed, and all were.

All reported Aroclors in QC and the sediment samples were quantified on at least an 4 peak match. Peaks with obvious interferences were not included in the quantitation. The method retention time window criteria of ± 0.03 minutes for a minimum of a 4 peak match for Aroclor identification was met in all QC and sediment samples.

2.3 Field QC Results

No field equipment rinsates associated with the project samples in Table 1 were analyzed for PCBs. No action was needed to qualify sample data.

Three field duplicates and their corresponding native sample were present in the SDGs validated: POG3PS6AB(0-4), POG3PS10P(0-4) and POG3-PS-5P(0-4). RPD values for the field duplicates collected in Table 1 are listed in Table 2. The SAP data quality objective (DQO) of < 30 % RPD was not met for Aroclor 1254 in POG3-PS10P (0-4), Aroclor 1260 in POG3-PS-6AB(0-4) amd total PCBs in POG3-PS-6AB(0-4) and POG3-PS10P (0-4). Action taken was to qualify Aroclor 1254 in POG3-PS10P (0-4), Aroclor 1260 in POG3-PS-6AB(0-4) amd total PCBs in POG3-PS-6AB(0-4) and POG3-PS10P (0-4) as estimated with a J code indicating greater imprecision than the DQO.

.2.4 Data Usability

Aroclor 1254 in POG3-PS10P (0-4), Aroclor 1260 in POG3-PS-6AB(0-4) amd total PCBs in POG3-PS-6AB(0-4) and POG3-PS10P (0-4) as estimated with a J code indicating greater imprecision than the DQO. Aroclor 1242 in OOOC-PS-29P(0-4) (35 %) and POG3PS4P was estimated from greater than expected field matrix and analytical variability. Aroclor 1260 and 1268 results quantified against the single point calibration standard in OD2S-PS-5P (4-8) and OO2S-PS-5ACD (4-8) and the undetected Aroclor 1268 in OD2SPS1BC and OD2SPS5A were qualified as estimated with a J code from a less than multiple point calibration curve.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

3.0 AMMONIA, BOD and TSS DATA

Pace utilized EPA reference methods 160.2 and 350.1 as specified in their Standard Operating Procedure G2-WCM-01, Revision No. 2 dated January 1, 2003 and G2-WCM-58, Revision No. 0 dated January 16, 2004. No significant deviations from this SOP was apparent from the documentation reviewed. No action was needed to qualify sample data.

BOD analysis was not a requirement in the RAWP. Pace utilized Standard Methods 5210B for BOD analysis. No significant deviations from this reference method was apparent from the documentation reviewed. No action was needed to qualify sample data.

3.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for ammonia, BOD and TSS analysis did not require any follow-up with Pace. No action was needed to qualify sample data.

3.2 Compliance Assessment

3.2.1 Holding Time/Preservation

Documentation of adequate acid preservation for ammonia was present. All EPA recommended holding times for the methods cited above were met.

None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

3.2.2 Calibration

All ammonia initial instrument calibrations for ammonia were properly performed using at least five standards and met the correlation coefficient criteria of greater than 0.995. Continuing calibration checks were performed at least once every 10 samples and all checks met performance criteria of 90-110%.

3.2.3 Laboratory Blanks

Laboratory blanks did not contain any TSS, BOD or ammonia above the Limit of Detection (LOD). No action was needed to qualify sample data.

3.2.4 Reference Standards/Lab Control Standards (LCS/LCSD)

Recovery of reference (EPA/ERA/APG) standards were all within Pace and RAWP accuracy limits. No action was needed to qualify sample data.

3.2.5 Laboratory Duplicate Sample Analysis

All laboratory duplicate and LCS/LCSD RPD results were within the Pace and RAWP precision limits. No action was needed to qualify sample data.

3.2.6 Matrix Spike Samples

All matrix spike sample recoveries were within the Pace and RAWP accuracy limits of 90 - 110 %. No action was needed to qualify sample data.

3.3 Field QC Results

One field equipment rinsate was collected with the project samples in Table 1 for TSS. No detectable TSS was present and no action was neded to qualify sample data.

A field duplicate for TSS for was collected for POG3-SW-56-902. TSS was detected at 8.3 and 8.0 mg/L (RPD 4 %). The RPD value was within the RAWP precision limit of 5 %. No action was needed to qualify sample data.

3.4 Data Usability

All BOD, ammonia and TSS data was usable as reported without qualification.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

4.0 MERCURY DATA

Pace utilized EPA method 1631E. No significant deviations from the EPA reference method was apparent from the documentation reviewed. No action was needed to qualify sample data.

4.1 Completeness Assessment

The data packages received for mercury analysis were complete. All samples submitted were digested and analyzed. No action was needed to qualify sample data.

4.2 Compliance Assessment

4.2.1 Holding Time/Preservation

All samples were analyzed within the 28 day holding time. No notation of storage or shipping temperature in exceedance of 4 ± 2°C was noted. No action was needed to qualify mercury sample data based on exceedance of holding time or preservation requirements.

4.2.2 Calibration

The initial instrument calibrations were five points ranging from 0.05 - 4 ng/L and correlation coefficients were all ≥ 0.995. Continuing calibration checks were performed at least once every 10 samples and were within Pace's 80-120% limits. No action was needed to qualify sample data.

4.2.3 Laboratory Blanks

Mercury in all bottle blanks and method blanks were not below the Pace LOD of 0.169 ng/L. Method blanks analyzed with DEWT-EF-LLHG-05 contained 0.314 ng/L, 0.2295 ng/L and 0.2849 mg/L. Action was needed to qualify mercury in sample DEWT-EF-LLHG-05 as undetected with a "U" code as the concentration was less than 5 X the associated method blank(s). A method blankanalyzed with DEWT-EF-LLHG-03 contained 0.2102 ng/L. No action was needed to qualify mercury in sample DEWT-EF-LLHG-03 as the concentration was greater than 5 X the associated method blank(s).

4.2.4 Ongoing Precision and Recovery (OPR) Standard

An OPR was prepared with each set of samples at 5 ng/L. Recoveries were all within Pace's limits of 79 - 121 %. No action was needed to qualify sample data.

4.2.5 Matrix Spike/Matrix Spike Duplicate

MS/MSD recoveries and RPD were all within Pace's limits of 75 - 125 % and < 24 % RPD. No action was needed to qualify sample data.

4.3 Field QC Results

Field blanks were collected with each project sample. Mercury was detected at 0.273 ng/L in the field blank collected with DEWT-EF-LLHG-05 and 0.230 ng/L in the field blank collected with DEWT-EF-LLHG03.Action was needed to qualify mercury in sample DEWT-EF-LLHG-05 as undetected with a "U" code as the concentration was less than 5 X the associated field blank.

No field duplicate was collected for the samples collected for mercury listed in Table 1. No action was needed to qualify sample data.

4.4 Data Usability

Mercury in sample DEWT-EF-LLHG-05 was undetected as the concentration was less than 5 X the associated field and lab blanks.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

If you have any questions regarding the qualification of data or the data validation process/criteria used, please contact me at (920) 469-9113.

Attachments:

Table 1, 2
Validated hard copy Data Sheets
Appendix A: Data Validation Checklist

Table 1 Data Validated - Lower Fox River Foth Van Dyke

LAB(S)	SDG#	Date Rec'd by Kuehl	Matrix	Field Sample ID	Field Collection Date	Lab sample ID	Analytes
Pace	872073	17-Jul-06	water	IRA-06-DEWT-EF-LLHg-03	19-May-06	872150-002	low level mercury
Pace	872073	17-Jul-06	field blank	IRA-06-DEWT-EF-LLHg-03FB	19-May-06	872150-003	low level mercury
Pace	872073	17-Jul-06	water	IRA-06-DEWT-EF-16	18-May-06	872073-001	PCBs, TSS, BOD, NH3
Pace	872073	17-Jul-06	water	IRA-06-DEWT-EF-17	19-May-06	872150-001	PCBs, TSS, BOD, NH3
Pace	872073	17-Jul-06	water	IRA-06-C/D2S-SW-34-912	19-May-06	872172-001	TSS
Pace	872073	17-Jul-06	water	IRA-06-C/D2S-SW-35-905	19-May-06	872172-002	TSS
Pace	872073	17-Jul-06	water	IRA-06-C/D2S-SW-36-902	19-May-06	872172-003	TSS
Pace	872481	17-Jul-06	water	IRA-06-DEWT-EF-LLHg-05	1-Jun-06	872481-001	low level mercury
Pace	872481	17-Jul-06	field blank	IRA-06-DEWT-EF-LLHg-05FB	1-Jun-06	872481-002	low level mercury
Pace	872592	17-Jul-06	water	IRA-06-C/D2S-SW-50-912	6-Jun-06	872592-001	TSS
Pace	872592	17-Jul-06	water	IRA-06-C/D2S-SW-51-905	6-Jun-06	872592-002	TSS
Pace	872592	17-Jul-06	water	IRA-06-C/D2S-SW-52-902	6-Jun-06	872592-003	TSS
Pace	872592	17-Jul-06	water	IRA-06-C/D2S-SW-53-912	5-May-06	872592-007	TSS
Pace	872592	17-Jul-06	field blank	IRA-06-C/D2S-SW-53-912-RINSE	5-May-06	872592-008	TSS
Pace	872592	17-Jul-06	water	IRA-06-C/D2S-SW-55-905	5-May-06	872592-009	TSS
Pace	872592	17-Jul-06	water	IRA-06-C/D2S-SW-56-902	5-May-06	872592-010	TSS
Pace	872592	17-Jul-06	field duplicate	IRA-06-C/D2S-SW-56-902-DUP	5-May-06	872592-011	TSS
Pace	872592	17-Jul-06	water	IRA-06-DEWT-EF-27	6-Jun-06	872638-001	PCBs, TSS, BOD, NH3
Pace	872592	17-Jul-06	water	IRA-06-DEWT-EF-28	7-Jun-06	872686-001	PCBs, TSS, BOD, NH3
Pace	872592	17-Jul-06	water	IRA-06-GAC T-1V2	5-Jun-06	872592-004	PCBs
Pace	872592	17-Jul-06	water	IRA-06-GAC T-2V4	5-Jun-06	872592-005	PCBs
Pace	872592	17-Jul-06	water	IRA-06-GAC T-3V5	5-Jun-06	872592-006	PCBs
Pace	872218B	17-Jul-06	sediment	IRA-06-STOCKPILE-01	22-May-06	872218-002	PCBs
Pace	872218B	17-Jul-06	solid	IRA-06-MEDIA-01	22-May-06	872218-003	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-DEWT-SLURRY-04	5-Jun-06	872599-001	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-DEWT-SLURRY-05	5-Jun-06	872599-002	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-DEWT-SLURRY-06	5-Jun-06	872599-003	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-POG3PS1AB(0-4)	2-Jun-06	872600-001	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-0D2SPS1BC(0-4)	2-Jun-06	872600-002	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-POG3PS2AB(0-4)	2-Jun-06	872600-003	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-POG3PS6P(0-4)	1-Jun-06	872600-004	PCBs
Pace	872599	17-Jul-06	field duplicate	IRA-06-POG3PS6AB(0-4)(DUP)	2-Jun-06	872600-005	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-0D2SPS5A-D(0-4)	2-Jun-06	872600-006	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-POG3PS2P(0-4)	1-Jun-06	872600-007	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-POG3PS6AB(0-4)	2-Jun-06	872600-008	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-POG3PS10P(0-4)	1-Jun-06	872600-009	PCBs
Pace	872599	17-Jul-06	field duplicate	IRA-06-POG3PS10P(0-4)(DUP)	1-Jun-06	872600-010	PCBs
Pace	872599	17-Jul-06	sediment	IRA-06-POG3PS1P(0-4)	1-Jun-06	872600-011	PCBs
Pace	872684	17-Jul-06	sediment	IRA-06-POG3PS3P(0-4)	5-Jun-06	872684-001	PCBs
Pace	872684	17-Jul-06	sediment	IRA-06-POG3PS4P(0-4)	5-Jun-06	872684-002	PCBs
Pace	872684	17-Jul-06	sediment	IRA-06-POG3PS12P(0-4)	5-Jun-06	872684-003	PCBs
Pace	872684	17-Jul-06	sediment	IRA-06-POG3PS3A(0-4)	5-Jun-06	872684-004	PCBs
Pace	872684	17-Jul-06	sediment	IRA-06-POG3PS4A(0-4)	5-Jun-06	872684-005	PCBs
Pace	872888	17-Jul-06	sediment	IRA-06-OOOC-PS-32P(0-4)	9-Jun-06	872888-001	PCBs
Pace	872888	17-Jul-06	sediment	IRA-06-OOOC-PS-29P(0-4)	9-Jun-06	872888-002	PCBs
Pace	872888	17-Jul-06	sediment	IRA-06-0D2S-PS-8ABC(0-4)	12-Jun-06	872888-003	PCBs
Pace	872888	17-Jul-06	sediment	IRA-06-OOOC-PS-33P(0-4)	9-Jun-06	872888-004	PCBs
Pace	872888	17-Jul-06	sediment	IRA-06-OOOC-PS-28P(0-4)	9-Jun-06	872888-006	PCBs
Pace	872888	17-Jul-06	sediment	IRA-06-OOOC-PS-28A-D(0-4)	12-Jun-06	872888-007	PCBs
Pace	873104	17-Jul-06	sediment	IRA-06-OOOC-PS-23A-D(0-4)(DUP)RE	9-Jun-06	872823-009	PCBs
Pace	873104	17-Jul-06	sediment	IRA-06-OOOC-PS-31P(0-4)	9-Jun-06	872888-005	PCBs
Pace	873104	17-Jul-06	sediment	IRA-06-0D2S-PS-7ABC(0-4)	12-Jun-06	872888-008	PCBs
Pace	873104	17-Jul-06	sediment	IRA-06-OOOC-PS-24A(0-4)	12-Jun-06	872888-009	PCBs
Pace	873104	17-Jul-06	sediment	IRA-06-OOOC-PS-31A(0-4)	13-Jun-06	872966-018	PCBs
Pace	873104	17-Jul-06	sediment	IRA-06-DEWT-SLURRY-10	19-Jun-06	873104-001	PCBs
Pace	873104	17-Jul-06	sediment	IRA-06-DEWT-SLURRY-11	19-Jun-06	873104-002	PCBs
Pace	873104	17-Jul-06	sediment	IRA-06-DEWT-SLURRY-12	19-Jun-06	873104-003	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-POG3-PS-5AB(0-4)	21-Jun-06	873228-001	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-POG3-PS-7A(0-4)	21-Jun-06	873228-002	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-POG3-PS-5P(0-4)	20-Jun-06	873228-003	PCBs
Pace	873228	4-Aug-06	sediment field duplicate	IRA-06-POG3-PS-5P(0-4) DUP	20-Jun-06	873228-004	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-POG3-PS-8D(0-4)	1-Jun-06	873228-005	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-POG3-PS-7P(0-4)	20-Jun-06	873228-006	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-POG3-PS-14P(0-4)	20-Jun-06	873228-007	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-0D2S-PS-5P(4-8)	23-May-06	873228-008	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-POG3-PS-6B(4-8)	24-May-06	873228-009	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-0D2S-PS-5ACD(4-8)	21-Jun-06	873228-010	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-POG3-PS-10P(4-8)	1-Jun-06	873228-011	PCBs
Pace	873228	4-Aug-06	sediment	IRA-06-0D2S-PS-8P(4-8)	25-May-06	873228-012	PCBs
Pace	873360	4-Aug-06	sediment	IRA-06-STOCKPILE-03	23-Jun-06	873310-001	PCBs
Pace	873360	4-Aug-06	sediment	IRA-06-DEWT-SLURRY-13	26-Jun-06	873360-001	PCBs
Pace	873360	4-Aug-06	sediment	IRA-06-DEWT-SLURRY-14	26-Jun-06	873360-002	PCBs
Pace	873360	4-Aug-06	sediment	IRA-06-DEWT-SLURRY-15	26-Jun-06	873360-003	PCBs
Pace	873660	4-Aug-06	sediment field duplicate	IRA-06-POG3-PS-12A-D(0-4) DUP	5-Jul-06	873660-002	PCBs
Pace	873660	4-Aug-06	sediment	IRA-06-POG3-PS-22ABC(0-4)22D(0-3.5)	5-Jul-06	873660-003	PCBs
Pace	873660	4-Aug-06	sediment	IRA-06-POG3-PS-11BCD(0-4)	5-Jul-06	873660-004	PCBs
Pace	873660	4-Aug-06	sediment	IRA-06-POG3-PS-20PB(0-3.5)	29-Jun-06	873660-005	PCBs
Pace	873660	4-Aug-06	sediment	IRA-06-POG3-PS-13A-D(0-4)	5-Jul-06	873660-006	PCBs
Pace	873660	4-Aug-06	sediment	IRA-06-POG3-PS-9AB(0-4)	5-Jul-06	873660-007	PCBs

04G007
10515

MAKuehl Co.

Data Validation

Lab/Field Audits

QA Plans

TECHNICAL MEMORANDUM

DATE: August 30, 2006

TO: Janis Kesy
Project Manager
Foth & Van Dyke

FROM: Marcia A. Kuehl
President/Owner
MAKuehl Company

SUBJECT: Data Validation for Lower Fox River OU 1 2005 Remedial Action Sampling Events of June-August, 2006
Foth & Van Dyke Project # : 04G007

1.0 OVERVIEW

Analytical results for samples listed in Table 1 and their associated laboratory QC samples collected from the Lower Fox River OU 1 have been evaluated using the EPA guidance documents "National Functional Guidelines for Organic Data Review", dated October 1999, EPA-540/R-99/008, and the "National Functional Guidelines for Inorganic Data Review", dated July, 2002, EPA-540/R-01-008.

The specific calibration and laboratory QC check requirements contained in the "Lower Fox River Operable Unit 1 Remedial Action-2004 Remedial Action Work Plan" dated May, 2004 (RAWP) were the primary criteria used in the assessment of the data for compliance with the project data quality objectives. The review was based on the data packages supplied by the analytical laboratory, Pace, located in Kimberly, Wisconsin.

Aroclor 1260 and 1268 results quantified against the single point calibration standard in POG3-PS97A(4-8) and POG3-PS-94P(4-8) were qualified as estimated from less than a multiple point calibration curve. Aroclor 1242, 1254, 1260 and total PCBs in POG3-PS-50P(0-4) and POG3-PS-50P(0-4) DUP was estimated from greater imprecision than the DQO.

Mercury in all samples except PREK-LLHg-19 and PREK-LLHg-23 was undetected as the concentration was less than 5 X the associated method blank(s). Mercury in samples DEWT-EF-LLHg-20, PREGAC-LLHg-17 and POSTK-LLHg-18 was undetected as the concentration was less than 5 X the associated field blank.

All BOD, ammonia and TSS data was usable as reported without qualification.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

All qualifiers assigned during the data validation process are discussed in detail below. The

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validated data sheets are attached, and the checklist used during the validation are in Appendix A.

2.0 PCB AS AROCLORS DATA

Pace utilized the EPA SW846 reference methods 3510C and 8082 as specified in their Standard Operating Procedure SVO-52, Revision No. 3 dated January, 2000 for water samples and EPA SW846 reference methods 35141 and 8082, automated soxhlet extraction on the air dried sample, acid clean-up and sulfur clean-up using copper for solid samples as specified in their Standard Operating Procedure K-SVO-77, Revision No. 3 dated June 24, 2004. No significant deviations from these SOPs were apparent from the documentation reviewed. No action was needed to qualify sample data.

2.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for PCB analysis did not require any follow-up with Pace to enable data validation.

The original signed chain of custody form was not sent with the sediment samples for SDG 874708, but was received later. This chain of custody documentation gap did not result in the sample data being qualified.

2.2 Compliance Assessment

2.2.1 Holding Times/Preservation

All samples for PCBs were received on ice. No notation of receipt temperature in exceedance of 2-6°C and no intact ice was noted for any samples analyzed for PCBs. None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

Water samples were extracted within 7 days after collection. After extraction all samples were analyzed within 14 days. No action was needed to qualify sample data.

2.2.2 Initial Calibration (ICAL)

Five point initial calibration curves ranging from 0.1-1.0 ug/ml for Aroclor 1016/1260, 1242 and 1254 were analyzed on both columns, RTX-CLP (primary quantitation column) and RTX-CLP2 (confirmation column) on 6/15/06 and 8/8/06. The rsd values measured for each peak were less than the 20 % data validation criteria. No action was taken to qualify sample data based on initial calibration results.

Aroclor 1268 was reported detected in two samples: POG3-PS97A(4-8) and POG3-PS-94P(4-8). Aroclor 1268 was quantified based on a one point calibration standard at 0.5 ug/mL analyzed with the samples. Pace qualified the Aroclor 1268 results quantified against the single point standard of Aroclor 1268 with an "X" qualifier. These samples contained both Aroclor 1260 and 1268. Aroclor 1260 was quantified against peaks in the Aroclor 1268 standard that are indicative of Aroclor 1260.

Pace qualified the Aroclor 1260 and Aroclor 1268 results quantified against Aroclor 1268 with an "X" qualifier. Aroclor 1260 and 1268 results quantified against the single point calibration standard in POG3-PS97A(4-8) and POG3-PS-94P(4-8) were qualified as estimated with a J code from this less than multiple point calibration curve.

2.2.3 Calibration Verification (CCAL)

The required method frequency of calibration verification was every 10 samples and at the end of the instrument run was met for every SDG. In all of the SDGs reviewed in Table 1, the CCALs consisted of a 0.3 ug/ml solution of Aroclor 1242 alternating with a 0.3 ug/ml solution of Aroclor 1254. The mean percent difference between the CCAL and ICAL calibration factors for the 5-10 peaks used for identification and quantitation were all less than the 15 % data validation criteria on the primary quantitation column. No action was needed to qualify sample data.

2.2.4 Laboratory Blanks

At least one laboratory blank was prepared and extracted with every 20 project samples or less analyzed. No laboratory blanks contained detectable Aroclors above the Limit of Detection (LOD).

2.2.5 Surrogate Recoveries

Decachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) recoveries in all project water samples were all within the Pace limits of 7 - 113 % (DCB) and 49 - 112 % (TCX). No action was needed to qualify sample data.

Decachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) recoveries in some sediment samples were was not useful (i.e. 0 %) , as these samples required dilution. Dilution factors greater than ten result in the surrogate concentration being too low to be detected. No action was taken to qualify sample data in samples with dilution factors greater than or equal to ten.

For sediment samples with dilution factors of less than ten, surrogate recoveries were within the data validation limits of 60 -140 %, except for decachlorobiphenyl recoveries in POG3-PS-97A(4-8) (56 %) and POG3-PS-7C(4-8)(59 %). Pace qualified these recoveries with a "F" qualifier. In accordance with EPA National Functional Guidelines for Organic Data Validation PEST Section VI. E 1(a), no action was taken was to qualify detected and undetected Aroclor results in these samples, as no recoveries were less than 30 %.

2.2.6 Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD)

At least one Laboratory Control Sample (LCS)and Laboratory Control Sample Duplicate (LCSD) at 5 ug/L Aroclor 1242 was prepared and analyzed with each SDG, or 20 water samples. All recoveries measured in the LCS were within the Pace limits of 47 - 138 % and < 20 % RPD. No action was needed to qualify sample data.

At least one Laboratory Control Sample (LCS)and Laboratory Control Sample Duplicate (LCSD) at 500 ug/kg Aroclor 1242 was prepared and analyzed with each SDG, or 20 sediment samples. All recoveries measured in the LCS were within the RAWP 65 - 135 % and < 20 % RPD. No action was needed to qualify sample data based on LCS recoveries.

2.2.7 Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery

Aroclor 1242 recovery of a 2 ppm spike in project sediment samples were all within the 65 - 135 % recovery limits and RPD 30 % limit. No action was needed to qualify sample data.

2.2.8 Detection Limit Attainment

The RAWP Reporting Limit s of 1.0 ug/L and 50 ug/kg were attained in all samples when accounting for the actual sample volume extracted or the percent solids of the sample. No action was needed to qualify sample data.

2.2.9 Verification of Reported Results

No detectable Aroclors were present in the project water samples analyzed. No discrepancies or false negatives were detected. QC sample results such as RPD, recovery and % difference were also recalculated, but at a 10 % frequency. No discrepancies that were not due to differences in lab instrument software and the validator's calculator significant figure/rounding protocols were found in QC sample results. All detected Aroclor values reported for QC sample results are from the primary column. The analysis on the secondary column was reviewed to assess if the Aroclor pattern(s) were confirmed, and all were.

All reported Aroclors in QC and the sediment samples were quantified on at least an 4 peak match, except for Aroclor 1242 in POG#-PS49P(0-4) and POG3-PS48ACD(0-4)48B(0-3.5) which was quantified on a 3 peak match due to interferences. Peaks with obvious interferences were not included in the quantitation. The method retention time window criteria of ± 0.03 minutes for a minimum of a 4 peak match for Aroclor identification was met in all QC samples.

2.3 Field QC Results

No field equipment rinsates associated with the project samples in Table 1 were analyzed for PCBs. No action was needed to qualify sample data.

One field duplicate was present in the SDGs validated POG3-PS-50P(0-4). RPD values calculated were 37 % (Aroclor 1242), 156 % (Aroclor 1254), 160 % (Aroclor 1260) and 104 % (total PCBs). The SAP data quality objective (DQO) of < 30 % RPD was not met for all reported Aroclors. Action taken was to qualify Aroclor 1242, 1254, 1260 and total PCBs in POG3-PS-50P(0-4) and POG3-PS-50P(0-4) DUP as estimated with a J code indicating greater imprecision than the DQO.

.2.4 Data Usability

Aroclor 1260 and 1268 results quantified against the single point calibration standard in POG3-PS97A(4-8) and POG3-PS-94P(4-8) were qualified as estimated from less than a multiple point calibration curve. Aroclor 1242, 1254, 1260 and total PCBs in POG3-PS-50P(0-4) and POG3-PS-50P(0-4) DUP was estimated from greater imprecision than the DQO.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region

of quantitation associated with less precision.

3.0 AMMONIA, BOD and TSS DATA

Pace utilized EPA reference methods 160.2 and 350.1 as specified in their Standard Operating Procedure G2-WCM-01, Revision No. 2 dated January 1, 2003 and G2-WCM-58, Revision No. 0 dated January 16, 2004. No significant deviations from this SOP was apparent from the documentation reviewed. No action was needed to qualify sample data.

BOD analysis was not a requirement in the RAWP. Pace utilized Standard Methods 5210B for BOD analysis. No significant deviations from this reference method was apparent from the documentation reviewed. No action was needed to qualify sample data.

3.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for ammonia, BOD and TSS analysis did not require any follow-up with Pace. No action was needed to qualify sample data.

3.2 Compliance Assessment

3.2.1 Holding Time/Preservation

Documentation of adequate acid preservation for ammonia was present. All EPA recommended holding times for the methods cited above were met.

None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

3.2.2 Calibration

All ammonia initial instrument calibrations for ammonia were properly performed using at least five standards and met the correlation coefficient criteria of greater than 0.995. Continuing calibration checks were performed at least once every 10 samples and all checks met performance criteria of 90-110%.

3.2.3 Laboratory Blanks

Laboratory blanks did not contain any TSS, BOD or ammonia above the Limit of Detection (LOD). No action was needed to qualify sample data.

3.2.4 Reference Standards/Lab Control Standards (LCS/LCSD)

Recovery of reference (EPA/ERA/APG) standards were all within Pace and RAWP accuracy limits. No action was needed to qualify sample data.

3.2.5 Laboratory Duplicate Sample Analysis

All laboratory duplicate and LCS/LCSD RPD results were within the Pace and RAWP precision limits. No action was needed to qualify sample data.

3.2.6 Matrix Spike Samples

All matrix spike sample recoveries were within the Pace and RAWP accuracy limits of 90 - 110 %. No action was needed to qualify sample data.

3.3 Field QC Results

No field equipment rinsate or field duplicate was collected with the project samples in Table 1 for TSS. No action was needed to qualify sample data.

3.4 Data Usability

All BOD, ammonia and TSS data was usable as reported without qualification.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

4.0 MERCURY DATA

Pace utilized EPA method 1631E. No significant deviations from the EPA reference method was apparent from the documentation reviewed. No action was needed to qualify sample data.

4.1 Completeness Assessment

The data packages received for mercury analysis were complete. All samples submitted were digested and analyzed. No action was needed to qualify sample data.

4.2 Compliance Assessment

4.2.1 Holding Time/Preservation

All samples were analyzed within the 28 day holding time. No notation of storage or shipping temperature in exceedance of 4 $\pm$ 2°C was noted. No action was needed to qualify mercury sample data based on exceedance of holding time or preservation requirements.

4.2.2 Calibration

The initial instrument calibrations were five points ranging from 0.05 - 4 ng/L and correlation coefficients were all $\geq$ 0.995. Continuing calibration checks were performed at least once every 10 samples and were within Pace's 80-120% limits. No action was needed to qualify sample data.

4.2.3 Laboratory Blanks

Mercury in bottle blanks and method blanks were not below the Pace LOD of 0.169 ng/L. Method blanks analyzed with the project samples contained 0.464 ng/L, 0.4792 ng/L, 0.3554 ng/L, 0.4502 ng/L and 0.2352 ng/L. Action was needed to qualify mercury in all samples except PREK-LLHg-19 and PREK-LLHg-23 as undetected with a "U" code as the concentration was less than 5 X the associated method blank(s).

4.2.4 Ongoing Precision and Recovery (OPR) Standard

An OPR was prepared with each set of samples at 5 ng/L. Recoveries were all within Pace's limits of 79 - 121 %. No action was needed to qualify sample data.

4.2.5 Matrix Spike/Matrix Spike Duplicate

MS/MSD recoveries and RPD were all within Pace's limits of 75 - 125 % and < 24 % RPD. No action was needed to qualify sample data.

4.3 Field QC Results

Field blanks were collected with each project sample. Mercury was detected at 0.286 ng/L in the field blank collected with DEWT-EF-LLHg-20, 0.864 ng/L in the field blank collected with PREGAC-LLHg-17 and 0.614 ng/L in the field blank collected with POSTK-LLHg-18. Action was needed to qualify mercury in samples DEWT-EF-LLHg-20, PREGAC-LLHg-17 and POSTK-LLHg-18 as undetected with a "U" code as the concentration was less than 5 X the associated field blank.

A field duplicate was collected for mercury for sample DEWT-PREGAC-LLHg-21. The detected mercury values of 2.03 and 2.09 ng/L resulted in an RPD value of 3 %. No action was needed to qualify sample data.

4.4 Data Usability

Mercury in al l samples except PREK-LLHg-19 and PREK-LLHg-23 was undetected as the concentration was less than 5 X the associated method blank(s). Mercury in samples DEWT-EF-LLHg-20, PREGAC-LLHg-17 and POSTK-LLHg-18 was undetected as the concentration was less than 5 X the associated field blank.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

If you have any questions regarding the qualification of data or the data validation process/criteria used, please contact me at (920) 469-9113.

Attachments:

Table 1
Validated hard copy Data Sheets
Appendix A: Data Validation Checklist

Table 1 Data Validated - Lower Fox River Foth Van Dyke

LAB(S)	SDG#	Date Rec'd by Kuehl	Matrix	Field Sample ID	Field Collection Date	Lab sample ID	Analytes
Pace	873345	8-Aug-06	water	IRA-06-DEWT-EF-LLHg-16	23-Jun-06	873359-001	TSS
Pace	873345	8-Aug-06	water	IRA-06-DEWT-PREGAC-LLHg-17	23-Jun-06	873359-002	TSS
Pace	873345	8-Aug-06	water	IRA-06-DEWT-POSTK-LLHg-18	23-Jun-06	873359-003	TSS
Pace	873345	8-Aug-06	water	IRA-06-DEWT-PREK-LLHg-19	23-Jun-06	873359-004	TSS
Pace	873345	8-Aug-06	water	IRA-06-POG3-SW-83-912	26-Jun-06	873400-001	TSS
Pace	873345	8-Aug-06	water	IRA-06-POG3-SW-84-905	26-Jun-06	873400-002	TSS
Pace	873345	8-Aug-06	water	IRA-06-POG3-SW-85-902	26-Jun-06	873400-003	TSS
Pace	873345	8-Aug-06	water	IRA-06-DEWT-EF-43	27-Jun-06	873401-001	BOD, NH3, TSS, PCBs
Pace	873345	8-Aug-06	water	IRA-06-DEWT-EF-LLHg-20	27-Jun-06	873403-001	TSS
Pace	873345	8-Aug-06	water	IRA-06-DEWT-PREGAC-LLHg-21	27-Jun-06	873403-002	TSS
Pace	873345	8-Aug-06	water	IRA-06-DEWT-POSTK-LLHg-22	27-Jun-06	873403-003	TSS
Pace	873345	8-Aug-06	water	IRA-06-DEWT-PREK-LLHg-23	27-Jun-06	873403-004	TSS
Pace	873345	8-Aug-06	water	IRA-06-DEWT-EF-LLHg-16	23-Jun-06	873345-001	low level mercury
Pace	873345	8-Aug-06	field blank	IRA-06-DEWT-EF-LLHg-16-FB	23-Jun-06	873345-002	low level mercury
Pace	873345	8-Aug-06	water	IRA-06-DEWT-PREGAC-LLHg-17	23-Jun-06	873345-003	low level mercury
Pace	873345	8-Aug-06	field blank	IRA-06-DEWT-PREGAC-LLHg-17-FB	23-Jun-06	873345-004	low level mercury
Pace	873345	8-Aug-06	water	IRA-06-DEWT-POSTK-LLHg-18	23-Jun-06	873345-005	low level mercury
Pace	873345	8-Aug-06	field blank	IRA-06-DEWT-POSTK-LLHg-18-FB	23-Jun-06	873345-006	low level mercury
Pace	873345	8-Aug-06	water	IRA-06-DEWT-PREK-LLHg-19	23-Jun-06	873345-007	low level mercury
Pace	873345	8-Aug-06	field blank	IRA-06-DEWT-PREK-LLHg-19-FB	23-Jun-06	873345-008	low level mercury
Pace	873345	8-Aug-06	water	IRA-06-DEWT-EF-LLHg-20	27-Jun-06	873399-001	low level mercury
Pace	873345	8-Aug-06	field blank	IRA-06-DEWT-EF-LLHg-20-FB	27-Jun-06	873399-002	low level mercury
Pace	873345	8-Aug-06	water	IRA-06-DEWT-PREGAC-LLHg-21	27-Jun-06	873399-003	low level mercury
Pace	873345	8-Aug-06	field blank	IRA-06-DEWT-PREGAC-LLHg-21-FB	27-Jun-06	873399-004	low level mercury
Pace	873345	8-Aug-06	water	IRA-06-DEWT-POSTK-LLHg-22-FB	27-Jun-06	873399-005	low level mercury
Pace	873345	8-Aug-06	field blank	IRA-06-DEWT-POSTK-LLHg-22	27-Jun-06	873399-006	low level mercury
Pace	873345	8-Aug-06	water	IRA-06-DEWT-PREK-LLHg-23	27-Jun-06	873399-007	low level mercury
Pace	873345	8-Aug-06	field blank	IRA-06-DEWT-PREK-LLHg-23-FB	27-Jun-06	873399-008	low level mercury
Pace	873345	8-Aug-06	field duplicate	IRA-06-DEWT-PREGAC-LLHg-21-DUP	27-Jun-06	873399-009	low level mercury
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-49A(0-3.5)49BC(0-4)	2-Aug-06	874708-001	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-49P(0-4)	1-Aug-06	874708-002	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-50A(0-3)	1-Aug-06	874708-003	PCBs
Pace	874708	23-Aug-06	field duplicate	IRA-06-POG3-PS-50P(0-4) DUP	1-Aug-06	874708-004	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-50P(0-4)	1-Aug-06	874708-005	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-48ACD(0-4)48B(0-3.5)	2-Aug-06	874708-006	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-94A(4-8)	14-Jul-06	874708-007	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-97P(4-8)	14-Jul-06	874708-008	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-17D(4-8)	29-Jun-06	874708-009	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-97A(4-8)	14-Jul-06	874708-010	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-90P(4-8)	14-Jul-06	874708-011	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-94P(4-8)	18-Jul-06	874708-012	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-7C(4-8)	1-Jun-06	874708-013	PCBs
Pace	874708	23-Aug-06	sediment	IRA-06-POG3-PS-16BD(4-8)	2-Aug-06	874708-015	PCBs

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MAKuehl Co.

Data Validation

Lab/Field Audits

QA Plans

TECHNICAL MEMORANDUM

DATE: October 28, 2006

TO: Janis Kesy
Project Manager
Foth & Van Dyke

FROM: Marcia A. Kuehl
President/Owner
MAKuehl Company

SUBJECT: Data Validation for Lower Fox River OU 1 2006 Remedial Action Sampling Events of August-September, 2006
Foth & Van Dyke Project # : 04G007

1.0 OVERVIEW

Analytical results for samples listed in Table 1 and their associated laboratory QC samples collected from the Lower Fox River OU 1 have been evaluated using the EPA guidance documents "National Functional Guidelines for Organic Data Review", dated October 1999, EPA-540/R-99/008, and the "National Functional Guidelines for Inorganic Data Review", dated July, 2002, EPA-540/R-01-008.

The specific calibration and laboratory QC check requirements contained in the "Lower Fox River Operable Unit 1 Remedial Action-2004 Remedial Action Work Plan" dated May, 2004 (RAWP) were the primary criteria used in the assessment of the data for compliance with the project data quality objectives. The review was based on the data packages supplied by the analytical laboratory, Pace, located in Kimberly, Wisconsin.

Aroclor 1260 and 1268 results quantified against the single point calibration standard in in POG4-PS-1P(0-4), POG4-PS-9P(0-4)DUP, POG4-PS-9AB(0-4) and POG4-PS-4A-D(0-4) were qualified as estimated from less than a multiple point calibration curve. Aroclor 1254, 1260 and total PCBs in POG3-PS-56A-D(0-4)/DUP and Aroclor 1260 and total PCBs in POG4-PS-9P(0-4)/DUP was estimated from greater field imprecision than the DQO.

All TSS, ammonia and BOD sample results were usable as reported.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

All qualifiers assigned during the data validation process are discussed in detail below. The validated data sheets are attached, and the checklist used during the validation are in Appendix A.

3470 Charlevoix Ct. Green Bay, Wisconsin 54311 Phone/Fax 920.469.9113 Email makuehl@aol.com

2.0 PCB AS AROCLORS DATA

Pace utilized the EPA SW846 reference methods 3510C and 8082 as specified in their Standard Operating Procedure SVO-52, Revision No. 3 dated January, 2000 for water samples and EPA SW846 reference methods 35141 and 8082, automated soxhlet extraction on the air dried sample, acid clean-up and sulfur clean-up using copper for solid samples as specified in their Standard Operating Procedure K-SVO-77, Revision No. 3 dated June 24, 2004. No significant deviations from these SOPs were apparent from the documentation reviewed. No action was needed to qualify sample data.

2.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for PCB analysis did not require any follow-up with Pace to enable data validation.

2.2 Compliance Assessment

2.2.1 Holding Times/Preservation

All samples for PCBs were received on ice. No notation of receipt temperature in exceedance of 2-6°C and no intact ice was noted for any samples analyzed for PCBs. None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

Water samples were extracted within 7 days after collection. After extraction all samples were analyzed within 14 days. No action was needed to qualify sample data.

2.2.2 Initial Calibration (ICAL)

Five point initial calibration curves ranging from 0.1-1.0 ug/ml for Aroclor 1016/1260, 1242 and 1254 were analyzed on both columns, RTX-CLP (primary quantitation column) and RTX-CLP2 (confirmation column) on 8/23-24/06, 9/15/06 and 9/25/06. The rsd values measured for each peak were less than the 20 % data validation criteria. No action was taken to qualify sample data based on initial calibration results.

Aroclor 1268 was reported detected in POG4-PS-1P(0-4), POG4-PS-9P(0-4)DUP, POG4-PS-9AB(0-4) and POG4-PS-4A-D(0-4). Aroclor 1268 was quantified based on a one point calibration standard at 0.5 ug/mL analyzed with the samples. Pace qualified the Aroclor 1268 results quantified against the single point standard of Aroclor 1268 with an "X" qualifier. This sample contained both Aroclor 1260 and 1268. Aroclor 1260 was quantified against peaks in the Aroclor 1268 standard that are indicative of Aroclor 1260. Pace qualified the Aroclor 1260 and Aroclor 1268 results quantified against Aroclor 1268 with an "X" qualifier. Aroclor 1260 and 1268 results quantified against the single point calibration standard in POG4-PS-1P(0-4), POG4-PS-9P(0-4)DUP, POG4-PS-9AB(0-4) and POG4-PS-4A-D(0-4) were qualified as estimated with a J code from this less than multiple point calibration curve.

2.2.3 Calibration Verification (CCAL)

The required method frequency of calibration verification was every 10 samples and at the end of the instrument run was met for every SDG. In all of the SDGs reviewed in Table 1, the CCALs consisted of a 0.3 ug/ml solution of Aroclor 1242 alternating with a 0.3 ug/ml solution of Aroclor 1254. The mean percent difference between the CCAL and ICAL calibration factors for the 5-10 peaks used for identification and quantitation were all less than the 15 % data validation criteria on the primary quantitation column. No action was needed to qualify sample data.

2.2.4 Laboratory Blanks

At least one laboratory blank was prepared and extracted with every 20 project samples or less analyzed. No laboratory blanks contained detectable Aroclors above the Limit of Detection (LOD).

2.2.5 Surrogate Recoveries

Decachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) recoveries in all project water samples were all within the Pace limits of 7 - 113 % (DCB) and 49 - 112 % (TCX). No action was needed to qualify sample data.

Decachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) recoveries in some sediment samples were was not useful (i.e. 0 %) , as these samples required dilution. Dilution factors greater than ten result in the surrogate concentration being too low to be detected. No action was taken to qualify sample data in samples with dilution factors greater than or equal to ten.

For sediment samples with dilution factors of less than ten, surrogate recoveries were within the data validation limits of 60 -140 %, except for decachlorobiphenyl recovery in POG4-PS-9P (0-4) (55 %), POG4-PS-9AB(0-4) (59 %), DEWT-SLURRY-47 (56 %) and DEWT-SLURRY-48 (51 %). Pace qualified these recoveries with a "F" qualifier. In accordance with EPA National Functional Guidelines for Organic Data Validation PEST Section VI. E 1(a), no action was taken was to qualify detected and undetected Aroclor results in this sample, as no recoveries were less than 30 %.

2.2.6 Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD)

At least one Laboratory Control Sample (LCS)and Laboratory Control Sample Duplicate (LCSD) at 5 ug/L Aroclor 1242 was prepared and analyzed with each SDG, or 20 water samples. All recoveries measured in the LCS were within the Pace limits of 47 - 138 % and < 20 % RPD. No action was needed to qualify sample data.

At least one Laboratory Control Sample (LCS)and Laboratory Control Sample Duplicate (LCSD) at 500 ug/kg Aroclor 1242 was prepared and analyzed with each SDG, or 20 sediment samples. All recoveries measured in the LCS were within the RAWP 65 - 135 % and < 20 % RPD. No action was needed to qualify sample data based on LCS recoveries.

2.2.7 Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery

Aroclor 1242 recovery of a 2 ppm spike in project sediment samples were all within the 65 - 135 % recovery limits and RPD 30 % limit. No action was needed to qualify sample data.

2.2.8 Detection Limit Attainment

The RAWP Reporting Limit s of 1.0 ug/L and 50 ug/kg were attained in all samples when accounting for the actual sample volume extracted or the percent solids of the sample. No action was needed to qualify sample data.

2.2.9 Verification of Reported Results

No detectable Aroclors were present in the project water samples analyzed. No discrepancies or false negatives were detected. QC sample results such as RPD, recovery and % difference were also recalculated, but at a 10 % frequency. No discrepancies that were not due to differences in lab instrument software and the validator's calculator significant figure/rounding protocols were found in QC sample results. All detected Aroclor values reported for QC sample results are from the primary column. The analysis on the secondary column was reviewed to assess if the Aroclor pattern(s) were confirmed, and all were.

All reported Aroclors in QC and the sediment samples were quantified on at least an 4 peak match, except for Aroclor 1242 in POG3-PS-56A-D(0-4), POG3-PS-54AB(0-4), POG3-PS-41AB(0-4) and POG4-PS-1P(0-4) which were quantified on a 3 peak match due to interferences. Peaks with obvious interferences were not included in the quantitation. The method retention time window criteria of ± 0.03 minutes for a minimum of a 4 peak match for Aroclor identification was met in all QC samples.

2.3 Field QC Results

No field equipment rinsates associated with the project samples in Table 1 were analyzed for PCBs. No action was needed to qualify sample data.

Two field duplicates were present in the SDGs validated (POG3-PS-56A-D(0-4, POG4-PS-9P(0-4). RPD values calculated were as follows:

POG3-PS-56A-D(0-4): Aroclor 1242: 8 %, Aroclor 1254 131 %, Aroclor 1260 158 %, total PCBs 115 %

POG4-PS-9P(0-4): Aroclor 1242: 14 %, Aroclor 1260 34 %, total PCBs 94 %

The SAP data quality objective (DQO) of < 30 % RPD was not met for all reported Aroclors. Action taken was to qualify Aroclor 1254, 1260 and total PCBs in POG3-PS-56A-D(0-4)/DUP and Aroclor 1260 and total PCBs in POG4-PS-9P(0-4)/DUP as estimated with a J code indicating greater imprecision than the DQO.

.2.4 Data Usability

Aroclor 1260 and 1268 results quantified against the single point calibration standard in in POG4-PS-1P(0-4), POG4-PS-9P(0-4)DUP, POG4-PS-9AB(0-4) and POG4-PS-4A-D(0-4) were qualified as estimated from less than a multiple point calibration curve. Aroclor 1254, 1260 and total PCBs in POG3-PS-56A-D(0-4)/DUP and Aroclor 1260 and total PCBs in POG4-PS-9P(0-4)/DUP was estimated from greater field imprecision than the DQO.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

3.0 AMMONIA, BOD and TSS DATA

Pace utilized EPA reference methods 160.2 and 350.1 as specified in their Standard Operating Procedure G2-WCM-01, Revision No. 2 dated January 1, 2003 and G2-WCM-58, Revision No. 0 dated January 16, 2004. No significant deviations from this SOP was apparent from the documentation reviewed. No action was needed to qualify sample data.

BOD analysis was not a requirement in the RAWP. Pace utilized Standard Methods 5210B for BOD analysis. No significant deviations from this reference method was apparent from the documentation reviewed. No action was needed to qualify sample data.

3.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for ammonia, BOD and TSS analysis did not require any follow-up with Pace. No action was needed to qualify sample data.

3.2 Compliance Assessment

3.2.1 Holding Time/Preservation

Documentation of adequate acid preservation for ammonia was present. All EPA recommended holding times for the methods cited above were met.

None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

3.2.2 Calibration

All ammonia initial instrument calibrations for ammonia were properly performed using at least five standards and met the correlation coefficient criteria of greater than 0.995. Continuing calibration checks were performed at least once every 10 samples and all checks met performance criteria of 90-110%.

3.2.3 Laboratory Blanks

Laboratory blanks did not contain any TSS, BOD or ammonia above the Limit of Detection (LOD). No action was needed to qualify sample data.

3.2.4 Reference Standards/Lab Control Standards (LCS/LCSD)

Recovery of reference (EPA/ERA/APG) standards were all within Pace and RAWP accuracy limits. No action was needed to qualify sample data.

3.2.5 Laboratory Duplicate Sample Analysis

All laboratory duplicate and LCS/LCSD RPD results were within the Pace and RAWP precision limits. No action was needed to qualify sample data.

3.2.6 Matrix Spike Samples

All matrix spike sample recoveries were within the Pace and RAWP accuracy limits of 90 - 110 %, except for ammonia (112.5 %) in sample DEWT-EF-94 MSD. Pace qualified the associated sample result with an "N" code. No further action was taken to qualify sample data, as the MS was within limit and no consistent high bias was evident.

3.3 Field QC Results

No field equipment rinsates or duplicates associated with the project samples in Table 1 were analyzed for TSS, ammonia or BOD. No action was needed to qualify sample data.

3.4 Data Usability

All TSS, ammonia and BOD sample results were usable as reported.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

If you have any questions regarding the qualification of data or the data validation process/criteria used, please contact me at (920) 469-9113.

Attachments:

Table 1
Validated hard copy Data Sheets
Appendix A: Data Validation Checklist

Table 1 Data Validated - Lower Fox River Foth Van Dyke

LAB(S)	SDG#	Date Rec'd by Kuehl	Matrix	Field Sample ID	Field Collection Date	Lab sample ID	Analytes
Pace	875766	11-Oct-06	sediment	IRA-06-POG3-PS-57A-D(0-4)	6-Sep-06	875766-001	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG3-PS-40ABC(0-4)	6-Sep-06	875766-002	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG3-PS-56A-D(0-4)	6-Sep-06	875766-003	PCBs
Pace	875766	11-Oct-06	field duplicate	IRA-06-POG3-PS-56A-D(0-4) DUP	6-Sep-06	875766-004	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG3-PS-55A(0-3 3/4)55B(0-4)	6-Sep-06	875766-005	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG3-PS-54AB(0-4)	6-Sep-06	875766-006	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG3-PS-41ABC(0-4)	6-Sep-06	875766-007	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG4-PS-1P(0-4)	31-Aug-06	875766-008	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG4-PS-1A(0-4)	31-Aug-06	875766-009	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG3-PS-41P(0-4)	5-Sep-06	875766-010	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG3-PS-32A(0-4)	5-Sep-06	875766-011	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG4-PS-2A(0-4)	31-Aug-06	875766-012	PCBs
Pace	875766	11-Oct-06	sediment	IRA-06-POG4-PS-2P(0-4)	31-Aug-06	875766-013	PCBs
Pace	876198B	13-Oct-06	sediment	IRA-06-POG4-PS-9P(0-4)	13-Sep-06	876198-014	PCBs
Pace	876198B	13-Oct-06	field duplicate	IRA-06-POG4-PS-9P(0-4) DUP	13-Sep-06	876198-015	PCBs
Pace	876198B	13-Oct-06	sediment	IRA-06-POG4-PS-9AB(0-4)	18-Sep-06	876198-016	PCBs
Pace	876198B	13-Oct-06	sediment	IRA-06-POG4-PS-7A-D(0-4)	18-Sep-06	876198-017	PCBs
Pace	876198B	13-Oct-06	sediment	IRA-06-POG4-PS-4A-D(0-4)	18-Sep-06	876198-018	PCBs
Pace	876198B	13-Oct-06	sediment	IRA-06-POG4-PS-8ABC(0-4) 8D (0-3 1/2)	18-Sep-06	876198-019	PCBs
Pace	876198B	13-Oct-06	sediment	IRA-06-POG4-PS-3ABC(0-4)	18-Sep-06	876198-020	PCBs
Pace	876198B	13-Oct-06	sediment	IRA-06-POG4-PS-3P(0-4)	13-Sep-06	876198-021	PCBs
Pace	876198B	13-Oct-06	sediment	IRA-06-STOCKPILE-08	18-Sep-06	876216-001	PCBs
Pace	876442	17-Oct-06	sediment	IRA-06-DEWT-SLURRY-46	25-Sep-06	876442-001	PCBs
Pace	876442	17-Oct-06	sediment	IRA-06-DEWT-SLURRY-47	25-Sep-06	876442-002	PCBs
Pace	876442	17-Oct-06	sediment	IRA-06-DEWT-SLURRY-48	25-Sep-06	876442-003	PCBs
Pace	876442	17-Oct-06	sediment	IRA-06-POG3-PSRD-19A-1-4	26-Sep-06	876442-004	PCBs
Pace	875896	25-Oct-06	water	IRA-06-POG3-SW-165-912	11-Sep-06	875896-001	TSS
Pace	875896	25-Oct-06	water	IRA-06-POG2-SW-166-905	11-Sep-06	875896-002	TSS
Pace	875896	25-Oct-06	water	IRA-06-POG3-SW-167-902	11-Sep-06	875896-003	TSS
Pace	875896	25-Oct-06	water	IRA-06-DEWT-EF-93	12-Sep-06	875949-001	BOD, NH3, TSS, PCBs
Pace	875896	25-Oct-06	water	IRA-06-POG3-SW-168-912	13-Sep-06	876008-001	TSS
Pace	875896	25-Oct-06	water	IRA-06-POG2-SW-169-905	13-Sep-06	876008-002	TSS
Pace	875896	25-Oct-06	water	IRA-06-POG2-SW-170-902	13-Sep-06	876008-003	TSS
Pace	875896	25-Oct-06	water	IRA-06-DEWT-EF-94	13-Sep-06	876009-001	BOD, NH3, TSS, PCBs
Pace	875896	25-Oct-06	water	IRA-06-DEWT-EF-95	14-Sep-06	876065-001	BOD, NH3, TSS, PCBs

MAKuehl Co.

Data Validation

Lab/Field Audits

QA Plans

MASTER FILE COPY
Scope 04G007 Classification 0505
Copy To

TECHNICAL MEMORANDUM

DATE: September 29, 2006

TO: Janis Kesy
Project Manager
Foth & Van Dyke

FROM: Marcia A. Kuehl
President/Owner
MAKuehl Company

SUBJECT: Data Validation for Lower Fox River OU 1 2006 Remedial Action Sampling Events of July-August, 2006
Foth & Van Dyke Project # : 04G007

1.0 OVERVIEW

Analytical results for samples listed in Table 1 and their associated laboratory QC samples collected from the Lower Fox River OU 1 have been evaluated using the EPA guidance documents "National Functional Guidelines for Organic Data Review", dated October 1999, EPA-540/R-99/008, and the "National Functional Guidelines for Inorganic Data Review", dated July, 2002, EPA-540/R-01-008.

The specific calibration and laboratory QC check requirements contained in the "Lower Fox River Operable Unit 1 Remedial Action-2004 Remedial Action Work Plan" dated May, 2004 (RAWP) were the primary criteria used in the assessment of the data for compliance with the project data quality objectives. The review was based on the data packages supplied by the analytical laboratory, Pace, located in Kimberly, Wisconsin.

Aroclor 1260 and 1268 results quantified against the single point calibration standard in DEWT-SLURRY-32 were qualified as estimated from less than a multiple point calibration curve.

Mercury in samples LLHG-62, 62FB, 64FB, 65, 66FB, 67FB, 68FB, 69, 70, 71 and 71FB was undetected as the concentration was not significantly different from lab background.

TSS and ammonia results in samples DEWT EF-50 and DEWT-EF-50-DUP were estimated from matrix variability. TSS in DEWT-EF-72 and DEWT-EF-73 was estimated from a possible high bias as evidenced by high LCS recovery.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

All qualifiers assigned during the data validation process are discussed in detail below. The validated data sheets are attached, and the checklist used during the validation are in

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Appendix A.

2.0 PCB AS AROCLORS DATA

Pace utilized the EPA SW846 reference methods 3510C and 8082 as specified in their Standard Operating Procedure SVO-52, Revision No. 3 dated January, 2000 for water samples and EPA SW846 reference methods 35141 and 8082, automated soxhlet extraction on the air dried sample, acid clean-up and sulfur clean-up using copper for solid samples as specified in their Standard Operating Procedure K-SVO-77, Revision No. 3 dated June 24, 2004. No significant deviations from these SOPs were apparent from the documentation reviewed. No action was needed to qualify sample data.

2.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for PCB analysis did not require any follow-up with Pace to enable data validation.

2.2 Compliance Assessment

2.2.1 Holding Times/Preservation

All samples for PCBs were received on ice. No notation of receipt temperature in exceedance of 2-6°C and no intact ice was noted for any samples analyzed for PCBs. None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

Water samples were extracted within 7 days after collection. After extraction all samples were analyzed within 14 days. No action was needed to qualify sample data.

2.2.2 Initial Calibration (ICAL)

Five point initial calibration curves ranging from 0.1-1.0 ug/ml for Aroclor 1016/1260, 1242 and 1254 were analyzed on both columns, RTX-CLP (primary quantitation column) and RTX-CLP2 (confirmation column) on 7/12-13/06, 8/6/06, 8/23-24/06 and 8/30/06. The rsd values measured for each peak were less than the 20 % data validation criteria. No action was taken to qualify sample data based on initial calibration results.

Aroclor 1268 was reported detected in DEWT-SLURRY-32. Aroclor 1268 was quantified based on a one point calibration standard at 0.5 ug/mL analyzed with the samples. Pace qualified the Aroclor 1268 results quantified against the single point standard of Aroclor 1268 with an "X" qualifier. This sample contained both Aroclor 1260 and 1268. Aroclor 1260 was quantified against peaks in the Aroclor 1268 standard that are indicative of Aroclor 1260. Pace qualified the Aroclor 1260 and Aroclor 1268 results quantified against Aroclor 1268 with an "X" qualifier. Aroclor 1260 and 1268 results quantified against the single point calibration standard in DEWT-SLURRY-32 were qualified as estimated with a J code from this less than multiple point calibration curve.

2.2.3 Calibration Verification (CCAL)

The required method frequency of calibration verification was every 10 samples and at the end of the instrument run was met for every SDG. In all of the SDGs reviewed in Table 1, the CCALs consisted of a 0.3 ug/ml solution of Aroclor 1242 alternating with a 0.3 ug/ml solution of Aroclor 1254. The mean percent difference between the CCAL and ICAL calibration factors for the 5-10 peaks used for identification and quantitation were all less than the 15 % data validation criteria on the primary quantitation column. No action was needed to qualify sample data.

2.2.4 Laboratory Blanks

At least one laboratory blank was prepared and extracted with every 20 project samples or less analyzed. No laboratory blanks contained detectable Aroclors above the Limit of Detection (LOD).

2.2.5 Surrogate Recoveries

Decachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) recoveries in all project water samples were all within the Pace limits of 7 - 113 % (DCB) and 49 - 112 % (TCX). No action was needed to qualify sample data.

Decachlorobiphenyl (DCB) and tetrachloro-m-xylene (TCX) recoveries in some sediment samples were was not useful (i.e. 0 %) , as these samples required dilution. Dilution factors greater than ten result in the surrogate concentration being too low to be detected. No action was taken to qualify sample data in samples with dilution factors greater than or equal to ten.

For sediment samples with dilution factors of less than ten, surrogate recoveries were within the data validation limits of 60 -140 %, except for decachlorobiphenyl recovery in POG3-PS59 AB (0-4) (58 %). Pace qualified this recovery with a "F" qualifier. In accordance with EPA National Functional Guidelines for Organic Data Validation PEST Section VI. E 1(a), no action was taken was to qualify detected and undetected Aroclor results in this sample, as no recoveries were less than 30 %.

2.2.6 Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD)

At least one Laboratory Control Sample (LCS)and Laboratory Control Sample Duplicate (LCSD) at 5 ug/L Aroclor 1242 was prepared and analyzed with each SDG, or 20 water samples. All recoveries measured in the LCS were within the Pace limits of 47 - 138 % and < 20 % RPD. No action was needed to qualify sample data.

At least one Laboratory Control Sample (LCS)and Laboratory Control Sample Duplicate (LCSD) at 500 ug/kg Aroclor 1242 was prepared and analyzed with each SDG, or 20 sediment samples. All recoveries measured in the LCS were within the RAWP 65 - 135 % and < 20 % RPD. No action was needed to qualify sample data based on LCS recoveries.

2.2.7 Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery

Aroclor 1242 recovery of a 2 ppm spike in project sediment samples were all within the 65 - 135 % recovery limits and RPD 30 % limit. No action was needed to qualify sample data.

2.2.8 Detection Limit Attainment

The RAWP Reporting Limit s of 1.0 ug/L and 50 ug/kg were attained in all samples when accounting for the actual sample volume extracted or the percent solids of the sample. No action was needed to qualify sample data.

2.2.9 Verification of Reported Results

No detectable Aroclors were present in the project water samples analyzed. No discrepancies or false negatives were detected. QC sample results such as RPD, recovery and % difference were also recalculated, but at a 10 % frequency. No discrepancies that were not due to differences in lab instrument software and the validator's calculator significant figure/rounding protocols were found in QC sample results. All detected Aroclor values reported for QC sample results are from the primary column. The analysis on the secondary column was reviewed to assess if the Aroclor pattern(s) were confirmed, and all were.

All reported Aroclors in QC and the sediment samples were quantified on at least an 4 peak match. Peaks with obvious interferences were not included in the quantitation. The method retention time window criteria of ± 0.03 minutes for a minimum of a 4 peak match for Aroclor identification was met in all QC samples.

2.3 Field QC Results

No field equipment rinsates associated with the project samples in Table 1 were analyzed for PCBs. No action was needed to qualify sample data.

Two field duplicates were present in the SDGs validated (DEWT-EF-50, DEWT-EF-80). As no detectable PCBs were present in these samples and their field duplicates, acceptable field precision was achieved.

.2.4 Data Usability

Aroclor 1260 and 1268 results quantified against the single point calibration standard in DEWT-SLURRY-32 were qualified as estimated from less than a multiple point calibration curve.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

3.0 AMMONIA, BOD and TSS DATA

Pace utilized EPA reference methods 160.2 and 350.1 as specified in their Standard Operating Procedure G2-WCM-01, Revision No. 2 dated January 1, 2003 and G2-WCM-58, Revision No. 0 dated January 16, 2004. No significant deviations from this SOP was apparent from the documentation reviewed. No action was needed to qualify sample data.

BOD analysis was not a requirement in the RAWP. Pace utilized Standard Methods 5210B for BOD

analysis. No significant deviations from this reference method was apparent from the documentation reviewed. No action was needed to qualify sample data.

3.1 Completeness Assessment

The Pace data packages received were complete. All samples listed in Table 1 that were submitted and indicated for analysis were analyzed. The data packages received for ammonia, BOD and TSS analysis did not require any follow-up with Pace. No action was needed to qualify sample data.

3.2 Compliance Assessment

3.2.1 Holding Time/Preservation

Documentation of adequate acid preservation for ammonia was present. All EPA recommended holding times for the methods cited above were met.

None of the SDGs contained temperature blanks shipped with them, but as all samples were received "on ice", no action was needed to qualify sample data.

3.2.2 Calibration

All ammonia initial instrument calibrations for ammonia were properly performed using at least five standards and met the correlation coefficient criteria of greater than 0.995. Continuing calibration checks were performed at least once every 10 samples and all checks met performance criteria of 90-110%.

3.2.3 Laboratory Blanks

Laboratory blanks did not contain any TSS or ammonia above the Limit of Detection (LOD). No action was needed to qualify sample data. Oxygen depletion in the BOD lab blanks analyzed with DEWT-EF-81 exceeded Pace's limit of 0.2 mg/L at 0.38 and 0.97 mg/L. Pace qualified the sample result with a "3" qualifier to indicate this QC lapse. No action was needed to qualify sample data as no detectable BOD was present in DEWT-EF-81 and therefore no high bias was possible.

3.2.4 Reference Standards/Lab Control Standards (LCS/LCSD)

Recovery of reference (EPA/ERA/APG) standards were all within Pace and RAWP accuracy limits, except TSS recovery in the LCS associated with samples DEWT-EF-72 and DEWT-EF-73 (357 %, limits 80-120 %). Pace qualified the sample results with a "&" code. Action taken was to qualify TSS in DEWT-EF-72 and DEWT-EF-73 as estimated with a J code from a possible high bias.

3.2.5 Laboratory Duplicate Sample Analysis

All laboratory duplicate and LCS/LCSD RPD results were within the Pace and RAWP precision limits. No action was needed to qualify sample data.

3.2.6 Matrix Spike Samples

All matrix spike sample recoveries were within the Pace and RAWP accuracy limits of 90 - 110 %. No action was needed to qualify sample data.

3.3 Field QC Results

One rinsate sample, POG3-SW-100-912-RINSE was collected with the project samples in Table 1 for TSS. No detectable TSS was present in the rinsate and no action was needed to qualify sample data. No field equipment rinsates associated with the project samples in Table 1 were analyzed for BOD or ammonia. No action was taken to qualify ammonia or BOD sample data.

Field duplicates for TSS were collected with the project samples listed in Table 1 and the Relative Percent Difference (RPD) calculated below:

Sample ID (IRA-05-)	TSS (mg/L)	TSS (mg/L) DUP	RPD
POG3-SW-102-902	20	20	0 %
DEWT-EF-50	0.40	0.60	40 %
DEWT-EF-80	0.60	0.63	5 %

The RPD value was not within the RAWP precision limit of 5 % for DEWT EF-50. Action taken was to qualify TSS results in samples DEWT EF-50 and DEWT-EF-50-DUP as estimated with a J code from this matrix variability.

A field duplicate was collected with the project samples listed in Table 1 for ammonia and BOD for IRA-06-DEWT-EF-50 and EF-80. BOD RPD values calculated were 5 % (DEWT-EF-80) and 0 % (DEWT-EF-50). Ammonia RPD values calculated were 5 % (DEWT-EF-80) and 23 % (DEWT-EF-50). As the RPD value for EF-50 exceeded the RAWP precision limit of 20 %, action taken was to qualify ammonia in EF-50 and its field duplicate as estimated with a J code from matrix variability.

3.4 Data Usability

TSS and ammonia results in samples DEWT EF-50 and DEWT-EF-50-DUP were estimated from matrix variability. TSS in DEWT-EF-72 and DEWT-EF-73 was estimated from a possible high bias as evidenced by high LCS recovery.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

4.0 MERCURY DATA

Pace utilized EPA method 1631E. No significant deviations from the EPA reference method was

apparent from the documentation reviewed. No action was needed to qualify sample data.

4.1 Completeness Assessment

The data packages received for mercury analysis were complete. All samples submitted were digested and analyzed. No action was needed to qualify sample data.

4.2 Compliance Assessment

4.2.1 Holding Time/Preservation

All samples were analyzed within the 28 day holding time. No notation of storage or shipping temperature in exceedance of 4 ± 2°C was noted. No action was needed to qualify mercury sample data based on exceedance of holding time or preservation requirements.

4.2.2 Calibration

The initial instrument calibrations were five points ranging from 0.05 - 4 ng/L and correlation coefficients were all ≥ 0.995. Continuing calibration checks were performed at least once every 10 samples and were within Pace's 80-120% limits. No action was needed to qualify sample data.

4.2.3 Laboratory Blanks

Mercury in bottle blanks and method blanks were not below the Pace LOD of 0.169 ng/L. Method blanks analyzed with the project samples LLHG-62, 62FB, 64, 64FB, 65, 65FB, 66, 66FB, 67, 67FB, 68, 68FB, 69, 69FB, 70, 70FB , 71 and 71FB contained 0.2737 ng/L. Action was needed to qualify mercury in samples LLHG-62, 62FB, 64FB, 65, 66FB, 67FB, 68FB, 69, 70, 71 and 71FB as undetected with a "U" code as the concentration was less than 5 X the associated method blank(s).

4.2.4 Ongoing Precision and Recovery (OPR) Standard

An OPR was prepared with each set of samples at 5 ng/L. Recoveries were all within Pace's limits of 79 - 121 %. No action was needed to qualify sample data.

4.2.5 Matrix Spike/Matrix Spike Duplicate

MS/MSD recoveries and RPD were all within Pace's limits of 75 - 125 % and < 24 % RPD. No action was needed to qualify sample data.

4.3 Field QC Results

Field blanks were collected with each project sample. Mercury was detected at concentrations ranging from 0.175-0.269 ng/L in the field blanks. No action was needed to qualify associated sample data, as all samples exceeded the field blank concentration by more than a factor of five.

A field duplicate was collected for mercury for sample DEWT-PREK-LLHG-84. The detected mercury values of 2.62 and 2.46 ng/L resulted in an RPD value of 6 %. No action was needed to qualify sample data.

4.4 Data Usability

Mercury in samples LLHG-62, 62FB, 64FB, 65, 66FB, 67FB, 68FB, 69, 70, 71 and 71FB was undetected as the concentration was not significantly different from lab background.

Results greater than the LOD, but less than the LOQ were qualified by Pace with a "Q" qualifier. During the validation process, all "Q" qualified results were further qualified with a J code indicating estimated data. These concentrations should be considered estimated as they are within the region of quantitation associated with less precision.

If you have any questions regarding the qualification of data or the data validation process/criteria used, please contact me at (920) 469-9113.

Attachments:

Table 1
Validated hard copy Data Sheets
Appendix A: Data Validation Checklist

Table 1 Data Validated - Lower Fox River Foth Van Dyke

LAB(S)	SDG#	Date Rec'd by Kuehl	Matrix	Field Sample ID	Field Collection Date	Lab sample ID	Analytes
Pace	874932	19-Sep-06	water	IRA-06-DEWT-EF71	10-Aug-06	874932-001	BOD, NH3, TSS, PCBs
Pace	874932	19-Sep-06	water	IRA-06-DEWT-NOFILTER-LLHG-96	9-Aug-06	874933-001	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-PREBOS3-LLHG-97	9-Aug-06	874933-002	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-POSTBOS3-LLHG-98	9-Aug-06	874933-003	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-PREBOSG5-LLHG-99	9-Aug-06	874933-004	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-POSTBOSG5-LLHG-100	9-Aug-06	874933-005	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-NOFILTER-LLHG-101	9-Aug-06	874933-006	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-PREBOS3-LLHG-102	9-Aug-06	874933-007	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-POSTBOS3-LLHG-103	9-Aug-06	874933-008	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-PREBOSG5-LLHG-104	9-Aug-06	874933-009	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-POSTBOSG5-LLHG-105	9-Aug-06	874933-010	TSS
Pace	874932	19-Sep-06	water	IRA-06-DEWT-EF72	11-Aug-06	874989-001	BOD, NH3, TSS, PCBs
Pace	874932	19-Sep-06	water	IRA-06-DEWT-EF73	12-Aug-06	875018-001	BOD, NH3, TSS, PCBs
Pace	874208	19-Sep-06	water	IRA-06-DEWT-EF55	20-Jul-06	874209-001	PCBs, BOD, NH3, TSS
Pace	874208	19-Sep-06	water	IRA-06-DEWT-EF56	21-Jul-06	874264-001	PCBs, BOD, NH3, TSS
Pace	874208	19-Sep-06	water	IRA-06-DEWT-EF57	22-Jul-06	874310-001, 874310-001	PCBs, BOD, NH3, TSS
Pace	874208	19-Sep-06	water	IRA-06-DEWT-EF-LLHG-62	20-Jul-06	874221-001, 874236-001	low level mercury
Pace	874208	19-Sep-06	field blank	IRA-06-DEWT-EF-LLHG-62FB	20-Jul-06	874221-002	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-DEWT-POSTK-LLHG-63	20-Jul-06	874221-003, 874236-002	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-DEWT-POSTK-LLHG-63FB	20-Jul-06	874221-004	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-PREK-LLHG-64	20-Jul-06	874221-005, 874236-003	low level mercury
Pace	874208	19-Sep-06	field duplicate	IRA-06-PREK-LLHG-64-DUP	20-Jul-06	874221-006	low level mercury
Pace	874208	19-Sep-06	field blank	IRA-06-PREK-LLHG-64FB	20-Jul-06	874221-007	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-DEWT-LLHG-EF65	20-Jul-06	874262-001, 874283-001	low level mercury, TSS
Pace	874208	19-Sep-06	field blank	IRA-06-DEWT-LLHG-EF65FB	20-Jul-06	874262-002	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-PREGAC-LLHG-66	20-Jul-06	874262-003, 874283-002	low level mercury, TSS
Pace	874208	19-Sep-06	field blank	IRA-06-PREGAC-LLHG-66FB	20-Jul-06	874262-004	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-DEWT-POSTK-LLHG-67	20-Jul-06	874262-005, 874283-003	low level mercury, TSS
Pace	874208	19-Sep-06	field blank	IRA-06-DEWT-POSTK-LLHG-67B	20-Jul-06	874262-006	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-PREK-LLHG-68	20-Jul-06	874262-007, 874283-004	low level mercury, TSS
Pace	874208	19-Sep-06	field blank	IRA-06-PREK-LLHG-68FB	20-Jul-06	874262-008	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-DEWT-EF-LLHG-69	21-Jul-06	874263-001, 874283-005	low level mercury, TSS
Pace	874208	19-Sep-06	field blank	IRA-06-DEWT-EF-LLHG-69FB	21-Jul-06	874263-002	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-DEWT-EF-LLHG-70	21-Jul-06	874279-001, 874283-006	low level mercury, TSS
Pace	874208	19-Sep-06	field blank	IRA-06-DEWT-EF-LLHG-70FB	21-Jul-06	874279-002	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-DEWT-EF-LLHG-71	21-Jul-06	874296-001, 874296-003	low level mercury, TSS
Pace	874208	19-Sep-06	field blank	IRA-06-DEWT-EF-LLHG-71FB	21-Jul-06	874296-002	low level mercury
Pace	874208	19-Sep-06	water	IRA-06-POG3-SW-99-912	19-Jul-06	874208-001	TSS
Pace	874208	19-Sep-06	field blank	IRA-06-POG3-SW-100-912-RINSE	19-Jul-06	874208-002	TSS
Pace	874208	19-Sep-06	water	IRA-06-POG3-SW-101-905	19-Jul-06	874208-003	TSS
Pace	874208	19-Sep-06	water	IRA-06-POG3-SW-102-902	19-Jul-06	874208-004	TSS
Pace	874208	19-Sep-06	field duplicate	IRA-06-POG3-SW-102-902-DUP	19-Jul-06	874208-005	TSS
Pace	874208	19-Sep-06	water	IRA-06-POG3-SW-103-912	21-Jul-06	874284-001	TSS
Pace	874208	19-Sep-06	water	IRA-06-POG3-SW-104-905	21-Jul-06	874284-002	TSS
Pace	874208	19-Sep-06	water	IRA-06-POG3-SW-105-902	21-Jul-06	874284-003	TSS
Pace	873916	19-Sep-06	water	IRA-06-DEWT-EF-50	13-Jul-06	873916-001	PCBs, BOD, NH3, TSS
Pace	873916	19-Sep-06	field duplicate	IRA-06-DEWT-EF-50-DUP	13-Jul-06	873916-002	PCBs, BOD, NH3, TSS
Pace	873916	19-Sep-06	water	IRA-06-DEWT-EF-51	14-Jul-06	873971-001	PCBs, BOD, NH3, TSS
Pace	875255	19-Sep-06	sediment	IRA-06-POG3-PS-33A(0-4)	17-Aug-06	875202-004	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-POG3-PS-59AB(0-4)	18-Aug-06	875255-001	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-POG3-PS-61A(0-4)	18-Aug-06	875255-002	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-POG3-PS-60A-D(0-4)	18-Aug-06	875255-003	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-POG3-PS-63A(0-4)	17-Aug-06	875255-004	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-POG3-PS-63P(0-4)	17-Aug-06	875255-005	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-POG3-PS-60P(0-4)	17-Aug-06	875255-006	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-POG3-PS-71P(0-4)	17-Aug-06	875255-007	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-DEWT-SLURRY-31	21-Aug-06	875294-001	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-DEWT-SLURRY-32	21-Aug-06	875294-002	PCBs
Pace	875255	19-Sep-06	sediment	IRA-06-DEWT-SLURRY-33	21-Aug-06	875294-003	PCBs
Pace	874896	26-Sep-06	water	IRA-06-DEWT-NOFILTER-LLHG-96	9-Aug-06	874896-001	low level mercury
Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-NOFILTER-LLHG-96-FB	9-Aug-06	874896-002	low level mercury
Pace	874896	26-Sep-06	water	IRA-06-DEWT-PREBOS3-LLHG-97	9-Aug-06	874896-003	low level mercury
Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-PREBOS3-LLHG-97-FB	9-Aug-06	874896-004	low level mercury
Pace	874896	26-Sep-06	water	IRA-06-DEWT-POSTBOS3-LLHG-98	9-Aug-06	874896-005	low level mercury
Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-POSTBOS3-LLHG-98-FB	9-Aug-06	874896-006	low level mercury
Pace	874896	26-Sep-06	water	IRA-06-DEWT-PREBOS5-LLHG-99	9-Aug-06	874896-007	low level mercury
Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-PREBOS5-LLHG-99-FB	9-Aug-06	874896-008	low level mercury
Pace	874896	26-Sep-06	water	IRA-06-DEWT-POSTBOS5-LLHG-100	9-Aug-06	874896-009	low level mercury
Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-POSTBOS5-LLHG-100-FB	9-Aug-06	874896-010	low level mercury
Pace	874896	26-Sep-06	water	IRA-06-DEWT-NOFILTER-LLHG-101	9-Aug-06	874896-011	low level mercury
Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-NOFILTER-LLHG-101-FB	9-Aug-06	874896-012	low level mercury
Pace	874896	26-Sep-06	water	IRA-06-DEWT-PREBOS3-LLHG-102	9-Aug-06	874896-013	low level mercury

Table 1 Data Validated - Lower Fox River Foth Van Dyke

Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-PREBOS3-LLHG-102-FB	9-Aug-06	874896-014	low level mercury
Pace	874896	26-Sep-06	water	IRA-06-DEWT-POSTBOS3-LLHG-103	9-Aug-06	874896-015	low level mercury
Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-POSTBOS3-LLHG-103-FB	9-Aug-06	874896-016	low level mercury
Pace	874896	26-Sep-06	water	IRA-06-DEWT-PREBOS5-LLHG-104	9-Aug-06	874896-017	low level mercury
Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-PREBOS5-LLHG-104-FB	9-Aug-06	874896-018	low level mercury
Pace	874896	26-Sep-06	water	IRA-06-DEWT-POSTBOS5-LLHG-105	9-Aug-06	874896-019	low level mercury
Pace	874896	26-Sep-06	field blank	IRA-06-DEWT-POSTBOS5-LLHG-105-FB	9-Aug-06	874896-020	low level mercury
Pace	875600	26-Sep-06	sediment	IRA-06-POG3-PSRD-21P(0-4)	30-Aug-06	875600-001	PCBs
Pace	875600	26-Sep-06	sediment	IRA-06-POG3-PSRD-21ACD(0-4)	31-Aug-06	875600-002	PCBs
Pace	875600	26-Sep-06	sediment	IRA-06-POG3-PS-26ACD(4-8)	30-Aug-06	875601-001	PCBs
Pace	875600	26-Sep-06	sediment	IRA-06-POG3-PS-49B(8-11 3/4)49C(8-12)	30-Aug-06	875601-002	PCBs
Pace	875600	26-Sep-06	sediment	IRA-06-POG3-PS-25AB(4-8)25C(4-7 1/2)	30-Aug-06	875601-003	PCBs
Pace	875319	26-Sep-06	water	IRA-06-DEWT-EF-79	22-Aug-06	875319-001	PCBs, BOD, NH3, TSS
Pace	875319	26-Sep-06	water	IRA-06-POG3-SW-139-912	21-Aug-06	875320-001	TSS
Pace	875319	26-Sep-06	water	IRA-06-POG3-SW-140-905	21-Aug-06	875320-002	TSS
Pace	875319	26-Sep-06	water	IRA-06-POG3-SW-141-902	21-Aug-06	875320-003	TSS
Pace	875319	26-Sep-06	water	IRA-06-DEWT-EF-80	23-Aug-06	875386-001	PCBs, BOD, NH3, TSS
Pace	875319	26-Sep-06	field duplicate	IRA-06-DEWT-EF-80-DUP	23-Aug-06	875386-002	PCBs, BOD, NH3, TSS
Pace	875319	26-Sep-06	water	IRA-06-DEWT-EF-LLHG-107	24-Aug-06	875424-001	TSS
Pace	875319	26-Sep-06	water	IRA-06-POG3-SW-142-912	23-Aug-06	875427-001	TSS
Pace	875319	26-Sep-06	water	IRA-06-POG3-SW-143-905	23-Aug-06	875427-002	TSS
Pace	875319	26-Sep-06	water	IRA-06-POG3-SW-144-902	23-Aug-06	875427-003	TSS
Pace	875319	26-Sep-06	water	IRA-06-DEWT-EF-81	24-Aug-06	875428-001	PCBs, BOD, NH3, TSS