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

December 29, 2009

SUBJECT: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada, Data Validation

Dear Ms. Arnold,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 2, 2009. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 22193:

SDG #	Fraction
G9J150241, G9K190437	Polychlorinated Biphenyls as Congeners, Dioxins/Dibenzofurans, Perchlorate

The data validation was performed under Stage 2B 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 Polychlorinated Dioxins/Diobenzofurans Data Review, September 2005
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004

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

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist

Attachment 1

Stage 2B/4

LDC #22193 (Tronox LLC-Northgate, Henderson NV / Tronox Phase B 2009)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PCB Cong. (1668A)		Dioxins (8290)		CLO_4 (314.0)																											
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	G9J150241	12/02/09	12/23/09	0	4	1	16	-	-																										
B	G9K190437	12/02/09	12/23/09	-	-	-	-	12	0																										
Total	T/LR			0	4	1	16	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

Tronox LLC Facility, 2009 Phase B Investigation
Henderson, Nevada
Data Validation Reports
LDC# 22193

Polychlorinated Biphenyls as Congeners

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada

Collection Date: October 20, 2009

LDC Report Date: December 18, 2009

Matrix: Soil

Parameters: Polychlorinated Biphenyls as Congeners

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): G9J150241

Sample Identification

SA33-0.0B
SA33-0.5B
SA33009-0.5B
SA33-33B

Introduction

This data review covers 4 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 1668A for Polychlorinated Biphenyls as Congeners.

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005) as there are no current guidelines for the method stated above.

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 and all criteria were met.

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 35.0% for labeled compounds.

The ion abundance ratios for all compounds 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 30.0% for unlabeled compounds and less than or equal to 50.0% for labeled compounds.

The ion abundance ratios for all compounds were within validation criteria.

V. Blanks

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

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
9302266MB	10/30/09	PCB-1 PCB-3 PCB-5* PCB-8* PCB-11 PCB-16* PCB-17 PCB-18 PCB-19 PCB-20*	0.31 pg/g 0.26 pg/g 2.5 pg/g 2.5 pg/g 9.9 pg/g 2.4 pg/g 1.6 pg/g 3.1 pg/g 0.32 pg/g 4.4 pg/g	All samples in SDG G9J150241

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
9302266MB (continued)	10/30/09	PCB-21*	4.4 pg/g	All samples in SDG G9J150241
		PCB-22	2.2 pg/g	
		PCB-24*	0.34 pg/g	
		PCB-25	0.41 pg/g	
		PCB-26	0.75 pg/g	
		PCB-27*	0.34 pg/g	
		PCB-28	3.9 pg/g	
		PCB-31	3.6 pg/g	
		PCB-32*	2.4 pg/g	
		PCB-33*	4.4 pg/g	
		PCB-37	1.0 pg/g	
		PCB-40	0.96 pg/g	
		PCB-41*	2.6 pg/g	
		PCB-42*	1.2 pg/g	
		PCB-43*	2.2 pg/g	
		PCB-44*	2.6 pg/g	
		PCB-45	0.50 pg/g	
		PCB-46	0.20 pg/g	
		PCB-47*	3.2 pg/g	
		PCB-48*	3.2 pg/g	
		PCB-49*	2.2 pg/g	
		PCB-51	0.34 pg/g	
		PCB-52*	3.0 pg/g	
		PCB-53	0.47 pg/g	
		PCB-54	0.078 pg/g	
		PCB-55	0.13 pg/g	
		PCB-56*	3.3 pg/g	
		PCB-59*	1.2 pg/g	
		PCB-60*	3.3 pg/g	
		PCB-61*	2.1 pg/g	
		PCB-63	0.14 pg/g	
		PCB-64*	2.6 pg/g	
		PCB-66*	2.7 pg/g	
		PCB-67	0.17 pg/g	
		PCB-68*	2.6 pg/g	
		PCB-70	4.1 pg/g	
		PCB-71	1.1 pg/g	
		PCB-73*	3.0 pg/g	
		PCB-74*	2.1 pg/g	
		PCB-75*	3.2 pg/g	
		PCB-76*	2.7 pg/g	
		PCB-80*	2.7 pg/g	
		PCB-82	0.39 pg/g	
		PCB-83	0.097 pg/g	
		PCB-84	0.73 pg/g	
		PCB-85*	0.43 pg/g	
		PCB-86*	2.1 pg/g	
		PCB-87*	2.1 pg/g	
		PCB-89*	2.1 pg/g	
		PCB-90*	2.1 pg/g	
		PCB-91	0.39 pg/g	
		PCB-92	0.46 pg/g	
		PCB-93*	2.3 pg/g	
		PCB-95*	2.3 pg/g	
		PCB-97*	2.1 pg/g	
		PCB-99	0.97 pg/g	
		PCB-101*	2.1 pg/g	
		PCB-104	0.074 pg/g	
		PCB-105*	0.65 pg/g	
		PCB-106*	1.2 pg/g	
		PCB-107/109*	0.15 pg/g	
		PCB-108/107*	0.15 pg/g	
		PCB-109/108*	0.097 pg/g	

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
9302266MB (continued)	10/30/09	PCB-110	2.6 pg/g	All samples in SDG G9J150241
		PCB-111*	2.1 pg/g	
		PCB-114	0.15 pg/g	
		PCB-117*	2.1 pg/g	
		PCB-118*	1.2 pg/g	
		PCB-120*	0.43 pg/g	
		PCB-124	0.059 pg/g	
		PCB-125*	2.1 pg/g	
		PCB-127*	0.65 pg/g	
		PCB-128	0.33 pg/g	
		PCB-129	0.099 pg/g	
		PCB-130	0.15 pg/g	
		PCB-132*	0.66 pg/g	
		PCB-134	0.18 pg/g	
		PCB-135*	0.53 pg/g	
		PCB-136	0.38 pg/g	
		PCB-137	0.10 pg/g	
		PCB-138*	2.5 pg/g	
		PCB-139*	2.2 pg/g	
		PCB-141	0.64 pg/g	
		PCB-144*	0.53 pg/g	
		PCB-146	0.33 pg/g	
		PCB-147	0.060 pg/g	
		PCB-149*	2.2 pg/g	
		PCB-151	0.66 pg/g	
		PCB-153	2.2 pg/g	
		PCB-155	0.12 pg/g	
		PCB-156	0.18 pg/g	
		PCB-157	0.072 pg/g	
		PCB-158*	0.29 pg/g	
		PCB-160*	0.29 pg/g	
		PCB-163*	2.5 pg/g	
		PCB-164*	2.5 pg/g	
		PCB-167	0.12 pg/g	
		PCB-168*	0.66 pg/g	
		PCB-170*	0.75 pg/g	
		PCB-171	0.25 pg/g	
		PCB-174	0.83 pg/g	
		PCB-177	0.47 pg/g	
		PCB-178	0.15 pg/g	
		PCB-179	0.25 pg/g	
		PCB-180	1.4 pg/g	
		PCB-182*	0.54 pg/g	
		PCB-183	0.47 pg/g	
		PCB-187*	0.54 pg/g	
		PCB-190*	0.75 pg/g	
		PCB-194	0.22 pg/g	
		PCB-195	0.11 pg/g	
		PCB-196*	0.33 pg/g	
		PCB-198	0.034 pg/g	
		PCB-199/200	0.036 pg/g	
		PCB-200/201	0.033 pg/g	
		PCB-201/199	0.29 pg/g	
		PCB-202	0.11 pg/g	
		PCB-203*	0.33 pg/g	
		PCB-206	0.051 pg/g	
		PCB-207	0.010 pg/g	
		PCB-209	0.20 pg/g	

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
SA33-0.0B (10X)	PCB-11	61 pg/g	61U pg/g
	PCB-17	36 pg/g	36U pg/g
	PCB-18	94 pg/g	94U pg/g
	PCB-19	13 pg/g	13U pg/g
	PCB-20*	220 pg/g	220U pg/g
	PCB-21*	220 pg/g	220U pg/g
	PCB-33*	220 pg/g	220U pg/g
	PCB-54	2.7 pg/g	2.7U pg/g
SA33-0.5B (10X)	PCB-11	79 pg/g	79U pg/g
	PCB-17	34 pg/g	34U pg/g
	PCB-18	81 pg/g	81U pg/g
	PCB-19	12 pg/g	12U pg/g
	PCB-20*	130 pg/g	130U pg/g
	PCB-21*	130 pg/g	130U pg/g
	PCB-26	35 pg/g	35U pg/g
	PCB-31	110 pg/g	110U pg/g
	PCB-33*	130 pg/g	130U pg/g
	PCB-54	2.1 pg/g	2.1U pg/g
SA33009-0.5B (10X)	PCB-11	56 pg/g	56U pg/g
	PCB-54	2.6 pg/g	2.6U pg/g

Sample	Compound	Reported Concentration	Modified Final Concentration
SA33-33B	PCB-5*	5.2 pg/g	5.2U pg/g
	PCB-8*	5.2 pg/g	5.2U pg/g
	PCB-11	12 pg/g	12U pg/g
	PCB-16*	11 pg/g	11U pg/g
	PCB-17	6.5 pg/g	6.5U pg/g
	PCB-18	9.1 pg/g	9.1U pg/g
	PCB-20*	13 pg/g	13U pg/g
	PCB-21*	13 pg/g	13U pg/g
	PCB-22	7.9 pg/g	7.9U pg/g
	PCB-28	9.4 pg/g	9.4U pg/g
	PCB-31	9.0 pg/g	9.0U pg/g
	PCB-32*	11 pg/g	11U pg/g
	PCB-33*	13 pg/g	13U pg/g
	PCB-41*	6.6 pg/g	6.6U pg/g
	PCB-42*	3.8 pg/g	3.8U pg/g
	PCB-43*	5.2 pg/g	5.2U pg/g
	PCB-44*	6.4 pg/g	6.4U pg/g
	PCB-47*	7.5 pg/g	7.5U pg/g
	PCB-48*	7.5 pg/g	7.5U pg/g
	PCB-49*	5.2 pg/g	5.2U pg/g
	PCB-52*	5.5 pg/g	5.5U pg/g
	PCB-56*	7.8 pg/g	7.8U pg/g
	PCB-59*	3.8 pg/g	3.8U pg/g
	PCB-60*	7.8 pg/g	7.8U pg/g
	PCB-64*	6.6 pg/g	6.6U pg/g
	PCB-66*	4.6 pg/g	4.6U pg/g
	PCB-68*	6.6 pg/g	6.6U pg/g
	PCB-70	7.3 pg/g	7.3U pg/g
	PCB-73*	5.5 pg/g	5.5U pg/g
	PCB-75*	7.5 pg/g	7.5U pg/g
	PCB-76*	4.6 pg/g	4.6U pg/g
	PCB-80*	4.6 pg/g	4.6U pg/g
	PCB-86*	4.5 pg/g	4.5U pg/g
	PCB-87*	4.5 pg/g	4.5U pg/g
	PCB-89*	3.7 pg/g	3.7U pg/g
	PCB-90*	3.7 pg/g	3.7U pg/g
	PCB-93*	4.8 pg/g	4.8U pg/g
	PCB-95*	4.8 pg/g	4.8U pg/g
	PCB-97*	4.5 pg/g	4.5U pg/g
	PCB-101*	3.7 pg/g	3.7U pg/g
	PCB-110	5.9 pg/g	5.9U pg/g
	PCB-111*	4.5 pg/g	4.5U pg/g
	PCB-117*	4.5 pg/g	4.5U pg/g
	PCB-125*	4.5 pg/g	4.5U pg/g
	PCB-138*	5.3 pg/g	5.3U pg/g
	PCB-139*	5.8 pg/g	5.8U pg/g
	PCB-149*	5.8 pg/g	5.8U pg/g
	PCB-153	4.2 pg/g	4.2U pg/g
	PCB-163*	5.3 pg/g	5.3U pg/g
	PCB-164*	5.3 pg/g	5.3U pg/g
	PCB-180	3.5 pg/g	3.5U pg/g

Sample FB082809-SO (from SDG R0904894) was identified as a field blank. No polychlorinated biphenyls as congeners contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB082809-SO	8/28/09	PCB-1	20.6 pg/L	All samples in SDG G9J150241
		PCB-2	15.0 pg/L	
		PCB-3	28.6 pg/L	
		PCB-8	185 pg/L	
		PCB-11	1660 pg/L	
		PCB-19	22.6 pg/L	
		PCB-18+30	150 pg/L	
		PCB-17	82.0 pg/L	
		PCB-16	128 pg/L	
		PCB-32	53.1 pg/L	
		PCB-26+29	34.8 pg/L	
		PCB-31	166 pg/L	
		PCB-20+28	197 pg/L	
		PCB-21+33	125 pg/L	
		PCB-22	78.5 pg/L	
		PCB-37	41.2 pg/L	
		PCB-52	588 pg/L	
		PCB-49+69	148 pg/L	
		PCB-44+47+65	296 pg/L	
		PCB-42	40.7 pg/L	
		PCB-41+71+40	83.4 pg/L	
		PCB-64	84.5 pg/L	
		PCB-70+61+74+76	418 pg/L	
		PCB-66	153 pg/L	
		PCB-56	71.6 pg/L	
		PCB-60	40.6 pg/L	
		PCB-77	37.6 pg/L	
		PCB-95	776 pg/L	
		PCB-88+91	125 pg/L	
		PCB-84	291 pg/L	
		PCB-92	192 pg/L	
		PCB-90+101+113	1180 pg/L	
		PCB-83+99	595 pg/L	
		PCB-86+87+97+109+119+125	879 pg/L	
		PCB-117	23.2 pg/L	
		PCB-85+116	161 pg/L	
		PCB-110+115	1470 pg/L	
		PCB-82	136 pg/L	
		PCB-108+124	54.4 pg/L	
		PCB-107	75.4 pg/L	
		PCB-118	1170 pg/L	
		PCB-105	434 pg/L	
		PCB-136	66.2 pg/L	
		PCB-135+151	151 pg/L	
		PCB-144	28.2 pg/L	
		PCB-147+149	499 pg/L	
		PCB-134	47.5 pg/L	
		PCB-139+140	19.2 pg/L	
		PCB-132	334 pg/L	
		PCB-146	87.3 pg/L	
		PCB-153+168	593 pg/L	
		PCB-141	122 pg/L	
		PCB-130	61.2 pg/L	
		PCB-137	73.3 pg/L	
		PCB-164	57.1 pg/L	
		PCB-129+138+163	1080 pg/L	
		PCB-158	124 pg/L	
		PCB-128+166	211 pg/L	
		PCB-167	58.4 pg/L	
		PCB-156+157	206 pg/L	
		PCB-179	14.8 pg/L	
		PCB-187	51.5 pg/L	
		PCB-183	38.3 pg/L	

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB082809-SO (continued)	8/28/09	PCB-174	71.9 pg/L	All samples in SDG G9J150241
		PCB-177	25.6 pg/L	
		PCB-171+173	24.3 pg/L	
		PCB-180+193	186 pg/L	
		PCB-170	165 pg/L	
		PCB-190	25.4 pg/L	
		PCB-198+199	55.4 pg/L	
		PCB-203	38.4 pg/L	
		PCB-194	46.7 pg/L	
		PCB-208	31.7 pg/L	
		PCB-206	83.4 pg/L	
		PCB-209	56.6 pg/L	
		Total MonoCB	64.3 pg/L	
		Total DiCB	1840 pg/L	
		Total TriCB	1080 pg/L	
		Total TetraCB	1960 pg/L	
		Total PentaCB	6630 pg/L	
		Total HexaCB	3820 pg/L	
		Total HeptaCB	602 pg/L	
		Total OctaCB	140 pg/L	
		Total NonaCB	115 pg/L	

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

Sample	Compound	Reported Concentration	Modified Final Concentration
SA33-33B	PCB-90+101+113	3.7 pg/g	3.7U pg/g
	PCB-110+115	5.9 pg/g	5.9U pg/g
	PCB-129+138+163	5.3 pg/g	5.3U pg/g

*Co-eluting isomer

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

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 percent recoveries (%R) were within QC limits.

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Project Quantitation Limit

All project quantitation limits were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
SA33-0.0B	PCB-138 PCB-139 PCB-149 PCB-153 PCB-163 PCB-164 PCB-170 PCB-174 PCB-180 PCB-182 PCB-187 PCB-190 PCB-196 PCB-203 PCB-207 PCB-209	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P
SA33-0.5B	PCB-138 PCB-139 PCB-141 PCB-149 PCB-153 PCB-163 PCB-164 PCB-170 PCB-174 PCB-180 PCB-182 PCB-187 PCB-190 PCB-194 PCB-196 PCB-203 PCB-206 PCB-207 PCB-208 PCB-209	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

Sample	Compound	Finding	Criteria	Flag	A or P
SA33009-0.5B	PCB-138 PCB-139 PCB-149 PCB-153 PCB-163 PCB-164 PCB-174 PCB-180 PCB-182 PCB-187 PCB-196 PCB-203 PCB-206 PCB-207 PCB-209	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG G9J150241	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 G9J150241	All compounds reported as estimated maximum possible concentration (EMPC).	JK (all detects)	A

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

Samples SA33-0.5B and SA33009-0.5B were identified as field duplicates. No polychlorinated biphenyls as congeners were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-1	57	45	-	12 (≤200)	-	-
PCB-2	110	68	-	42 (≤200)	-	-
PCB-3	170	96	-	74 (≤200)	-	-
PCB-5*	220	270	-	50 (≤200)	-	-
PCB-6	73	69	-	4 (≤200)	-	-
PCB-7*	50	200U	-	150 (≤200)	-	-
PCB-8*	220	270	-	50 (≤200)	-	-
PCB-9*	50	200U	-	150 (≤200)	-	-
PCB-11	79	56	-	23 (≤200)	-	-
PCB-12*	220	150	-	70 (≤200)	-	-
PCB-13*	220	150	-	70 (≤200)	-	-
PCB-15	660	540	-	120 (≤200)	-	-
PCB-16*	170	360	-	190 (≤200)	-	-
PCB-17	34	140	-	106 (≤200)	-	-
PCB-18	81	290	-	209 (≤200)	J (all detects)	A
PCB-19	12	28	-	16 (≤200)	-	-
PCB-20*	130	320	-	190 (≤200)	-	-
PCB-21*	130	320	-	190 (≤200)	-	-
PCB-22	150	310	-	160 (≤200)	-	-
PCB-23	9.6	8.4	-	1.2 (≤200)	-	-
PCB-24*	36	59	-	23 (≤200)	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-25	29	43	-	14 (≤200)	-	-
PCB-26	35	76	-	41 (≤200)	-	-
PCB-27*	36	59	-	23 (≤200)	-	-
PCB-28	350	670	-	320 (≤200)	J (all detects)	A
PCB-29	11	11	-	0 (≤200)	-	-
PCB-30	5.2	5.8	-	0.6 (≤200)	-	-
PCB-31	110	390	-	280 (≤200)	J (all detects)	A
PCB-32*	170	360	-	190 (≤200)	-	-
PCB-33*	130	320	-	190 (≤200)	-	-
PCB-34	17	17	-	0 (≤200)	-	-
PCB-35	91	69	-	22 (≤200)	-	-
PCB-36	55	44	-	11 (≤200)	-	-
PCB-37	470	520	-	50 (≤200)	-	-
PCB-38	20	20	-	0 (≤200)	-	-
PCB-39	66	58	-	8 (≤200)	-	-
PCB-40	260	270	-	10 (≤200)	-	-
PCB-41*	1000	1100	-	100 (≤200)	-	-
PCB-42*	290	350	-	60 (≤200)	-	-
PCB-43*	590	770	-	180 (≤200)	-	-
PCB-44	900	1000	-	100 (≤200)	-	-
PCB-45	98	120	-	22 (≤200)	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-46	53	58	-	5 (≤200)	-	-
PCB-47*	410	460	-	50 (≤200)	-	-
PCB-48*	410	460	-	50 (≤200)	-	-
PCB-49*	590	770	-	180 (≤200)	-	-
PCB-50	13	14	-	1 (≤200)	-	-
PCB-51	51	54	-	3 (≤200)	-	-
PCB-52*	1500	1700	13 (≤50)	-	-	-
PCB-53	150	180	-	30 (≤200)	-	-
PCB-54	2.1	2.6	-	0.5 (≤200)	-	-
PCB-55	140	97	-	43 (≤200)	-	-
PCB-56*	920	1100	-	180 (≤200)	-	-
PCB-58	68	53	-	15 (≤200)	-	-
PCB-59*	290	350	-	60 (≤200)	-	-
PCB-60*	920	1100	-	180 (≤200)	-	-
PCB-61*	480	610	-	130 (≤200)	-	-
PCB-62	87	68	-	19 (≤200)	-	-
PCB-63	80	78	-	2 (≤200)	-	-
PCB-64*	1000	1100	-	100 (≤200)	-	-
PCB-65	21	19	-	2 (≤200)	-	-
PCB-66*	830	960	-	130 (≤200)	-	-
PCB-67	82	58	-	34 (≤200)	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-68*	1000	1100	-	100 (≤200)	-	-
PCB-70	1100	1500	31 (≤50)	-	-	-
PCB-71	360	340	-	20 (≤200)	-	-
PCB-72	160	130	-	30 (≤200)	-	-
PCB-73*	1500	1700	13 (≤50)	-	-	-
PCB-74*	480	610	-	130 (≤200)	-	-
PCB-75*	410	460	-	50 (≤200)	-	-
PCB-76*	830	960	-	130 (≤200)	-	-
PCB-78	63	36	-	27 (≤200)	-	-
PCB-79	230	150	-	80 (≤200)	-	-
PCB-80*	830	960	-	130 (≤200)	-	-
PCB-82	1100	880	-	220 (≤200)	J (all detects)	A
PCB-83*	690	480	-	210 (≤200)	J (all detects)	A
PCB-84	1000	870	-	130 (≤200)	-	-
PCB-85*	1800	1300	32 (≤50)	-	-	-
PCB-86*	5100	4400	15 (≤50)	-	-	-
PCB-87*	5100	4400	15 (≤50)	-	-	-
PCB-88*	350	250	-	100 (≤200)	-	-
PCB-89*	5800	4700	21 (≤50)	-	-	-
PCB-90*	5800	4700	21 (≤50)	-	-	-
PCB-91	630	550	-	80 (≤200)	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-92	1500	1100	31 (≤50)	-	-	-
PCB-93*	6800	5300	25 (≤50)	-	-	-
PCB-95*	6800	5300	25 (≤50)	-	-	-
PCB-97*	5100	4400	15 (≤50)	-	-	-
PCB-98*	190	180	-	10 (≤200)	-	-
PCB-99	1900	1600	17 (≤50)	-	-	-
PCB-100	200U	110	-	90 (≤200)	-	-
PCB-101*	5800	4700	21 (≤50)	-	-	-
PCB-102*	190	180	-	10 (≤200)	-	-
PCB-103	150	110	-	40 (≤200)	-	-
PCB-104	20	16	-	4 (≤200)	-	-
PCB-105*	1700	1500	13 (≤50)	-	-	-
PCB-106*	2500	2300	8 (≤50)	-	-	-
PCB-107/109*	900	660	-	240 (≤200)	J (all detects)	A
PCB-108/107*	900	660	-	240 (≤200)	J (all detects)	A
PCB-109/108*	690	480	-	210 (≤200)	J (all detects)	A
PCB-110	8700	6800	25 (≤50)	-	-	-
PCB-111*	5100	4400	15 (≤50)	-	-	-
PCB-113	200U	100	-	100 (≤200)	-	-
PCB-114	170	130	-	40 (≤77)	-	-
PCB-117*	5100	4400	15 (≤50)	-	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-118*	2500	2300	8 (≤50)	-	-	-
PCB-119	120	120	-	0 (≤200)	-	-
PCB-120*	1800	1300	32 (≤50)	-	-	-
PCB-121*	350	250	-	100 (≤200)	-	-
PCB-122	170	130	-	40 (≤200)	-	-
PCB-124	450	340	-	110 (≤200)	-	-
PCB-125*	5100	4400	15 (≤50)	-	-	-
PCB-126	250	160	-	90 (≤110)	-	-
PCB-127*	1700	1500	13 (≤50)	-	-	-
PCB-128	3100	2100	38 (≤50)	-	-	-
PCB-129	1500	1000	-	500 (≤200)	-	-
PCB-130	1800	1200	40 (≤50)	-	-	-
PCB-131*	630	470	-	160 (≤200)	-	-
PCB-132*	8900	5700	44 (≤50)	-	-	-
PCB-133	550	370	-	180 (≤200)	-	-
PCB-134	1600	960	-	640 (≤200)	J (all detects)	A
PCB-135*	6900	4600	40 (≤50)	-	-	-
PCB-136	3700	2700	31 (≤50)	-	-	-
PCB-137	530	370	-	160 (≤200)	-	-
PCB-138*	28000	18000	43 (≤50)	-	-	-
PCB-139*	31000	22000	34 (≤50)	-	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-140	300	190	-	110 (≤200)	-	-
PCB-141	11000	6900	46 (≤50)	-	-	-
PCB-142*	630	470	-	160 (≤200)	-	-
PCB-144*	6900	4600	40 (≤50)	-	-	-
PCB-145	96	61	-	35 (≤200)	-	-
PCB-146	6000	3800	45 (≤50)	-	-	-
PCB-147	430	300	-	130 (≤200)	-	-
PCB-148	420	260	-	160 (≤200)	-	-
PCB-149*	31000	22000	34 (≤50)	-	-	-
PCB-150	290	190	-	100 (≤200)	-	-
PCB-151	9600	6600	37 (≤50)	-	-	-
PCB-152	77	54	-	23 (≤200)	-	-
PCB-153	28000	18000	43 (≤50)	-	-	-
PCB-154	660	410	-	250 (≤200)	J (all detects)	A
PCB-155	160	110	-	50 (≤200)	-	-
PCB-156	2100	1400	40 (≤50)	-	-	-
PCB-157	440	280	44 (≤50)	-	-	-
PCB-158*	3900	3700	5 (≤50)	-	-	-
PCB-159	1100	660	50 (≤50)	-	-	-
PCB-160*	3900	2700	36 (≤50)	-	-	-
PCB-161	280	160	-	120 (≤200)	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-162	780	470	-	310 (≤200)	J (all detects)	A
PCB-163*	28000	18000	43 (≤50)	-	-	-
PCB-164*	28000	18000	43 (≤50)	-	-	-
PCB-165*	630	470	-	160 (≤200)	-	-
PCB-166	220	160	-	60 (≤200)	-	-
PCB-167	1200	670	57 (≤50)	-	J (all detects)	A
PCB-168*	8900	5700	44 (≤50)	-	-	-
PCB-169	120	62	-	58 (≤73)	-	-
PCB-170*	16000	9800	48 (≤50)	-	-	-
PCB-171	4300	3400	23 (≤50)	-	-	-
PCB-172*	4300	3200	29 (≤50)	-	-	-
PCB-173	460	380	-	80 (≤200)	-	-
PCB-174	19000	15000	24 (≤50)	-	-	-
PCB-175	1600	1300	21 (≤50)	-	-	-
PCB-176	2200	1800	20 (≤50)	-	-	-
PCB-177	9500	7300	26 (≤50)	-	-	-
PCB-178	3600	2900	22 (≤50)	-	-	-
PCB-179	6100	5100	18 (≤50)	-	-	-
PCB-180	36000	23000	44 (≤50)	-	-	-
PCB-182*	15000	10000	40 (≤50)	-	-	-
PCB-183	9700	7400	27 (≤50)	-	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-184	1000	800	-	200 (≤200)	-	-
PCB-185	2600	2100	21 (≤50)	-	-	-
PCB-186	140	120	-	20 (≤200)	-	-
PCB-187*	15000	10000	40 (≤50)	-	-	-
PCB-188	500	340	-	160 (≤200)	-	-
PCB-189	1000	640	44 (≤50)	-	-	-
PCB-190*	16000	9800	48 (≤50)	-	-	-
PCB-191	1100	830	28 (≤50)	-	-	-
PCB-192*	4300	3200	29 (≤50)	-	-	-
PCB-193	2600	1900	31 (≤50)	-	-	-
PCB-194	13000	7700	51 (≤50)	-	J (all detects)	A
PCB-195	3900	2300	52 (≤50)	-	J (all detects)	A
PCB-196*	20000	12000	50 (≤50)	-	-	-
PCB-197	3700	2100	55 (≤50)	-	J (all detects)	A
PCB-198	2700	1500	57 (≤50)	-	J (all detects)	A
PCB-199/200	2600	1500	54 (≤50)	-	J (all detects)	A
PCB-200/201	4500	3700	20 (≤50)	-	-	-
PCB-201/199	14000	8800	46 (≤50)	-	-	-
PCB-202	2300	1400	49 (≤50)	-	-	-
PCB-203*	20000	12000	50 (≤50)	-	-	-
PCB-204	2200	1200	59 (≤50)	-	J (all detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA33-0.5B	SA33009-0.5B				
PCB-205	2900	1600	58 (≤50)	-	J (all detects)	A
PCB-206	15000	11000	31 (≤50)	-	-	-
PCB-207	22000	14000	44 (≤50)	-	-	-
PCB-208	10000	6500	42 (≤50)	-	-	-
PCB-209	80000	56000	35 (≤50)	-	-	-

*Co-eluting isomer

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Polychlorinated Biphenyls as Congeners - Data Qualification Summary - SDG G9J150241

SDG	Sample	Compound	Flag	A or P	Reason (Code)
G9J150241	SA33-0.0B	PCB-138 PCB-139 PCB-149 PCB-153 PCB-163 PCB-164 PCB-170 PCB-174 PCB-180 PCB-182 PCB-187 PCB-190 PCB-196 PCB-203 PCB-207 PCB-209	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Project Quantitation Limit (e)
G9J150241	SA33-0.5B	PCB-138 PCB-139 PCB-141 PCB-149 PCB-153 PCB-163 PCB-164 PCB-170 PCB-174 PCB-180 PCB-182 PCB-187 PCB-190 PCB-194 PCB-196 PCB-203 PCB-206 PCB-207 PCB-208 PCB-209	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Project Quantitation Limit (e)
G9J150241	SA33009-0.5B	PCB-138 PCB-139 PCB-149 PCB-153 PCB-163 PCB-164 PCB-174 PCB-180 PCB-182 PCB-187 PCB-196 PCB-203 PCB-206 PCB-207 PCB-209	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Project Quantitation Limit (e)

SDG	Sample	Compound	Flag	A or P	Reason (Code)
G9J150241	SA33-0.0B SA33-0.5B SA33009-0.5B SA33-33B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)
G9J150241	SA33-0.0B SA33-0.5B SA33009-0.5B SA33-33B	All compounds reported as EMPC	JK (all detects)	A	Project Quantitation Limit (k)
G9J150241	SA33-0.5B SA33009-0.5B	PCB-18 PCB-28 PCB-31 PCB-82 PCB-83* PCB-107/109* PCB-108/107* PCB-109/108* PCB-134 PCB-154 PCB-162	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference) (fd)
G9J150241	SA33-0.5B SA33009-0.5B	PCB-167 PCB-194 PCB-195 PCB-197 PCB-198 PCB-199/200 PCB-204 PCB-205	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD) (fd)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Polychlorinated Biphenyls as Congeners - Laboratory Blank Data Qualification Summary - SDG G9J150241

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
G9J150241	SA33-0.0B (10X)	PCB-11 PCB-17 PCB-18 PCB-19 PCB-20* PCB-21* PCB-33* PCB-54	61U pg/g 36U pg/g 94U pg/g 13U pg/g 220U pg/g 220U pg/g 220U pg/g 2.7U pg/g	A	bl

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
G9J150241	SA33-0.5B (10X)	PCB-11 PCB-17 PCB-18 PCB-19 PCB-20* PCB-21* PCB-26 PCB-31 PCB-33* PCB-54	79U pg/g 34U pg/g 81U pg/g 12U pg/g 130U pg/g 130U pg/g 35U pg/g 110U pg/g 130U pg/g 2.1U pg/g	A	bl
G9J150241	SA33009-0.5B (10X)	PCB-11 PCB-54	56U pg/g 2.6U pg/g	A	bl

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
G9J150241	SA33-33B	PCB-5*	5.2U pg/g	A	bl
		PCB-8*	5.2U pg/g		
		PCB-11	12U pg/g		
		PCB-16*	11U pg/g		
		PCB-17	6.5U pg/g		
		PCB-18	9.1U pg/g		
		PCB-20*	13U pg/g		
		PCB-21*	13U pg/g		
		PCB-22	7.9U pg/g		
		PCB-28	9.4U pg/g		
		PCB-31	9.0U pg/g		
		PCB-32*	11U pg/g		
		PCB-33*	13U pg/g		
		PCB-41*	6.6U pg/g		
		PCB-42*	3.8U pg/g		
		PCB-43*	5.2U pg/g		
		PCB-44*	6.4U pg/g		
		PCB-47*	7.5U pg/g		
		PCB-48*	7.5U pg/g		
		PCB-49*	5.2U pg/g		
		PCB-52*	5.5U pg/g		
		PCB-56*	7.8U pg/g		
		PCB-59*	3.8U pg/g		
		PCB-60*	7.8U pg/g		
		PCB-64*	6.6U pg/g		
		PCB-66*	4.6U pg/g		
		PCB-68*	6.6U pg/g		
		PCB-70	7.3U pg/g		
		PCB-73*	5.5U pg/g		
		PCB-75*	7.5U pg/g		
		PCB-76*	4.6U pg/g		
		PCB-80*	4.6U pg/g		
		PCB-86*	4.5U pg/g		
		PCB-87*	4.5U pg/g		
		PCB-89*	3.7U pg/g		
		PCB-90*	3.7U pg/g		
		PCB-93*	4.8U pg/g		
		PCB-95*	4.8U pg/g		
		PCB-97*	4.5U pg/g		
		PCB-101*	3.7U pg/g		
		PCB-110	5.9U pg/g		
		PCB-111*	4.5U pg/g		
		PCB-117*	4.5U pg/g		
		PCB-125*	4.5U pg/g		
		PCB-138*	5.3U pg/g		
		PCB-139*	5.8U pg/g		
		PCB-149*	5.8U pg/g		
		PCB-153	4.2U pg/g		
		PCB-163*	5.3U pg/g		
		PCB-164*	5.3U pg/g		
		PCB-180	3.5U pg/g		

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Polychlorinated Biphenyls as Congeners - Field Blank Data Qualification Summary - SDG G9J150241

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
G9J150241	SA33-33B	PCB-90+101+113 PCB-110+115 PCB-129+138+163	3.7U pg/g 5.9U pg/g 5.3U pg/g	A	bf

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
Stage 2B

LDC #: 22193A3c
SDG #: G9J150241
Laboratory: Test America

Date: 12/15/09
Page: 1 of 1
Reviewer: K
2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Biphenyl Congeners (EPA Method 1668A)

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
I.	Technical holding times	A	Sampling dates: 10/20/09
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration/ICV	A	
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	N	client spiked.
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	SW N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 2+3
XV.	Field blanks	SW	FB08=809-SO(F9048944)

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	SA33-0.0B S	11	930266MB	21		31	
2	SA33-0.5B	12		22		32	
3	SA33009-0.5B	13		23		33	
4	SA33-33B	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	

LDC #: 22193A3c
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668)

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

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/30/09 **Blank analysis date:** 11/17/09
Conc. units: pg/g **A/sociated samples:** All

Compound	Blank ID	Sample Identification								
	9302266MB	5X	1 (10X)	2 (10X)	3 (10x)	4		other > 5X		
PCB 1	0.31	1.55								
PCB 3	0.26	1.3								
PCB 5 *	2.5	12.5				5.2/U				
PCB 8 *	2.5	12.5				5.2/U				
PCB 11	9.9	49.5	61/U	79/U	56/U	12/U				
PCB 16 *	2.4	12				11/U				
PCB 17	1.6	8	36/U	34/U		6.5/U				
PCB 18	3.1	15.5	94/U	81/U		9.1/U				
PCB 19	0.32	1.6	13/U	12/U						
PCB 20 *	4.4	22	220/U	130/U		13/U				
PCB 21 *	4.4	22	220/U	130/U		13/U				
PCB 22	2.2	11				7.9/U				
PCB 24 *	0.34	1.7								
PCB 25	0.41	2.05								
PCB 26	0.75	3.75		35/U						
PCB 27 *	0.34	1.7								
PCB 28	3.9	19.5				9.4/U				
PCB 31	3.6	18		110/U		9.0/U				
PCB 32 *	2.4	12				11/U				
PCB 33 *	4.4	22	220/U	130/U		13/U				
PCB 37	1.0	5								

PCB 40	0.96	4.8								
PCB 41 *	2.6	13				6.6/U				
PCB 42 *	1.2	6				3.8/U				
PCB 43 *	2.2	11				5.2/U				
PCB 44 *	2.6	13				6.4/U				
PCB 45	0.50	2.5								
PCB 46	0.20	1								
PCB 47 *	3.2	16				7.5/U				
PCB 48 *	3.2	16				7.5/U				
PCB 49 *	2.2	11				5.2/U				
PCB 51	0.34	1.7								
PCB 52 *	3.0	15				5.5/U				
PCB 53	0.47	2.35								
PCB 54	0.078	0.39	2.7/U	2.1/U	2.6/U					
PCB 55	0.13	0.65								
PCB 56 *	3.3	16.5				7.8/U				
PCB 59 *	1.2	6				3.8/U				
PCB 60 *	3.3	16.5				7.8/U				
PCB 61 *	2.1	10.5								
PCB 63	0.14	0.7								
PCB 64 *	2.6	13				6.6/U				
PCB 66 *	2.7	13.5				4.6/U				
PCB 67	0.17	0.85								
PCB 68 *	2.6	13				6.6/U				
PCB 70	4.1	20.5				7.3/U				
PCB 71	1.1	5.5								
PCB 73 *	3.0	15				5.5/U				
PCB 74 *	2.1	10.5								
PCB 75 *	3.2	16				7.5/U				
PCB 76 *	2.7	13.5				4.6/U				
PCB 80 *	2.7	13.5				4.6/U				

PCB 82	0.39	1.95								
PCB 83	0.097	0.485								
PCB 84	0.73	3.65								
PCB 85 *	0.43	2.15								
PCB 86 *	2.1	10.5				4.5/U				
PCB 87 *	2.1	10.5				4.5/U				
PCB 89 *	2.1	10.5				3.7/U				
PCB 90 *	2.1	10.5				3.7/U				
PCB 91	0.39	1.95								
PCB 92	0.46	2.3								
PCB 93 *	2.3	11.5				4.8/U				
PCB 95 *	2.3	11.5				4.8/U				
PCB 97 *	2.1	10.5				4.5/U				
PCB 99	0.97	4.85								
PCB 101 *	2.1	10.5				3.7/U				
PCB 104	0.074	0.37								
PCB 105 *	0.65	3.25								
PCB 106 *	1.2	6								
PCB 107/109 *	0.15	0.75								
PCB 108/107 *	0.15	0.75								
PCB 109/108 *	0.097	0.485								
PCB 110	2.6	13				5.9/U				
PCB 111 *	2.1	10.5				4.5/U				
PCB 114	0.15	0.75								
PCB 117 *	2.1	10.5				4.5/U				
PCB 118 *	1.2	6								
PCB 120 *	0.43	2.15								
PCB 124	0.059	0.295								
PCB 125 *	2.1	10.5				4.5/U				
PCB 127 *	0.65	3.25								
PCB 128	0.33	1.65								

PCB 129	0.099	0.495								
PCB 130	0.15	0.75								
PCB 132 *	0.66	3.3								
PCB 134	0.18	0.9								
PCB 135 *	0.53	2.65								
PCB 136	0.38	1.9								
PCB 137	0.10	0.5								
PCB 138 *	2.5	12.5				5.3/U				
PCB 139 *	2.2	11				5.8/U				
PCB 141	0.64	3.2								
PCB 144 *	0.53	2.65								
PCB 146	0.33	1.65								
PCB 147	0.060	0.3								
PCB 149 *	2.2	11				5.8/U				
PCB 151	0.66	3.3								
PCB 153	2.2	11				4.2/U				
PCB 155	0.12	0.6								
PCB 156	0.18	0.9								
PCB 157	0.072	0.36								
PCB 158 *	0.29	1.45								
PCB 160 *	0.29	1.45								
PCB 163 *	2.5	12.5				5.3/U				
PCB 164 *	2.5	12.5				5.3/U				
PCB 167	0.12	0.6								
PCB 168 *	0.66	3.3								
PCB 170 *	0.75	3.75								
PCB 171	0.25	1.25								
PCB 174	0.83	4.15								
PCB 177	0.47	2.35								
PCB 178	0.15	0.75								
PCB 179	0.25	1.25								

PCB 180	1.4	7				3.5/U				
PCB 182 *	0.54	2.7								
PCB 183	0.47	2.35								
PCB 187 *	0.54	2.7								
PCB 190 *	0.75	3.75								
PCB 194	0.22	1.1								
PCB 195	0.11	0.55								
PCB 196 *	0.33	1.65								
PCB 198	0.034	0.17								
PCB 199/200	0.036	0.18								
PCB 200/201	0.033	0.165								
PCB 201/199	0.29	1.45								
PCB 202	0.11	0.55								
PCB 203 *	0.33	1.65								
PCB 206	0.051	0.255								
PCB 207	0.010	0.05								
PCB 209	0.20	1								

* Co-eluting isomer

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

LDC #: 22193A3c
SDG #:_____

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page:___of___
Reviewer:_____
2nd Reviewer:_____

METHOD: HRGC/HRMS PCB Congeners (EPA Method 1668)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Blank units: pg/L **Associated sample units:** pg/g
Field blank type: (circle one) Field Blank / Rinsate / Other:_____ Associated Samples: ALL

Compound	Blank ID	Sample Identification								
	FB082809-SO	(5X)	4	ALLs > 5X						
PCB 1	20.6	0.103								
PCB 2	15.0	0.075								
PCB 3	28.6	0.143								
PCB 8	185	0.925								
PCB 11	1660	8.3								
PCB 19	22.6	0.113								
PCBs 18+30	150	0.75								
PCB 17	82.0	0.41								
PCB 16	128	0.64								
PCB 32	53.1	0.2655								
PCBs 26+29	34.8	0.174								
PCB 31	166	0.83								
PCBs 20+28	197	0.985								
PCBs 21+33	125	0.625								
PCB 22	78.5	0.3925								
PCB 37	41.2	0.206								
PCB 52	588	2.94								
PCBs 49+69	148	0.74								
PCBs 44+47+65	296	1.48								
PCB 42	40.7	0.2035								
PCBs 41+71+40	83.4	0.417								
PCB 64	84.5	0.4225								
PCBs 70+61+74+76	418	2.09								

PCB 66	153	0.765								
PCB 56	71.6	0.358								
PCB 60	40.6	0.203								
PCB 77	37.6	0.188								
PCB 95	776	3.88								
PCBs 88+91	125	0.625								
PCB 84	291	1.455								
PCB 92	192	0.96								
PCBs 90+101+113	1180	5.9	3.T/U							
PCBs 83+99	595	2.975								
PCBs 86+87+97+109+119+125	879	4.395								
PCB 117	23.2	0.116								
PCBs 85+116	161	0.805								
PCBs 110+115	1470	7.35	5.9/U							
PCB 82	136	0.68								
PCBs 108+124	54.4	0.272								
PCB 107	75.4	0.377								
PCB 118	1170	5.85								
PCB 105	434	2.17								
PCB 136	66.2	0.331								
PCBs 135+151	151	0.755								
PCB 144	28.2	0.141								
PCBs 147+149	499	2.495								
PCB 134	47.5	0.2375								
PCBs 139+140	19.2	0.096								
PCB 132	334	1.67								
PCB 146	87.3	0.4365								
PCBs 153+168	593	2.965								
PCB 141	122	0.61								
PCB 130	61.2	0.306								

PCB 137	73.3	0.3665								
PCB 164	57.1	0.2855								
PCBs 129+138+163	1080	5.4	5.3/4							
PCB 158	124	0.62								
PCBs 128+166	211	1.055								
PCB 167	58.4	0.292								
PCBs 156+157	206	1.03								
PCB 179	14.8	0.074								
PCB 187	51.5	0.2575								
PCB 183	38.3	0.1915								
PCB 174	71.9	0.3595								
PCB 177	25.6	0.128								
PCBs 171+173	24.3	0.1215								
PCBs 180+193	186	0.93								
PCB 170	165	0.825								
PCB 190	25.4	0.127								
PCBs 198+199	55.4	0.277								
PCB 203	38.4	0.192								
PCB 194	46.7	0.2335								
PCB 208	31.7	0.1585								
PCB 206	83.4	0.417								
PCB 209	56.6	0.283								
Total MonoCB	64.3	0.3215								
Total DiCB	1840	9.2								
Total TriCB	1080	5.4								
Total TetraCB	1960	9.8								
Total PentaCB	6630	33.15								
Total HexaCB	3820	19.1								
Total HeptaCB	602	3.01								
Total OctaCB	140	0.7								

Total NonaCB	115	0.575								

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".

V:\Pei\Tronox\FQC\FB_SO_Area 3.wpd

LDC #: 22193A3C
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: a
2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Biphenyls (EPA Method 1668)

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

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

#	Date	Sample ID	cpds > calib range Finding	Associated Samples	Qualifications
		1	PCB 138. 139. 149. 153. 163. 164		J dets (P le)
			170. 174. 180, 182. 187. 190. 196		
			203. 207. 209		
		2	PCB 138. 139. 141, 149, 153. 163. 164.		
			170, 174. 180, 182. 187. 190, 194, 196		
			203. 206. 207. 208. 209		
		3	PCB 138. 139. 149. 153. 163. 164. 174.		
			180, 182, 187. 196. 203. 206. 207		
			209		
		MI	All 2MPC results (& Hdg)	MI	J K (K)

Comments: See sample calculation verification worksheet for recalculations

LDC#:22193A3c
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 8
Reviewer: CV
2nd Reviewer:

METHOD: HRGC/HRMS PCB Cong (EPA Method 1668A)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 2	Concentration (pg/g) 3	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
PCB 1	57	45		12	(≤200)	
PCB 2	110	68		42	(≤200)	
PCB 3	170	96		74	(≤200)	
PCB 5 *	220	270		50	(≤200)	
PCB 6	73	69		4	(≤200)	
PCB 7 *	50	200U		150	(≤200)	
PCB 8 *	220	270		50	(≤200)	
PCB 9 *	50	200U		150	(≤200)	
PCB 11	79	56		23	(≤200)	
PCB 12 *	220	150		70	(≤200)	
PCB 13 *	220	150		70	(≤200)	
PCB 15	660	540		120	(≤200)	
PCB 16 *	170	360		190	(≤200)	
PCB 17	34	140		106	(≤200)	
PCB 18	81	290		209	(≤200)	Jdets/A (fd)
PCB 19	12	28		16	(≤200)	
PCB 20 *	130	320		190	(≤200)	
PCB 21 *	130	320		190	(≤200)	
PCB 22	150	310		160	(≤200)	
PCB 23	9.6	8.4		1.2	(≤200)	
PCB 24 *	36	59		23	(≤200)	
PCB 25	29	43		14	(≤200)	
PCB 26	35	76		41	(≤200)	
PCB 27 *	36	59		23	(≤200)	
PCB 28	350	670		320	(≤200)	Jdets/A (fd)
PCB 29	11	11		0	(≤200)	
PCB 30	5.2	5.8		0.6	(≤200)	

LDC#:22193A3c
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer: _____

METHOD: HRGC/HRMS PCB Cong (EPA Method 1668A)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g)		(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
	2	3				
PCB 31	110	390		280	(≤200)	Idets/A (1+d)
PCB 32 *	170	360		190	(≤200)	
PCB 33 *	130	320		190	(≤200)	
PCB 34	17	17		0	(≤200)	
PCB 35	91	69		22	(≤200)	
PCB 36	55	44		11	(≤200)	
PCB 37	470	520		50	(≤200)	
PCB 38	20	20		0	(≤200)	
PCB 39	66	58		8	(≤200)	
PCB 40	260	270		10	(≤200)	
PCB 41 *	1000	1100		100	(≤200)	
PCB 42 *	290	350		60	(≤200)	
PCB 43 *	590	770		180	(≤200)	
PCB 44	900	1000		100	(≤200)	
PCB 45	98	120		22	(≤200)	
PCB 46	53	58		5	(≤200)	
PCB 47 *	410	460		50	(≤200)	
PCB 48 *	410	460		50	(≤200)	
PCB 49 *	590	770		180	(≤200)	
PCB 50	13	14		1	(≤200)	
PCB 51	51	54		3	(≤200)	
PCB 52 *	1500	1700	13			
PCB 53	150	180		30	(≤200)	
PCB 54	2.1	2.6		0.5	(≤200)	
PCB 55	140	97		43	(≤200)	
PCB 56 *	920	1100		180	(≤200)	
PCB 58	68	53		15	(≤200)	

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: HRGC/HRMS PCB Cong (EPA Method 1668A)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 2	Concentration (pg/g) 3	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
PCB 59 *	290	350		60	(≤200)	
PCB 60 *	920	1100		180	(≤200)	
PCB 61 *	480	610		130	(≤200)	
PCB 62	87	68		19	(≤200)	
PCB 63	80	78		2	(≤200)	
PCB 64 *	1000	1100		100	(≤200)	
PCB 65	21	19		2	(≤200)	
PCB 66 *	830	960		130	(≤200)	
PCB 67	82	58		34	(≤200)	
PCB 68 *	1000	1100		100	(≤200)	
PCB 70	1100	1500	31			
PCB 71	360	340		20	(≤200)	
PCB 72	160	130		30	(≤200)	
PCB 73 *	1500	1700	13			
PCB 74 *	480	610		130	(≤200)	
PCB 75 *	410	460		50	(≤200)	
PCB 76 *	830	960		130	(≤200)	
PCB 78	63	36		27	(≤200)	
PCB 79	230	150		80	(≤200)	
PCB 80 *	830	960		130	(≤200)	
PCB 82	1100	880		220	(≤200)	Jdets/A (+d)
PCB 83 *	690	480		210	(≤200)	↓
PCB 84	1000	870		130	(≤200)	
PCB 85 *	1800	1300	32		(≤200)	
PCB 86 *	5100	4400	15		(≤200)	
PCB 87 *	5100	4400	15		(≤200)	
PCB 88 *	350	250		100	(≤200)	

LDC#:22193A3c
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer:

METHOD: HRGC/HRMS PCB Cong (EPA Method 1668A)

Y N NA Were field duplicate pairs identified in this SDG?
Y/N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 2	Concentration (pg/g) 3	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
PCB 89 *	5800	4700	21			
PCB 90 *	5800	4700	21			
PCB 91	630	550		80	(≤200)	
PCB 92	1500	1100	31			
PCB 93 *	6800	5300	25			
PCB 95 *	6800	5300	25			
PCB 97 *	5100	4400	15			
PCB 98 *	190	180		10	(≤200)	
PCB 99	1900	1600	17			
PCB 100	200U	110		90	(≤200)	
PCB 101 *	5800	4700	21			
PCB 102 *	190	180		10	(≤200)	
PCB 103	150	110		40	(≤200)	
PCB 104	20	16		4	(≤200)	
PCB 105 *	1700	1500	13			
PCB 106 *	2500	2300	8			
PCB 107/109 *	900	660		240	(≤200)	det/A (td)
PCB 108/107 *	900	660		240	(≤200)	↓
PCB 109/108 *	690	480		210	(≤200)	
PCB 110	8700	6800	25			
PCB 111 *	5100	4400	15			
PCB 113	200U	100		100	(≤200)	
PCB 114	170	130		40	(≤77)	
PCB 117 *	5100	4400	15			
PCB 118 *	2500	2300	8			
PCB 119	120	120		0	(≤200)	
PCB 120 *	1800	1300	32			

LDC#:22193A3c
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 2nd Reviewer:

METHOD: HRGC/HRMS PCB Cong (EPA Method 1668A)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 2	Concentration (pg/g) 3	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
PCB 121 *	350	250		100	(≤200)	
PCB 122	170	130		40	(≤200)	
PCB 124	450	340		110	(≤200)	
PCB 125 *	5100	4400	15			
PCB 126	250	160		90	(≤110)	
PCB 127 *	1700	1500	13			
PCB 128	3100	2100	38			
PCB 129	1500	1000		500	(≤200)	
PCB 130	1800	1200	40			
PCB 131 *	630	470		160	(≤200)	
PCB 132 *	8900	5700	44			
PCB 133	550	370		180	(≤200)	
PCB 134	1600	960		640	(≤200)	Idet3/4 (1fd)
PCB 135 *	6900	4600	40			
PCB 136	3700	2700	31			
PCB 137	530	370		160	(≤200)	
PCB 138 *	28000	18000	43			
PCB 139 *	31000	22000	34			
PCB 140	300	190		110	(≤200)	
PCB 141	11000	6900	46			
PCB 142 *	630	470		160	(≤200)	
PCB 144 *	6900	4600	40			
PCB 145	96	61		35	(≤200)	
PCB 146	6000	3800	45			
PCB 147	430	300		130	(≤200)	
PCB 148	420	260		160	(≤200)	
PCB 149 *	31000	22000	34			

LDC#:22193A3c
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS PCB Cong (EPA Method 1668A)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 2	Concentration (pg/g) 3	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
PCB 150	290	190		100	(≤200)	
PCB 151	9600	6600	37			
PCB 152	77	54		23	(≤200)	
PCB 153	28000	18000	43			
PCB 154	660	410		250	(≤200)	↓dets/A (fd)
PCB 155	160	110		50	(≤200)	
PCB 156	2100	1400	40			
PCB 157	440	280	44			
PCB 158 *	3900	3700	5			
PCB 159	1100	660	50			
PCB 160 *	3900	2700	36			
PCB 161	280	160		120	(≤200)	
PCB 162	780	470		310	(≤200)	↓dets/A (fd)
PCB 163 *	28000	18000	43			
PCB 164 *	28000	18000	43			
PCB 165 *	630	470		160	(≤200)	
PCB 166	220	160		60	(≤200)	
PCB 167	1200	670	57			↓dets/A (fd)
PCB 168 *	8900	5700	44			
PCB 169	120	62		58	(≤73)	
PCB 170 *	16000	9800	48			
PCB 171	4300	3400	23			
PCB 172 *	4300	3200	29			
PCB 173	460	380		80	(≤200)	
PCB 174	19000	15000	24			
PCB 175	1600	1300	21			
PCB 176	2200	1800	20			

LDC#:22193A3c
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS PCB Cong (EPA Method 1668A)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 2	Concentration (pg/g) 3	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
PCB 177	9500	7300	26			
PCB 178	3600	2900	22			
PCB 179	6100	5100	18			
PCB 180	36000	23000	44			
PCB 182 *	15000	10000	40			
PCB 183	9700	7400	27			
PCB 184	1000	800		200	(≤200)	
PCB 185	2600	2100	21			
PCB 186	140	120		20	(≤200)	
PCB 187 *	15000	10000	40			
PCB 188	500	340		160	(≤200)	
PCB 189	1000	640	44			
PCB 190 *	16000	9800	48			
PCB 191	1100	830	28			
PCB 192 *	4300	3200	29			
PCB 193	2600	1900	31			
PCB 194	13000	7700	51			Jdets/A (fd)
PCB 195	3900	2300	52			↓
PCB 196 *	20000	12000	50			
PCB 197	3700	2100	55			Jdets/A (fd)
PCB 198	2700	1500	57			↓
PCB 199/200	2600	1500	54			
PCB 200/201	4500	3700	20			
PCB 201/199	14000	8800	46			
PCB 202	2300	1400	49			
PCB 203 *	20000	12000	50			
PCB 204	2200	1200	59			Jdets/A (fd)

LDC#:21563H3c
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS PCB Cong (EPA Method 1668A)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 2	Concentration (pg/g) 3	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
PCB 205	2900	1600	58			Idet3/A (+d)
PCB 206	15000	11000	31			
PCB 207	22000	14000	44			
PCB 208	10000	6500	42			
PCB 209	80000	56000	35			

* Co-eluting isomer

Tronox LLC Facility, 2009 Phase B Investigation
Henderson, Nevada
Data Validation Reports
LDC# 22193

Perchlorate

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada

Collection Date: October 23 through October 30, 2009

LDC Report Date: December 21, 2009

Matrix: Water

Parameters: Perchlorate

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): G9K190437

Sample Identification

M-141B
M-141009B
PB-102309-A3
M-139B
M-145B
M-144B
M-146B
M-138B
M-138009B
M-148B
M-137B
EB103009-GWA4
M-139BMS
M-139BMSD

Introduction

This data review covers 14 water samples listed on the cover sheet. The analyses were per EPA Method 314.0 for Perchlorate.

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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the method stated above.

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 III.

Field duplicates are summarized in Section IX.

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. Calibration

a. Initial Calibration

All criteria for the initial calibration were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No perchlorate was found in the initial, continuing and preparation blanks.

Sample EB103009-GWA4 was identified as an equipment blank. No contaminant concentrations were found in this blank.

Sample FB080409-GW (from SDG R0904290) was identified as a field blank. No contaminant concentrations were found in this blank.

Sample PB-102309-A3 was identified as a pump blank. No contaminant concentrations were found in this blank with the following exceptions:

Pump Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
PB-102309-A3	10/23/09	Perchlorate	6.6 ug/L	M-141B M-141009B M-139B M-145B M-148B

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

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VI. Laboratory Control Samples

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

VII. Sample Result Verification and Project Quantitation Limit

All sample result verifications were acceptable.

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG G9K190437	All analytes reported below the PQL.	J (all detects)	A

VIII. Overall Assessment

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

IX. Field Duplicates

Samples M-141B and M-141009B and samples M-138B and M-138009B were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-141B	M-141009B				
Perchlorate	716000	714000	0 (≤30)	-	-	-

Analyte	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-138B	M-138009B				
Perchlorate	1920	1890	2 (≤30)	-	-	-

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Perchlorate - Data Qualification Summary - SDG G9K190437

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Perchlorate - Laboratory Blank Data Qualification Summary - SDG G9K190437

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Perchlorate - Equipment Blank Data Qualification Summary - SDG G9K190437

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Perchlorate - Field Blank Data Qualification Summary - SDG G9K190437

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Perchlorate - Pump Blank Data Qualification Summary - SDG G9K190437

No Sample Data Qualified in this SDG

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
Stage ~~2B~~ 4

LDC #: 22193B6
SDG #: G9K190437
Laboratory: Test America

Date: 12-2-09
Page: 1 of 1
Reviewer: CR
2nd Reviewer: W

METHOD: (Analyte) Perchlorate (EPA Method 314.0)

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
I.	Technical holding times	A	Sampling dates: 10/23/09 - 10/30/09
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	MS/D
V	Duplicates	N	
VI.	Laboratory control samples	A	LCS
VII.	Sample result verification	A	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(1,2), (8,9)
X	Field blanks	SW	EB=12, Pump Blank = 3, ~~see below~~ CR FB=FB080409-GW CSOG# R0904290)

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: water

1	M-141B	11	M-137B	21		31	PB
2	M-141009B	12	EB103009-GWA4	22		32	
3	PB-102309-A3	13	M-139BMS	23		33	
4	M-139B	14	M-139BMSD	24		34	
5	M-145B	15		25		35	
6	M-144B	16		26		36	
7	M-146B	17		27		37	
8	M-138B	18		28		38	
9	M-138009B	19		29		39	
10	M-148B	20		30		40	

Notes: ~~FB = FB092909-SO (SOG# R0904226)~~ CR
~~EB092909-SO (SOG# R0904804)~~
~~FB092909-SO (SOG# R0904279)~~

LDC #: 22193B6
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Reviewer: CR
2nd Reviewer: IA

Method: Inorganics (EPA Method see cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were < 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

LDC #: 22193B6
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: ER
2nd Reviewer: VV

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✓			

LDC #: 22193B6
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: CR
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method See Cover

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?

Reason: bp

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 10/23/09 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Pump Blank Associated Samples: 1, 2, 4, 5, 10

Analyte	Blank ID	Action Limit	Sample Identification							
	3		No Qualifiers							
ClO4	6.6	66								

LDC#: 22193B6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: CE
2nd Reviewer: W

Inorganics, Method See Cover

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/L)		RPD (≤30)	Difference	Limits	Qualification (Parent only)
	1	2				
Perchlorate	716000	714000	0			

V:\FIELD DUPLICATES\FD_inorganic\22193B6.wpd

Analyte	Concentration (ug/L)		RPD (≤30)	Difference	Limits	Qualification (Parent only)
	8	9				
Perchlorate	1920	1890	2			

LDC #: 22193B6
SDG #: see cover

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer: CR
2nd Reviewer: [illegible]

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 11/9/09

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ug/l)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	1	0.00166	*0.999618*	0.999618	Y
		s2	4	0.00767			
		s3	20	0.04261			
		s4	40	0.08716			
		s5	60	0.13357			
		s6	80	0.18076			
		s7	100	0.23229			
Calibration verification		CCV	60	59.458	99	—	
Calibration verification			60	54.426	91	—	
Calibration verification			100	95.627	96	—	

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

LDC #: 22193B6
SDG #: Seecover

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: CR
2nd Reviewer: W

METHOD: Inorganics, Method Seecover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	ClO4	49.7	50.0	99	99	Y
13	Matrix spike sample	↓	(SSR-SR) 4750	5000	95	95	↓
13/14	Duplicate sample	↓	6380	6470	1.4	1.3	↓

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

LDC #: 22193B6
SDG #: seecover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CP
2nd reviewer: [illegible]

METHOD: Inorganics, Method seecover

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

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for ClO4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\left(\frac{\text{Area} - \text{offset}}{\text{slope}}\right) DF$

Recalculation:

$5 = \left(\frac{0.05324 - 0.0003}{0.0021}\right) 20 = 504 \text{ ug/L}$

$6 = \left(\frac{0.06330 - 0.0003}{0.0021}\right) 100 = 3000 \text{ ug/L}$

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	5	ClO4	499	504	Y
	6	~~2950~~ ClO4	2950	3000	Y

Note:

Tronox LLC Facility, 2009 Phase B Investigation
Henderson, Nevada
Data Validation Reports
LDC# 22193

Dioxins/Dibenzofurans

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada

Collection Date: October 14 through October 21, 2009

LDC Report Date: December 18, 2009

Matrix: Soil/Water

Parameters: Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): G9J150241

Sample Identification

SA160-0.5B
SA178-0.5B
SA142-20.5B
SA142009-20.5B
SA108-20B
SA141-14B
SA141009-14B
SA143-24B
SA171-5B
EB101909-SO1A3
SA157-0.5B
SA157009-0.5B
SA33-0.5B
SA33009-0.5B
SA156-0.5B
SA52-15B
SA149-22B
SA108-20BMS
SA108-20BMSD

Introduction

This data review covers 18 soil samples and 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) as there are no current guidelines for the method stated above.

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
9301394MB	10/28/09	OCDD	0.84 pg/g	All samples in SDG G9J150241

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
SA141-14B	OCDD	1.1 pg/g	1.1U pg/g
SA141009-14B	OCDD	1.1 pg/g	1.1U pg/g
SA143-24B	OCDD	2.6 pg/g	2.6U pg/g
SA171-5B	OCDD	0.95 pg/g	0.95U pg/g

Sample EB101909-SO1A3 was identified as an equipment blank. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank.

Samples FB080309-SO (from SDG R0904279) and FB082809-SO (from SDG R0904894) were identified as field blanks. No polychlorinated dioxin/dibenzofuran contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB080309-SO	8/3/09	1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,4,6,7,8-HpCDF OCDF Total HpCDD	2.58 pg/L 10.4 pg/L 1.71 pg/L 3.68 pg/L 2.58 pg/L	SA156-0.5B

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. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

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
SA142-20.5B	^{13}C-OCDD	36 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
SA142009-20.5B	^{13}C-2,3,7,8-TCDF ^{13}C-2,3,7,8-TCDD ^{13}C-1,2,3,7,8-PeCDF ^{13}C-1,2,3,7,8-PeCDD ^{13}C-1,2,3,4,7,8-HxCDF ^{13}C-1,2,3,6,7,8-HxCDD ^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	27 (40-135) 30 (40-135) 28 (40-135) 25 (40-135) 21 (40-135) 24 (40-135) 27 (40-135) 28 (40-135) 30 (40-135)	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 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 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	P
SA143-24B	^{13}C-OCDD	33 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
SA156-0.5B	^{13}C-2,3,7,8-TCDF ^{13}C-2,3,7,8-TCDD ^{13}C-1,2,3,7,8-PeCDD ^{13}C-1,2,3,4,7,8-HxCDF ^{13}C-1,2,3,6,7,8-HxCDD ^{13}C-1,2,3,4,6,7,8-HpCDF ^{13}C-1,2,3,4,6,7,8-HpCDD ^{13}C-OCDD	34 (40-135) 38 (40-135) 37 (40-135) 27 (40-135) 34 (40-135) 30 (40-135) 39 (40-135) 29 (40-135)	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 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 1,2,3,4,7,8-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 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	P
EB101909-SO1A3	^{13}C-1,2,3,4,7,8-HxCDF ^{13}C-1,2,3,6,7,8-HxCDD ^{13}C-1,2,3,4,6,7,8-HpCDF	24 (40-135) 29 (40-135) 33 (40-135)	1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,7,8-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 1,2,3,4,7,8,9-HpCDF	J (all detects) UJ (all non-detects)	P

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Project Quantitation Limit

All project quantitation limits were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
SA143-24B SA171-5B	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	P

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG G9J150241	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 G9J150241	All compounds reported as estimated maximum possible concentration (EMPC).	JK (all detects)	A

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

Samples SA142-20.5B and SA142009-20.5B, samples SA141-14B and SA141009-14B, samples SA157-0.5B and SA157009-0.5B, and samples SA33-0.5B and SA33009-0.5B were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	SA142-20.5B	SA142009-20.5B				
2,3,7,8-TCDD	1.6	2.3	-	0.7 (≤0.52)	J (all detects)	A
1,2,3,7,8-PeCDD	4.2	6.6	-	2.4 (≤2.6)	-	-
1,2,3,4,7,8-HxCDD	2.4	5.1	-	2.7 (≤2.6)	-	-
1,2,3,6,7,8-HxCDD	4.8	11	-	6.2 (≤2.6)	J (all detects)	A
1,2,3,7,8,9-HxCDD	5.1	14	-	8.9 (≤2.6)	J (all detects)	A
1,2,3,4,6,7,8-HpCDD	16	40	86 (≤50)	-	J (all detects)	A
OCDD	15	43	-	28 (≤5.2)	J (all detects)	A
2,3,7,8-TCDF	34	42	21 (≤50)	-	-	-
1,2,3,7,8-PeCDF	60	91	41 (≤50)	-	-	-
2,3,4,7,8-PeCDF	28	38	30 (≤50)	-	-	-
1,2,3,4,7,8-HxCDF	93	200	73 (≤50)	-	J (all detects)	A
1,2,3,6,7,8-HxCDF	69	140	68 (≤50)	-	J (all detects)	A
2,3,4,6,7,8-HxCDF	18	41	78 (≤50)	-	J (all detects)	A
1,2,3,7,8,9-HxCDF	13	23	-	10 (≤2.6)	J (all detects)	A
1,2,3,4,6,7,8-HpCDF	220	510	79 (≤50)	-	J (all detects)	A
1,2,3,4,7,8,9-HpCDF	99	190	63 (≤50)	-	J (all detects)	A
OCDF	610	1400	79 (≤50)	-	J (all detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	SA141-14B	SA141009-14B				
1,2,3,6,7,8-HxCDD	2.7U	0.22	-	2.48 (≤2.7)	-	-
1,2,3,7,8,9-HxCDD	2.7U	0.23	-	2.47 (≤2.7)	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	SA141-14B	SA141009-14B				
1,2,3,4,6,7,8-HpCDD	0.36	0.42	-	0.06 (≤2.7)	-	-
OCDD	1.1	1.1	-	0 (≤5.4)	-	-
2,3,7,8-TCDF	0.51	0.52U	-	0.01 (≤0.52)	-	-
1,2,3,7,8-PeCDF	1.0	0.95	-	0.05 (≤2.7)	-	-
2,3,4,7,8-PeCDF	0.52	0.50	-	0.02 (≤2.7)	-	-
1,2,3,4,7,8-HxCDF	2.2	1.5	-	0.7 (≤2.7)	-	-
1,2,3,6,7,8-HxCDF	1.5	1.1	-	0.4 (≤2.7)	-	-
2,3,4,6,7,8-HxCDF	0.39	0.47	-	0.08 (≤2.7)	-	-
1,2,3,7,8,9-HxCDF	2.7U	0.33	-	2.37 (≤2.7)	-	-
1,2,3,4,6,7,8-HpCDF	5.0	2.2	-	2.8 (≤2.7)	-	-
1,2,3,4,7,8,9-HpCDF	1.7	1.0	-	0.7 (≤2.7)	-	-
OCDF	13	5.4	-	7.6 (≤5.4)	J (all detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	SA157-0.5B	SA157009-0.5B				
2,3,7,8-TCDD	0.37	0.44	-	0.07 (≤0.53)	-	-
1,2,3,7,8-PeCDD	1.3	1.1	-	0.2 (≤2.6)	-	-
1,2,3,4,7,8-HxCDD	0.76	0.60	-	0.16 (≤2.6)	-	-
1,2,3,6,7,8-HxCDD	2.0	1.3	-	0.7 (≤2.6)	-	-
1,2,3,7,8,9-HxCDD	2.3	1.6	-	0.7 (≤2.6)	-	-
1,2,3,4,6,7,8-HpCDD	6.8	4.7	-	2.1 (≤2.6)	-	-
OCDD	8.3	6.3	-	2 (≤2.6)	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	SA157-0.5B	SA157009-0.5B				
2,3,7,8-TCDF	24	21	13 (≤50)	-	-	-
1,2,3,7,8-PeCDF	19	14	30 (≤50)	-	-	-
2,3,4,7,8-PeCDF	8.4	7.5	-	0.9 (≤2.6)	-	-
1,2,3,4,7,8-HxCDF	34	22	43 (≤50)	-	-	-
1,2,3,6,7,8-HxCDF	24	16	40 (≤50)	-	-	-
2,3,4,6,7,8-HxCDF	6.9	4.3	-	2.6 (≤2.6)	-	-
1,2,3,7,8,9-HxCDF	4.8	2.5	-	2.3 (≤2.6)	-	-
1,2,3,4,6,7,8-HpCDF	88	56	44 (≤50)	-	-	-
1,2,3,4,7,8,9-HpCDF	36	22	48 (≤50)	-	-	-
OCDF	200	130	42 (≤50)	-	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	SA33-0.5B	SA33009-0.5B				
2,3,7,8-TCDD	20	17	16 (≤50)	-	-	-
1,2,3,7,8-PeCDD	70	54	26 (≤50)	-	-	-
1,2,3,4,7,8-HxCDD	45	32	34 (≤50)	-	-	-
1,2,3,6,7,8-HxCDD	97	65	40 (≤50)	-	-	-
1,2,3,7,8,9-HxCDD	110	69	46 (≤50)	-	-	-
1,2,3,4,6,7,8-HpCDD	350	210	50 (≤50)	-	-	-
OCDD	520	220	81 (≤50)	-	J (all detects)	A
2,3,7,8-TCDF	540	470	14 (≤50)	-	-	-
1,2,3,7,8-PeCDF	900	670	29 (≤50)	-	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	SA33-0.5B	SA33009-0.5B				
2,3,4,7,8-PeCDF	420	370	13 (≤50)	-	-	-
1,2,3,4,7,8-HxCDF	1900	1400	30 (≤50)	-	-	-
1,2,3,6,7,8-HxCDF	1300	930	33 (≤50)	-	-	-
2,3,4,6,7,8-HxCDF	360	260	32 (≤50)	-	-	-
1,2,3,7,8,9-HxCDF	90	150	-	60 (≤50)	J (all detects)	A
1,2,3,4,6,7,8-HpCDF	4600	2700	52 (≤50)	-	J (all detects)	A
1,2,3,4,7,8,9-HpCDF	1700	1300	27 (≤50)	-	-	-
OCDF	12000	7500	46 (≤50)	-	-	-

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Dioxins/Dibenzofurans - Data Qualification Summary - SDG G9J150241

SDG	Sample	Compound	Flag	A or P	Reason (Code)
G9J150241	SA142-20.5B SA143-24B	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R) (i)
G9J150241	SA142009-20.5B	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 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 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R) (i)
G9J150241	SA156-0.5B	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 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 1,2,3,4,7,8-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 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R) (i)
G9J150241	EB101909-SO1A3	1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,7,8-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 1,2,3,4,7,8,9-HpCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R) (i)
G9J150241	SA143-24B SA171-5B	2,3,7,8-TCDF	None	P	Project Quantitation Limit

SDG	Sample	Compound	Flag	A or P	Reason (Code)
G9J150241	SA160-0.5B SA178-0.5B SA142-20.5B SA142009-20.5B SA108-20B SA141-14B SA141009-14B SA143-24B SA171-5B EB101909-SO1A3 SA157-0.5B SA157009-0.5B SA33-0.5B SA33009-0.5B SA156-0.5B SA52-15B SA149-22B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)
G9J150241	SA160-0.5B SA178-0.5B SA142-20.5B SA142009-20.5B SA108-20B SA141-14B SA141009-14B SA143-24B SA171-5B EB101909-SO1A3 SA157-0.5B SA157009-0.5B SA33-0.5B SA33009-0.5B SA156-0.5B SA52-15B SA149-22B	All compounds reported as EMPC	JK (all detects)	A	Project Quantitation Limit (k)
G9J150241	SA142-20.5B SA142009-20.5B	2,3,7,8-TCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD OCDD 1,2,3,7,8,9-HxCDF	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference) (fd)
G9J150241	SA142-20.5B SA142009-20.5B	1,2,3,4,6,7,8-HpCDD 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-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF OCDD	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD) (fd)
G9J150241	SA141-14B SA141009-14B	OCDF	J (all detects)	A	Field duplicates (Difference) (fd)
G9J150241	SA33-0.5B SA33009-0.5B	1,2,3,7,8,9-HxCDF	J (all detects)	A	Field duplicates (Difference) (fd)

SDG	Sample	Compound	Flag	A or P	Reason (Code)
G9J150241	SA33-0.5B SA33009-0.5B	OCDD 1,2,3,4,6,7,8-HpCDF	J (all detects) J (all detects)	A	Field duplicates (RPD) (fd)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG G9J150241

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
G9J150241	SA141-14B	OCDD	1.1U pg/g	A	bl
G9J150241	SA141009-14B	OCDD	1.1U pg/g	A	bl
G9J150241	SA143-24B	OCDD	2.6U pg/g	A	bl
G9J150241	SA171-5B	OCDD	0.95U pg/g	A	bl

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Dioxins/Dibenzofurans - Equipment Blank Data Qualification Summary - SDG G9J150241

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG G9J150241

No Sample Data Qualified in this SDG

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
Stage 2B

LDC #: 22193A21
SDG #: G9J150241
Laboratory: Test America

Date: 12/13/09
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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
I.	Technical holding times	A	Sampling dates: 10/14 – 21/09
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration ~~ICV~~	A	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	SW	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	SW N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 3+4, 6+7, 11+12, 13+14
XV.	Field blanks	SW	EB = 10*, ~~EB080309-SO(R09R2T9)~~, ~~FB08-89508~~ (R09R894) (R09R894)

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	SA160-0.5B S	11	SA157-0.5B	21	930139+13	31	
2	SA178-0.5B	12	SA157009-0.5B	22	930229MB	32	
3	SA142-20.5B	13	SA33-0.5B	23		33	
4	SA142009-20.5B	14	SA33009-0.5B	24		34	
5	SA108-20B	15	SA156-0.5B 4	25		35	
6	SA141-14B	16	SA52-15B	26		36	
7	SA141009-14B	17	SA149-22B	27		37	
8	SA143-24B	18	SA108-20BMS	28		38	
9	SA171-5B	19	SA108-20BMSD	29		39	
10	EB101909-SO1A3 W	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	I. 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:

LDC #: 22193A1
SDG #: Delaware

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/28/09 **Blank analysis date:** 11/10/09
Conc. units: pg/g Associated Samples: all (bl)

Compound	Blank ID	Sample Identification								
9-30	13974MB	6	7	8	9		all >5x			
4	0.84	1.1/4	1.1/4	2.6/4	0.95/4					

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

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 #: 22193A2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 2

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

(Y) N N/A Were field blanks identified in this SDG?
Blank units: pg/L **Associated sample units:** ng/Kg
Sampling date: 8/3/09
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: 15 (>5X)

Compound	Blank ID	Sample Identification								
	FB080309-SO	5X								
F	2.58	0.0129								
G	10.4	0.052								
O	1.71	0.00855								
Q	3.68	0.0184								
U	2.58	0.0129								
CRQL										

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

LDC #: 22193A2
SDG #: 30 qeuv

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: 9
2nd Reviewer: 2

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".

Y (N) N/A Are all internal standard recoveries were within the 40-135% criteria?
Y (N) N/A Was the S/N ratio all internal standard peaks > 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications ( )
		3	I	36 (40-135)	J/UJ/P (F. 2)
				( )	
		4	A	27 ( )	J/UJ/P (all A-2)
			B	30 ( )	
			C	28 ( )	
			D	25 ( )	
			E	21 ( )	
			F	24 ( )	
			G	27 ( )	
			H	28 ( )	
			I	30 ( )	
				( )	
		8	I	33 ( )	J/UJ/P (F. 2)
				( )	
		15	A	34 ( )	J/UJ/P (A-G. H, K-2)
			B	38 ( )	
			D	37 ( )	
			E	27 ( )	
			F	34 ( )	
			G	30 ( )	

	Internal Standards	Check Standard Used		Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF		I.	^{13}C-OCDD	
B.	^{13}C-2,3,7,8-TCDD		K.	^{13}C-1,2,3,4-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF		L.	^{13}C-1,2,3,7,8,9-HxCDD	
D.	^{13}C-1,2,3,7,8-PeCDD		M		
E.	^{13}C-1,2,3,4,7,8-HxCDF		N.		
F.	^{13}C-1,2,3,6,7,8-HxCDD		O.		
G.	^{13}C-1,2,3,4,6,7,8-HpCDF		P.		
H.	^{13}C-1,2,3,4,6,7,8-HpCDD				

LDC #: 22193A2
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: q
2nd Reviewer: l

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".

Y (N) N/A Are all internal standard recoveries were within the 40-135% criteria?
(Y) N N/A Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)		Qualifications (i)
		15	H	39	(40-135)	J/UJ/P (F-E. Q)
			I	29	(↓)	↓
					( )	
		10	E	24	(40-135)	J/UJ/P (C-E. K-P)
			F	29	( )	
			G	33	(↓)	↓
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

	Internal Standards	Check Standard Used		Internal Standards	Check Standard Used
A.	^{13}C-2,3,7,8-TCDF		I.	^{13}C-OCDD	
B.	^{13}C-2,3,7,8-TCDD		K.	^{13}C-1,2,3,4-TCDD	
C.	^{13}C-1,2,3,7,8-PeCDF		L.	^{13}C-1,2,3,7,8,9-HxCDD	
D.	^{13}C-1,2,3,7,8-PeCDD		M		
E.	^{13}C-1,2,3,4,7,8-HxCDF		N.		
F.	^{13}C-1,2,3,6,7,8-HxCDD		O.		
G.	^{13}C-1,2,3,4,6,7,8-HpCDF		P.		
H.	^{13}C-1,2,3,4,6,7,8-HpCDD				

LDC #: 22193A2
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 2

METHOD: HRGC/HRMS Polychlorinated Biphenyls (EPA Method 1668)

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

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

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		8,9	No confirmation for 2,3,7,8-TCDF	8	None/P
		All	EMPC (RT lag)	All	J+ (K)

Comments: See sample calculation verification worksheet for recalculations

LDC#:22193A21
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer: 9

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

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 3	Concentration (pg/g) 4	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
A	1.6	2.3		0.7	(≤0.52)	√dets/A (fd)
B	4.2	6.6		2.4	(≤2.6)	
C	2.4	5.1		2.7	(≤2.6)	
D	4.8	11		6.2	(≤2.6)	√dets/B (fd)
E	5.1	14		8.9	(≤2.6)	
F	16	40	86			
G	15	43		28	(≤5.2)	
H	34	42	21			
I	60	91	41			
J	28	38	30			
K	93	200	73			√dets/B (fd)
L	69	140	68			
M	18	41	78			
N	13	23		10	(≤2.6)	
O	220	510	79			
P	99	190	63			
Q	610	1400	79			

Compound	Concentration (pg/g) 6	Concentration (pg/g) 7	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
D	2.7U	0.22		2.48	(≤2.7)	
E	2.7U	0.23		2.47	(≤2.7)	
F	0.36	0.42		0.06	(≤2.7)	
G	1.1	1.1		0	(≤5.4)	
H	0.51	0.52U		0.01	(≤0.52)	
I	1.0	0.95		0.05	(≤2.7)	
J	0.52	0.50		0.02	(≤2.7)	

LDC#: 22193A21
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer: 9

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

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 6	Concentration (pg/g) 7	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
K	2.2	1.5		0.7	(≤2.7)	
L	1.5	1.1		0.4	(≤2.7)	
M	0.39	0.47		0.08	(≤2.7)	
N	2.7U	0.33		2.37	(≤2.7)	
O	5.0	2.2		2.8	(≤2.7)	
P	1.7	1.0		0.7	(≤2.7)	
Q	13	5.4		7.6	(<5.4)	Jdet/A (fd)

Compound	Concentration (pg/g) 11	Concentration (pg/g) 12	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
A	0.37	0.44		0.07	(≤0.53)	
B	1.3	1.1		0.2	(≤2.6)	
C	0.76	0.60		0.16	(≤2.6)	
D	2.0	1.3		0.7	(≤2.6)	
E	2.3	1.6		0.7	(≤2.6)	
F	6.8	4.7		2.1	(≤2.6)	
G	8.3	6.3		2	(≤5.2)	
H	24	21	13			
I	19	14	30			
J	8.4	7.5		0.9	(≤2.6)	
K	34	22	43			
L	24	16	40			
M	6.9	4.3		2.6	(≤2.6)	
N	4.8	2.5		2.3	(≤2.6)	
O	88	56	44			
P	36	22	48			
Q	200	130	42			

LDC#: 22193A21
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer: 9

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

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (pg/g) 13	Concentration (pg/g) 14	(≤50) RPD	(pg/g) Difference	(pg/g) Limits	Qualifications (Parent Only)
A	20	17	16			
B	70	54	26			
C	45	32	34			
D	97	65	40			
E	110	69	46			
F	350	210	50			
G	520	220	81			Idets/A (+d)
H	540	470	14			
I	900	670	29			
J	420	370	13			
K	1900	1400	30			
L	1300	930	33			
M	360	260	32			
N	90	150		60	(≤50)	Idets/A (+d)
O	4600	2700	52			
P	1700	1300	27			
Q	12000	7500	46			