APPENDIX G

Section 9

Outfall 004, February 16, 2009

MEC^X Data Validation Reports

DATA VALIDATION REPORT

Boeing SSFL NPDES

SAMPLE DELIVERY GROUP: ISB1808

Prepared by

MEC^X, LP
12269 East Vassar Drive
Aurora, CO 80014

I. INTRODUCTION

Task Order Title:	Boeing SSFL NPDES
Contract Task Order:	1261.100D.00
Sample Delivery Group:	ISB1808
Project Manager:	B. Kelly
Matrix:	Water
QC Level:	IV
No. of Samples:	1
No. of Reanalyses/Dilutions:	0
Laboratory:	TestAmerica-Irvine

Table 1. Sample Identification

Client ID	Laboratory ID	Sub-Laboratory ID	Matrix	Collected	Method
Outfall 004	ISB1808-01	D9B170145-001, 31431-001, F9B170213-001	Water	02/16/09 1200	245.1, 245.1 (Diss), 900.0, 901.1, 903.0, 904.0, 905.0, 906.0, 908.0, 1613B

II. Sample Management

No anomalies were observed regarding sample management. The samples were received at all laboratories within the temperature limit of 4 ±2^{o}C. According to the case narrative for this SDG, the samples were received intact at all laboratories. The COCs were appropriately signed and dated by field and/or laboratory personnel. As the sample was couriered to TestAmerica-Irvine, custody seals were not required. Custody seal were present and intact upon arrival at TestAmerica-Denver, TestAmerica-St. Louis, and Vista. If necessary, the client ID was added to the sample result summary by the reviewer.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. The associated value is the quantitation limit or the estimated detection limit for dioxins.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. The associated value is the sample detection limit or the quantitation limit for perchlorate only.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The associated value is an estimated quantity.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D was noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination as indicated by the preparation (method) blank results.	Presumed contamination as indicated by the preparation (method) or calibration blank results.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or RPD high.	MS recovery was poor.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination as indicated by the trip blank results.	Not applicable.
+	False positive – reported compound was not present.	Not applicable.
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination as indicated by the FB or ER results.	Presumed contamination as indicated by the FB or ER results.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.

Qualification Code Reference Table Cont.

D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Unusual problems found with the data that have been described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Unusual problems found with the data that have been described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.

III. Method Analyses

A. EPA METHOD 1613—Dioxin/Furans

Reviewed By: K. Shadowlight
Date Reviewed: March 30, 2009

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC^X Data Validation Procedure for Dioxins and Furans (DVP-19, Rev. 0), USEPA Method 1613*, and the *National Functional Guidelines Chlorinated Dioxin/Furan Data Review* (9/05).

- Holding Times: Extraction and analytical holding times were met. The water sample was extracted and analyzed within one year of collection.

- Instrument Performance: Instrument performance criteria were met. Following are findings associated with instrument performance.

    - GC Column Performance: A Windows Defining Mix (WDM) containing the first and last eluting congeners of each descriptor and isomer specificity compounds was not analyzed prior to the initial calibration sequence or at the beginning of each analytical sequence; however, the first and last eluting congeners and isomer specificity compounds were added to the midpoint of the initial calibration and to the continuing calibration standards. The GC column performance in the calibrations was acceptable, with the height of the valley between the closely eluting isomers and 2,3,7,8-TCDD reported as less than 25%.

    - Mass Spectrometer Performance: The mass spectrometer performance was acceptable with the static resolving power greater than 10,000.

- Calibration: Calibration criteria were met.

    - Initial Calibration: Initial calibration criteria were met. The initial calibration was acceptable with %RSDs $\leq$20% for the 16 native compounds (calibration by isotope dilution) and $\leq$35% for the one native and all labeled compounds (calibration by internal standard). The relative retention times and ion abundance ratios were within the Method 1613 QC limits for all standards.

    - Continuing Calibration: Calibration verification (VER) consisted of a mid-level standard (CS3) analyzed at the beginning of each analytical sequence. The VERs were acceptable with the concentrations within the acceptance criteria listed in Table 6 of EPA Method 1613. The ion abundance ratios and relative retention times were within the method QC limits.

- Blanks: The method blank had no target compound detects above the EDL.

- Blank Spikes and Laboratory Control Samples: OPR recoveries were within the acceptance criteria listed in Table 6 of Method 1613.

- Field QC Samples: Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. Following are findings associated with field QC samples:

    - Field Blanks and Equipment Rinsates: This SDG had no identified field blank or equipment rinsate samples.

    - Field Duplicates: There were no field duplicate samples identified for this SDG.

- Internal Standards Performance: The labeled standard recoveries were within the acceptance criteria listed in Table 7 of Method 1613.

- Compound Identification: Compound identification was verified. The laboratory analyzed for polychlorinated dioxins/furans by EPA Method 1613.

- Compound Quantification and Reported Detection Limits: Compound quantitation was verified by recalculating any sample detects and a representative number of blank spike concentrations. The laboratory calculated and reported compound-specific detection limits. The laboratory does not include EMPCs in the results reported for totals; therefore, no totals were qualified. Any detects between the estimated detection limit (EDL) and the reporting limit (RL) were qualified as estimated, "J," and coded with "DNQ," in order to comply with the NPDES permit. Nondetects are valid to the estimated detection limit (EDL).

B. EPA METHODS 245.1—Mercury

Reviewed By:
Date Reviewed:

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *MEC^X Data Validation Procedure for Metals (DVP-5, Rev. 0 and DVP-21, Rev. 0), EPA Methods 2007, 200.8, and 245.1,* and the *National Functional Guidelines for Inorganic Data Review* (10/04).

- Holding Times: The analytical holding time, 28 days for mercury, was met.

- Tuning: Not applicable to this analysis.

- Calibration: Calibration criteria were met. Mercury initial calibration r^2 values were $\geq$0.995. Initial and continuing calibration recoveries were within 85-115%. The CRA standard was recovered within the control limits of 70-130%.

- Blanks: There were no applicable detects in the method blanks or CCBs.

- Interference Check Samples: Not applicable to this analysis.

- Blank Spikes and Laboratory Control Samples: The recovery was within the laboratory-established QC limits.

- Laboratory Duplicates: No laboratory duplicate analysis was performed on the sample in this SDG.

- Matrix Spike/Matrix Spike Duplicate: No MS/MSD analyses were performed on the sample in this SDG. Method accuracy was evaluated based on LCS results.

- Serial Dilution: No serial dilution analyses were performed on the sample in this SDG.

- Internal Standards Performance: Not applicable to this analysis.

- Sample Result Verification: Calculations were verified and the sample results reported on the sample result summaries were verified against the raw data. No transcription errors or calculation errors were noted. Detects reported below the reporting limit were qualified as estimated, "J," and coded with "DNQ," in order to comply with the NPDES permit. Reported nondetects are valid to the MDL.

- Field QC Samples: Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. Following are findings associated with field QC samples:

    - Field Blanks and Equipment Rinsates: This SDG had no identified field blank or equipment rinsate samples.

    - Field Duplicates: There were no field duplicate samples identified for this SDG.

C. VARIOUS EPA METHODS — Radionuclides

Reviewed By: P. Meeks
Date Reviewed: March 25, 2009

The sample listed in Table 1 for this analysis was validated based on the guidelines outlined in the *EPA Methods 900.0, 901.1, 903.1, 904.0, 905.0, and 906.0, ASTM Method D-5174,* and the *National Functional Guidelines for Inorganic Data Review* (10/04).

- Holding Times: The tritium sample was analyzed within 180 days of collection. The aliquots for gross alpha, gross beta, cesium-137, potassium-40, and total uranium were prepared beyond the five-day holding time for unpreserved samples; therefore, the

results for these analytes were qualified as estimated, "J," for detects and, "UJ," for nondetects. All remaining aliquots were prepared within the five-day holding time for unpreserved samples.

- Calibration: The laboratory calibration information included the standard certificates and applicable preparation/dilutions logs for NIST-traceability.

  The gross alpha detector efficiency was less than 20%; therefore, nondetected gross alpha in the sample was qualified as estimated, "UJ." The gross beta detector efficiency was greater than 20%.

  The tritium aliquot was spiked for efficiency determination; therefore, no calibration was necessary. The tritium detector efficiency for the sample was at least 20% and was considered acceptable. The strontium, radium-226, and radium-228 chemical yields were considered acceptable. The gamma spectroscopy analytes were determined at the maximum photopeak energy. The kinetic phosphorescence analyzer (KPA) was calibrated immediately prior to the sample analysis. All KPA calibration check standard recoveries were within 90-110% and were deemed acceptable.

- Blanks: There were no analytes detected in the method blanks.

- Blank Spikes and Laboratory Control Samples: The recoveries and the strontium-90, radium-226, and radium-228 RPDs were within laboratory-established control limits.

- Laboratory Duplicates: No laboratory duplicate analyses were performed on the sample in this SDG.

- Matrix Spike/Matrix Spike Duplicate: No matrix spike or MS/MSD analyses were performed on the sample in this SDG. Method accuracy and precision, when applicable, were evaluated based on LCS results.

- Sample Result Verification: An EPA Level IV review was performed for the sample in this data package. The sample results and MDAs reported on the sample result form were verified against the raw data and no calculation or transcription errors were noted. Total uranium, normally reported in aqueous units, was converted to pCi/L using a conversion factor for naturally occurring uranium. Detects reported below the reporting limit were qualified as estimated, "J," and coded with "DNQ," in order to comply with the NPDES permit. Reported nondetects are valid to the MDA.

  The reviewer noted that the total uncertainty for potassium-40 was more than an order of magnitude larger than usually reported for site samples. The laboratory attributed this high uncertainty to a very low sample count and a slightly high background count.

- Field QC Samples: Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC

data. Any remaining detects were used to evaluate the associated site samples. Following are findings associated with field QC samples:

- Field Blanks and Equipment Rinsates: This SDG had no identified field blank or equipment rinsate samples.

- Field Duplicates: There were no field duplicate samples identified for this SDG.

Sample ID:	ISB1808-01 Outfall 004			EPA Method 1613
Client Data		**Sample Data**		**Laboratory Data**
Name:	Test America-Irvine, CA	Matrix:	Aqueous	Lab Sample: 31444-001
Project:	ISB1808	Sample Size:	0.970 L	QC Batch No.: 1907
Date Collected:	16-Feb-09			Date Analyzed DB-5: 25-Feb-09
Time Collected:	1200			

Date Received: 18-Feb-09
Date Extracted: 21-Feb-09
Date Analyzed DB-225: NA

Analyte	Conc. (ug/L)	DL [a]	EMPC[b]	Qualifiers
2,3,7,8-TCDD	ND U	0.000000446		
1,2,3,7,8-PeCDD	ND	0.000000838		
1,2,3,4,7,8-HxCDD	ND	0.00000132		
1,2,3,6,7,8-HxCDD	ND	0.00000127		
1,2,3,7,8,9-HxCDD	ND	0.00000125		
1,2,3,4,6,7,8-HpCDD	0.0000312			
OCDD	0.000488			
2,3,7,8-TCDF	ND U	0.000000350		
1,2,3,7,8-PeCDF	ND	0.000000487		
2,3,4,7,8-PeCDF	ND	0.000000475		
1,2,3,4,7,8-HxCDF	ND	0.000000604		
1,2,3,6,7,8-HxCDF	ND	0.000000662		
2,3,4,6,7,8-HxCDF	ND	0.000000716		
1,2,3,7,8,9-HxCDF	ND	0.00000103		
1,2,3,4,6,7,8-HpCDF	0.00000419 J/DNQ			J
1,2,3,4,7,8,9-HpCDF	ND U	0.00000142		
OCDF	0.0000147 J/DNQ			J

	Labeled Standard	%R	LCL-UCL[d]	Qualifiers
IS	13C-2,3,7,8-TCDD	90.3	25 - 164	
	13C-1,2,3,7,8-PeCDD	82.1	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	86.9	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	82.1	28 - 130	
	13C-1,2,3,4,6,7,8-HpCDD	76.8	23 - 140	
	13C-OCDD	62.6	17 - 157	
	13C-2,3,7,8-TCDF	99.2	24 - 169	
	13C-1,2,3,7,8-PeCDF	88.4	24 - 185	
	13C-2,3,4,7,8-PeCDF	85.1	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	90.6	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	80.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	87.3	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	81.8	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	77.1	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	76.6	26 - 138	
	13C-OCDF	62.4	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	91.2	35 - 197	

Totals				
Total TCDD	ND U	0.000000446		
Total PeCDD	ND U	0.000000838		
Total HxCDD	0.00000395 J/DNQ			
Total HpCDD	0.0000610			
Total TCDF	ND U	0.000000350		
Total PeCDF	ND U	0.000000481		
Total HxCDF	0.00000393 J/DNQ			
Total HpCDF	0.00000419 J/DNQ		0.0000159	

Footnotes

a. Sample specific estimated detection limit.
b. Estimated maximum possible concentration.
c. Method detection limit.
d. Lower control limit - upper control limit.

Analyst: JMH

Approved By: Martha M. Maier 07-Mar-2009 08:13

LEVEL IV

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

MWH-Pasadena/Boeing
618 Michillinda Avenue, Suite 200
Arcadia, CA 91007
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: ISB1808

Sampled: 02/16/09
Received: 02/16/09

MCAWW 245.1

Analyte	Method	Batch	MDL Limit	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: ISB1808-01 (Outfall 004 - Water) - cont.									
Reporting Units: ug/L									
Mercury J/DNQ	MCAWW 245.1	9050174	0.027	0.2	**0.034**	1	02/19/09	02/19/09	J

LEVEL IV

TestAmerica Irvine

Joseph Doak
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

MWH-Pasadena/Boeing
618 Michillinda Avenue, Suite 200
Arcadia, CA 91007
Attention: Bronwyn Kelly

Project ID: Routine Outfall 004
Report Number: ISB1808

Sampled: 02/16/09
Received: 02/16/09

MCAWW 245.1-DISS

Analyte	Method	Batch	MDL	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: ISB1808-01 (Outfall 004 - Water) - cont.									
Reporting Units: ug/L									
Mercury	MCAWW 245.1-DISS	9050182	0.027	0.2	ND	1	02/19/09	02/19/09	

LEVEL IV

TestAmerica Irvine

Joseph Doak
Project Manager

TestAmerica Irvine

Client Sample ID: ISB1808-01

Radiochemistry

Outfall 004

Lab Sample ID: F9B180228-001
Work Order: K7DJ5
Matrix: WATER

Date Collected: 02/16/09 1200
Date Received: 02/18/09 0930

Parameter	Result	Qual	Total Uncert. (2 σ+/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by EPA 901.1 MOD				pCi/L	Batch # 9058211		Yld %
Cesium 137 UJ/H	1.1	U	7.0	20.0	13	02/27/09	03/15/09
Potassium 40 ↓ ↓	-90	U	3400		200	02/27/09	03/15/09
Gross Alpha/Beta EPA 900				pCi/L	Batch # 9050133		Yld %
Gross Alpha UJ/H, C	1.4	U	1.1	3.0	1.6	02/24/09	03/04/09
Gross Beta J/H	**7.2**		**1.2**	4.0	**1.1**	**02/24/09**	**03/04/09**
Radium 226 by EPA 903.0 MOD				pCi/L	Batch # 9049439		Yld % 91
Radium (226) J/DNQ	**0.17**	**J**	**0.12**	1.00	**0.17**	**02/18/09**	**03/13/09**
Radium 228 by GFPC EPA 904 MOD				pCi/L	Batch # 9049441		Yld % 80
Radium 228 U	0.14	U	0.31	1.00	0.52	02/18/09	03/13/09
TRITIUM (Distill) by EPA 906.0 MOD				pCi/L	Batch # 9066052		Yld %
Tritium U	-10	U	170	500	310	03/07/09	03/13/09
SR-90 BY GFPC EPA-905 MOD				pCi/L	Batch # 9049442		Yld % 68
Strontium 90 U	0.14	U	0.25	3.00	0.43	02/18/09	02/28/09
Total Uranium by KPA ASTM 5174-91				pCi/L	Batch # 9050413		Yld %
Total Uranium J/DNQ,H	**0.594**	**J**	**0.071**	0.677	**0.21**	**02/19/09**	**03/08/09**

LEVEL IV

NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.
Bold results are greater than the MDC.

J Result is greater than sample detection limit but less than stated reporting limit.
U Result is less than the sample detection limit.