

LABORATORY DATA CONSULTANTS, INC.

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Northgate Environmental Management, Inc.

June 25, 2010

1100 Quail Street Ste. 102 Newport Beach, CA 92660 ATTN: Ms. Cindy Arnold

SUBJECT: Tronox LLC Facility, PCS, Henderson, Nevada,

Data Validation

Dear Ms. Arnold,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on June 15, 2010. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 23367:

SDG#

Fraction

G0E030473, G0E170470, G0E200430 Dioxins/Dibenzofurans

The data validation was performed under Stage 2B/4 guidelines. The analyses were validated using the following documents, as applicable to each method:

- Standard Operating Procedures (SOP) 40, Data Review/Validation, BRC 2009
- Quality Assurance Project Plan Tronox LLC Facility, Henderson Nevada, June 2009
- NDEP Guidance, May 2006
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Diobenzofurans Data Review, September 2005

Please feel free to contact us if you have any questions.

Sincerely,

Erlinda T. Rauto

E Rauto

Operations Manager/Senior Chemist

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LDC #: <u>23367</u> SDG #: <u>G0E030473, G0E170470, G0E200430</u> Page: 1 of 1 Reviewer: JE 2nd Reviewer: BC

Tronox Northgate Henderson Worksheet

EDD Area	Yes	No	NA	Findings/Comments
I. Completeness	4 3 3 4 3			
Is there an EDD for the associated Tronox validation report?	X			
II. EDD Qualifier Population		ŀ		4 77 1 4 7 M M 42003 2
Were all qualifiers from the validation report populated into the EDD?	X			
III. EDD Lab Anomalies	Tree-			
Were EDD anomalies identified?		X		
If yes, were they corrected or documented for the client?			X	See EDD_discrepancy_ form_LDC23367_062410.doc
IV. EDD Delivery	(6) 4条数		9,8 1.	
Was the final EDD sent to the client?	X			

Tronox LLC Facility, PCS, Henderson, Nevada Data Validation Reports LDC #23367

Dioxins/Dibenzofurans



Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date:

April 30, 2010

LDC Report Date:

June 22, 2010

Matrix:

Water

Parameters:

Dioxins/Dibenzofurans

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): G0E030473

Sample Identification

EB-04302010-RZB 01:18PM EB-04302010-RZB 08:10AM

EB-04302010-RZD

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8290 for Polychlorinated Dioxins/Dibenzofurans.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
0127403MB	5/7/10	1,2,3,4,6,7,8-HpCDD OCDD	0.63 pg/L 2.0 pg/L	All samples in SDG G0E030473

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
EB-04302010-RZB 01:18PM	1,2,3,4,6,7,8-HpCDD	2.9 pg/L	2.9U pg/L
EB-04302010-RZB 08:10AM	1,2,3,4,6,7,8-HpCDD	1.2 pg/L	1.2U pg/L
	OCDD	5.7 pg/L	5.7U pg/L
EB-04302010-RZD	1,2,3,4,6,7,8-HpCDD	2.8 pg/L	2.8U pg/L
	OCDD	7.2 pg/L	7.2U pg/L

Samples EB-04302010-RZB 01:18PM, EB-04302010-RZB 08:10AM, and EB-04302010-RZD were identified as equipment blanks. No polychlorinated dioxin/dibenzofuran contaminants were found in these blanks with the following exceptions:

Equipment Blank ID	Sampling Date	Compound	Concentration	Associated Samples
EB-04302010-RZB 01:18PM	4/30/10	1,2,3,6,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF	0.58 pg/L 2.9 pg/L 15 pg/L 5.5 pg/L 3.5 pg/L 7.1 pg/L 7.0 pg/L 2.0 pg/L 0.81 pg/L 20 pg/L 40 pg/L	No associated samples in this SDG
EB-04302010-RZB 08:10AM	4/30/10	1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF	0.67 pg/L 0.46 pg/L 1.2 pg/L 5.7 pg/L 0.91 pg/L 0.78 pg/L 0.44 pg/L 0.85 pg/L 0.74 pg/L 0.68 pg/L 2.0 pg/L	No associated samples in this SDG
EB-04302010-RZD	4/30/10	1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	1.7 pg/L 1.4 pg/L 1.5 pg/L 2.8 pg/L 7.2 pg/L 1.5 pg/L 2.2 pg/L 1.2 pg/L 1.9 pg/L 1.6 pg/L 2.4 pg/L 1.4 pg/L 5.0 pg/L	No associated samples in this SDG

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits.

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG G0E030473	All compounds reported below the PQL.	J (all detects)	А

All compounds reported as EMPC were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG G0E030473	All compounds reported as estimated maximum possible concentration (EMPC).	JK (all detects)	А

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, PCS, Henderson, Nevada Dioxins/Dibenzofurans - Data Qualification Summary - SDG G0E030473

SDG	Sample	Compound	Flag	A or P	Reason (Code)	
G0E030473	EB-04302010-RZB 01:18PM EB-04302010-RZB 08:10AM EB-04302010-RZD	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)	
G0E030473	EB-04302010-RZB 01:18PM EB-04302010-RZB 08:10AM EB-04302010-RZD	All compounds reported as EMPC	JK (all detects)	A	Project Quantitation Limit (k)	

Tronox LLC Facility, PCS, Henderson, Nevada Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG G0E030473

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
G0E030473	EB-04302010-RZB 01:18PM	1,2,3,4,6,7,8-HpCDD	2.9U pg/L	А	bl
G0E030473	EB-04302010-RZB 08:10AM	1,2,3,4,6,7,8-HpCDD OCDD	1.2U pg/L 5.7U pg/L	А	bl
G0E030473	EB-04302010-RZD	1,2,3,4,6,7,8-HpCDD OCDD	2.8U pg/L 7.2U pg/L	А	bl

Tronox LLC Facility, PCS, Henderson, Nevada Dioxins/Dibenzofurans - Equipment Blank Data Qualification Summary - SDG G0E030473

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #: 23367A21	VALIDATION COMPLETENESS WORKSHEET
SDG #: G0E030473	Stage 2B
Laboratory: Test America	
METHOD: HRGC/HRMS Diox	ins/Dibenzofurans (EPA SW 846 Method 8290)

	Date:	4/10
	Page:_	 of
	Reviewer:	9
2nd	Reviewer:	<u></u>
		7

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	1	Sampling dates: 4/30/10
11.	HRGC/HRMS Instrument performance check	4	, ,
111.	Initial calibration	4	
IV.	Routine calibration/IO	A	
V.	Blanks	W	
VI.	Matrix spike/Matrix spike duplicates		cient spiried
VII.	Laboratory control samples	A	205 p
VIII.	Regional quality assurance and quality control	N	\ \
IX.	Internal standards	4	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	√N	All ZMPe regults - JK(K)
XII.	System performance	N	
XIII.	Overall assessment of data	\$	
XIV.	Field duplicates	N	
XV.	Field blanks	$\langle \mathcal{M} \rangle$	28=1,2.3

A = Acceptable Note:

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

M	HPUS				
1	EB-04302010-RZB 01:18PM	11	0 127403 MB	21	31
2	EB-04302010-RZB 08:10AM	12		22	32
3	EB-04302010-RZD	13		23	33
4		14		24	34
5		15		25	35
6		16		26	36
7		17		27	37
8		18		28	38
9		19		29	39
10		20		30	40

Notes:			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dloxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-1CDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HXCDF		
			TOOGH-8,0,1,4,0,2,1	U. Total HpCDD
6. 1,2,3,7,0-PBCDD	g. oceb	L. 1,2,3,6,7,8-HxCDF	3000	
				V. Iotal TCDF
UUUXU-0,1,4,6,3,1,0	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HXCDF	A Total TOD	
100000000000000000000000000000000000000			ממסר ושומר ייי	W. Iotal PecoF
U. 1,4,3,6,7,8-MXCUU	1. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HXCDF	מתריפים ופוסר מ	
000000000000000000000000000000000000000				A. Iotal HXCDF
L: 1,2,3,1,0,3-11XOOO	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HyChh	
			000x: 15:5:	T. Joseph Trock

Notes:

SDG #: Legan LDC#-233/14>

VALIDATION FINDINGS WORKSHEET Blanks

Reviewer:_ 2nd Reviewer: Page:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were all samples associated with a method blank?

Was a method blank analyzed for each matrix?

|V|N Mas the blank contaminated? If yes, please see qualification below. Blank extraction date: |V|N

Sample Identification Associated Samples: 8 2 U 1 0 T ۸ 413WB b x Blank ID 0 d N O Compound Conc. units: #

Blank extraction date:_ Conc. units:

Blank analysis date:

Associated Samples:

_			 					
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	tion							
	Sample Identification							
	S							
	Blank ID							
	Compound							
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CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #:<u>23367A21</u> SDG #:<u>See Cover</u>

VALIDATION FINDINGS WORKSHEET

Field Blanks

Page: $\int_{\mathcal{F}}$ Reviewer: $\int_{\mathcal{F}}$ 2nd Reviewer: $\int_{\mathcal{F}}$

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

|V N N/A Were field blanks identified in this SDG? Blank units: <u>pg/L</u> Associated sample units: <u>p</u>

Sampling date: 4/30/10

Field blank type: (circle one) Field Blank / Rinsate / Other: Ass

Associated Samples: None

Compound	Blank ID			3,	Sample Identification	cation		
	EB-0430	2X						
D	0.58	0.003						
Щ	2.9	0.0145						
ව	15	0.075						
	5.5	0.0275						
Į.	3.5	0.0175						
¥	7.1	0.0355						
	7.0	0.035						
N	2.0	0.01						
Z	0.81	0.004						
0	20	0.1						
Δ.	6.1	0.0305						
σ	40	0.2						
								:
CROI								

SDG #:See Cover LDC #:23367A21

VALIDATION FINDINGS WORKSHEET

Field Blanks

Page:__ Reviewer: 2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Associated sample units:_ Y N/A Were field blanks identified in this SDG? Blank units: pg/L

Field blank type: (circle one) Field Blank / Rinsate / Other: Sampling date: 4/30/10

Associated Samples:

	Blank ID			S	Sample Identification	cation		
EB-04	EB-04302010-RZB (8:10)	2X						
	0.67	0.00335						
	0.46	0.0023						
	1.2	0.006						
	5.7	0.0285						
	0.91	0.00455						
	0.78	0.0039						
	0.44	0.0022						
	0.85	0.00425						
	0.74	0.0037						
	0.68	0.0034						
	2.0	0.01						

SDG #:See Cover LDC #:23367A21

VALIDATION FINDINGS WORKSHEET

Field Blanks

Page: Reviewer: 2nd Reviewer:_

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

b/bd Associated sample units: Y N/A Were field blanks identified in this SDG? Blank units: pg/L

Associated Samples: Field blank type: (circle one) Field Blank / Rinsate / Other: Sampling date: 4/30/10

None

Sample Identification 0.0085 0.0075 0.0075 0.0095 0.007 0.014 0.036 0.011 0.006 0.008 0.012 0.025 0.007 2 EB-04302010-RZD Blank ID 1.5 2.8 1.5 1.7 4. 7.2 2.2 1.9 1.6 2.4 5.0 Compound CROL

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date:

May 14, 2010

LDC Report Date:

June 22, 2010

Matrix:

Soil

Parameters:

Dioxins/Dibenzofurans

Validation Level:

Stage 2B & 4

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): G0E170470

Sample Identification

SSAK5-04-1BPC

SSAK5-03-1BPC**

SSAK4-02-1BPC

SSAK5-04-1BPCMS

SSAK5-04-1BPCMSD

^{**}Indicates sample underwent Stage 4 review

Introduction

This data review covers 5 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8290 for Polychlorinated Dioxins/Dibenzofurans.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Samples indicated by a double asterisk on the front cover underwent a Stage 4 review. A Stage 2B review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by Stage 2B criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The exact mass of 380.9760 of PFK was verified. The static resolving power was at least 10,000 (10% valley definition) for samples on which Stage 4 review was performed. Raw data were not evaluated for the samples reviewed by Stage 2B criteria.

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

The minimum S/N ratio for each target compound was greater than or equal to 2.5 and greater than or equal to 10 for each recovery and internal standard compound for samples on which Stage 4 review was performed. Raw data were not evaluated for the samples reviewed by Stage 2B criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
0140389MB	5/20/10	1,2,3,4,6,7,8-HpCDD OCDD 2,3,7,8-TCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF OCDF	0.092 pg/g 0.37 pg/g 0.098 pg/g 0.065 pg/g 0.045 pg/g 0.042 pg/g 0.037 pg/g 0.092 pg/g 0.14 pg/g	All samples in SDG G0E170470

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified.

Sample FB-04072010-RZD (from SDG G0D090441) was identified as a field blank. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF	0.89 pg/L 1.5 pg/L 2.2 pg/L 8.3 pg/L 1.4 pg/L 1.6 pg/L 1.5 pg/L 1.6 pg/L 1.3 pg/L 1.4 pg/L 4.1 pg/L	All samples in SDG G0E170470

Sample concentrations were compared to concentrations detected in the field blanks as required by the QAPP. No sample data was qualified.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Although the MS/MSD percent recoveries (%R) and relative percent differences (RPD) were not within QC limits for several compounds, the MS or LCS percent recoveries (%R) were within QC limits and no data were qualified.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits with the following exceptions:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
SSAK5-04-1BPC	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	31 (40-135) 29 (40-135) 19 (40-135)	1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	Р
SSAK5-03-1BPC**	¹³ C-OCDD	37 (40-135)	OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	Р
SSAK4-02-1BPC	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	37 (40-135) 36 (40-135) 15 (40-135)	1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	Р

X. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a Stage 4 review was performed. Raw data were not evaluated for the samples reviewed by Stage 2B criteria.

XI. Project Quantitation Limit

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
SSAK4-02-1BPC	2,3,7,8-TCDF 1,2,3,4,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	Р

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG G0E170470	All compounds reported below the PQL.	J (all detects)	А

All compounds reported as EMPC were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG G0E170470	All compounds reported as estimated maximum possible concentration (EMPC).	JK (all detects)	Α

Raw data were not evaluated for the samples reviewed by Stage 2B criteria.

XII. System Performance

The system performance was acceptable for samples on which a Stage 4 review was performed. Raw data were not evaluated for the samples reviewed by Stage 2B criteria.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, PCS, Henderson, Nevada Dioxins/Dibenzofurans - Data Qualification Summary - SDG G0E170470

SDG	Sample	Compound	Flag	A or P	Reason (Code)
G0E170470	SSAK5-04-1BPC SSAK4-02-1BPC	1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R) (i)
G0E170470	SSAK5-03-1BPC**	OCDD	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	Р	Internal standards (%R) (i)
G0E170470	SSAK4-02-1BPC	2,3,7,8-TCDF 1,2,3,4,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects)	Р	Project Quantitation Limit (e)
G0E170470	SSAK5-04-1BPC SSAK5-03-1BPC** SSAK4-02-1BPC	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (sp)
G0E170470	SSAK5-04-1BPC SSAK5-03-1BPC** SSAK4-02-1BPC	All compounds reported as EMPC	JK (all detects)	А	Project Quantitation Limit (k)

Tronox LLC Facility, PCS, Henderson, Nevada Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG G0E170470

No Sample Data Qualified in this SDG

Tronox LLC Facility, PCS, Henderson, Nevada Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG G0E170470

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #: 23367B21	VALIDATION COMPLETENESS WORKSHEET
SDG #: G0E170470	Stage 2B
Laboratory: Test America	
METHOD: HRGC/HRMS Diox	xins/Dibenzofurans (EPA SW 846 Method 8290)

	Date:	9/1/10
	Page:_/ Reviewer:	101/
2nd	Reviewer:	

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	\forall	Sampling dates: SALID
II.	HRGC/HRMS Instrument performance check	4	
111.	Initial calibration	#	
IV.	Routine calibration/ ISO	-A	
V.	Blanks	M	
VI.	Matrix spike/Matrix spike duplicates	au	
VII.	Laboratory control samples	#	109
VIII.	Regional quality assurance and quality control	N,	
IX.	Internal standards	av	
Χ,	Target compound identifications	A	
XI.	Compound quantitation and CRQLs	-SVN	
XII.	System performance	A	
XIII.	Overall assessment of data	\$	
XIV.	Field duplicates	N	
XV.	Field blanks	\sim	FB-04072010-RZD (FODOQOSAI)

A = Acceptable Note:

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate

TB = Trip blank
EB = Equipment blank

Validated Samples:

1	SSAK5-04-1BPC	5	11	0140389MB	21	31	
2	SSAK5-03-1BPC ***		12	,	22	32	
3	SSAK4-02-1BPC		13		23	33	
4	SSAK5-04-1BPCMS		14		24	34	
5	SSAK5-04-1BPCMSD	V	15		25	35	
6			16		26	36	
7			17		27	37	
8			18		28	38	
9			19		29	39	
10			20		30	40	

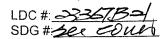
Notes:			
		 ,	

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HXCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	1. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:

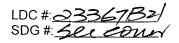


VALIDATION FINDINGS CHECKLIST

Page: / of // Reviewer: // 2nd Reviewer: // // // Page: // Of // Of // Page: // Of // O

Method: Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times		·		
All technical holding times were met.				
Cooler temperature criteria was met.				
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?				
Were the retention time windows established for all homologues?				
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers \leq 25% ?	_			
Is the static resolving power at least 10,000 (10% valley definition)?				
Was the mass resolution adequately check with PFK?				
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?				
III. Initial calibration				
Was the initial calibration performed at 5 concentration levels?				
Were all percent relative standard deviations (%RSD) \leq 20% for unlabeled standards and \leq 30% for labeled standards?				
Did all calibration standards meet the Ion Abundance Ratio criteria?				
Was the signal to noise ratio for each target compound \geq 2.5 and for each recovery and internal standard \geq 10?				
IV. Continuing calibration				
Was a routine calibration performed at the beginning and end of each 12 hour period?		^		
Were all percent differences (%D) \leq 20% for unlabeled standards and \leq 30% for labeled standards?				
Did all routine calibration standards meet the Ion Abundance Ratio criteria?				
V. Blanks				
Was a method blank associated with every sample in this SDG?				
Was a method blank performed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?				
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		_		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VII. Laboratory control samples				
Was an LCS analyzed for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				



VALIDATION FINDINGS CHECKLIST

Page: of 2
Reviewer: 9
2nd Reviewer: 4

				//
VIII. Regional Quality Assurance and Quality Control			,	
Were performance evaluation (PE) samples performed?			1_	
Were the performance evaluation (PE) samples within the acceptance limits?			\perp	1
IX. Internal standards				
Were internal standard recoveries within the 40-135% criteria?	<u> </u>	/	_	
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	/			<u> </u>
X. Target compound identification	1	1	1	1
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?		_		
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?		<u> </u>		
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	/			
Did compound spectra contain all characteristic ions listed in the table attached?	<u> </u>			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?		<u> </u>	ļ	
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	<u> </u>	 		
Does the maximum intensity of each specified characteristic ion coincide within \pm 2 seconds (includes labeled standards)?	1	}		
For PCDF identification, was any signal (S/N \geq 2.5, at \pm seconds RT) detected in the corresponding PCDPE channel?			/	
Was an acceptable lock mass recorded and monitored?				
XI. Compound quantitation/CRQLs	<u> </u>		1 6 6 6 1 7 1	
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?				
XII. System performance				
System performance was found to be acceptable.		<u> </u>		
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.				·
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.				
Target compounds were detected in the field duplicates.				
XV. Field blanks		74 (A) 24 (A) 24 (A)		
Field blanks were identified in this SDG.				
Target compounds were detected in the field blanks.				

SDG #: See Cover LDC #: 23367B21

VALIDATION FINDINGS WORKSHEET **Blanks**

Page: 1 of 1 Reviewer: 2nd Reviewer:

METHOD: HRGC/HRMS Dioxins (EPA Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were all samples associated with a method blank?

Was a method blank performed for each matrix and whenever a sample extraction was performed?

Was the method blank contaminated? If yes, please see qualification below. n date: 5/20/10 Blank analysis date: 5/25/10 A/N N/A

Blank extraction date: 5/20/10

Conc. units: pg/g				sociated sa	Associated samples: All (> 5X)	All (> 5X)		
Compound	Blank ID				Sample	Sample Identification		
	0140389MB	5X						
Щ	0.092	0.46						
9	0.37	1.85						
Τ	0.098	0.49						
¥	0.065	0.325						
	0.045	0.225						
Ψ	0.042	0.21						
Z	0.037	0.185						
0	0.092	0.46						
Ø	0.14	0.7						
						:		

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the method blank concentration were qualified as not detected, "U".

SDG #: See Cover LDC #: 23367B21

VALIDATION FINDINGS WORKSHEET

Field Blanks

2nd Reviewer: Page:_ Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Associated sample units: Y/N N/A Were field blanks identified in this SDG?

Blank units: pg/L Associated sample units
Sampling date: 4/7/10

Associated Samples: Field blank type: (circle one) Field Blank / Rinsate / Other.

All (>5X)

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	ation																
	Sample Identification																
	Ş																
		2X	0.00445	0.0075	0.011	0.0415	0.007	0.008	0.0075	0.008	0.0065	0.007	0.0205				
	Blank ID	FB-04072010-RZD	0.89	1.5	2.2	8.3	1.4	1.6	1.5	1.6	1.3	1.4	4.1				
	Compound																
			U	ш	IL	ဖ	¥		Σ	z	0	۵	Ø				CBO

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORRSHEET

SDG #:42

2nd Reviewer:__ Page: Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

NA

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an

associated MS/MSD. Soil / Water. (YN N/A

Was a MS/MSD analyzed every 20 samples of each matrix? Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

	_	7 -	7	-	-		, . ,														_		
Qualifications	Noteral	1					\	170 818 E															
Associated Samples																							
RPD (Limits)	40 (530)	())		4- (433)	48(535)	53(54S)	()	())	()	(()	()	()		()	(()	()	()	()	
MSD %R (Limits)	()	149 (72-140)	162(72-151)	172 (72-152)	(15-18) =21	226-17-138)	41/25-141)	(()))	()	()	()		()	()	())	(()	()	
MS %R (Limits))))	()	()	153 479-439)	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	
Compound	H	7	Σ	Z	0	4	Ø																
QI QSW/SW	4/5	/																					
Date																							
, n	- 1		- 1		T	T	T				\neg	\neg			一	7					_	\neg	

LDC #: <u>233678</u>7 SDG #2<u>ec 20</u>MM

VALIDATION FINDINGS WORKSHEET

Internal Standards

Reviewer: 2nd Reviewer: 2

Page: Zof

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

| NAM | Are all internal standard recoveries were within the 40-135% criteria?

7	400		Standard Standard		% Recovery (1 imit: 40-135%)	. 40-135%)		Qualifications
ا!	Cale	Lab Librard) (120 126		6-1 A 1 E-A 0-8
)			Ď	100	1	
			<i>+</i> +	.0	29)	\ 	
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			Δ	<u> </u>		((
			+	91))	
			1	5)		//)) (
			H	Ø.	a	/) (N
))	
		Internal Standards	Check Standard Used		1	Internal Standards		Check Standard Used
₹	13C-2,3,7,8-TCDF	CDF		-	13C-OCDD			
ю	느	CDD		X.	¹³ C-1,2,3,4-TCDD			
Ö	<u> </u>	-PeCDF		L.	¹³ C-1,2,3,7,8,9-HxCDD	CDD		
ا ا	<u> </u>	-PeCDD		Σ				
ш	<u> </u>	,8-HxCDF		z				
пŢ		,8-HxCDD		o				
ΰ	13C-1,2,3,4,6,7,8-HpCDF	,7,8-НрСDF		Δİ				
I	_	7.8-HpCDD						

LDC #1282/1824 SDG #1282 COVER

VALIDATION FINDINGS WORKSHEET Compound Quantitation and Reported CRQLs

Page: Ot/ Reviewer: 2nd Reviewer:

METHOD; HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A

Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound? Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

Qualifications	Jaks (e)			(A) A7						
Associated Samples	3			au						
Finding	H. K. O. P. &	,	7	ZMPC LISULTS						
Sample ID	m			al						
Date							0			
*										

Comments: See sample calculation verification worksheet for recalculations

2nd Reviewer:_ Page: Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

RRF = $(A_{\nu})(C_{\mu})/(A_{\mu})(C_{\nu})$ average RRF = sum of the RRFs/number of standards %RSD = 100 * (S/X)

 $A_{\bf k}=$ Area of associated internal standard $C_{\bf k}=$ Concentration of internal standard X= Mean of the RRFs

 $\begin{aligned} A_x &= \text{Area of compound,} \\ C_x &= \text{Concentration of compound,} \\ S &= \text{Standard deviation of the RRFs,} \end{aligned}$

_				Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
*	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Average RRF (initial)	RRF	RRF	CS#%	C 0 0 %
Ŀ	No!	1		/ - '	// 00 /	122		4011e/	dens,
1	1001	1/2/	2,3,7,8-1CDF ("C-2,3,7,8-1CDF)	1.004	1.000	is	1.06	8.10	セイズ
	(405)	01/01/6	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.049	1.049	1.06	1.06	4./2	100
		\	1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	1.163	1.162	1.20	1.50	XX	8/8
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.073	1.073	// //	111	7.66	7.886
			OCDF (4c-OCDD)	1.523	1.523	1.58	1.58	8.42	225
2	1942	0/14/1	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.088	1.088	1.10	1.10	120	1. J
			2,3,7,8-TCDD (13C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)						
			OCDF (1ºC-OCDD)						
9			2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (¹³C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8,-HpCDD)						
			OCDF (**c-OCDD)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.



Routine Calibration Results Verification VALIDATION FINDINGS WORKSHEET

2nd Reviewer: Page:_ Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF RRF = $(A_u)(C_u)/(A_u)(C_v)$

ave. RRF = initial calibration average RRF Where:

RRF = continuing calibration RRF

 $A_x = Area of compound,$ $C_x = Concentration of compound,$

 $A_{\kappa} = Area$ of associated internal standard $C_{\kappa} = Concentration$ of internal standard

L					Reported	Recalculated	Reported	Receivilated	<u></u>
							5000	- Constant	
*		Calibration		Average RRF	RRF	RRF			
*	—	Date	Compound (Reference Internal Standard)	(initial)	(၁၁)	(၁၁)	0%	0%	_
-	234/10405 - Line	1-1-1	2,3,7,8-TCDF (1°C-2,3,7,8-TCDF)	7001	1.08	80.1	7.7	7.1	-
		01/2/10	2,3,7,8-TCDD (13C-2,3,7,8-TCDD)	1.049	1.06	1.06	6.0	D. O	
			1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	1.163	4	4	2.0	N	
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	1.073	1.13	u:	4.9	0,0	
			OCDF ("C-OCDD)	(523)	1.70	1-71	1.6	11.5	
2	出が存	1 holy	2,3,7,8-TCDF (¹³C-2,3,7,8-TCDF)	7001	1.00	100	\$ 1.00	W, W	
	. \	10/5/5	2,3,7,8-TCDD (1°C-2,3,7,8-TCDD)	1049	1.05	1.05	4.0	4.0	
		,	1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)	1.163	55.	1. UV	s.s	2.0	
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)	CT0.	1.16	1.1	イ・イ	7.7	
			OCDF (13C-OCDD)	1.533	1.70	1.70	9:11	- S	
3	26W410BSD	174	2,3,7,8-TCDF (1 ³ C-2,3,7,8-TCDF)	1.088	0.99	660	8	K 80	
		01/2/6	2,3,7,8-TCDD ("C-2,3,7,8-TCDD)						
		_	1,2,3,6,7,8-HxCDD (13C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (13C-1,2,4,6,7,8,-HpCDD)						
			OCDF (3C-OCDD)						

Refer to Routine Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results. Comments:

SDG # LORD COND LDC #: 2334782

Matrix Spike/Matrix Spike Duplicates Results Verification VALIDATION FINDINGS WORKSHEET

Reviewer: Page: Zof

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSR - SR)/SA

SSR = Spiked sample result, SR = Sample result SA = Spike added Where:

MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 4

RPD = I MSR - MSDR I * 2/(MSR + MSDR)

	ďs	ike	Sample	Spiked	Spiked Sample	Matrix Spike	Spike	Matrix Spike Duplicate	e Duplicate	Reported	Recalculated
Compound	₽¥)	Added ()	Concentration (PSA)	Concentrati (PSA)	Concentration (アシ角)	Percent Recovery	Recovery	Percent Recovery	Recovery	RPD	RPD
	SW	MSD	/ ,	MS	MSD	Reported	Recalc	Reported	Recalc	-	
2,3,7,8-TCDD	20.5	7.	0.084	7.72	25.3	(0 88	(08	(19	19	3	€)
1,2,3,7,8-PeCDD	103	901	, S N	5)	122	112	[2]	911	116	5.8	365
1,2,3,4,7,8-HxCDD	-		11.0	= 0	102	113	(13	96	de	<u> </u>	Ŵ
1,2,3,4,7,8,9-HpCDF	1	<i>\</i>	2.6	189	263	53	(52	246	246	49	4
OCDF	Soc	4	21	305	526	140	40	176	240	53	5

Comments: Refer to Matrix Spike/Matrix Spike Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.



Laboratory Control Sample Results Verification VALIDATION FINDINGS WORKSHEET

2nd Reviewer: Reviewer:_

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA

Where: SSC = Spiked sample concentration SA = Spike added

LCS = Laboraotry control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 0/40389

RPD = ILCS - LCSD | * 2/(LCS + LCSD)

			0 701100		80	v	USD I	0	I/SJ1	CS/I CSD
bulloamo	A S	Spike Added	Spirked Sample Concentration	tration	Percent Recovery	ecovery	Percent Recovery	ecovery	RF	RPD
	83	I CSD	1.08	1 CSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
2.3.7.8-TCDD	20.0		1.00	¥	0/1	011				
1.2.3.7.8-PeCDD	100	_	[12		7	112				
12.3.4.7.8-HxCDD	_		20		(09	60				
12.3.4.7.8.9-HpCDF			Ī		112	12				
OCDF	300	-	233		211	7//				
								. —		
						, , , , , , , , , , , , , , , , , , ,				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

	ir		
Analyte	HPCDF HPCDF HPCDF (S) HPCDD HPCDD HPCDD (S) NCDPE PFK	000F 000F 000D 000D 000D (S) 000D (S) D00PE PFK	
Elemental Composition	C ₁₂ H ²⁵ Cl ₃ TClO C ₁₂ H ²⁵ Cl ₃ TClO 1°C ₁₂ H ²⁵ Cl ₃ TClO 1°C ₁₂ H ²⁵ Cl ₃ TClO C ₁₂ H ²⁵ Cl ₃ TClO C ₁₂ H ²⁵ Cl ₃ TClO ₂ 1°C ₁₂ H ²⁵ Cl ₃ TCl ₂ O ₂ 1°C ₁₂ H ²⁵ Cl ₃ TCl ₂ O ₂ C ₁₂ H ²⁵ Cl ₃ TCl ₂ O ₂ C ₁₂ H ²⁵ Cl ₃ TCl ₂ O ₂	C _{1.2} *C _{1.3} *C ₁ O C _{1.2} *C _{1.3} *C _{1.0} C _{1.2} *C _{1.3} *C _{1.0}	
Ol nol	M M M M M M M M M M M M M M M M M M M	M+2 M+4 M+2 M+4 M+4 LOCK	
Accurate Mass ^(a)	407.7818 409.7788 417.8250 429.8220 425.7737 435.8169 437.8140 479.7165 [430.9728]	441.7428 443.7399 457.7377 459.7348 469.7780 471.7750 513.6775	
Descriptor	4	ഗ	
Analyte	TCDF TCDF (8) TCDF (8) TCDD TCDD TCDD (8) TCDD (8) HXCDPE	Pecde Pecde Pecde (S) Pecdd Pecdd Pecdd (S) Pecdd (S) Pecdd (S)	HXCDF HXCDF (S) HXCDF (S) HXCDD HXCDD HXCDD HXCDD (S) HXCDD (S) HXCDD (S) PYCDD (S)
Elemental Composition	C ₁₂ 4,*Cl ₁ O C ₁₂ 4,*Cl ₂ O C ₁₂ 4,*Cl ₃ O	C ₁₂ H ₃ *Cl ₃ 7ClO C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O 1°C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O 1°C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O ₂ 1°C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O ₂ 1°C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O ₂ C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O ₂ C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O ₂ C ₁₂ H ₃ *Cl ₃ 7Cl ₂ O ₂ C ₂ H ₃ *Cl ₃ 7ClO	C ₁₂ H ₂ ² Cl ₃ 7ClO C ₁₂ H ₂ ² Cl ₃ 7Cl ₂ O 13C ₁₂ H ₂ 2Cl ₃ 7Cl ₂ O 13C ₁₂ H ₂ 2Cl ₃ 7ClO C ₁₂ H ₂ 2Cl ₃ 7ClO ₂ O 13C ₁₂ H ₂ 2Cl ₃ 7ClO ₂ O C ₁₂ H ₂ 2Cl ₃ 7ClO ₂ O
Ol nol	M M M M M M M M M M M M M M M M M M M	A A A A A A A A A A A A A A A A A A A	M+2 M+2 M+2 M+2 M+4 M+4 M+4 M+4
Accurate mass ^(s)	303,9016 305,8987 315,9419 317,9389 319,8965 321,8936 331,9368 333,9338 375,8364 [354,9792]	339.8597 341.8567 351.9000 353.8970 355.8546 357.8516 367.8949 369.8919 409.7974 [354.9792]	373.8208 375.8178 383.8639 385.8610 389.8156 391.8127 401.8559 403.8529 445.7555 [430.9728]
Descriptor	-	Ø	ო

(a) The following nuclidic masses were used:

H = 1.007825 O = 15.994915 C = 12.000000 %CI = 34.968853 ¹³C = 13.003355 %CI = 36.965903 F = 18.9984

S = internal/recovery standard

LDC #: 336782 SDG #:Sex = 2 WeV

only.

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: /of /
Reviewer: 2nd reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

/	ĺΥ	N	N/A
			N/A

Were all reported results recalculated and verified for all level IV samples?

Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Example:

Con	centration	$= \frac{(A_{\circ})(I_{\circ})(DF)}{(A_{\circ})(RRF)(V_{\circ})(\%S)}$
A _×	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
l _s	=	Amount of internal standard added in nanograms (ng)
V _o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
RRF	=	Relative Response Factor (average) from the initial calibration
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices

Sample I.D	
Conc. = $(1465-68)(2000)($ 226278000)(1.049)(10.4)6.8 = 1.3^{2} $7=/9$	39)

#	Sample ID	Compound	Reported Concentration ()	Calculated Concentration ()	Qualification

Laboratory Data Consultants, Inc. **Data Validation Report**

Project/Site Name:

Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date:

May 18, 2010

LDC Report Date:

June 22, 2010

Matrix:

Water

Parameters:

Dioxins/Dibenzofurans

Validation Level:

Stage 2B

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): G0E200430

Sample Identification

EB-05182010-RZC

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8290 for Polychlorinated Dioxins/Dibenzofurans.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.
- JK The analytical result is an estimated maximum possible concentration (EMPC).
- X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.
- J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.
- J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.
- J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
0140358MB	5/20/10	1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,7,8-TCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HyCDF OCDF	0.59 pg/L 0.56 pg/L 0.91 pg/L 2.8 pg/L 0.93 pg/L 0.68 pg/L 0.82 pg/L 0.67 pg/L 1.2 pg/L 2.1 pg/L	All samples in SDG G0E200430

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
EB-05182010-RZC	1,2,3,7,8,9-HxCDD	2.7 pg/L	2.7U pg/L

Sample EB-05182010-RZC was identified as an equipment blank. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Compound	Concentration	Associated Samples
EB-05182010-RZC	5/18/10	1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 0CDF	1.8 pg/L 3.0 pg/L 2.7 pg/L 22 pg/L 120 pg/L 9.0 pg/L 9.8 pg/L 6.5 pg/L 19 pg/L 6.5 pg/L 3.9 pg/L 61 pg/L 25 pg/L 150 pg/L	No associated samples in this SDG

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits.

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Project Quantitation Limit

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
All samples in SDG G0E200430	2,3,7,8-TCDF	2nd column confirmation was not performed for this compound.	This compound must be confirmed on the 2nd column per the method.	None	Р

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG G0E200430	All compounds reported below the PQL.	J (all detects)	A

All compounds reported as EMPC were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG G0E200430	All compounds reported as estimated maximum possible concentration (EMPC).	JK (all detects)	Α

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, PCS, Henderson, Nevada Dioxins/Dibenzofurans - Data Qualification Summary - SDG G0E200430

SDG	Sample	Compound	Flag	A or P	Reason (Code)
G0E200430	EB-05182010-RZC	2,3,7,8-TCDF	None	Р	Project Quantitation Limit (o)
G0E200430	EB-05182010-RZC	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (sp)
G0E200430	EB-05182010-RZC	All compounds reported as EMPC	JK (all detects)	А	Project Quantitation Limit (k)

Tronox LLC Facility, PCS, Henderson, Nevada Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG G0E200430

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
G0E200430	EB-05182010-RZC	1,2,3,7,8,9-HxCDD	2.7U pg/L	А	bi

Tronox LLC Facility, PCS, Henderson, Nevada Dioxins/Dibenzofurans - Equipment Blank Data Qualification Summary - SDG G0E200430

No Sample Data Qualified in this SDG

Tronox Northgate Henderson VALIDATION COMPLETENESS WORKSHEET

LDC #: 23367C21 SDG #: G0E200430

Stage 2B

Laboratory: Test America

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	8	Sampling dates: 5/18/10
[].	HRGC/HRMS Instrument performance check	4	/ /
III.	Initial calibration	1	
IV.	Routine calibration/IX	\$	
V.	Blanks	w	
VI.	Matrix spike/Matrix spike duplicates	N	cient Derfred
VII.	Laboratory control samples	A	1CS \$
VIII.	Regional quality assurance and quality control	N	1
IX.	Internal standards	A-	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	SW	All ZMPC - VE(K)
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	W	ZB = 1

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

1	EB-05182010-RZC W	11	0140358MB	21	31	
2		12		22	32	
3		13		23	33	
4		14		24	34	
5		15		25	35	
6		16		26	36	
7		17		27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	

Notes:			

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

1				
A: 2,3,7,8-1 CDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HXCDF	P. 1234789-HeCDE	
7 7 7 7 A A			000000000000000000000000000000000000000	o. Iotal HpCDD
000000000000000000000000000000000000000	e. Ochb	L. 1,2,3,6,7,8-HxCDF	0,000	100+1+0+
1				V. 10tal 1001
C. 1,2,3,4,7,8+HXCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HXCDF	R Total TCDD	100
				W. lotal PecuF
U. 1,2,3,6,7,8-HxCDD	1. 1,2,3,7,8-PeCDF	明してくれるのとなって、スー		
			S. Total Pecino	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	1 2 3 4 7 8. DeCDE			
		O. 1,4,6,4,6,7,8-HPCDF	T. Total HxCDD	\ Total Haccor

Notes:

SDG #: See Cover LDC #: 23367C21

VALIDATION FINDINGS WORKSHEET Blanks

Page: 1 of 1 Reviewer: 4 2nd Reviewer:__

METHOD: HRGC/HRMS Dioxins (EPA Method 8290)

Phease see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were all samples associated with a method blank?

Was a method blank performed for each matrix and whenever a sample extraction was performed?

Was the method blank contaminated? If yes, please see qualification below. Y N N/A N/A N/A N/A

Blank analysis date: 5/23/10 Blank extraction date: 5/20/10

Sample Identification All (bl) NX Associated samples: 2.7/∪ 2.95 4.55 4.65 3.35 10.5 2.8 3.4 젉 7 4.1 9 0140358MB Blank ID 0.56 0.590.93 0.68 0.91 0.82 0.67 2.8 1.2 2.1 Compound Conc. units: pg/L Ω ≥ 0

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the method blank concentration were qualified as not detected, "U".

SDG #: See Cover LDC #:23367C21

VALIDATION FINDINGS WORKSHEET

Field Blanks

2nd Reviewer: Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Associated sample units: | Y N N/A Were field blanks identified in this SDG? | Blank units: pg/L Associated sample units Sampling date: 5/18/10

Associated Samples: Field blank type: (circle one) Field Blank / Rinsate / Other.

None

Compound	Blank ID			Sample Id	Sample Identification		
	EB-05182010-RZC	5X					
O	1.8	0.009					
D	3.0	0.015					
Ш	2.7	0.0135					
Ш	22	0.11					
9	120	9.0					
I	9.0	0.045					
	9.8	0.049					
ſ	6.5	0.0325			:		
×	28	0.14					
	19	0.095					
Σ	6.5	0.0325					
Z	3.9	0.0195					
0	61	0.305					
Δ.	25	0.125					
O	150	0.75					
CROL							

Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U". CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

100 #:33367CZJ 80G #:266CZJVOJ

VALIDATION FINDINGS WORKSHEET Compound Quantitation and Reported CRQLs

Page: of Reviewer:

2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

A Z Z Z

Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound? Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

Qualifications	Noke	7		(下)オフ					
Associated Samples				AN					
Finding	No 2, 2, 5, 5, 120F	Confirmation,		2UPC REWAS					
Sample ID	411			M					
Date						0			
*									

Comments: See sample calculation verification worksheet for recalculations