

LABORATORY DATA CONSULTANTS, INC.

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

June 2, 2010

SUBJECT: Tronox LLC Facility, 2010 PCS, Henderson, Nevada,
Data Validation

Dear Ms. Arnold,

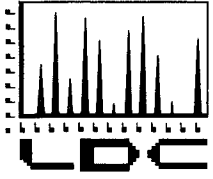
Enclosed are the final validation reports for the fractions listed below. These SDGs were received on May 5, 2010. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 23126:

<u>SDG #</u>	<u>Fraction</u>
280-2131-1, 280-2131-5, 280-2131-6, 280-2131-8, 280-2131-9, 280-2216-1, 280-2216-2, 280-2216-4, 280-2216-5, 280-2216-6, 280-2216-7, 280-2270-1, 280-2270-2, 280-2280-1, 280-2280-2, 280-2280-4, 280-2280-5, 280-2280-6, 280-2352-6, 280-2280-7, 280-2301-1, 280-2301-3, 280-2301-4, 280-2301-7, 280-2352-1, 280-2352-4	Semivolatiles, Chlorinated Pesticides, Metals, Perchlorate

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

- Standard Operating Procedures (SOP) 40, Data Review/Validation, BRC 2009
- Quality Assurance Project Plan Tronox LLC Facility, Henderson Nevada, June 2009
- NDEP Guidance, May 2006
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004



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

Sincerely,

A handwritten signature in cursive script that reads 'ERauto'.

Erlinda T. Rauto
Operations Manager/Senior Chemist

LDC #23126 (Tronox LLC-Northgate, Henderson NV / Tronox PCS)

LDC	SDG#	DATE REC'D	DATE DUE (3)	SVOA (8270C)		Pest. (8081A)		As (6020)		Co (6020)		Pb (6020)		Mn (6020)		Mg (6020)		CLO ₄ (314.0)		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	W	S	W	S				
Matrix: Water/Soil																																					
A	280-2131-1	05/05/10	05/26/10	0	14	-	-	0	16	-	-	0	5	0	5	-	-	-	0	5																	
B	280-2131-5	05/05/10	05/26/10	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
C	280-2131-6	05/05/10	05/26/10	0	1	-	-	0	2	-	-	-	-	-	-	-	-	-	-	-																	
D	280-2131-8	05/05/10	05/26/10	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
E	280-2131-9	05/05/10	05/26/10	-	-	-	-	0	2	-	-	-	-	-	-	-	-	-	-	-																	
F	280-2216-1	05/05/10	05/26/10	0	1	-	-	0	23	0	7	0	2	0	12	-	-	0	2																		
G	280-2216-2	05/05/10	05/26/10	1	0	1	0	1	5	1	0	1	0	1	0	1	0	1	3																		
H	280-2216-4	05/05/10	05/26/10	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
I	280-2216-5	05/05/10	05/26/10	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
J	280-2216-6	05/05/10	05/26/10	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
K	280-2216-7	05/05/10	05/26/10	-	-	-	-	0	11	-	-	-	-	-	-	-	-	-	-	-																	
L	280-2270-1	05/05/10	05/26/10	-	-	-	-	0	3	-	-	-	-	-	-	-	-	-	-	-																	
M	280-2270-2	05/05/10	05/26/10	0	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
N	280-2280-1	05/05/10	05/26/10	0	6	-	-	0	20	0	3	-	-	0	15	0	6	0	8																		
O	280-2280-2	05/05/10	05/26/10	1	0	1	0	1	0	1	0	-	-	1	0	1	0	1	4																		
P	280-2280-4	05/05/10	05/26/10	0	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
P	280-2280-4	05/05/10	05/26/10	0	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
Q	280-2280-5	05/05/10	05/26/10	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
R	280-2280-6	05/05/10	05/26/10	-	-	-	-	0	2	-	-	-	-	0	1	-	-	-	-	-																	
S	280-2352-6	05/05/10	05/26/10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3																	
T	280-2280-7	05/05/10	05/26/10	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
U	280-2301-1	05/05/10	05/26/10	-	-	0	2	0	2	-	-	-	-	-	-	-	-	-	0	13																	
U	280-2301-1	05/05/10	05/26/10	-	-	0	0	0	8	-	-	-	-	-	-	-	-	-	0	0																	
V	280-2301-3	05/05/10	05/26/10	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
W	280-2301-4	05/05/10	05/26/10	0	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
X	280-2301-7	05/05/10	05/26/10	-	-	-	-	0	1	-	-	-	-	-	-	-	-	-	-	-																	
Y	280-2352-1	05/05/10	05/26/10	0	1	-	-	0	22	-	-	-	-	0	5	-	-	0	9																		
Y	280-2352-1	05/05/10	05/26/10	0	4	-	-	0	2	-	-	-	-	0	0	-	-	0	2																		
Z	280-2352-4	05/05/10	05/26/10	0	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																	
Total	T/LR			2	67	2	2	2	119	2	10	1	7	2	38	2	6	2	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	313		

**Tronox PCS
Data Validation Reports
LDC# 23126**

Semivolatiles

LDC

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 6, 2010
LDC Report Date: May 27, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2131-1

Sample Identification

RSAQ3-3BPC_FD
SA169-6BPC_FD
RSAQ3-3BPC
RSAQ3-5BPC
SA169-3BPC
SA169-5BPC
SA169-6BPC
RSAK7-3BPC
RSAK7-5BPC
SSAJ8-01-1BPC
SSAJ8-01-5BPC
RSAJ8-5BPC
RSAJ8-3BPC_FD
RSAJ8-3BPC
RSAJ8-3BPCMS
RSAJ8-3BPCMSD

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
MB280-10308/1-A	4/8/10	Bis(2-ethylhexyl)phthalate	81.9 ug/Kg	All samples in SDG 280-2131-1

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
RSAQ3-3BPC_FD	Bis(2-ethylhexyl)phthalate	93 ug/Kg	93U ug/Kg
SA169-6BPC_FD (10X)	Bis(2-ethylhexyl)phthalate	1200 ug/Kg	1200U ug/Kg
RSAQ3-3BPC	Bis(2-ethylhexyl)phthalate	110 ug/Kg	110U ug/Kg
RSAQ3-5BPC	Bis(2-ethylhexyl)phthalate	120 ug/Kg	120U ug/Kg
SA169-3BPC	Bis(2-ethylhexyl)phthalate	120 ug/Kg	120U ug/Kg
SA169-6BPC (10X)	Bis(2-ethylhexyl)phthalate	1400 ug/Kg	1400U ug/Kg
RSAK7-3BPC	Bis(2-ethylhexyl)phthalate	140 ug/Kg	140U ug/Kg
RSAK7-5BPC	Bis(2-ethylhexyl)phthalate	110 ug/Kg	110U ug/Kg
SSAJ8-01-1BPC	Bis(2-ethylhexyl)phthalate	110 ug/Kg	110U ug/Kg
SSAJ8-01-5BPC	Bis(2-ethylhexyl)phthalate	110 ug/Kg	110U ug/Kg
RSAJ8-5BPC	Bis(2-ethylhexyl)phthalate	100 ug/Kg	100U ug/Kg
RSAJ8-3BPC_FD	Bis(2-ethylhexyl)phthalate	120 ug/Kg	120U ug/Kg
RSAJ8-3BPC	Bis(2-ethylhexyl)phthalate	130 ug/Kg	130U ug/Kg

Samples FB-04072010-RZD (from SDG 280-2216-2) and FB04062010-RZB (from SDG 280-2131-2) were identified as field blanks. No semivolatile contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	RSAK7-3BPC RSAK7-5BPC SSAJ8-01-1BPC SSAJ8-01-5BPC RSAJ8-5BPC RSAJ8-3BPC_FD RSAJ8-3BPC
FB04062010-RZB	4/6/10	Bis(2-ethylhexyl)phthalate	2.7 ug/L	RSAQ3-3BPC_FD SA169-6BPC_FD RSAQ3-3BPC RSAQ3-5BPC SA169-3BPC SA169-5BPC SA169-6BPC

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2131-1	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

Samples RSAQ3-3BPC_FD and RSAQ3-3BPC, samples SA169-6BPC_FD and SA169-6BPC, samples RSAJ8-3BPC_FD and RSAJ8-3BPC, samples RSAK7-3BPC and RSAK7-3BPC_FD (from SDG 280-2131-2), and samples SSAJ8-01-1BPC and SSAJ8-01-1BPC_FD (from SDG 280-2131-2) were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	RSAQ3-3BPC_FD	RSAQ3-3BPC				
Bis(2-ethylhexyl)phthalate	93	110	-	17 (≤ 360)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA169-6BPC_FD	SA169-6BPC				
Benzo(a)anthracene	3500U	340	-	3160 (≤ 3500)	-	-
Benzo(a)pyrene	3500U	280	-	3220 (≤ 3500)	-	-
Benzo(b)fluoranthene	350	700	-	350 (≤ 3500)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA169-6BPC_FD	SA169-6BPC				
Benzo(g,h,i)perylene	190	320	-	130 (≤ 3500)	-	-
bis(2-ethylhexyl)phthalate	1200	1400	-	200 (≤ 3500)	-	-
Chrysene	410	620	-	210 (≤ 3500)	-	-
Fluoranthene	3500U	580	-	2920 (≤ 3500)	-	-
Phenanthrene	220	330	-	110 (≤ 3500)	-	-
Pyrene	320	610	-	290 (≤ 3500)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	RSAJ8-3BPC_FD	RSAJ8-3BPC				
Benzo(a)anthracene	23	350U	-	327 (≤ 360)	-	-
Benzo(a)pyrene	23	350U	-	327 (≤ 360)	-	-
Benzo(b)fluoranthene	74	64	-	10 (≤ 360)	-	-
Benzo(g,h,i)perylene	22	350U	-	328 (≤ 360)	-	-
bis(2-ethylhexyl)phthalate	120	130	-	10 (≤ 360)	-	-
Chrysene	58	59	-	1 (≤ 360)	-	-
Fluoranthene	46	44	-	2 (≤ 360)	-	-
Octachlorostyrene	5600	5700	-	100 (≤ 360)	-	-
Pyrene	37	39	-	2 (≤ 360)	-	-
Hexachlorobenzene	16000	18000	-	2000 (≤ 3600)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	RSAK7-3BPC	RSAK7-3BPC_FD				
Benzo(b)fluoranthene	350U	30	-	320 (≤ 360)	-	-
Bis(2-ethylhexyl)phthalate	140	140	-	0 (≤ 360)	-	-
Chrysene	46	54	-	8 (≤ 360)	-	-
Fluoranthene	46	50	-	4 (≤ 360)	-	-
Octachlorostyrene	5100	5900	8 (≤ 50)	-	-	-
Phenanthrene	23	31	-	8 (≤ 360)	-	-
Pyrene	28	32	-	4 (≤ 360)	-	-
Hexachlorobenzene	27000	34000	23 (≤ 50)	-	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAJ8-01-1BPC	SSAJ8-01-1BPC_FD				
Benzo(a)anthracene	45	35	-	10 (≤ 360)	-	-
Benzo(b)fluoranthene	110	92	-	18 (≤ 360)	-	-
Benzo(g,h,i)perylene	19	17	-	2 (≤ 360)	-	-
Bis(2-ethylhexyl)phthalate	110	120	-	10 (≤ 360)	-	-
Chrysene	190	170	-	20 (≤ 360)	-	-
Fluoranthene	220	180	-	40 (≤ 360)	-	-
Phenanthrene	57	44	-	13 (≤ 360)	-	-
Pyrene	150	120	-	30 (≤ 360)	-	-
Octachlorostyrene	21000	18000	26 (≤ 50)	-	-	-
Hexachlorobenzene	74000	66000	22 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2131-1**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2131-1	RSAQ3-3BPC_FD SA169-6BPC_FD RSAQ3-3BPC RSAQ3-5BPC SA169-3BPC SA169-5BPC SA169-6BPC RSAK7-3BPC RSAK7-5BPC SSAJ8-01-1BPC SSAJ8-01-5BPC RSAJ8-5BPC RSAJ8-3BPC_FD RSAJ8-3BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2131-1**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P	Code
280-2131-1	RSAQ3-3BPC_FD	Bis(2-ethylhexyl)phthalate	93U ug/Kg	A	bl
280-2131-1	SA169-6BPC_FD (10X)	Bis(2-ethylhexyl)phthalate	1200U ug/Kg	A	bl
280-2131-1	RSAQ3-3BPC	Bis(2-ethylhexyl)phthalate	110U ug/Kg	A	bl
280-2131-1	RSAQ3-5BPC	Bis(2-ethylhexyl)phthalate	120U ug/Kg	A	bl
280-2131-1	SA169-3BPC	Bis(2-ethylhexyl)phthalate	120U ug/Kg	A	bl
280-2131-1	SA169-6BPC (10X)	Bis(2-ethylhexyl)phthalate	1400U ug/Kg	A	bl
280-2131-1	RSAK7-3BPC	Bis(2-ethylhexyl)phthalate	140U ug/Kg	A	bl
280-2131-1	RSAK7-5BPC	Bis(2-ethylhexyl)phthalate	110U ug/Kg	A	bl
280-2131-1	SSAJ8-01-1BPC	Bis(2-ethylhexyl)phthalate	110U ug/Kg	A	bl
280-2131-1	SSAJ8-01-5BPC	Bis(2-ethylhexyl)phthalate	110U ug/Kg	A	bl
280-2131-1	RSAJ8-5BPC	Bis(2-ethylhexyl)phthalate	100U ug/Kg	A	bl

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P	Code
280-2131-1	RSAJ8-3BPC_FD	Bis(2-ethylhexyl)phthalate	120U ug/Kg	A	bl
280-2131-1	RSAJ8-3BPC	Bis(2-ethylhexyl)phthalate	130U ug/Kg	A	bl

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2131-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #: 23126A2a
 SDG #: 280-2131-1
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 5/11/10
 Page: 1 of 1
 Reviewer: JVL
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: <u>4/6/10</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	<u>2 RSD</u> <u>12</u>
IV.	Continuing calibration/ICV	A	<u>CCV/ICV ≤ 25%</u>
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	<u>LCS</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	<u>D₁ = 1,3</u> <u>D₂ = 2,7</u> <u>D₃ = 13,14</u> <u>D₄ = 8 + RSAK7-3BPC-F</u> <u>D₅ = 10 + SSAJ8-01-1BPC-F</u>
XVII.	Field blanks	SW	<u>FB = FB-04072010-R2B (280-2216-2)</u> <u>(both from</u> <u>FB04062010-R2B (280-2131-2)</u> <u>280-2131-2)</u>

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples:

Soil

1	RSAQ3-3BPC_FD <u>D₁</u>	11	SSAJ8-01-5BPC	21		31	
2	SA169-6BPC_FD <u>D₂</u>	12	RSAJ8-5BPC	22		32	
3	RSAQ3-3BPC <u>D₁</u>	13	RSAJ8-3BPC_FD <u>D₃</u>	23		33	
4	RSAQ3-5BPC	14	RSAJ8-3BPC <u>D₃</u>	24		34	
5	SA169-3BPC	15	RSAJ8-3BPCMS	25		35	
6	SA169-5BPC	16	RSAJ8-3BPCMSD	26		36	
7	SA169-6BPC <u>D₂</u>	17		27		37	
8	RSAK7-3BPC <u>D₄</u>	18		28		38	
9	RSAK7-5BPC	19		29		39	
10	SSAJ8-1BPC <u>D₅</u>	20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. <i>1,4 - Dioxane</i>
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. <i>Octa Chloro Styrene</i>
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

- Y N N/A Was a method blank analyzed for each matrix?
- Y N N/A Was a method blank analyzed for each concentration preparation level?
- Y N N/A Was a method blank associated with every sample?
- Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 4/08/10 Blank analysis date: 4/10/10 Associated Samples: All (6 R)

Conc. units: ug/kg

Compound	Blank ID	Sample Identification							
		1	2 (0x)	3	4	5	6	7 (10x)	8
EEE	MB 280-10308A-A 81.9	93/u	1200/u	110/u	120/u	120/u	490	1400/u	140/u

Blank extraction date: _____ Blank analysis date: same as above
 Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification							
		9	10	11	12	13	14	15	16
EEE	MB 280-10308A-A 81.9	110/u	110/u	110/u	100/u	120/u	130/u	130/u	

LDC #: 23126 A7A

SDG #: Sec Com

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
Were percent recoveries (%R) for surrogates within QC limits?
if 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
if any %R was less than 10 percent, was a reanalysis performed to confirm %R?

N A
 Y N A

VALIDATION FINDINGS WORKSHEET

Surrogate Recovery

Page: 1 of 1
Reviewer: JK
2nd Reviewer: JK

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		2 (10x)	TBP	39 (51-120)	No qual (only 1 out)
		7 (10x)		50	
		8 (10x)		32	
		9 (10x)		48	No qual (RSS only)
		10 (20x)		0	No qual
		13 (10x)		24	
		14 (10x)		27	

* QC limits are advisory

S1 (NBZ) = Nitrobenzene-d5	QC Limits (Soil)	23-120	QC Limits (Water)	35-114
S2 (FBP) = 2-Fluorobiphenyl	30-115	S5 (2FP) = 2-Fluorophenol	25-121	QC Limits (Water)
S3 (TPH) = Terphenyl-d14	18-137	S6 (TBP) = 2,4,6-Tribromophenol	19-122	21-100
S4 (PHL) = Phenol-d5	24-113	S7 (2CP) = 2-Chlorophenol-d4	20-130*	10-123
		S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	33-110*
				16-110*

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

LDC #: 23126A24
 SDG #: See below

Page: 1 of 1
 Reviewer: SVL
 2nd Reviewer: L

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

Y/N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y/N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y/N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		15/16	SS	()	257 (51-120)	()	14	No qual (MS) ↓
			UUU	()	164 (70-150)	()		
				()	()	()		
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Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A. Phenol	26-90%	< 35%	12-110%	< 42%	Acenaphthene	31-137%	< 19%	46-118%	< 31%
C. 2-Chlorophenol	25-102%	< 50%	27-123%	< 40%	4-Nitrophenol	11-114%	< 50%	10-80%	< 50%
E. 1,4-Dichlorobenzene	28-104%	< 27%	36-97%	< 28%	2,4-Dinitrotoluene	28-89%	< 47%	24-96%	< 38%
J. N-Nitroso-di-n-propylamine	41-126%	< 38%	41-116%	< 38%	Pentachlorophenol	17-109%	< 47%	9-103%	< 50%
R. 1,2,4-Trichlorobenzene	38-107%	< 23%	39-98%	< 28%	Pyrene	35-142%	< 36%	26-127%	< 31%
V. 4-Chloro-3-methylphenol	26-103%	< 33%	23-97%	< 42%					

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: GC/MS PAH (EPA SW 846 Method 8270C)

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

Compound Name	Conc (ug/Kg)		RPD (≤ 50%)	Diff	Diff Limits	Quals (Parent Only)
	1	3				
bis(2-ethylhexyl)phthalate	93	110		17	≤360	

Compound Name	Conc (ug/Kg)		RPD (≤ 50%)	Diff	Diff Limits	Quals (Parent Only)
	2	7				
Benzo(a)anthracene	3500U	340		3160	≤3500	
Benzo(a)pyrene	3500U	280		3220	≤3500	
Benzo(b)fluoranthene	350	700		350	≤3500	
Benzo(g,h,i)perylene	190	320		130	≤3500	
bis(2-ethylhexyl)phthalate	1200	1400		200	≤3500	
Chrysene	410	620		210	≤3500	
Fluoranthene	3500U	580		2920	≤3500	
Phenanthrene	220	330		110	≤3500	
Pyrene	320	610		290	≤3500	

Compound Name	Conc (ug/Kg)		RPD (≤ 50%)	Diff	Diff Limits	Quals (Parent Only)
	13	14				
Benzo(a)anthracene	23	350U		327	≤350	
Benzo(a)pyrene	23	350U		327	≤350	
Benzo(b)fluoranthene	74	64		10	≤360	
Benzo(g,h,i)perylene	22	350U		328	≤350	
bis(2-ethylhexyl)phthalate	120	130		10	≤360	
Chrysene	58	59		1	≤360	
Fluoranthene	46	44		2	≤360	
Octachlorostyrene	5600	5700		100	≤360	
Pyrene	37	39		2	≤360	
Hexachlorobenzene	16000	18000		2000	≤3600	

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: GC/MS PAH (EPA SW 846 Method 8270C)
 Y N NA Were field duplicate pairs identified in this SDG?
 Y N NA Were target analytes detected in the field duplicate pairs?

Compound Name	Conc (ug/Kg)		RPD (≤ 50%)	Diff	Diff Limits	Quals (Parent Only)
	8	RSAK7-3BPC ₂ FD				
Benzo(b)fluoranthene	350U	30		320	≤360	
bis(2-ethylhexyl)phthalate	140	140		0	≤360	
Chrysene	46	54		8	≤360	
Fluoranthene	46	50		4	≤360	
Octachlorostyrene	5100	5900	8			
Phenanthrene	23	31		8	≤360	
Pyrene	28	32		4	≤360	
Hexachlorobenzene	27000	34000	23			

Compound Name	Conc (ug/Kg)		RPD (≤ 50%)	Diff	Diff Limits	Quals (Parent Only)
	10	SSAJ8-01-1BPC ₂ FD				
Benzo(a)anthracene	45	35		10	≤360	
Benzo(b)fluoranthene	110	92		18	≤360	
Benzo(g,h,i)perylene	19	17		2	≤360	
bis(2-ethylhexyl)phthalate	110	120		10	≤360	
Chrysene	190	170		20	≤360	
Fluoranthene	220	180		40	≤360	
Phenanthrene	57	44		13	≤360	
Pyrene	150	120		30	≤360	
Octachlorostyrene	21000	18000	26			
Hexachlorobenzene	74000	66000	22			

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 6, 2010
LDC Report Date: May 20, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2131-5

Sample Identification

SSAJ8-01-3BPC
SSAJ8-01-4BPC
SSAJ8-01-3BPCMS
SSAJ8-01-3BPCMSD

Introduction

This data review covers 4 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
MB280-11011/3-A	4/14/10	Bis(2-ethylhexyl)phthalate	73.6 ug/Kg	All samples in SDG 280-2131-5

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
SSAJ8-01-3BPC	Bis(2-ethylhexyl)phthalate	320 ug/Kg	320U ug/Kg
SSAJ8-01-4BPC	Bis(2-ethylhexyl)phthalate	100 ug/Kg	100U ug/Kg

Sample FB-04072010-RZD (from SDG 280-2216-2) was identified as a field blank. No semivolatiles were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	All samples in SDG 280-2131-5

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2131-5	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2131-5**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2131-5	SSAJ8-01-3BPC SSAJ8-01-4BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2131-5**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P	Code
280-2131-5	SSAJ8-01-3BPC	Bis(2-ethylhexyl)phthalate	320U ug/Kg	A	bl
280-2131-5	SSAJ8-01-4BPC	Bis(2-ethylhexyl)phthalate	100U ug/Kg	A	bl

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2131-5**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126B2a
 SDG #: 280-2131-5
 Laboratory: Test America

Stage 2B

Date: 5/18/10
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/16/10
II.	GC/MS instrument performance check	A	
III.	Initial calibration	A	2 RSD ✓
IV.	Continuing calibration/ICV	A	COV/ICV ≤ 25%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	FB = FB-04072010-R2D (from 280-2216-2)

~~EB = EB-04122019-RIG3-R2D (from 280-2352-2)~~

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: 201

1	SSAJ8-01-3BPC	† 11	MB 280-11011/3-A	21		31
2	SSAJ8-01-4BPC	12		22		32
3	SSAJ8-01-3BPCMS	13		23		33
4	SSAJ8-01-3BPCMSD	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

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

VALIDATION FINDINGS WORKSHEET

Blanks

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

- Y N N/A Was a method blank analyzed for each matrix?
- Y N N/A Was a method blank analyzed for each concentration preparation level?
- Y N N/A Was a method blank associated with every sample?
- Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 4/4/10 **Blank analysis date:** 4/16/10

Conc. units: µg/kg **Associated Samples:** A11

(b2)

Compound	Blank ID	Sample Identification			
	MB 280-1	01/3-A	1	2	
EEE	73.6	320/4	100/4		

Blank extraction date: _____ **Blank analysis date:** _____ **Associated Samples:** _____

Compound	Blank ID	Sample Identification			

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 6, 2010

LDC Report Date: May 20, 2010

Matrix: Soil

Parameters: Semivolatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2131-6

Sample Identification

SA169-7BPC

Introduction

This data review covers one soil sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample FB04062010-RZB (from SDG 280-2131-2) was identified as a field blank. No semivolatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB04062010-RZB	4/6/10	Bis(2-ethylhexyl)phthalate	2.7 ug/L	All samples in SDG 280-2131-6

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2131-6	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2131-6**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2131-6	SA169-7BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2131-6**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2131-6**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126C2a

SDG #: 280-2131-6

Laboratory: Test America

Stage 2B

Date: 5/18/10

Page: 1 of 1

Reviewer: JVG

2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: <u>4/6/10</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	<u>2 RSD</u> <u>rv</u>
IV.	Continuing calibration/ICV	A	<u>CCV/ICV ≤ 25%</u>
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	<u>client spec</u>
VIII.	Laboratory control samples	A	<u>LCS</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	<u>FB = FB04062010-R2B (280-2131-2)</u> <u>FB = FB04122010-R2B (280-2352-2)</u>

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:

Soil

1	SA169-7BPC	11		21		31	
2	<u>MB 280-11504 / 1-A</u>	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 6, 2010

LDC Report Date: May 20, 2010

Matrix: Soil

Parameters: Semivolatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2131-8

Sample Identification

RSAJ8-7BPC

RSAJ8-6BPC

RSAJ8-7BPCMS

RSAJ8-7BPCMSD

Introduction

This data review covers 4 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
MB280-11720/1-A	4/20/10	Bis(2-ethylhexyl)phthalate	87.2 ug/Kg	All samples in SDG 280-2131-8

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
RSAJ8-7BPC	Bis(2-ethylhexyl)phthalate	120 ug/Kg	120U ug/Kg
RSAJ8-6BPC	Bis(2-ethylhexyl)phthalate	120 ug/Kg	120U ug/Kg

Sample FB-04072010-RZD (from SDG 280-2216-2) was identified as a field blank. No semivolatiles were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	All samples in SDG 280-2131-8

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2131-8	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2131-8**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2131-8	RSAJ8-7BPC RSAJ8-6BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2131-8**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P	Code
280-2131-8	RSAJ8-7BPC	Bis(2-ethylhexyl)phthalate	120U ug/Kg	A	bl
280-2131-8	RSAJ8-6BPC	Bis(2-ethylhexyl)phthalate	120U ug/Kg	A	bl

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2131-8**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126D2a
 SDG #: 280-2131-8
 Laboratory: Test America

Stage 2B

Date: 5/18/10
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/06/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD ✓
IV.	Continuing calibration/ICV	A	CCV/ICV ≤ 25%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	FB = FB-04072010-RZD (280-2216-2)

~~EB = EB-04122010-RIG3-RZD (280-2352-2)~~

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:

soil

1	RSAJ8-7BPC	11	MB 280-11720/1-A	21		31	
2	RSAJ8-6BPC	12		22		32	
3	RSAJ8-7BPCMS	13		23		33	
4	RSAJ8-7BPCMSD	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	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(e)pyrene**
B. Bis(2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 7, 2010
LDC Report Date: May 20, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2216-1

Sample Identification

SA110-5BPC
SA110-5BPCMS
SA110-5BPCMSD

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
MB280-10436/1-A	4/9/10	Bis(2-ethylhexyl)phthalate Di-n-octylphthalate	82.0 ug/Kg 84.0 ug/Kg	All samples in SDG 280-2216-1

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
SA110-5BPC	Bis(2-ethylhexyl)phthalate	130 ug/Kg	130U ug/Kg

Sample FB04062010-RZB (from SDG 280-2131-2) was identified as a field blank. No semivolatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB04062010-RZB	4/6/10	Bis(2-ethylhexyl)phthalate	2.7 ug/L	All samples in SDG 280-2216-1

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-1	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2216-1**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2216-1	SA110-5BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2216-1**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P	Code
280-2216-1	SA110-5BPC	Bis(2-ethylhexyl)phthalate	130U ug/Kg	A	bl

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2216-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126F2a
 SDG #: 280-2216-1
 Laboratory: Test America

Stage 2B

Date: 5/18/10
 Page: 1 of 1
 Reviewer: JLG
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/07/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD r2
IV.	Continuing calibration/ICV	A	CV/ICV ≤ 25%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	FB = FB04062010-RZB (280-2131-2) EB = EB 04122010-RFCG-RZB (280-2252-2)

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:

Soil

1	SA110-5BPC	11	MB 280-10476/1-A	21	31
2	SA110-5BPCMS	12		22	32
3	SA110-5BPCMSD	13		23	33
4		14		24	34
5		15		25	35
6		16		26	36
7		17		27	37
8		18		28	38
9		19		29	39
10		20		30	40

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

VALIDATION FINDINGS WORKSHEET
Blanks

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

- N N/A Was a method blank analyzed for each matrix?
- N N/A Was a method blank analyzed for each concentration preparation level?
- N N/A Was a method blank associated with every sample?
- N N/A Was the blank contaminated? If yes, please see qualification below.

(bl)

Blank extraction date: 4/29/10 Blank analysis date: 4/1/10 Associated Samples: A1
 Conc. units: ug/kg

Compound	Blank ID	Sample Identification
	MB 280-10436/1-A	1
EEE	82.0	130/1
FFF	84.0	

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

Compound	Blank ID	Sample Identification

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 7, 2010

LDC Report Date: May 20, 2010

Matrix: Water

Parameters: Semivolatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2216-2

Sample Identification

FB-04072010-RZD

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
MB280-10593/1-A	4/11/10	Bis(2-ethylhexyl)phthalate	2.17 ug/L	All samples in SDG 280-2216-2

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
FB-04072010-RZD	Bis(2-ethylhexyl)phthalate	2.2 ug/L	2.2U ug/L

Sample FB-04072010-RZD was identified as a field blank. No semivolatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	No associated samples in this SDG

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-2	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2216-2**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2216-2	FB-04072010-RZD	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2216-2**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P	Code
280-2216-2	FB-04072010-RZD	Bis(2-ethylhexyl)phthalate	2.2U ug/L	A	bl

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2216-2**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126G2a
 SDG #: 280-2216-2
 Laboratory: Test America

Date: 5/19/10
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/10/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	? RSD ✓
IV.	Continuing calibration/ICV	A	CV (W) ≤ 25%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	Client Spec
VIII.	Laboratory control samples	A	LCS ID
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	A	
XVII.	Field blanks	SW	FB = 1

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: Water

1	FB-04072010-RZD	11		21		31	
2	MB 280-10593/1-A	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 7, 2010

LDC Report Date: May 20, 2010

Matrix: Soil

Parameters: Semivolatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2216-4

Sample Identification

SA110-3BPC

Introduction

This data review covers one soil sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample FB04062010-RZB (from SDG 280-2131-2) was identified as a field blank. No semivolatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB04062010-RZB	4/6/10	Bis(2-ethylhexyl)phthalate	2.7 ug/L	All samples in SDG 280-2216-4

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-4	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2216-4**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2216-4	SA110-3BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2216-4**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2216-4**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126H2a
 SDG #: 280-2216-4
 Laboratory: Test America

Date: 5/19/10
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/6/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD ✓
IV.	Continuing calibration/ICV	A	CV/AV = 25 %
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	Client spec SS A06-05-1 BPC
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	FB = FB04062010-R2B (280-2131-2) EB = EB04122010-RIG1-R2B (280-2252-2)

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: Soil

1	SA110-3BPC	11		21		31	
2	NB 280-10714/1-A	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

(COC not signed)

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 7, 2010
LDC Report Date: May 20, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2216-5

Sample Identification

SSAN7-01-1BPC
SA137-3BPC
SSAJ8-02-1BPC
SSAJ8-02-1BPC_FD

Introduction

This data review covers 4 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Samples FB-04072010-RZD (from SDG 280-2216-2) and FB-04072010-RZC (from SDG 280-2280-2) were identified as field blanks. No semivolatile contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	SSAJ8-02-1BPC SSAJ8-02-1BPC_FD

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-5	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

Samples SSAJ8-02-1BPC and SSAJ8-02-1BPC_FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAJ8-02-1BPC	SSAJ8-02-1BPC_FD				
Bis(2-ethylhexyl)phthalate	350U	97	-	253 (≤ 350)	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2216-5**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2216-5	SSAN7-01-1BPC SA137-3BPC SSAJ8-02-1BPC SSAJ8-02-1BPC_FD	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2216-5**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2216-5**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 2312612a
 SDG #: 280-2216-5
 Laboratory: Test America

Stage 2B

Date: 5/19/10
 Page: 1 of 1
 Reviewer: SVL
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: <u>4/07/10</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	<u>SSA06-05-1BPC</u>
VIII.	Laboratory control samples	A	<u>LCS</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	<u>D = 3.4</u>
XVII.	Field blanks	SW	<u>FB = FB-04072010-R2D (280-2216-2)</u> <u>*FB-04072010-R2C (280-2280-2)</u>

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

*ND = No compounds detected D = Duplicate
 R = Rinsate TB = Trip blank
 FB = Field blank EB = Equipment blank

Validated Samples: (oi)

1	SSAN7-01-1BPC	11		21		31	
2	SA137-3BPC	12		22		32	
3	SSAJ8-02-1BPC <u>D</u>	13		23		33	
4	SSAJ8-02-1BPC_FD <u>D</u>	14		24		34	
5	<u>MB 280-16714/A-A</u>	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(e)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 1,4 - Dioxane
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Octachlorostyrene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 23/26 I 2a
 SDG #: See Corr

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: JVG
 2nd reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

N N/A Were field duplicate pairs identified in this SDG?
 N N/A Were target compounds identified in the field duplicate pairs?

Compound	Concentration (^{ug} / _{kg})		RPD
	3	4	
EEE	350 U	97	253 (≤ 350 D)

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 7, 2010

LDC Report Date: May 20, 2010

Matrix: Soil

Parameters: Semivolatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2216-6

Sample Identification

SA84-5BPC

Introduction

This data review covers one soil sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample FB04062010-RZB (from SDG 280-2131-2) was identified as a field blank. No semivolatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB04062010-RZB	4/6/10	Bis(2-ethylhexyl)phthalate	2.7 ug/L	All samples in SDG 280-2216-6

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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 not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-6	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2216-6**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2216-6	SA84-5BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2216-6**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2216-6**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126J2a
 SDG #: 280-2216-6
 Laboratory: Test America

Stage 2B

Date: 5/19/10
 Page: 1 of 1
 Reviewer: SLG
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/07/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD r ²
IV.	Continuing calibration/ICV	A	CCV/ICV ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	Client spec SA156-5BPC (No asstd. sample, No qual)
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	FB = FB04062010-R2B (280-2131-2) EB = EB-04122010-R1G1 R2B (280-2352-2)

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: Soil

1	SA84-5BPC	11		21		31	
2	MB 280-10974/LA	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes:* = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 7, 2010

LDC Report Date: May 27, 2010

Matrix: Soil

Parameters: Semivolatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2270-2

Sample Identification

SSAK8-01-1BPC

SSAK8-01-1BPC_FD

Introduction

This data review covers 2 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample FB-04072010-RZD (from SDG 280-2216-2) was identified as a field blank. No semivolatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	All samples in SDG 280-2270-2

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2270-2	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

Samples SSAK8-01-1BPC and SSAK8-01-1BPC_FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAK8-01-1BPC	SSAK8-01-1BPC_FD				
Bis(2-ethylhexyl)phthalate	60	340U	-	280 (≤ 340)	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2270-2**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2270-2	SSAK8-01-1BPC SSAK8-01-1BPC_FD	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2270-2**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2270-2**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126M2a

SDG #: 280-2270-2

Laboratory: Test America

Stage 2B

Date: 5/19/20

Page: 1 of 1

Reviewer: JVG

2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/07/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD r ²
IV.	Continuing calibration/ICV	A	CV/ICV < 25%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	SSAK 3-03-1BPC ; RSAI 2-12BPC
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 1, 2
XVII.	Field blanks	SW	FB = FB-04072010-RZD (280-2216-2)

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected D = Duplicate
R = Rinsate TB = Trip blank
FB = Field blank EB = Equipment blank

Validated Samples: 50;

1	SSAK8-01-1BPC	11		21		31	
2	SSAK8-01-1BPC_FD	12		22		32	
3	MB 280-10 760 / -A	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. <i>1,4-Dioxane</i>
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. <i>Octachlorostyrene</i>
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 23126 M2a
 SDG #: Sea Comm

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
 Reviewer: JVB
 2nd reviewer: h

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Y N N/A
 Y N N/A

Were field duplicate pairs identified in this SDG?
 Were target compounds identified in the field duplicate pairs?

Compound	Concentration (<u>ug/kg</u>)		RPD
	1	2	
EEE	60	340 u	280 (≤ 340 D)

Compound	Concentration ()		RPD
	1	2	

Compound	Concentration ()		RPD
	1	2	

Compound	Concentration ()		RPD
	1	2	

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 8, 2010
LDC Report Date: May 20, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-1

Sample Identification

SSAO5-03-1BPC
SSAO5-03-5BPC
SSAO6-04-5BPC
SSAO6-05-1BPC
SSAO6-05-5BPC
SSAO6-05-5BPC-FD
SSAO6-05-1BPCMS
SSAO6-05-1BPCMSD

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample EB-04072010-RZC (from SDG 280-2383-1) was identified as an equipment blank. No semivolatile contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Compound	Concentration	Associated Samples
EB-04072010-RZC	4/8/10	Bis(2-ethylhexyl)phthalate	2.4 ug/L	All samples in SDG 280-2280-1

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

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No semivolatiles were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-1	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

Samples SSAO6-05-5BPC and SSAO6-05-5BPC-FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAO6-05-5BPC	SSAO6-05-5BPC-FD				
Bis(2-ethylhexyl)phthalate	350U	90	-	260 (≤ 350)	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2280-1**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2280-1	SSAO5-03-1BPC SSAO5-03-5BPC SSAO6-04-5BPC SSAO6-05-1BPC SSAO6-05-5BPC SSAO6-05-5BPC-FD	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2280-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Equipment Blank Data Qualification Summary - SDG 280-2280-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2280-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #: 23126N2a
 SDG #: 280-2280-1
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 5/19/10
 Page: 1 of 1
 Reviewer: JVL
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/6/8/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD ✓
IV.	Continuing calibration/ICV	A	CCV / CV ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 5, 6
XVII.	Field blanks	SW	FB = FB-04072010-RZC (280-2280-2) EB = EB-04072010-RZC (280-2383-1)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected D = Duplicate
 R = Rinsate TB = Trip blank
 FB = Field blank EB = Equipment blank

Validated Samples:

Soil

1	SSAO5-03-1BPC	11	MB 280-1074/1-A	21		31	
2	SSAO5-03-5BPC	12		22		32	
3	SSAO6-04-5BPC	13		23		33	
4	SSAO6-05-1BPC	14		24		34	
5	SSAO6-05-5BPC	15		25		35	
6	SSAO6-05-5BPC-FD	16		26		36	
7	SSAO6-05-1BPCMS	17		27		37	
8	SSAO6-05-1BPCMSD	18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. <i>1,4-Dioxane</i>
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. <i>Octachlorostyrene</i>
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 73126 N29
SDG #: See Com

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer: JLG
2nd reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Y N N/A
Y N N/A

Were field duplicate pairs identified in this SDG?

Were target compounds identified in the field duplicate pairs?

Compound	Concentration (<i>ug/kg</i>)		RPD
	5	6	
EEE	350 u	90	260 (≤ 350 D)

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 8, 2010

LDC Report Date: May 20, 2010

Matrix: Water

Parameters: Semivolatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-2

Sample Identification

FB-04072010-RZC

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample FB-04072010-RZC was identified as a field blank. No semivolatile contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-2	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2280-2**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2280-2	FB-04072010-RZC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2280-2**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2280-2**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 2312602a
 SDG #: 280-2280-2
 Laboratory: Test America

Date: 5/19/10
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/08/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD r _r
IV.	Continuing calibration/ICV	A	CV/ION ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	client spec
VIII.	Laboratory control samples	A	LCS 10
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	FB = 1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: WATER

1	FB-04072010-RZC	11		21		31	
2	MB 280-11077/4-A	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 8, 2010
LDC Report Date: May 26, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B & 4
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-4

Sample Identification

SSAO5-02-1BPC**
SSAO5-02-1BPC_FD
SSAO5-03-2BPC**
SSAK2-01-1BPC**
SSAK2-01-1BPC_FD
SSAK3-02-1BPC**
SSAK3-03-1BPC**
SSAK3-04-1BPC**
SSAK3-04-1BPC_FD
RSAI2-12BPC**
SSAO6-04-1BPC**
SSAO6-04-1BPC_FD
SSAO7-01-1BPC**
SSAO7-01-1BPC_FD
SSAK3-03-1BPCMS
SSAK3-03-1BPCMSD
RSAI2-12BPCMS
RSAI2-12BPCMSD

**Indicates sample underwent Stage 4 review

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- 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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample EB-04072010-RZC (both from SDG 280-2383-1) was identified as an equipment blank. No semivolatile contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Compound	Concentration	Associated Samples
EB-04072010-RZC	4/8/10	Bis(2-ethylhexyl)phthalate	2.4 ug/L	SSAO5-02-1BPC** SSAO5-02-1BPC_FD SSAO5-03-2BPC** SSAO6-04-1BPC** SSAO6-04-1BPC_FD SSAO7-01-1BPC** SSAO7-01-1BPC_FD

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

Samples FB-04072010-RZD (from SDG 280-2216-2) and FB-04072010-RZC (from SDG 280-2280-2) were identified as field blanks. No semivolatile contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	SSAK2-01-1BPC** SSAK2-01-1BPC_FD SSAK3-02-1BPC** SSAK3-03-1BPC** SSAK3-04-1BPC** SSAK3-04-1BPC_FD RSAI2-12BPC**

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for samples SSAO6-04-1BPC** and SSAO6-04-1BPC_FD. Since the samples were diluted out, no data were qualified.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

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

XII. Project Quantitation Limit

All compound quantitation and CRQLs were within validation criteria for samples on which a Stage 4 review was performed.

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-4	All compounds reported below the PQL.	J (all detects)	A

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

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

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

XV. Overall Assessment

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

XVI. Field Duplicates

Samples SSAO5-02-1BPC** and SSAO5-02-1BPC_FD, samples SSAK2-01-1BPC** and SSAK2-01-1BPC_FD, samples SSAK3-04-1BPC** and SSAK3-04-1BPC_FD, samples SSAO6-04-1BPC** and SSAO6-04-1BPC_FD, and samples SSAO7-01-1BPC** and SSAO7-01-1BPC_FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAK3-04-1BPC**	SSAK3-04-1BPC_FD				
Hexachlorobenzene	72	59	-	13 (≤ 350)	-	-
Bis(2-ethylhexyl)phthalate	350U	190	-	160 (≤ 350)	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2280-4**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2280-4	SSAO5-02-1BPC** SSAO5-02-1BPC_FD SSAO5-03-2BPC** SSAK2-01-1BPC** SSAK2-01-1BPC_FD SSAK3-02-1BPC** SSAK3-03-1BPC** SSAK3-04-1BPC** SSAK3-04-1BPC_FD RSAI2-12BPC** SSAO6-04-1BPC** SSAO6-04-1BPC_FD SSAO7-01-1BPC** SSAO7-01-1BPC_FD	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2280-4**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Equipment Blank Data Qualification Summary - SDG 280-2280-4**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2280-4**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126P2a

SDG #: 280-2280-4

Laboratory: Test America

Stage 2B / 4

Date: 5/19/10

Page: 1 of 1

Reviewer: JL

2nd Reviewer: ✓

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: <u>4/08/10</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	*A	
XII.	Compound quantitation/CRQLs	*A	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	*A	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	$D_1 = 1, 2$ $D_2^* = 4, 5$ $D_3 = 8, 9$ $D_4^* = 11, 17$ $D_5^* = 13, 14$ * FB = FB-04072010-R2C (280-2280-2) ↓ - FB-04072010-R2D (280-2216-2)
XVII.	Field blanks	SW	EB = EB-04072010-R2C (280-2383-1)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

*ND = No compounds detected D = Duplicate
 R = Rinsate TB = Trip blank
 FB = Field blank EB = Equipment blank

Validated Samples:

**** Level IV** SOI

1	SSAO5-02-1BPC ** D_1	11	SSAO6-04-1BPC *** D_1	21	MB 280-10760 /-A	31
2	SSAO5-02-1BPC_FD D_1	12	SSAO6-04-1BPC_FD D_4	22		32
3	SSAO5-03-2BPC **	13	SSAO7-01-1BPC ** D_3	23		33
4	SSAK2-01-1BPC ** D_2	14	SSAO7-01-1BPC_FD D_5	24		34
5	SSAK2-01-1BPC_FD D_1	15	SSAK3-03-1BPCMS	25		35
6	SSAK3-02-1BPC **	16	SSAK3-03-1BPCMSD	26		36
7	SSAK3-03-1BPC **	17	RSI2-12BPCMS	27		37
8	SSAK3-04-1BPC ** D_3	18	RSI2-12BPCMSD	28		38
9	SSAK3-04-1BPC_FD D_3	19		29		39
10	RSI2-12BPC **	20		30		40

LDC #: 23126 P2a
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: JV6
 2nd Reviewer: [Signature]

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples analyzed within the 12 hour clock criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 0.05?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 23126 P2a
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: JG
 2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		/		
Were the performance evaluation (PE) samples within the acceptance limits?			/	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	/			
Were retention times within + 30 seconds from the associated calibration standard?	/			
XI. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	/			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	/			
Were chromatogram peaks verified and accounted for?	/			
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	/			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			/	
Were relative intensities of the major ions within \pm 20% between the sample and the reference spectra?			/	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		/		
XIV. System performance				
System performance was found to be acceptable.	/			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target compounds were detected in the field duplicates.	/			
XVII. Field blanks				
Field blanks were identified in this SDG.	/			
Target compounds were detected in the field blanks.	/			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. <i>1,4-Pioxane</i>
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. <i>Octachlorostyrene</i>
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 23126 P2a
 SDG #: See Conv

VALIDATION FINDINGS WORKSHEET Field Blanks

Page: of 1
 Reviewer: JVG
 2nd Reviewer: ---

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Y/N N/A Were field blanks identified in this SDG?

Y N/A Were target compounds detected in the field blanks?

Blank units: ug/L Associated sample units: ug/kg

Sampling date: 4/07/10

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

Associated Samples: 4-10

Compound	Blank ID	Sample Identification			
	FB-04072010-RZD				
EEE	2.2	(ND	>	5X BK)
CRQL					

Blank units: ug/L Associated sample units: ug/kg

Sampling date: 4/08/10

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

Associated Samples: 1-3, 11-14

Compound	Blank ID	Sample Identification			
	FB-04072010-RZC				
EEE	2.4	(ND	>	5X BK)
CRQL					

5x Phthalates
 2x All others

LDC #: 23126 P2a
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: JV
 2nd reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Y N N/A
 Y N N/A

Were field duplicate pairs identified in this SDG?

Were target compounds identified in the field duplicate pairs?

Compound	Concentration (^{ug/kg})		RPD
	8	9	
SS	72	59	13 (E350D)
EEE	350 u	190	160 ↓

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

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

$RRF = (A_x)(C_{is}) / (A_{is})(C_x)$ A_x = Area of Compound A_{is} = Area of associated internal standard
 average RRF = sum of the RRFs/number of standards C_x = Concentration of compound, C_{is} = Concentration of internal standard
 %RSD = $100 * (S/X)$ S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (50 std)	RRF (50 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	ICAL	4/13/2010	1,4-Dioxane (IS1)	0.5725	0.5725	0.5719	0.5719	3.4	3.42
	MSS K		Naphthalene (IS2)	1.0312	1.0312	0.9822	0.9822	11.7	11.69
			Fluorene (IS3)	1.3050	1.3050	1.2461	1.2462	11.2	11.20
			Hexachlorobenzene (IS4)	0.2559	0.2559	0.2432	0.2432	7.7	7.68
			Chrysene (IS5)	1.0610	1.0610	1.0410	1.0410	10.7	10.66
			Benzo(a)pyrene (IS6)	1.1036	1.1036	1.0281	1.0281	5.7	5.71

Inc IS/Cpd	Area cpd	Area IS
40/50	149509	208921
40/50	1021070	792159
40/50	789238	483840
40/50	270605	845901
40/50	1301240	981110
40/50	1376307	997687

Conc	1,4-Dioxane	Naphthalene	Fluorene	Hexachlorob	Chrysene	Benzo(a)py
4.00	0.6099	1.1409	1.3747		1.1807	0.9292
10.00	0.5857	1.0702	1.3919	0.2646	1.1392	1.0099
20.00	0.5807	1.0728	1.3882	0.2598	1.1556	1.0972
50.00	0.5725	1.0312	1.3050	0.2559	1.0610	1.1036
80.00	0.5572	0.9598	1.2199	0.2461	1.0154	1.0631
120.00	0.5574	0.9097	1.1599	0.2364	0.9617	1.0333
160.00	0.5534	0.8529	1.0970	0.2245	0.9268	0.9979
200.00	0.5580	0.8202	1.0426	0.2150	0.8874	0.9906
X =	0.5719	0.9822	1.2462	0.2432	1.0410	1.0281
S =	0.0195	0.1148	0.1395	0.0187	0.1110	0.0587

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

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

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

% Difference = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$
 RRF = $(Ax)(Cis) / (Ais)(Cx)$

Where:

ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 Ax = Area of compound Ais = Area of associated internal standard
 Cx = Concentration of compound Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference IS)	Average RRF (Initial RRF)	Reported (CC RRF)	Recalculated (CC RRF)	Reported %D	Recalculated %D
1	D3996	04/16/10	1,4-Dioxane (IS1)	0.5719	0.5422	0.5422	5.2	5.2
			Naphthalene (IS2)	0.9822	0.9549	0.9549	2.8	2.8
			Fluorene (IS3)	1.2461	1.2271	1.2271	1.5	1.5
			Hexachlorobenzene (IS4)	0.2432	0.2442	0.2442	0.4	0.4
			Chrysene (IS5)	1.0410	1.0164	1.0164	2.4	2.4
			Benzo(a)pyrene (IS6)	1.0281	1.0477	1.0477	1.9	1.9

Compound (Reference IS)	Concentration (IS/Cpd)	Area Cpd	Area IS
1,4-Dioxane (IS1)	40/80	218127	201167
Naphthalene (IS2)	40/80	1533221	802846
Fluorene (IS3)	40/80	1213581	494495
Hexachlorobenzene (IS4)	40/80	436103	892871
Chrysene (IS5)	40/80	2100765	1033434
Benzo(a)pyrene (IS6)	40/80	2251279	1074358

LDC #: 23126 R2A

VALIDATION FINDINGS WORKSHEET

Page: 1 of 1

SDG #: See Cover

Surrogate Results Verification

Reviewer: JVC

2nd reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found

SS = Surrogate Spiked

Sample ID: # 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	100	98.1	98	98	0
2-Fluorobiphenyl	↓	95.4	95	95	↓
Terphenyl-d14		102.7	103	103	
Phenol-d5	150	151.5	101	101	↓
2-Fluorophenol	↓	144.9	97	97	
2,4,6-Tribromophenol		151.1	101	101	
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

% Recovery = $100 \cdot (SSC - SC) / SA$ Where: SSC = Spiked sample concentration SC = Sample concentration
 SA = Spike added

RPD = $100 \cdot |MS - MSD| \cdot 2 / (MS + MSD)$ MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 17/18

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD	
	MS	MSD		MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene	2860	2880	0	2280	2260	80	80	79	79	1	1
Pentachlorophenol											
Pyrene	2860	2880	16	2640	2570	89	92	89	89	3	3

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

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

% Recovery = $100 * (SC/SA)$ Where: SSC = Spike concentration
 SA = Spike added

RPD = $100 * \frac{LCSC - LCSDC}{LCSC + LCSDC}$ LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: LCS 280-1076/3-A

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS		LCSD		LCS/LCSD												
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		RPD												
	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalculated											
Phenol																					
N-Nitroso-di-n-propylamine																					
4-Chloro-3-methylphenol																					
Acenaphthene	2660	NA	2220	NA	84	83.5															
Pentachlorophenol	2660		2500		94	94															
Pyrene																					

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

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 8, 2010

LDC Report Date: May 26, 2010

Matrix: Soil

Parameters: Semivolatiles

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-5

Sample Identification

SSAO4-02-3BPC

Introduction

This data review covers one soil sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample EB-04072010-RZC (from SDG 280-2383-1) was identified as an equipment blank. No semivolatile contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Compound	Concentration	Associated Samples
EB-04072010-RZC	4/7/10	Bis(2-ethylhexyl)phthalate	2.4 ug/L	All samples in SDG 280-2280-5

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

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No semivolatle contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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 not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria.

XII. Project Quantitation Limit

All compound quantitation and CRQLs were within validation criteria.

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-5	All compounds reported below the PQL.	J (all detects)	A

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2280-5**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2280-5	SSAO4-02-3BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2280-5**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Equipment Blank Data Qualification Summary - SDG 280-2280-5**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2280-5**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B 4

LDC #: 23126Q2a
 SDG #: 280-2280-5
 Laboratory: Test America

Date: 5/19/10
 Page: 1 of 1
 Reviewer: SVL
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/08/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	3 RSD RV
IV.	Continuing calibration/ICV	A	CCV/ICV ≤ 25 %
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	Client Spec SA150-5BPC (No acst'd sample, No equal)
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	/EB = EB-04072010-RZC (280-2383-1)
XVII.	Field blanks	SW	{ FB = FB-04072010-RZC (280-2280-2) EB = EB-04122010-RZG-RZD (280-2352-2)

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: Soi)

1	SSAO4-02-3BPC	11		21		31	
2	WB 280-10974/1-A	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 23126 Q 2A
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: JV
 2nd Reviewer: [Signature]

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	/			
Were all samples analyzed within the 12 hour clock criteria?	/			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	/			
Was a curve fit used for evaluation?	/			
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?	/			
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 0.05?	/			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	/			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	/			
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?	/			
V. Blanks				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank analyzed for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.			/	
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	/			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			/	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			/	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	/			
Was a MS/MSD analyzed every 20 samples of each matrix?	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			/	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	/			

LDC #: 23126 Q2A
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: JUC
 2nd Reviewer: W

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were retention times within + 30 seconds from the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
XIV. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XVII. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis(2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

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

$RRF = (A_x)(C_{is}) / (A_{is})(C_x)$ A_x = Area of Compound A_{is} = Area of associated internal standard
 average RRF = sum of the RRFs/number of standards C_x = Concentration of compound, C_{is} = Concentration of internal standard
 %RSD = $100 * (S/X)$ S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (50 std)	RRF (50 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	ICAL	3/18/2010	1,4-Dioxane (IS1)	0.5882	0.5882	0.5862	0.5862	6.9	6.88
	MSS D		Naphthalene (IS2)	1.1221	1.1221	1.1134	1.1134	3.0	3.01
			Fluorene (IS3)	1.3445	1.3445	1.3224	1.3225	5.0	5.04
			Hexachlorobenzene (IS4)	0.2412	0.2412	0.2488	0.2487	8.9	8.87
			Chrysene (IS5)	1.0697	1.0697	1.0065	1.0065	8.2	8.17
			Benzo(a)pyrene (IS6)	1.1044	1.1044	1.0885	1.0885	6.7	6.69

Inc IS/Cpd	Area cpd	Area IS
40/50	292285	397528
40/50	1966829	1402196
40/50	1609531	957696
40/50	483347	1602894
40/50	2492854	1864283
40/50	2472315	1790944

Conc	1,4-Dioxane	Naphthalene	Fluorene	Hexachlorob	Chrysene	Benzo(a)py
4.00	0.6542	1.1382	1.2049		1.0249	0.9762
10.00	0.6168	1.1444	1.2482	0.2132	1.0017	1.0038
20.00	0.5587	1.1266	1.2972	0.2367	1.0484	1.0453
50.00	0.5882	1.1221	1.3445	0.2412	1.0697	1.1044
80.00	0.5191	1.0774	1.3440	0.2492	1.0741	1.1019
120.00	0.5793	1.1406	1.3805	0.2535	1.0559	1.1505
160.00	0.5706	1.1068	1.3878	0.2641	0.9457	1.1705
200.00	0.6029	1.0507	1.3725	0.2833	0.8319	1.1554
X =	0.5862	1.1134	1.3225	0.2487	1.0065	1.0885
S =	0.0403	0.0335	0.0666	0.0221	0.0822	0.0728

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

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

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

Where:
 ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 Ax = Area of compound Ais = Area of associated internal standard
 Cx = Concentration of compound Cis = Concentration of internal standard

$$\% \text{ Difference} = 100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$$

$$\text{RRF} = (Ax)(Cis) / (Ais)(Cx)$$

#	Standard ID	Calibration Date	Compound (Reference IS)	Average RRF (Initial RRF)	Reported (CC RRF)	Recalculated (CC RRF)	Reported %D	Recalculated %D
1	D3996	04/16/10	1,4-Dioxane (IS1)	0.5862	0.5805	0.5805	1.0	1.0
			Naphthalene (IS2)	1.1134	1.1128	1.1128	0.1	0.1
			Fluorene (IS3)	1.3224	1.3203	1.3203	0.2	0.2
			Hexachlorobenzene (IS4)	0.2488	0.2542	0.2542	2.2	2.2
			Chrysene (IS5)	1.0065	1.0377	1.0377	3.1	3.1
			Benzo(a)pyrene (IS6)	1.0885	1.2035	1.2035	10.6	10.6

Compound (Reference IS)	Concentration (IS/Cpd)	Area Cpd	Area IS
1,4-Dioxane (IS1)	40/80	453857	390903
Naphthalene (IS2)	40/80	3177574	1427715
Fluorene (IS3)	40/80	2697204	1021471
Hexachlorobenzene (IS4)	40/80	868351	1708342
Chrysene (IS5)	40/80	4195266	2021491
Benzo(a)pyrene (IS6)	40/80	4035191	1676408

LDC #: 03/26 α m
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
 Reviewer: JVG
 2nd reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS * 100$

Where: SF = Surrogate Found
 SS = Surrogate Spiked

Sample ID: # 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	100	62.8	63	66	0
2-Fluorobiphenyl	↓	66.4	66	66	↓
Terphenyl-d14	↓	85.3	85	85	
Phenol-d5	150	99.5	77 66	66	
2-Fluorophenol	↓	96.4	4 64	64	
2,4,6-Tribromophenol	↓	91.6	61	61	
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

% Recovery = $100 * (SC/SA)$ Where: SSC = Spike concentration
 SA = Spike added

RPD = $100 * \frac{LCS - LCSDC}{LCS + LCSDC}$ LCS = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: LCS 280 - 10974 / 2-A

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS		LCSD		Percent Recovery		Percent Recovery		RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Phenol														
N-Nitroso-di-n-propylamine														
4-Chloro-3-methylphenol														
Acenaphthene	2450	NA	1950	NA	79	79								
Pentachlorophenol	2450	↓	2350	↓	96	96								
Pyrene														

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

LDC #: 23126 Q ra
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1
 Reviewer: JNB
 2nd reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Y N N/A
Y N N/A

Were all reported results recalculated and verified for all level IV samples?
 Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_x)(I_s)(V_i)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$$

- A_x = Area of the characteristic ion (EICP) for the compound to be measured
- A_{is} = Area of the characteristic ion (EICP) for the specific internal standard
- I_s = Amount of internal standard added in nanograms (ng)
- V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).
- V_i = Volume of extract injected in microliters (ul)
- V_i = Volume of the concentrated extract in microliters (ul)
- Df = Dilution Factor.
- %S = Percent solids, applicable to soil and solid matrices only.
- 2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. # | _____ :

$$\text{Conc.} = \left[\frac{(12874)}{(150985)} \right] \times \dots + 0.0493$$

$$= \frac{0.06127 (40) (1ml) (1000)}{(31.1g) (0.908)}$$

#	Sample ID	Compound	Reported Concentration ()	Calculated Concentration ()	Qualification
		= 86.79 ≈ 87 ug/kg			

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 8, 2010
LDC Report Date: May 26, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 4
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-7

Sample Identification

RSAI2-14BPC
RSAI2-14BPCMS
RSAI2-14BPCMSD

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
All samples in SDG 280-2280-7	All TCL compounds	16	14	J- (all detects) UJ (all non-detects)	P

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

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
MB280-12380/1-A	4/24/10	Bis(2-ethylhexyl)phthalate Diethylphthalate	91.7 ug/Kg 48.9 ug/Kg	All samples in SDG 280-2280-7

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
RSAI2-14BPC	Bis(2-ethylhexyl)phthalate Diethylphthalate	100 ug/Kg 40 ug/Kg	100U ug/Kg 40U ug/Kg

Sample FB-04072010-RZD (from SDG 280-2216-2) was identified as a field blank. No semivolatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	All samples in SDG 280-2280-7

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

All target compound identifications were within validation criteria.

XII. Project Quantitation Limit

All compound quantitation and CRQLs were within validation criteria.

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-7	All compounds reported below the PQL.	J (all detects)	A

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2280-7**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2280-7	RSAI2-14BPC	All TCL compounds	J- (all detects) UJ (all non-detects)	P	Technical holding times (h)
280-2280-7	RSAI2-14BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2280-7**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P	Code
280-2280-7	RSAI2-14BPC	Bis(2-ethylhexyl)phthalate Diethylphthalate	100U ug/Kg 40U ug/Kg	A	bl

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2280-7**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126T2a
 SDG #: 280-2280-7
 Laboratory: Test America

Stage 2B 4

Date: 5/19/10
 Page: 1 of 1
 Reviewer: SVL
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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	SW	Sampling dates: 4/08/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD ✓
IV.	Continuing calibration/ICV	A	CW / CV ≤ 25 %
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	NA	
XII.	Compound quantitation/CRQLs	NA	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	NA	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	FB = FB - 04072010 - R2D (280-2216-2) FB = EB - 04122010 - R2D - R2D (280-2357-2)

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: 501

1	RSAI2-14BPC	11		21		31	
2	RSAI2-14BPCMS	12		22		32	
3	RSAI2-14BPCMSD	13		23		33	
4 ⁺	MB 280-12380/A	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 #: 23126 T 2a
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: JV6
 2nd Reviewer: [Signature]

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples analyzed within the 12 hour clock criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) ≥ 0.05?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 23126 T2a
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: JNB
 2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were retention times within + 30 seconds from the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within $\pm 20\%$ between the sample and the reference spectra?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
XIV. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XVII. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 1,4-Dioxane
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Octachlorostyrene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 23 126 T2a
SDG #: Sec Com

VALIDATION FINDINGS WORKSHEET

Technical Holding Times

Page: 1 of 1
Reviewer: JV6
2nd Reviewer: h

All circled dates have exceeded the technical holding times.
Y/N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	<u>Extraction date</u>	Analysis date	Total # of Days	Qualifier
A11	S	N	4 / 08 / 10	4 / 24 / 10	4 / 26 / 10	16	J-MS/P (

TECHNICAL HOLDING TIME CRITERIA
Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

- Y N N/A Was a method blank analyzed for each matrix?
- Y N N/A Was a method blank analyzed for each concentration preparation level?
- Y N N/A Was a method blank associated with every sample?
- Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 4/24/10 Blank analysis date: 4/26/10
Conc. units: ug/kg Associated Samples: A1 (bl)

Compound	Blank ID	Sample Identification			
	MB 250-12380/1-A				
EEF	91.7	1	100/U		
LL	48.9		40/U		

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

Compound	Blank ID	Sample Identification			

5x Phthalates
2x all others

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

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

$RRF = (A_x)(C_{is}) / (A_{is})(C_x)$
 average RRF = sum of the RRFs/number of standards
 $\%RSD = 100 * (S/X)$
 A_x = Area of Compound
 A_{is} = Area of associated internal standard
 C_x = Concentration of compound,
 C_{is} = Concentration of internal standard
 S = Standard deviation of the RRFs,
 X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Internal Standard)	Reported		Recalculated		Reported		Recalculated	
				RRF (50 std)	RRF (50 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD		
1	ICAL	4/20/2010	1,4-Dioxane (IS1)	0.7058	0.7058	0.6724	0.6724	4.7	4.7	4.66	4.66
	MSS Y		Naphthalene (IS2)	1.0439	1.0439	1.0093	1.0094	9.3	9.3	9.31	9.31
			Fluorene (IS3)	1.3785	1.3785	1.3159	1.3159	7.0	7.0	7.03	7.03
			Hexachlorobenzene (IS4)	0.1957	0.1957	0.1957	0.1957	3.3	3.3	3.33	3.33
			Chrysene (IS5)	1.1000	1.0995	1.0921	1.0922	7.4	7.4	7.40	7.40
			Benzo(a)pyrene (IS6)	1.1590	1.1590	1.0622	1.0622	9.8	9.8	9.84	9.84

Inc IS/Cpd	Area cpd	Area IS
40/50	276925	313873
40/50	1617439	1239573
40/50	1234123	716229
40/50	303072	1238699
40/50	1806969	1314740
40/50	1734579	1197319

Conc	1,4-Dioxane	Naphthalene	Fluorene	Hexachlorob	Chrysene	Benzo(a)py
4.00	0.7210	1.1465	1.4250	0.2057	1.2269	0.8463
10.00	0.6823	1.0828	1.3650	0.1974	1.1748	0.9826
20.00	0.7058	1.0751	1.4034	0.1957	1.1215	1.1326
80.00	0.6515	0.9974	1.3117	0.2016	1.0721	1.1514
120.00	0.6385	0.9445	1.2596	0.1922	1.0334	1.0904
160.00	0.6494	0.9053	1.1971	0.1873	1.0213	1.0825
200.00	0.6585	0.8794	1.1868	0.1898	0.9873	1.0531
X =	0.6724	1.0094	1.3159	0.1957	1.0922	1.0622
S =	0.0313	0.0939	0.0925	0.0065	0.0809	0.1046

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

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

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

Where:
 ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 Ax = Area of compound Ais = Area of associated internal standard
 Cx = Concentration of compound Cis = Concentration of internal standard

$$\% \text{ Difference} = 100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$$

$$\text{RRF} = (\text{Ax})(\text{Cis}) / (\text{Ais})(\text{Cx})$$

#	Standard ID	Calibration Date	Compound (Reference IS)	Average RRF (Initial RRF)	Reported (CC RRF)	Recalculated (CC RRF)	Reported %D	Recalculated %D
1	Y1968	04/26/10	1,4-Dioxane (IS1)	0.6724	0.6410	0.6410	4.7	4.7
			Naphthalene (IS2)	1.0093	0.9796	0.9796	2.9	2.9
			Fluorene (IS3)	1.3159	1.2955	1.2955	1.6	1.6
			Hexachlorobenzene (IS4)	0.1957	0.1951	0.1951	0.3	0.3
			Chrysene (IS5)	1.0921	1.0269	1.0269	6.0	6.0
			Benzo(a)pyrene (IS6)	1.0622	1.1116	1.1116	4.6	4.6

Compound (Reference IS)	Concentration (IS/Cpd)	Area Cpd	Area IS
1,4-Dioxane (IS1)	40/80	530018	413417
Naphthalene (IS2)	40/80	3251231	1659515
Fluorene (IS3)	40/80	2561260	988530
Hexachlorobenzene (IS4)	40/80	673312	1725810
Chrysene (IS5)	40/80	3615470	1760383
Benzo(a)pyrene (IS6)	40/80	3761932	1692153

LDC #: 37150 1 2A

SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Surrogate Results Verification

Page: 1 of 1

Reviewer: JVL

2nd reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: # 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	100	79.1	79	79	0
2-Fluorobiphenyl	↓	75.1	75	75	↓
Terphenyl-d14	↓	83.8	83	83	↓
Phenol-d5	15	119.3	80	80	↓
2-Fluorophenol	↓	117.9	79	79	↓
2,4,6-Tribromophenol	↓	115.2	77	77	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 03126 Tm
 SDG #: See Case

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

% Recovery = $100 * (SSC - SC) / SA$

Where: SSC = Spiked sample concentration
 SA = Spike added

SC = Sample concentration

RPD = $100 * MSD / (MS + MSD)$

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 2/7

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene	2800	2840		1840	1890	66	66	67	67	3	3
Polychlorophenol											
Pyrene				1920	2010	68	68	71	71	5	5

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

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

% Recovery = $100 * (SC/SA)$ Where: SSC = Spike concentration
 SA = Spike added

RPD = $100 * (LCS - LCSDC) / (LCS + LCSDC)$ LCS = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: LCS 28 - 12380 / 2-A

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS		LCSDC		Percent Recovery		RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol												
N-Nitroso-di-n-propylamine												
4-Chloro-3-methylphenol												
Acenaphthene	2640	NA	2060	NA	78	78						
Pentachlorophenol	2640	f	212	f	80	80						
Pyrene												

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

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 9, 2010
LDC Report Date: May 20, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2301-3

Sample Identification

SSAJ3-01-1BPC
SSAJ3-01-1BPCMS
SSAJ3-01-1BPCMSD

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample FB-04072010-RZD (from SDG 280-2216-2) was identified as a field blank. No semivolatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	All samples in SDG 280-2301-3

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2301-3	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2301-3**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2301-3	SSAJ3-01-1BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2301-3**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2301-3**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126V2a
 SDG #: 280-2301-3
 Laboratory: Test America

Date: 5/19/10
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/09/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	? RSD r _r
IV.	Continuing calibration/ICV	A	CCV / ICV ≤ 25 }
V.	Blanks	A	z
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	FB = FB-04072010-R2D (286-2216-2)

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: Soil

1	SSAJ3-01-1BPC	11		21		31	
2	SSAJ3-01-1BPCMS	12		22		32	
3	SSAJ3-01-1BPCMSD	13		23		33	
4	MB 280-110 G5 / 1-A	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	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 9, 2010
LDC Report Date: May 20, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2301-4

Sample Identification

SSAM6-01-1BPC
SSAM6-01-2BPC
SA60-3BPC
SA60-4BPC
SSAN6-04-1BPC
SSAN6-04-1BPC_FD

Introduction

This data review covers 6 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No semivolatile contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2301-4	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

Samples SSAN6-04-1BPC and SSAN6-04-1BPC_FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2301-4**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2301-4	SSAM6-01-1BPC SSAM6-01-2BPC SA60-3BPC SA60-4BPC SSAN6-04-1BPC SSAN6-04-1BPC_FD	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2301-4**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2301-4**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126W2a
 SDG #: 280-2301-4
 Laboratory: Test America

Stage 2B

Date: 5/19/10
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/09/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	7 RSD r _r
IV.	Continuing calibration/ICV	A	COV/ICV = 252
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	Client Spec SSAJ3-01-1BPC
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 5, 6
XVII.	Field blanks	SW ND	FB = 31 EB = 32, 33, 34, 35

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:

Soil

1	SSAM6-01-1BPC	11		21	FB 31	FB-04072010-RZC (280-228)
2	SSAM6-01-2BPC	12		22	EB1 32	EB-04142010-RIG1-RZC (280-229)
3	SA60-3BPC	13		23	EB2 33	EB-04142010-RIG2-RZC
4	SA60-4BPC	14		24	EB3 34	EB-04122010-RIG2-RZC (280-235)
5	SSAN6-04-1BPC D	15		25	EB4 35	EB-04172010-RZC (280-238)
6	SSAN6-04-1BPC_FD D	16		26		
7	MB 280-11065 A-A	17		27		
8		18		28		
9		19		29		
10		20		30		

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 12, 2010
LDC Report Date: May 26, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B & 4
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2352-1

Sample Identification

SA156-3BPC**
SA156-5BPC**
SA156-7BPC**
SA156-9BPC**
SA156-3BPC_FD
SA156-5BPCMS
SA156-5BPCMSD

**Indicates sample underwent Stage 4 review

Introduction

This data review covers 7 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- 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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Sample EB-04122010-RIG1-RZB (from SDG 2802352-2) was identified as an equipment blank. No semivolatile contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Compound	Concentration	Associated Samples
EB-04122010-RIG1-RZB	4/12/10	Bis(2-ethylhexyl)phthalate	2.3 ug/L	All samples in SDG 280-2352-1

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

Sample FB-04062010-RZB (from SDG 280-2131-2) was identified as a field blank. No semivolatile contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04062010-RZB	4/6/10	Bis(2-ethylhexyl)phthalate	2.7 ug/L	All samples in SDG 280-2352-1

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

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

XII. Project Quantitation Limit

All compound quantitation and CRQLs were within validation criteria for samples on which a Stage 4 review was performed.

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2352-1	All compounds reported below the PQL.	J (all detects)	A

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

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

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

XV. Overall Assessment

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

XVI. Field Duplicates

Samples SA156-3BPC** and SA156-3BPC_FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA156-3BPC**	SA156-3BPC_FD				
Bis(2-ethylhexyl)phthalate	350U	94	-	256 (≤ 350)	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2352-1**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2352-1	SA156-3BPC** SA156-5BPC** SA156-7BPC** SA156-9BPC** SA156-3BPC_FD	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2352-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Equipment Blank Data Qualification Summary - SDG 280-2352-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2352-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126Y2a
 SDG #: 280-2352-1
 Laboratory: Test America

Stage 2B/4

Date: 5/19/10
 Page: 1 of 1
 Reviewer: SVG
 2nd Reviewer: L

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 4/12/10
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	2 RSD ✓
IV.	Continuing calibration/ICV	A	CV/AV ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	NA	
XII.	Compound quantitation/CRQLs	NA	
XIII.	Tentatively identified compounds (TICs)	NN	
XIV.	System performance	NA	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	d = 1.5
XVII.	Field blanks	SW	FB = FB04062010-R2B (from 280-2131-2)

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:
 ** incl N soil

1	SA156-3BPC	** D	11	MB 280-10974/1-A	21		31
2	SA156-5BPC	**	12		22		32
3	SA156-7BPC	**	13		23		33
4	SA156-9BPC	**	14		24		34
5	SA156-3BPC_FD	D	15		25		35
6	SA156-5BPCMS		16		26		36
7	SA156-5BPCMSD		17		27		37
8			18		28		38
9			19		29		39
10			20		30		40

DC #: 22167 Y2A
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: JVC
 2nd Reviewer: [Signature]

Method: Semivolatiles (EPA SW 846 Method 8270C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples analyzed within the 12 hour clock criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent relative standard deviations (%RSD) ≤ 30% and relative response factors (RRF) > 0.05?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) ≤ 25% and relative response factors (RRF) ≥ 0.05?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 23126 Y 2a
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: JL
 2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were retention times within + 30 seconds from the associated calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Tentatively identified compounds (TICs)				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within $\pm 20\%$ between the sample and the reference spectra?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XIV. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVI. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XVII. Field blanks				
Field blanks were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 1,4-Dioxane
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU. Octachlorostyrene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 23126 Y 26
 SDG #: San Juan

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: SVL
 2nd reviewer: L

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Y N N/A Were field duplicate pairs identified in this SDG?
Y N N/A Were target compounds identified in the field duplicate pairs?

Compound	Concentration (<u>ug/kg</u>)		RPD
	1	5	
EEE	350 u	94	256 ≤ 350 D

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

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

$RRF = (A_x)(C_{is}) / (A_{is})(C_x)$ A_x = Area of Compound A_{is} = Area of associated internal standard
 average RRF = sum of the RRFs/number of standards C_x = Concentration of compound, C_{is} = Concentration of internal standard
 %RSD = $100 * (S/X)$ S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (.50 std)	RRF (.50 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	ICAL	3/18/2010	1,4-Dioxane (IS1)	0.5882	0.5882	0.5862	0.5862	6.9	6.88
	MSS D		Naphthalene (IS2)	1.1221	1.1221	1.1134	1.1134	3.0	3.01
			Fluorene (IS3)	1.3445	1.3445	1.3224	1.3225	5.0	5.04
			Hexachlorobenzene (IS4)	0.2412	0.2412	0.2488	0.2487	8.9	8.87
			Chrysene (IS5)	1.0697	1.0697	1.0065	1.0065	8.2	8.17
			Benzo(a)pyrene (IS6)	1.1044	1.1044	1.0885	1.0885	6.7	6.69

Inc IS/Cpd	Area cpd	Area IS
40/50	292285	397528
40/50	1966829	1402196
40/50	1609531	957696
40/50	483347	1602894
40/50	2492854	1864283
40/50	2472315	1790944

Conc	1,4-Dioxane	Naphthalene	Fluorene	Hexachlorob	Chrysene	Benzo(a)py
4.00	0.6542	1.1382	1.2049		1.0249	0.9762
10.00	0.6168	1.1444	1.2482	0.2132	1.0017	1.0038
20.00	0.5587	1.1266	1.2972	0.2367	1.0484	1.0453
50.00	0.5882	1.1221	1.3445	0.2412	1.0697	1.1044
80.00	0.5191	1.0774	1.3440	0.2492	1.0741	1.1019
120.00	0.5793	1.1406	1.3805	0.2535	1.0559	1.1505
160.00	0.5706	1.1068	1.3878	0.2641	0.9457	1.1705
200.00	0.6029	1.0507	1.3725	0.2833	0.8319	1.1554
X =	0.5862	1.1134	1.3225	0.2487	1.0065	1.0885
S =	0.0403	0.0335	0.0666	0.0221	0.0822	0.0728

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

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

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

Where:
 $\% \text{ Difference} = 100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$
 $\text{RRF} = (\text{Ax})(\text{Cis}) / (\text{Ais})(\text{Cx})$
 ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 Ax = Area of compound Ais = Area of associated internal standard
 Cx = Concentration of compound Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference IS)	Average RRF (Initial RRF)	Reported (CC RRF)	Recalculated (CC RRF)	Reported %D	Recalculated %D
1	D3996	04/16/10	1,4-Dioxane (IS1)	0.5862	0.5805	0.5805	1.0	1.0
			Naphthalene (IS2)	1.1134	1.1128	1.1128	0.1	0.1
			Fluorene (IS3)	1.3224	1.3203	1.3203	0.2	0.2
			Hexachlorobenzene (IS4)	0.2488	0.2542	0.2542	2.2	2.2
			Chrysene (IS5)	1.0065	1.0377	1.0377	3.1	3.1
			Benzo(a)pyrene (IS6)	1.0885	1.2035	1.2035	10.6	10.6

Compound (Reference IS)	Concentration (IS/Cpd)	Area Cpd	Area IS
1,4-Dioxane (IS1)	40/80	453857	390903
Naphthalene (IS2)	40/80	3177574	1427715
Fluorene (IS3)	40/80	2697204	1021471
Hexachlorobenzene (IS4)	40/80	868351	1708342
Chrysene (IS5)	40/80	4195266	2021491
Benzo(a)pyrene (IS6)	40/80	4035191	1676408

LDC #: 23126729

VALIDATION FINDINGS WORKSHEET

Page: 1 of 1SDG #: See Cover

Surrogate Results Verification

Reviewer: JVY2nd reviewer: W

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: $SF/SS * 100$ Where: SF = Surrogate Found
SS = Surrogate SpikedSample ID: # 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	150	67.86	68	68	0
2-Fluorobiphenyl	↓	70.77	71	71	↓
Terphenyl-d14	↓	89.84	90	90	↓
Phenol-d5	150	102.2	71	71	↓
2-Fluorophenol	↓	106.5	71	71	↓
2,4,6-Tribromophenol	↓	111.69	74	74	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 77126 / 24
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
 Reviewer: DV
 2nd Reviewer: [Signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

% Recovery = $100 * (SSC - SC) / SA$ Where: SSC = Spiked sample concentration SC = Sample concentration
 SA = Spike added

RPD = $100 * MSC / (MSC + MSDC)$ MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 6/7

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol											
N-Nitroso-di-n-propylamine											
4-Chloro-3-methylphenol											
Acenaphthene	2770	2900	6	1950	1380	70	70	48	48	34	34
Pentachlorophenol											
Pyrene	2770	2900	↓	2500	1970	90	90	66	66	26	26

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

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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

% Recovery = $100 * (SC/SA)$ Where: SSC = Spike concentration
 SA = Spike added

RPD = $100 * (LCS - LCSDC) / (LCS + LCSDC)$ LCS = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: LCS 780 - 10974 / 2-A

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS		LCSDC		Percent Recovery		Percent Recovery		RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalc
Phenol														
N-Nitroso-di-n-propylamine														
4-Chloro-3-methylphenol														
Acenaphthene	2450	NA	1450	NA	79	79.5								
Pentachlorophenol	2450	↓	2350	↓	96	96								
Pyrene														

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

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 12, 2010
LDC Report Date: May 20, 2010
Matrix: Soil
Parameters: Semivolatiles
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2352-4

Sample Identification

SSAM7-04-1BPC
SSAM7-03-1BPC
SSAJ3-02-1BPC
SSAJ3-02-1BPC_FD
SSAH3-01-1BPC

Introduction

This data review covers 5 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

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 Superfund Organic Methods Data Review (June 2008).

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 XVI.

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.
- UU 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. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 .

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs) and 25.0% for all other compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

Samples EB-04122010-RIG3-RZD and EB-04122010-RIG2-RZC (both from SDG 280-2352-2) were identified as equipment blanks. No semivolatile contaminants were found in these blanks with the following exceptions:

Equipment Blank ID	Sampling Date	Compound	Concentration	Associated Samples
EB-04122010-RIG3-RZD	4/12/10	Bis(2-ethylhexyl)phthalate	2.3 ug/L	SSAJ3-02-1BPC SSAJ3-02-1BPC_FD SSAH3-01-1BPC

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

Samples FB-04072010-RZD (from SDG 280-2216-2) and FB-04072010-RZC (from SDG 280-2280-2) were identified as field blanks. No semivolatile contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Compound	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Bis(2-ethylhexyl)phthalate	2.2 ug/L	SSAJ3-02-1BPC SSAJ3-02-1BPC_FD SSAH3-01-1BPC

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

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2352-4	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

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

XVI. Field Duplicates

Samples SSAJ3-02-1BPC and SSAJ3-02-1BPC_FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG 280-2352-4**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2352-4	SSAM7-04-1BPC SSAM7-03-1BPC SSAJ3-02-1BPC SSAJ3-02-1BPC_FD SSAH3-01-1BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 280-2352-4**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Equipment Blank Data Qualification Summary - SDG 280-2352-4**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Semivolatiles - Field Blank Data Qualification Summary - SDG 280-2352-4**

No Sample Data Qualified in this SDG

**Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET**

LDC #: 23126Z2a
SDG #: 280-2352-4
Laboratory: Test America

Stage 2B

Date: 5/19/10
Page: 1 of 1
Reviewer: JYG
2nd Reviewer: _____

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: <u>4/12/10</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	<u>7% RSD 1Y</u>
IV.	Continuing calibration/ICV	A	<u>CV/1CV ≤ 25%</u>
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	<u>SSAJ3-01-1BPC</u>
VIII.	Laboratory control samples	A	<u>LCS</u>
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	<u>D = 3, 4</u>
XVII.	Field blanks	SW	<u>FB = 31, 32* EB = 33, 34*</u>

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
*ND = No compounds detected D = Duplicate
R = Rinsate
FB = Field blank
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	SSAM7-04-1BPC	11		21		FB1 31	FB-04072010-R2D (280-2216)
2	SSAM7-03-1BPC	12		22		FB2 32	FB-04072010-R2C (280-2280)
3	SSAJ3-02-1BPC	13		23		EB1 33	EB-04122010-RIG3-R2D
4	SSAJ3-02-1BPC FD	14		24		EB2 34	EB-04122010-RIG2-R2C
5	SSAH3-01-1BPC	15		25		35	
6		16		26		36	(280-2352-2)
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis(2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 4,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,6-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

**Tronox PCS
Data Validation Reports
LDC# 23126**

Chlorinated Pesticides

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 7, 2010

LDC Report Date: May 20, 2010

Matrix: Water

Parameters: Chlorinated Pesticides

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2216-2

Sample Identification

FB-04072010-RZD

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081A for Chlorinated Pesticides.

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 Superfund Organic Methods Data Review (June 2008).

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.
- UU 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. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single compounds were performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 20.0% QC limits.

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks.

Sample FB-04072010-RZD was identified as a field blank. No chlorinated pesticide contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-2	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Chlorinated Pesticides - Data Qualification Summary - SDG 280-2216-2**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2216-2	FB-04072010-RZD	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 280-2216-2**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 280-2216-2**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126G3a
 SDG #: 280-2216-2
 Laboratory: Test America

Date: 5-18-10
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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: 4/7/10
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	r ²
IV.	Continuing calibration/ICV	SWA	ICV/CCV ≤ 20%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	Client specified
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	EB=
XV.	Field blanks	ND	FB=1

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

1	FB-04072010-RZD W	11		21		31	280-10593-Blk
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 8, 2010

LDC Report Date: May 20, 2010

Matrix: Water

Parameters: Chlorinated Pesticides

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-2

Sample Identification

FB-04072010-RZC

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081A for Chlorinated Pesticides.

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 Superfund Organic Methods Data Review (June 2008).

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. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single compounds were performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990 .

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 20.0% QC limits.

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks.

Sample FB-04072010-RZC was identified as a field blank. No chlorinated pesticide contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-2	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Chlorinated Pesticides - Data Qualification Summary - SDG 280-2280-2**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2280-2	FB-04072010-RZC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 280-2280-2**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 280-2280-2**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 2312603a
 SDG #: 280-2280-2
 Laboratory: Test America

Stage 2B

Date: 5-18-10
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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: 4/8/10
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	r2
IV.	Continuing calibration/ICV	SW	ICV/CCV < 20%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	Client specified
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	ND	FB = L

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	FB-04072010-RZC	W	11	21	31	280-10593-BLK
2			12	22	32	
3			13	23	33	
4			14	24	34	
5			15	25	35	
6			16	26	36	
7			17	27	37	
8			18	28	38	
9			19	29	39	
10			20	30	40	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 9, 2010
LDC Report Date: May 20, 2010
Matrix: Soil
Parameters: Chlorinated Pesticides
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2301-1

Sample Identification

SSAI2-02-1BPC
SSAI2-02-5BPC
SSAI2-02-1BPCMS
SSAI2-02-1BPCMSD
SSAI2-02-5BPCMS
SSAI2-02-5BPCMSD

Introduction

This data review covers 6 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081A for Chlorinated Pesticides.

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 Superfund Organic Methods Data Review (June 2008).

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. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single compounds were performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 20.0% QC limits.

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks.

Sample FB-04072010-RZD (from SDG 280-2216-2) was identified as a field blank. No chlorinated pesticide contaminants were found in these blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits. Since the samples were diluted out, no data were qualified.

VII. 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 not within the QC limits. Since the samples were diluted out, no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2301-1	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Chlorinated Pesticides - Data Qualification Summary - SDG 280-2301-1**

SDG	Sample	Compound	Flag	A or P	Reason (Code)
280-2301-1	SSAI2-02-1BPC SSAI2-02-5BPC	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG 280-2301-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG 280-2301-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126U3a
 SDG #: 280-2301-1
 Laboratory: Test America

Date: 5-18-10
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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: 4/9/10
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	r ² , 0/08SD
IV.	Continuing calibration/ICV	SW	ICV/CCV ≤ 20%
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	ND	FB = FB-04072010-R2D (has SDG # 280-2216-1)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

RL 501

1	SSAI2-02-1BPC	11		21		31	280-10837-BLK
2	SSAI2-02-5BPC	12		22		32	
3	SSAI2-02-1BPCMS	13		23		33	
4	SSAI2-02-1BPCMSD	14		24		34	
5	SSAI2-02-5BPCMS	15		25		35	
6	SSAI2-02-5BPCMSD	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:

Tronox PCS
Data Validation Reports
LDC# 23126

Metals

LDC

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 6, 2010
LDC Report Date: May 26, 2010
Matrix: Soil
Parameters: Metals
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2131-1

Sample Identification

RSAQ3-3BPC_FD
RSAQ3-3BPC
RSAQ3-5BPC
SSA06-02-1BPC_FD
RSAP6-1BPC_FD
RSAP6-1BPC
RSAP6-5BPC
SSA06-02-1BPC
SSA06-02-5BPC
SSA06-02-9BPC
SSA06-02-10BPC
SA51-1BPC
SA51-5BPC
SA51-5BPCFD
RSAK7-3BPC
RSAK7-5BPC
SSA06-02-5BPCMS
SSA06-02-5BPCMSD

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6020 for Arsenic, Lead, and Manganese.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

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

Samples FB-04072010-RZC (from SDG 280-2280-2), FB-04072010-RZD (from SDG 280-2216-2), and FB04062010-RZB (from SDG 280-2131-1) were identified as field blanks. No metal contaminants were found in these blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2131-1	All analytes reported below the PQL.	J (all detects)	A

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 RSAQ3-3BPC_FD and RSAQ3-3BPC, samples SSA06-02-1BPC_FD and SSA06-02-1BPC, samples RSAP6-1BPC_FD and RSAP6-1BPC, samples SA51-5BPC and SA51-5BPCFD, and samples RSAK7-3BPC and RSAK7-3BPC_FD (from SDG 280-2131-2) were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	RSAQ3-3BPC_FD	RSAQ3-3BPC				
Arsenic	3.4	3.2	6 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSA06-02-1BPC_FD	SSA06-02-1BPC				
Arsenic	4.1	7.3	56 (≤ 50)	-	J (all detects)	A

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSA06-02-1BPC_FD	SSA06-02-1BPC				
Lead	11	15	31 (≤ 50)	-	-	-
Manganese	850	1300	42 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	RSAP6-1BPC_FD	RSAP6-1BPC				
Arsenic	1100	1100	0 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA51-5BPC	SA51-5BPCFD				
Arsenic	3.4	3.3	3 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	RSAK7-3BPC_FD	RSAK7-3BPC				
Arsenic	5.8	6.2	7 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Data Qualification Summary - SDG 280-2131-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2131-1	RSAQ3-3BPC_FD RSAQ3-3BPC RSAQ3-5BPC SSA06-02-1BPC_FD RSAP6-1BPC_FD RSAP6-1BPC RSAP6-5BPC SSA06-02-1BPC SSA06-02-5BPC SSA06-02-9BPC SSA06-02-10BPC SA51-1BPC SA51-5BPC SA51-5BPCFD RSAK7-3BPC RSAK7-5BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)
280-2131-1	SSA06-02-1BPC_FD SSA06-02-1BPC	Arsenic	J (all detects)	A	Field duplicates (RPD) (fd)

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG 280-2131-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG 280-2131-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126A4
 SDG #: 280-2131-1
 Laboratory: Test America

Date: 5
 Page: 10
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: As, Pb, Mn (EPA SW 846 Method 6020)

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: 4/6/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(1,2), (4,8), (5,6), (13,14), see
XV.	Field Blanks	ND	FB=FB-04072010-RZC, FB#0407200-RZD, C506# 280-2280-2 (280-2216-2) FB04062010-RZB (280-2131-1)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinstate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: Soil

1	RSAQ3-3BPC_FD	11	SSA06-02-10BPC	21	PBS	31
2	RSAQ3-3BPC	12	SA51-1BPC	22		32
3	RSAQ3-5BPC	13	SA51-5BPC	23		33
4	SSA06-02-1BPC_FD	14	SA51-5BPCFD	24		34
5	RSAP6-1BPC_FD	15	RSAK7-3BPC	25		35
6	RSAP6-1BPC	16	RSAK7-5BPC	26		36
7	RSAP6-5BPC	17	SSA06-02-5BPCMS	27		37
8	SSA06-02-1BPC	18	SSA06-02-5BPCMSD	28		38
9	SSA06-02-5BPC	19		29		39
10	SSA06-02-9BPC	20		30		40

Notes: FD: (15, RSAK7-3BPC - FD (506# 280-2131-2))

LDC#: 23126A4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: Metals (EPA Method 6020/7000)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?
 V:\FIELD DUPLICATES\FD_inorganic\23126A4.wpd

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Arsenic	3.4	3.2	6			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	4	8	RPD	Difference	Limits	
Arsenic	4.1	7.3	56			Jdet/A (fd)
Lead	11	15	31			
Manganese	850	1300	42			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	5	6	RPD	Difference	Limits	
Arsenic	1100	1100	0			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	13	14	RPD	Difference	Limits	
Arsenic	3.4	3.3	3			

LDC 23126A6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page 2 of 2
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: Metals (EPA Method 6020/6010/7000)

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 (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	RS AK7-3BPC_FD (SDG#: 280-2131-2)	15	RPD	Difference	Limits	
Arsenic	5.8	6.2	7			

V:\FIELD DUPLICATES\FD_inorganic\23126A6a.wpd

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 6, 2010
LDC Report Date: May 21, 2010
Matrix: Soil
Parameters: Arsenic
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2131-6

Sample Identification

RSAP6-7BPC
RSAP6-9BPC

Introduction

This data review covers 2 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6020 for Arsenic.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

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

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No arsenic was found in this blank.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2131-6	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Data Qualification Summary - SDG 280-2131-6**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2131-6	RSAP6-7BPC RSAP6-9BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Laboratory Blank Data Qualification Summary - SDG 280-2131-6**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Field Blank Data Qualification Summary - SDG 280-2131-6**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126C4
 SDG #: 280-2131-6
 Laboratory: Test America

Stage 2B

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: W

METHOD: As (EPA SW 846 Method 6020)

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: 4/6/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	NA	client specified for MS/D (S06#280-22167)
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	NA	Not performed (S06#280-22167)
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV.	Field Blanks	ND	FB = FB04072010 - RZC (S06#280-22802)

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: Soil

1	RSAP6-7BPC	11	<u>RBS</u>	21		31	
2	RSAP6-9BPC	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 6, 2010
LDC Report Date: May 21, 2010
Matrix: Soil
Parameters: Arsenic
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2131-9

Sample Identification

SSA06-02-3BPC
SA51-3BPC
SSA06-02-3BPCMS
SSA06-02-3BPCMSD

Introduction

This data review covers 4 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6020 for Arsenic.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

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

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No arsenic was found in this blank.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2131-9	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Arsenic - Data Qualification Summary - SDG 280-2131-9**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2131-9	SSA06-02-3BPC SA51-3BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Arsenic - Laboratory Blank Data Qualification Summary - SDG 280-2131-9**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Arsenic - Field Blank Data Qualification Summary - SDG 280-2131-9**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126E4

SDG #: 280-2131-9

Laboratory: Test America

Stage 2B

Date: 5-18-10

Page: 1 of 1

Reviewer: CR

2nd Reviewer: [Signature]

METHOD: As (EPA SW 846 Method 6020)

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: 4/6/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV.	Field Blanks	ND	FB = FB-04072010 - R2C (SN# 280-2280-2)

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: Soil

1	SSA06-02-3BPC	11	QBS	21		31	
2	SA51-3BPC	12		22		32	
3	SSA06-02-3BPCMS	13		23		33	
4	SSA06-02-3BPCMSD	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 7, 2010
LDC Report Date: May 24, 2010
Matrix: Soil
Parameters: Metals
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2216-1

Sample Identification

SSAN7-01-1BPC	SSAJ8-02-1BPC_FD
SSAN7-01-2BPC	SSAJ8-02-5BPC
SSAN7-01-5BPC	SSAN7-01-1BPCMS
SA137-3BPC	SSAN7-01-1BPCMSD
SA137-4BPC	SSAJ8-02-1BPC
SA137-5BPC	
SA137-5BPC_FD	
SA39-3BPC	
SA39-5BPC	
SA130-3BPC	
SA130-5BPC	
SA130-5BPC_FD	
SA40-1BPC	
SA40-5BPC	
RSAR7-3BPC	
SA84-3BPC	
SA84-4BPC	
SA84-5BPC	
SA204-3BPC	
SA204-5BPC	

Introduction

This data review covers 25 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6020 for Metals. The metals analyzed were Arsenic, Cobalt, Lead, and Manganese.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Cobalt	0.0118 ug/L	SA137-3BPC SA137-4BPC SA137-5BPC SA137-5BPC_FD
ICB/CCB	Manganese	0.511 ug/L	SA137-4BPC SA137-5BPC SA137-5BPC_FD

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

Samples FB-04072010-RZC (from SDG 280-2280-2), FB-04072010-RZD (from SDG 280-2216-2), and FB04062010-RZB (from SDG 280-2131-1) were identified as field blanks. No metal contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB-04072010-RZC	4/8/10	Cobalt	0.016 ug/L	SSAN7-01-1BPC SSAN7-01-2BPC SSAN7-01-5BPC SA137-3BPC SA137-4BPC SA137-5BPC SA137-5BPC_FD

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

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-1	All analytes reported below the PQL.	J (all detects)	A

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 SA137-5BPC and SA137-5BPC_FD, samples SA130-5BPC and SA130-5BPC_FD, and samples SSAJ8-02-1BPC_FD and SSAJ8-02-1BPC were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA137-5BPC	SA137-5BPC_FD				
Arsenic	89	74	18 (≤ 50)	-	-	-
Cobalt	140	130	7 (≤ 50)	-	-	-
Manganese	6900	6100	12 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA130-5BPC	SA130-5BPC_FD				
Arsenic	1600	1600	0 (≤ 50)	-	-	-
Manganese	64000	68000	6 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAJ8-02-1BPC_FD	SSAJ8-02-1BPC				
Arsenic	3.3	3.4	3 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Data Qualification Summary - SDG 280-2216-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2216-1	SSAN7-01-1BPC SSAN7-01-2BPC SSAN7-01-5BPC SA137-3BPC SA137-4BPC SA137-5BPC SA137-5BPC_FD SA39-3BPC SA39-5BPC SA130-3BPC SA130-5BPC SA130-5BPC_FD SA40-1BPC SA40-5BPC RSAR7-3BPC SA84-3BPC SA84-4BPC SA84-5BPC SA204-3BPC SA204-5BPC SSAJ8-02-1BPC_FD SSAJ8-02-5BPC SSAJ8-02-1BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG 280-2216-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG 280-2216-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126F4
 SDG #: 280-2216-1
 Laboratory: Test America

Date: 5-18-10
 Page: 1 of 1
 Reviewer: OR
 2nd Reviewer: W

METHOD: Metals (EPA SW 846 Method 6020)

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: 4/7/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	ms/d
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(6,7), (11,12), (21,25)
XV.	Field Blanks	SW	FB-01072010-R2C, FB-01072010-R2D, FB-01062010-R2E (280-228-2) (280-2216-2) (280-2131-1)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: Soil

1	SSAN7-01-1BPC	11	SA130-5BPC	21	SSAJ8-02-1BPC_FD	31	PBS
2	SSAN7-01-2BPC	12	SA130-5BPC_FD	22	SSAJ8-02-5BPC	32	PBS
3	SSAN7-01-5BPC	13	SA40-1BPC	23	SSAN7-01-1BPCMS	33	
4	SA137-3BPC	14	SA40-5BPC	24	SSAN7-01-1BPCMSD	34	
5	SA137-4BPC	15	RSAR7-3BPC	25	SSAJ8-02-1BPC	35	
6	SA137-5BPC	16	SA84-3BPC	26		36	
7	SA137-5BPC_FD	17	SA84-4BPC	27		37	
8	SA39-3BPC	18	SA84-5BPC	28		38	
9	SA39-5BPC	19	SA204-3BPC	29		39	
10	SA130-3BPC	20	SA204-5BPC	30		40	

Notes: _____

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Co			0.0118		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 5-7

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Mn			0.511		

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 23126F4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: [Signature]

METHOD: Metals (EPA Method 6020/7000)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?
 V:\FIELD DUPLICATES\FD_inorganic\23126F4.wpd

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	6	7	RPD	Difference	Limits	
Arsenic	89	74	18			
Cobalt	140	130	7			
Manganese	6900	6100	12			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	11	12	RPD	Difference	Limits	
Arsenic	1600	1600	0			
Manganese	64000	68000	6			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	21	25	RPD	Difference	Limits	
Arsenic	3.3	3.4	3			

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 7, 2010
LDC Report Date: May 24, 2010
Matrix: Soil/Water
Parameters: Metals
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2216-2

Sample Identification

SA203-2BPC
SA203-2BPC_FD
SA203-4BPC
SA203-6BPC
SA203-8BPC
FB-04072010-RZD
SA203-8BPCMS
SA203-8BPCMSD

Introduction

This data review covers 7 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 6020 for Metals. The metals analyzed were Arsenic, Cobalt, Lead, Magnesium, and Manganese.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Cobalt	0.0110 ug/L	All water samples in SDG 280-2216-2

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	Analyte	Reported Concentration	Modified Final Concentration
FB-04072010-RZD	Cobalt	0.012 ug/L	1.0U ug/L

Samples FB04062010-RZB (from SDG 280-2131-1) and FB-04072010-RZD were identified as field blanks. No metal contaminants were found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB-04072010-RZD	4/7/10	Cobalt Manganese	0.012 ug/L 1.3 ug/L	No associated samples in this SDG

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-2	All analytes reported below the PQL.	J (all detects)	A

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 SA203-2BPC and SA203-2BPC_FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA203-2BPC	SA203-2BPC_FD				
Arsenic	11	12	9 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Data Qualification Summary - SDG 280-2216-2**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2216-2	SA203-2BPC SA203-2BPC_FD SA203-4BPC SA203-6BPC SA203-8BPC FB-04072010-RZD	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG 280-2216-2**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
280-2216-2	FB-04072010-RZD	Cobalt	1.0U ug/L	A	bl

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG 280-2216-2**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126G4
 SDG #: 280-2216-2
 Laboratory: Test America

Stage 2B

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: [Signature]

METHOD: Metals (EPA SW 846 Method 6020)

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: 4/7/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(1,2)
XV.	Field Blanks	SW	FB=6, FB04062010-RZB (280-2131-1)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: soil/water

1	SA203-2BPC	S	11	21	QBS	31
2	SA203-2BPC_FD		12	22	QBS	32
3	SA203-4BPC		13	23		33
4	SA203-6BPC		14	24		34
5	SA203-8BPC	↓	15	25		35
6	FB-04072010-RZD	W	16	26		36
7	SA203-8BPCMS	S	17	27		37
8	SA203-8BPCMSD	↓	18	28		38
9			19	29		39
10			20	30		40

Notes: _____

LDC #: 23126G4

SDG #: See Cover

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)

Sample Concentration units, unless otherwise noted: ug/L

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA

Associated Samples: All Water

Reason Code: bl

Page: 1 of 1

Reviewer: CR

2nd Reviewer: [Signature]

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^b (ug/L)	Action Limit	6								
Co			0.0110		0.012 / 1.0								

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 23126G4

SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: Metals (EPA Method 6020/7000)

- ~~Y~~ ~~N~~ ~~NA~~ Were field duplicate pairs identified in this SDG?
 - ~~Y~~ ~~N~~ ~~NA~~ Were target analytes detected in the field duplicate pairs?
- V:\FIELD DUPLICATES\FD_inorganic\23126G4.wpd

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Arsenic	11	12	9			

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 7, 2010
LDC Report Date: May 21, 2010
Matrix: Soil
Parameters: Arsenic
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2216-7

Sample Identification

SA137-6BPC
SA137-8BPC
SA137-10BPC
SA130-6BPC
SA130-8BPC
SA39-6BPC
SA39-8BPC
RSAR7-4BPC
SA84-6BPC
SA84-8BPC
SA204-4BPC
SA137-6BPCMS
SA137-6BPCMSD

Introduction

This data review covers 13 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6020 for Arsenic.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

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

Sample FB-04072010-RZC (from SDG 280-2280-2) and sample FB04062010-RZB (from SDG 280-2131-1) were identified as field blanks. No arsenic were found in these blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-7	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Data Qualification Summary - SDG 280-2216-7**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2216-7	SA137-6BPC SA137-8BPC SA137-10BPC SA130-6BPC SA130-8BPC SA39-6BPC SA39-8BPC RSAR7-4BPC SA84-6BPC SA84-8BPC SA204-4BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Laboratory Blank Data Qualification Summary - SDG 280-2216-7**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Field Blank Data Qualification Summary - SDG 280-2216-7**

No Sample Data Qualified in this SDG

LDC #: 23126K4
 SDG #: 280-2216-7
 Laboratory: Test America

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
 Stage 2B

Date: 5-18-16
 Page: 1 of 1
 Reviewer: ae
 2nd Reviewer: [Signature]

METHOD: As (EPA SW 846 Method 6020)

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: <u>4/7/10</u>
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	<u>MS/D</u>
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	<u>LCS</u>
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	<u>Not utilized</u>
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV.	Field Blanks	ND	<u>FB = FB04072010-R2C, FB04062010-R2B</u> <u>(280-2280-2)</u> <u>(280-2131-1)</u>

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: soil

1	SA137-6BPC	11	SA204-4BPC	21	<u>RBS</u>	31	
2	SA137-8BPC	12	SA137-6BPCMS	22		32	
3	SA137-10BPC	13	SA137-6BPCMSD	23		33	
4	SA130-6BPC	14		24		34	
5	SA130-8BPC	15		25		35	
6	SA39-6BPC	16		26		36	
7	SA39-8BPC	17		27		37	
8	RSAR7-4BPC	18		28		38	
9	SA84-6BPC	19		29		39	
10	SA84-8BPC	20		30		40	

Notes: _____

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 7, 2010
LDC Report Date: May 21, 2010
Matrix: Soil
Parameters: Arsenic
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2270-1

Sample Identification

SSAK8-01-1BPC
SSAK8-01-1BPC_FD
SSAK8-01-5BPC

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6020 for Arsenic.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

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

Sample FB-04072010-RZD (from SDG 280-2216-2) was identified as a field blank. No arsenic was found in this blank.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2270-1	All analytes reported below the PQL.	J (all detects)	A

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 SSAK8-01-1BPC and SSAK8-01-1BPC_FD were identified as field duplicates. No Arsenic were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAK8-01-1BPC	SSAK8-01-1BPC_FD				
Arsenic	2.9	2.6	-	0.3 (≤ 0.62)	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Data Qualification Summary - SDG 280-2270-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2270-1	SSAK8-01-1BPC SSAK8-01-1BPC_FD SSAK8-01-5BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Laboratory Blank Data Qualification Summary - SDG 280-2270-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Field Blank Data Qualification Summary - SDG 280-2270-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126L4

SDG #: 280-2270-1

Laboratory: Test America

Stage 2B

Date: 5-18-10

Page: 1 of 1

Reviewer: CR

2nd Reviewer: W

METHOD: As (EPA SW 846 Method 6020)

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: 4/7/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	BBB etene specified ^{of} msh/d (506 280-2280-1)
VII.	Duplicate Sample Analysis	AN	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	(506 280-2280-1)
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(1,2)
XV.	Field Blanks	ND	FB = FB-04072010-RZD

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

(280-2216-2)
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: soil

1	SSAK8-01-1BPC	11	BBB	21		31	
2	SSAK8-01-1BPC_FD	12		22		32	
3	SSAK8-01-5BPC	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC#: 23126L4

SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: Metals (EPA Method 6020/7000)

- Y N NA Were field duplicate pairs identified in this SDG?
 - Y N NA Were target analytes detected in the field duplicate pairs?
- V:\FIELD DUPLICATES\FD_inorganic\23126L4.wpd

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Arsenic	2.9	2.6		0.3	≤0.62	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 8, 2010
LDC Report Date: May 26, 2010
Matrix: Soil
Parameters: Metals
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-1

Sample Identification

SA188-3BPC	SSAO7-01-1BPC
SA188-3BPC_FD	SSAO7-01-1BPC_FD
SA188-5BPC	SSAO7-01-5BPC
SSAO5-02-1BPC	SSAO5-02-5BPCMS
SSAO5-02-1BPC_FD	SSAO5-02-5BPCMSD
SSAO5-02-5BPC	SSAO6-04-5BPCMS
SSAO5-03-1BPC	SSAO6-04-5BPCMSD
SSAO5-03-1BPC_FD	SSAO6-05-1BPCMS
SSAO5-03-5BPC	SSAO6-05-1BPCMSD
SSAO4-02-1BPC	SSAO7-01-5BPCMS
SSAO4-02-5BPC	SSAO7-01-5BPCMSD
SSAO6-04-1BPC	
SSAO6-04-1BPC_FD	
SSAO6-04-5BPC	
SA63-1BPC	
SA63-5BPC	
SA63-5BPC_FD	
SSAO6-05-1BPC	
SSAO6-05-5BPC	
SSAO6-05-5BPC_FD	

Introduction

This data review covers 31 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6020 for Metals. The metals analyzed were Arsenic, Cobalt, Magnesium, and Manganese.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Magnesium	1.65 ug/L	SSAO5-02-1BPC SSAO5-02-1BPC_FD
ICB/CCB	Magnesium	1.75 ug/L	SSAO5-02-5BPC
ICB/CCB	Magnesium	2.42 ug/L	SSAO6-04-1BPC SSAO6-04-1BPC_FD SSAO6-04-5BPC
ICB/CCB	Cobalt	0.0179 ug/L	SSAO7-01-1BPC SSAO7-01-1BPC_FD SSAO7-01-5BPC
ICB/CCB	Manganese	1.20 ug/L	SSAO6-05-5BPC SSAO6-05-5BPC_FD SSAO7-01-1BPC SSAO7-01-1BPC_FD SSAO7-01-5BPC
ICB/CCB	Manganese	0.930 ug/L	SSAO6-05-1BPC

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Manganese	0.127 mg/Kg	SSAO6-05-1BPC SSAO6-05-5BPC SSAO6-05-5BPC_FD SSAO7-01-1BPC SSAO7-01-1BPC_FD SSAO7-01-5BPC

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

Sample EB-04072010-RZC (from SDG 280-2383-1) was identified as an equipment blank. No arsenic or manganese was found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-04072010-RZC	4/8/10	Cobalt	0.093 ug/L	SSAO7-01-1BPC SSAO7-01-1BPC_FD SSAO7-01-5BPC
EB-04072010-RZC	4/8/10	Manganese	15 ug/L	SA188-3BPC SA188-3BPC_FD SA188-5BPC SSAO5-03-1BPC SSAO5-03-1BPC_FD SSAO5-03-5BPC SSAO6-04-1BPC SSAO6-04-1BPC_FD SSAO6-04-5BPC SSAO6-05-1BPC SSAO6-05-5BPC SSAO6-05-5BPC_FD

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

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No metal contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB-04072010-RZC	4/8/10	Cobalt	0.016 ug/L	SSAO7-01-1BPC SSAO7-01-1BPC_FD SSAO7-01-5BPC

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

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-1	All analytes reported below the PQL.	J (all detects)	A

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 SA188-3BPC and SA188-3BPC_FD, samples SSAO5-02-1BPC and SSAO5-02-1BPC_FD, samples SSAO5-03-1BPC and SSAO5-03-1BPC_FD, samples SSAO6-04-1BPC and SSAO6-04-1BPC_FD, samples SA63-5BPC and SA63-5BPC_FD, samples SSAO6-05-5BPC and SSAO6-05-5BPC_FD, and samples SSAO7-01-1BPC and SSAO7-01-1BPC_FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA188-3BPC	SA188-3BPC_FD				
Manganese	4300	3800	12 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAO5-02-1BPC	SSAO5-02-1BPC_FD				
Arsenic	6.8	8.2	19 (≤ 50)	-	-	-
Magnesium	9500	11000	15 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAO5-03-1BPC	SSAO5-03-1BPC_FD				
Arsenic	4.6	4.4	4 (≤ 50)	-	-	-
Manganese	350	470	29 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAO6-04-1BPC	SSAO6-04-1BPC_FD				
Arsenic	1.2	1.5	-	0.3 (≤ 0.65)	-	-
Manganese	220	260	17 (≤ 50)	-	-	-
Magnesium	5300	7700	37 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA63-5BPC	SA63-5BPC_FD				
Arsenic	7.5	7.2	4 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAO6-05-5BPC	SSAO6-05-5BPC_FD				
Arsenic	7.0	8.1	15 (≤ 50)	-	-	-
Manganese	940	1100	16 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAO7-01-1BPC	SSAO7-01-1BPC_FD				
Arsenic	4.9	5.2	6 (≤ 50)	-	-	-
Manganese	790	800	1 (≤ 50)	-	-	-
Cobalt	7.7	9.0	16 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Data Qualification Summary - SDG 280-2280-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2280-1	SA188-3BPC SA188-3BPC_FD SA188-5BPC SSAO5-02-1BPC SSAO5-02-1BPC_FD SSAO5-02-5BPC SSAO5-03-1BPC SSAO5-03-1BPC_FD SSAO5-03-5BPC SSAO4-02-1BPC SSAO4-02-5BPC SSAO6-04-1BPC SSAO6-04-1BPC_FD SSAO6-04-5BPC SA63-1BPC SA63-5BPC SA63-5BPC_FD SSAO6-05-1BPC SSAO6-05-5BPC SSAO6-05-5BPC_FD SSAO7-01-1BPC SSAO7-01-1BPC_FD SSAO7-01-5BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG 280-2280-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Equipment Blank Data Qualification Summary - SDG 280-2280-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG 280-2280-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126N4
 SDG #: 280-2280-1
 Laboratory: Test America

Stage 2B

Date: 5-18-10
 Page: 1 of 1
 Reviewer: *CR*
 2nd Reviewer: *VR*

METHOD: Metals (EPA SW 846 Method 6020)

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: 4/8/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(1,2), (4,5), (7,8), (12,13), (16,17), (19,20), (21,22)
XV.	Field Blanks	SW	FB = FB-04072010-RZC (S06# 280-2280-2) EB = EB-04072010-RZC (280-2383-1)

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: *soil*

1	SA188-3BPC	11	SSAO4-02-5BPC	21	SSAO7-01-1BPC	31	SSAO7-01-5BPCMSD
2	SA188-3BPC_FD	12	SSAO6-04-1BPC	22	SSAO7-01-1BPC_FD	32	
3	SA188-5BPC	13	SSAO6-04-1BPC_FD	23	SSAO7-01-5BPC	33	POS (1-15)
4	SSAO5-02-1BPC	14	SSAO6-04-5BPC	24	SSAO5-02-5BPCMS	34	POS (16-23)
5	SSAO5-02-1BPC_FD	15	SA63-1BPC	25	SSAO5-02-5BPCMSD	35	
6	SSAO5-02-5BPC	16	SA63-5BPC	26	SSAO6-04-5BPCMS	36	
7	SSAO5-03-1BPC	17	SA63-5BPC_FD	27	SSAO6-04-5BPCMSD	37	
8	SSAO5-03-1BPC_FD	18	SSAO6-05-1BPC	28	SSAO6-05-1BPCMS	38	
9	SSAO5-03-5BPC	19	SSAO6-05-5BPC	29	SSAO6-05-1BPCMSD	39	
10	SSAO4-02-1BPC	20	SSAO6-05-5BPC_FD	30	SSAO7-01-5BPCMS	40	

Notes: _____

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Mg			1.65		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 6

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Mg			1.75		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 12-14

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Mg			2.42		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 21-23

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Co			0.0179		

Sample Concentration units, unless otherwise noted: mg/Kg Associated Samples: 19-23

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Mn			1.20	0.12	

LDC #: 23126N4

SDG #: See Cover

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)

Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET

PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 100x

Associated Samples: 18

Reason Code: bl

Page: 5 of 6
Reviewer: CR
2nd Reviewer: W

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Mn			0.930		

Sample Concentration units, unless otherwise noted: mg/Kg

Associated Samples: 18-23

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers
Mn	0.127				

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 23126N4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 2
 Reviewer: CR
 2nd Reviewer: [Signature]

METHOD: Metals (EPA Method 6020/7000)

- 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 (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Manganese	4300	3800	12			

V:\FIELD DUPLICATES\FD_inorganic\23126N4.wpd

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	4	5	RPD	Difference	Limits	
Arsenic	6.8	8.2	19			
Magnesium	9500	11000	15			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	7	8	RPD	Difference	Limits	
Arsenic	4.6	4.4	4			
Manganese	350	470	29			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	12	13	RPD	Difference	Limits	
Arsenic	1.2	1.5		0.3	(≤0.65)	
Manganese	220	260	17			
Magnesium	5300	7700	37			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	16	17	RPD	Difference	Limits	
Arsenic	7.5	7.2	4			

LDC#: 23126N4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 2 of 2
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: Metals (EPA Method 6020/7000)

- 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 (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	19	20	RPD	Difference	Limits	
Arsenic	7.0	8.1	15			
Manganese	940	1100	16			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	21	22	RPD	Difference	Limits	
Arsenic	4.9	5.2	6			
Manganese	790	800	1			
Cobalt	7.7	9.0	16			

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 8, 2010
LDC Report Date: May 24, 2010
Matrix: Water
Parameters: Metals
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-2

Sample Identification

FB-04072010-RZC
FB-04072010-RZCMS
FB-04072010-RZCMSD

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6020 for Metals. The metals analyzed were Arsenic, Cobalt, Magnesium, and Manganese.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Manganese	0.334 ug/L	All samples in SDG 280-2280-2
ICB/CCB	Cobalt	0.0110 ug/L	All samples in SDG 280-2280-2

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	Analyte	Reported Concentration	Modified Final Concentration
FB-04072010-RZC	Cobalt	0.016 ug/L	1.0U ug/L

Sample FB-04072010-RZC was identified as a field blank. No metal contaminants were found in this blank with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB-04072010-RZC	4/8/10	Cobalt	0.016 ug/L	No associated samples in this SDG

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-2	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Data Qualification Summary - SDG 280-2280-2**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2280-2	FB-04072010-RZC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG 280-2280-2**

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
280-2280-2	FB-04072010-RZC	Cobalt	1.0U ug/L	A	bl

**Tronox LLC Facility, PCS, Henderson, Nevada
Metals - Field Blank Data Qualification Summary - SDG 280-2280-2**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 2312604
 SDG #: 280-2280-2
 Laboratory: Test America

Stage 2B

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: [Signature]

METHOD: Metals (EPA SW 846 Method 6020)

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: 4/8/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV.	Field Blanks	SW	FB = 1 (no associated samples)

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: water

1	FB-04072010-RZC	11	PBW	21		31	
2	FB-04072010-RZCMS	12		22		32	
3	FB-04072010-RZCMSD	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 2312604

SDG #: See Cover

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)

Sample Concentration units, unless otherwise noted: ug/L

VALIDATION FINDINGS WORKSHEET

PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA

Associated Samples: All

Reason Code: bl

Page: 1 of 1

Reviewer: CA

2nd Reviewer: LA

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	1								
Co			0.0110		0.016 / 1.0								
Mn		0.334											

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 8, 2010
LDC Report Date: May 24, 2010
Matrix: Soil
Parameters: Arsenic & Manganese
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2280-6

Sample Identification

SSAO4-02-3BPC
SSAO6-05-3BPC

Introduction

This data review covers 2 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6020 for Arsenic and Manganese.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No arsenic or manganese was found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Manganese	0.0836 ug/L	SSAO6-05-3BPC

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

Sample EB-04142010-RIG1-RZC (from SDG 280-2448-2) was identified as an equipment blank. No arsenic or manganese was found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-04142010-RIG1-RZC	4/14/10	Manganese	1.6 ug/L	SSAO6-05-3BPC

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

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No arsenic or manganese was found in this blank.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-6	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic & Manganese - Data Qualification Summary - SDG 280-2280-6**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2280-6	SSAO4-02-3BPC SSAO6-05-3BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic & Manganese - Laboratory Blank Data Qualification Summary - SDG 280-2280-6**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic & Manganese - Equipment Blank Data Qualification Summary - SDG 280-2280-6**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic & Manganese - Field Blank Data Qualification Summary - SDG 280-2280-6**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126R4
 SDG #: 280-2280-6
 Laboratory: Test America

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: W

METHOD: As & Mn (EPA SW 846 Method 6020)

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: 4/8/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/D (SDGM 280-2216-7)
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not Utilized
XI.	ICP Serial Dilution	A	LSDGM 280-2216-7)
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV.	Field Blanks	SW	FB = FB-04072010-RZC, EB EB-04142010-RIG 1-RZ (280-2280-2) (280-2448-2)

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: Soil

1	SSAO4-02-3BPC	11	RBS	21		31	
2	SSAO6-05-3BPC	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1		Al, Sb, (As) Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
2		Al, Sb, (As) Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, (Mn) Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
ICP-MS		Al, Sb, (As) Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, (Mn) Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,

Comments: Mercury by CVAA if performed

LDC #: 23126R4

SDG #: See Cover

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)

Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET

PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 100x

Associated Samples: 2

Reason Code: bi

Page: 1 of 1

Reviewer: CR

2nd Reviewer: R

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Action Limit	No Qualifiers						
Mn			0.0836								

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 23162F4
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET Field Blanks

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

METHOD: Trace Metals (EPA SW846 6010B/7000)

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

Blank units: ug/L Associated sample units: mg/Kg Reason: be

Soil factor applied 100x

Sampling date: 4/14/10 Associated Samples: Z

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

Analyte	Blank ID	Sample Identification
Co	EB-04142010-RIG1-RZC (SDG#: 280-2448-2)	<u>No Qualifiers</u>
Mn	0.015	
Mg	1.6	
	1.6	
	TS	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 9, 2010
LDC Report Date: May 21, 2010
Matrix: Soil
Parameters: Arsenic
Validation Level: Stage 2B & 4
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2301-1

Sample Identification

RSAK8-1BPC**
RSAK8-5BPC**
SA42-1BPC**
SA42-5BPC**
SA42-5BPC_FD
SA41-2BPC**
SA41-5BPC**
SSAQ4-02-1BPC**
SSAQ4-02-5BPC**
SSAQ4-02-5BPC_FD
RSAK8-1BPCMS
RSAK8-1BPCMSD

**Indicates sample underwent Stage 4 review

Introduction

This data review covers 12 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6020 for Arsenic.

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).

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.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- 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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

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

Samples FB-04072010-RZC (from SDG 280-2280-2), FB-04072010-RZD (from SDG 280-2216-2) and FB04062010-RZB (from SDG 280-2131-1) were identified as field blanks. No arsenic were found in these blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All sample result verifications were acceptable for samples on which a Stage 4 review was performed.

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2301-1	All analytes reported below the PQL.	J (all detects)	A

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

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples SA42-5BPC** and SA42-5BPC_FD and samples SSAQ4-02-5BPC** and SSAQ4-02-5BPC_FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA42-5BPC**	SA42-5BPC_FD				
Arsenic	3.4	3.3	3 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAQ4-02-5BPC**	SSAQ4-02-5BPC_FD				
Arsenic	3.8	3.8	0 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Data Qualification Summary - SDG 280-2301-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2301-1	RSAK8-1BPC** RSAK8-5BPC** SA42-1BPC** SA42-5BPC** SA42-5BPC_FD SA41-2BPC** SA41-5BPC** SSAQ4-02-1BPC** SSAQ4-02-5BPC** SSAQ4-02-5BPC_FD	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Laboratory Blank Data Qualification Summary - SDG 280-2301-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Field Blank Data Qualification Summary - SDG 280-2301-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126U4
 SDG #: 280-2301-1
 Laboratory: Test America

Stage 2B /4

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: W

METHOD: As (EPA SW 846 Method 6020)

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: 4/9/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	A	Not reviewed for stage 2B
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(4,5), (9,10)
XV.	Field Blanks	ND	FB = FB-04072010-RZC, FB-04072010-RZD (280-2280-2) (280-2216-2)

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

* see below

Validated Samples:

soil **Level III

1	RSAK8-1BPC **	11	RSAK8-1BPCMS	21	FB S	31	
2	RSAK8-5BPC **	12	RSAK8-1BPCMSD	22		32	
3	SA42-1BPC **	13		23		33	
4	SA42-5BPC **	14		24		34	
5	SA42-5BPC_FD	15		25		35	
6	SA41-2BPC **	16		26		36	
7	SA41-5BPC **	17		27		37	
8	SSAQ4-02-1BPC **	18		28		38	
9	SSAQ4-02-5BPC **	19		29		39	
10	SSAQ4-02-5BPC_FD	20		30		40	

Notes: * FB = FB04062010-RZB (280-2131-1)

C #: 2372604
 IG #: See cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 4
 Reviewer: CR
 2nd Reviewer: W

Method: Metals (EPA SW 846 Method 6010/7000/6020)

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 isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution < 5%?	✓			
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	✓			
Were all initial calibration correlation coefficients > 0.995?	✓			
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. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
IV. Matrix spike/Matrix spike 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 +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were < 5X the RL.	✓			
V. Laboratory/control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

DC #: 231247
 IDG #: seaver

VALIDATION FINDINGS CHECKLIST

Page: 2 of 4
 Reviewer: ER
 2nd Reviewer: W

Validation Area	Yes	No	NA	Findings/Comments
VI. Furnace/Atomic Absorption QC				
If MSA was performed, was the correlation coefficients > 0.995?			/	
Do all applicable analyses have duplicate injections? (Level IV only)			/	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			/	
Were analytical spike recoveries within the 85-115% QC limits?			/	
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	/			
Were all percent differences (%Ds) < 10%?	/			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		/		
VIII. Internal Standards (EPA SW 846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?	/			
If the %Rs were outside the criteria, was a reanalysis performed?	/			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		/		
Were the performance evaluation (PE) samples within the acceptance limits?			/	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
XIII. Field blanks				
Field blanks were identified in this SDG.	/			
Target analytes were detected in the field blanks.		/		

LDC#: 23126U4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 11 of 11
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: Metals (EPA Method 6020/7000)

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

V:\FIELD DUPLICATES\FD_inorganic\23126U4.wpd

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	4	5	RPD	Difference	Limits	
Arsenic	3.4	3.3	3			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	9	10	RPD	Difference	Limits	
Arsenic	3.8	3.8	0			

LDC #: 232604
 SDG #: SEE COVER

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

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

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

An initial and 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 (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
 True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated		Reported		Acceptable (Y/N)
					%R	%R	%R	%R	
<u>B</u>	ICP (Initial calibration)								
	GFAA (Initial calibration)								
	CVAA (Initial calibration)								
	ICP (Continuing calibration)								
	GFAA (Continuing calibration)								
	CVAA (Continuing calibration)								
ICV	ICP/MS (Initial calibration)	As	41.8	40	105	104		Y	
CCV (2004)	ICP/MS (Continuing calibration)	As	51.4	50	103	103		Y	

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.

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

LDC #: B2664
 SDG #: See cover

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

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

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

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

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$$\%D = \frac{|I-SDR|}{I} \times 100$$

Where, I = Initial Sample Result (mg/L)
 SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units) mg/Ls	True / D / SDR (units) mg/Ls	Recalculated		Acceptable (Y/N)
					%R / RPD / %D	%R / RPD / %D	
ICS AB	ICP interference check	As	103	100	103	102	Y
LCS	Laboratory control sample		20.3	20	102	101	Y
11	Matrix spike		(SSR-SR) 20.5	21.4	96	96	Y
11/12	Duplicate		24.6	25.9	5	5	Y
1	ICP serial dilution	Y	4.1	4.22	2.9	2.4	Y

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 #: 29764
SDG #: Seeger

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

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

<input type="checkbox"/> N	N/A	Have results been reported and calculated correctly?
<input checked="" type="checkbox"/> Y	N	Are results within the calibrated range of the instruments and within the linear range of the ICP?
<input checked="" type="checkbox"/> Y	N	Are all detection limits below the CRDL?

Detected analyte results for As were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In. Vol.) (\%S)}$

- RD = Raw data concentration
- FV = Final volume (ml)
- In. Vol. = Initial volume (ml) or weight (G)
- Dil = Dilution factor
- %S = Decimal percent solids

Recalculation:

$$\frac{(100\text{ mL})(5) \left(\frac{7.94\ \mu\text{g/L}}{1000}\right)}{(0.927)(1.04\text{ g})} = 4.1\ \text{mg/kg}$$

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
1	As As	4.1	4.1	Y

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada

Collection Date: April 9, 2010

LDC Report Date: May 21, 2010

Matrix: Soil

Parameters: Arsenic

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2301-7

Sample Identification

SA42-3BPC

Introduction

This data review covers one soil sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6020 for Arsenic.

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).

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.

Blanks are summarized in Section IV.

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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

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

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No arsenic was found in this blank.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2301-7	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Data Qualification Summary - SDG 280-2301-7**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2301-7	SA42-3BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Laboratory Blank Data Qualification Summary - SDG 280-2301-7**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic - Field Blank Data Qualification Summary - SDG 280-2301-7**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126X4
 SDG #: 280-2301-7
 Laboratory: Test America

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: W

METHOD: As (EPA SW 846 Method 6020)

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: 4/9/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/D (SD6# 280-2131-9)
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	(SD6# 280-2131-9)
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	N	
XV.	Field Blanks	ND	FB = FB-04072010-R ZC (SD6# 280-2280-2)

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: Soil

1	SA42-3BPC	11	PBS	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 12, 2010
LDC Report Date: May 21, 2010
Matrix: Soil
Parameters: Arsenic & Manganese
Validation Level: Stage 2B & 4
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2352-1

Sample Identification

SSAN7-02-1BPC	SSAN6-02-1BPC
SSAN7-02-1BPC_FD	SSAN6-02-1BPC_FD
SSAN7-02-5BPC	SSAN6-02-5BPC
SSAN3-01-1BPC	SA156-3BPC_FD
SSAN3-01-5BPC	SSAN3-02-1BPCMS
SSAN3-02-1BPC	SSAN3-02-1BPCMSD
SSAN3-02-5BPC	SSAN2-01-1BPCMS
SSAN2-01-1BPC	SSAN2-01-1BPCMSD
SSAN2-01-5BPC	SA156-5BPCMS
SA56-3BPC	SA156-5BPCMSD
SA56-5BPC	
SA156-3BPC**	
SA156-5BPC**	
SA56-3BPC_FD	
SSAM7-04-1BPC	
SSAM7-04-5BPC	
SSAM7-04-5BPC_FD	
SSAM7-03-1BPC	
SSAM7-03-5BPC	
SSAM7-03-5BPC_FD	

**Indicates sample underwent Stage 4 review

Introduction

This data review covers 30 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 6020 for Arsenic and Manganese.

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).

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.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- 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.
- UU 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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

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

Samples EB-04122010-RIG1-RZB and EB-04122010-RIG2-RZC (both from SDG 280-2352-2) were identified as equipment blanks. No arsenic or manganese was found in these blanks with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-04122010-RIG2-RZC	4/12/10	Manganese	16 ug/L	SSAN2-01-1BPC SSAN2-01-5BPC SA56-3BPC SA56-5BPC SA56-3BPC_FD

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

Samples FB-04072010-RZC (from SDG 280-2280-2) and FB-04062010-RZB (from SDG 280-2131-1) were identified as field blanks. No arsenic or manganese was found in these blanks.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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. Duplicate Sample Analysis

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

VIII. Laboratory Control Samples (LCS)

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

IX. Internal Standards

All internal standard percent recoveries (%R) were within QC limits.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification and Project Quantitation Limit

All sample result verifications were acceptable for samples on which a Stage 4 review was performed.

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2352-1	All analytes reported below the PQL.	J (all detects)	A

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

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples SSAN7-02-1BPC and SSAN7-02-1BPC_FD, samples SA56-3BPC and SA56-3BPC_FD, samples SSAM7-04-5BPC and SSAM7-04-5BPC_FD, samples SSAM7-03-5BPC and SSAM7-03-5BPC_FD, samples SSAN6-02-1BPC and SSAN6-02-1BPC_FD, and samples SA156-3BPC_FD and SA156-3BPC** were identified as field duplicates. No arsenic or manganese was detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAN7-02-1BPC	SSAN7-02-1BPC_FD				
Arsenic	3.6	3.5	3 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA56-3BPC	SA56-3BPC_FD				
Arsenic	2.9	2.9	-	0 (≤ 0.61)	-	-
Manganese	330	270	20 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAM7-04-5BPC	SSAM7-04-5BPC_FD				
Arsenic	4.2	4.1	2 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAM7-03-5BPC	SSAM7-03-5BPC_FD				
Arsenic	4.3	3.9	10 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAN6-02-1BPC	SSAN6-02-1BPC_FD				
Arsenic	4.4	4.7	7 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA156-3BPC**	SA156-3BPC_FD				
Arsenic	6.3	3.7	52 (≤ 50)	-	J (all detects)	A

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic & Manganese - Data Qualification Summary - SDG 280-2352-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2352-1	SSAN7-02-1BPC SSAN7-02-1BPC_FD SSAN7-02-5BPC SSAN3-01-1BPC SSAN3-01-5BPC SSAN3-02-1BPC SSAN3-02-5BPC SSAN2-01-1BPC SSAN2-01-5BPC SA56-3BPC SA56-5BPC SA156-3BPC** SA156-5BPC** SA56-3BPC_FD SSAM7-04-1BPC SSAM7-04-5BPC SSAM7-04-5BPC_FD SSAM7-03-1BPC SSAM7-03-5BPC SSAM7-03-5BPC_FD SSAN6-02-1BPC SSAN6-02-1BPC_FD SSAN6-02-5BPC SA156-3BPC_FD	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)
280-2352-1	SA156-3BPC** SA156-3BPC_FD	Arsenic	J (all detects)	A	Field duplicates (RPD) (fd)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic & Manganese - Laboratory Blank Data Qualification Summary - SDG 280-2352-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic & Manganese - Equipment Blank Data Qualification Summary - SDG 280-2352-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Arsenic & Manganese - Field Blank Data Qualification Summary - SDG 280-2352-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126Y4
 SDG #: 280-2352-1
 Laboratory: Test America

Stage 2B / 4

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: [Signature]

METHOD: As & Mn (EPA SW 846 Method 6020)

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: 4/12/10
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	A	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS/D
VII.	Duplicate Sample Analysis	N	
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	A	
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	A	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(1,2), (10,14), (16,17), (19,20), (21,22), (24,12)
XV.	Field Blanks	SW	FB = FB-04072010-RZC, FB04062010-RZB (280-2280-2) (506 280 2131-1)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

*see below

Validated Samples: Soil

**Level 4

1	SSAN7-02-1BPC	11	SA56-5BPC	21	SSAN6-02-1BPC	31	PBS (1-14)
2	SSAN7-02-1BPC_FD	12	SA156-3BPC **	22	SSAN6-02-1BPC_FD	32	PBS (15-24)
3	SSAN7-02-5BPC	13	SA156-5BPC **	23	SSAN6-02-5BPC	33	
4	SSAN3-01-1BPC	14	SA56-3BPC_FD	24	SA156-3BPC_FD	34	
5	SSAN3-01-5BPC	15	SSAM7-04-1BPC	25	SSAN3-02-1BPCMS	35	
6	SSAN3-02-1BPC	16	SSAM7-04-5BPC	26	SSAN3-02-1BPCMSD	36	
7	SSAN3-02-5BPC	17	SSAM7-04-5BPC_FD	27	SSAN2-01-1BPCMS	37	
8	SSAN2-01-1BPC	18	SSAM7-03-1BPC	28	SSAN2-01-1BPCMSD	38	
9	SSAN2-01-5BPC	19	SSAM7-03-5BPC	29	SA156-5BPCMS	39	
10	SA56-3BPC	20	SSAM7-03-5BPC_FD	30	SA156-5BPCMSD	40	

Notes: *EB = EB-04122010-RIG1-RZB (280-2352-2)
 EB-04122010-RIG2-RZC

VALIDATION FINDINGS CHECKLIST

Method:Metals (EPA SW 846 Method 6010/7000/6020)

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 isotopes in the tuning solution mass resolution within 0.1 amu?	/			
Were %RSD of isotopes in the tuning solution < 5%?	/			
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	/			
Were all initial calibration correlation coefficients ≥ 0.995?	/			
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. ICP/Interference Check Sample				
Were ICP interference check samples performed daily?	/			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	/			
IV. Matrix spike/Matrix spike 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 +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were < 5X the RL.	/			
V. Laboratory control samples				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	/			

LDC #: 2016044
 SDG #: secaer

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: ER
 2nd Reviewer: V

Validation Area	Yes	No	NA	Findings/Comments
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients > 0.995?			/	
Do all applicable analyses have duplicate injections? (Level IV only)			/	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			/	
Were analytical spike recoveries within the 85-115% QC limits?			/	
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	/			
Were all percent differences (%Ds) < 10%?	/			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		/		
VIII. Internal Standards (EPA SW-846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?	/	/		
If the %Rs were outside the criteria, was a reanalysis performed?		/		
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		/		
Were the performance evaluation (PE) samples within the acceptance limits?			/	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
XI. Overall Assessment of data				
Overall assessment of data was found to be acceptable.	/			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	/			
Target analytes were detected in the field duplicates.	/			
XIII. Field blanks				
Field blanks were identified in this SDG.	/	/		
Target analytes were detected in the field blanks.		/		

METHOD: Trace Metals (EPA SW846 6010B/7000)
 N N/A Were field blanks identified in this SDG?
 N N/A Were target analytes detected in the field blanks?
Blank units: ug/L Associated sample units: mg/Kg
Sampling date: 4/12/10 Soil factor applied: 100x
Field blank type: (circle one) Field Blank / Rinsate / Other: EB

Field Blank: (be)
Associated Samples: 8-11, 14

Analyte	Blank ID	Action Level	Sample Identification
	EB-04122010-RIG2-RZC (SDG#: 280-2352-2)		<u>No Qualifiers</u>
Ce	0.11		
Mn	16	16	
Mg	59	59	

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

LDC#: 23126Y4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: Metals (EPA Method 6020/7000)

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 (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Arsenic	3.6	3.5	3			

V:\FIELD DUPLICATES\FD_inorganic\23126Y4.wpd

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	10	14	RPD	Difference	Limits	
Arsenic	2.9	2.9		0	(≤0.61)	
Manganese	330	270	20			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	16	17	RPD	Difference	Limits	
Arsenic	4.2	4.1	2			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	19	20	RPD	Difference	Limits	
Arsenic	4.3	3.9	10			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	21	22	RPD	Difference	Limits	
Arsenic	4.4	4.7	7			

Compound	Concentration (mg/Kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	12	24	RPD	Difference	Limits	
Arsenic	6.3	3.7	52			Jdet/A (fd)

LDC #: 2312644
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
 Reviewer: GR
 2nd Reviewer: WR

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

An initial and 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 (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
 True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated		Acceptable (Y/N)
					%R	Reported %R	
	ICP (Initial calibration)						
	GFAA (Initial calibration)						
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
	GFAA (Continuing calibration)						
	CVAA (Continuing calibration)						
ICV	ICP/MS (Initial calibration)	As	41.8	40	105	104	P
CCV (23-A)	ICP/MS (Continuing calibration)	↓	52.4	50	105	105	P

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.

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

LDC #: 2312644
 SDG #: See cover

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

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

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

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
 SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units mg/kg)	True / D / SDR (units)	Recalculated		Acceptable (Y/N)
					%R / RPD / %D	Reported %R / RPD / %D	
ICSAB	ICP interference check	As	103	100	103	102	Y
LCS	Laboratory control sample		21.2	20	106	106	
ZS	Matrix spike		(SSR-SR) 19.2	18.4	104	104	
25/26	Duplicate		24.0	25.1	4	4	
6	ICP serial dilution		4.8	5.06	5.4	4.7	Y

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 #: 2312644
 SDG #: seedier

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd reviewer: [Signature]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

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

- N N/A Have results been reported and calculated correctly?
- N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
- N N/A Are all detection limits below the CRDL?

Detected analyte results for As were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In. Vol.)(\%S)}$

Recalculation:

- RD = Raw data concentration
- FV = Final volume (ml)
- In. Vol. = Initial volume (ml) or weight (G)
- Dil = Dilution factor
- %S = Decimal percent solids

$$\frac{(100 \text{ mL})(5) \left(\frac{11.89 \text{ } \mu\text{g/L}}{1000} \right)}{(0.899)(1.05 \text{ g})} = 6.3 \text{ mg/kg}$$

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
AS 12	As As	6.3	6.3	Y

Tronox PCS
Data Validation Reports
LDC# 23126

Perchlorate

LDC

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 6, 2010
LDC Report Date: May 24, 2010
Matrix: Soil
Parameters: Perchlorate
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2131-1

Sample Identification

SSA06-02-1BPC_FD
SSA06-02-1BPC
SSA06-02-5BPC
SSA06-02-9BPC
SSA06-02-10BPC
SSA06-02-5BPCMS
SSA06-02-5BPCMSD
SSA06-02-5BPCDUP

Introduction

This data review covers 8 soil 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).

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.

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.
- UU 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 FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No perchlorate was found in this blank.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
SSA06-02-5BPCMS/MSD (All samples in SDG 280-2131-1)	Perchlorate	-	127 (75-125)	-	J+ (all detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2131-1	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

VIII. Overall Assessment

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

IX. Field Duplicates

Samples SSA06-02-1BPC_FD and SSA06-02-1BPC were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSA06-02-1BPC_FD	SSA06-02-1BPC				
Perchlorate	8.5	9.2	8 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Data Qualification Summary - SDG 280-2131-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2131-1	SSA06-02-1BPC_FD SSA06-02-1BPC SSA06-02-5BPC SSA06-02-9BPC SSA06-02-10BPC	Perchlorate	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R) (m)
280-2131-1	SSA06-02-1BPC_FD SSA06-02-1BPC SSA06-02-5BPC SSA06-02-9BPC SSA06-02-10BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Laboratory Blank Data Qualification Summary - SDG 280-2131-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Field Blank Data Qualification Summary - SDG 280-2131-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126A6
 SDG #: 280-2131-1
 Laboratory: Test America

Date: 5-18-10
 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: 4/6/10
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	SW	MS/D
V.	Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS/D
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(1,2)
X.	Field blanks	ND	FB=FB-04072010-RZC (280-2280-2)

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: soil

1	SSA06-02-1BPC_FD	11	RB5	21		31
2	SSA06-02-1BPC	12		22		32
3	SSA06-02-5BPC	13		23		33
4	SSA06-02-9BPC	14		24		34
5	SSA06-02-10BPC	15		25		35
6	SSA06-02-5BPCMS	16		26		36
7	SSA06-02-5BPCMSD	17		27		37
8	SSA06-02-5BPCDUP	18		28		38
9		19		29		39
10		20		30		40

Notes: _____

LDC#: 23126A6

SDG#: See Cover

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1

Reviewer: CR

2nd Reviewer: L

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 (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	1	2				
Perchlorate	8.5	9.2	8			

V:\FIELD DUPLICATES\FD_inorganic\23126A6.wpd

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 7, 2010
LDC Report Date: May 24, 2010
Matrix: Soil
Parameters: Perchlorate
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2216-1

Sample Identification

SA39-3BPC
SA39-5BPC

Introduction

This data review covers 2 soil 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).

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.

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.
- UU 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 FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No perchlorate was found in this blank.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
SSA06-02-5BPCMS/MSD (All samples in SDG 280-2216-1)	Perchlorate	-	127 (75-125)	-	J+ (all detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-1	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

VIII. Overall Assessment

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Data Qualification Summary - SDG 280-2216-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2216-1	SA39-3BPC SA39-5BPC	Perchlorate	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R) (m)
280-2216-1	SA39-3BPC SA39-5BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Laboratory Blank Data Qualification Summary - SDG 280-2216-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Field Blank Data Qualification Summary - SDG 280-2216-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126F6
 SDG #: 280-2216-1
 Laboratory: Test America

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: [Signature]

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: 4/7/10
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	SW	MS/D (S06x 280-2131-1)
V.	Duplicates	A	DUP ↓
VI.	Laboratory control samples	A	LCS/D
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	ND	FB = FB-04072010-RZC (280-2280-2)

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: Soil

1	SA39-3BPC	11	FB	21		31	
2	SA39-5BPC	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 7, 2010
LDC Report Date: May 24, 2010
Matrix: Soil/Water
Parameters: Perchlorate
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): 280-2216-2

Sample Identification

RSAR7-4BPC
RSAR7-6BPC
RSAR7-8BPC
FB-04072010-RZD

Introduction

This data review covers 3 soil samples and one water sample 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).

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.

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.
- UU 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.

Samples FB04062010-RZB (from SDG 280-2131-2) and FB-04072010-RZD were identified as field blanks. No perchlorate was found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB04062010-RZB	4/6/10	Perchlorate	92 ug/L	All soil samples in SDG 280-2216-2

Sample concentrations were compared to concentrations detected in the field 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) analyses 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. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2216-2	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

VIII. Overall Assessment

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Data Qualification Summary - SDG 280-2216-2**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2216-2	RSAR7-4BPC RSAR7-6BPC RSAR7-8BPC FB-04072010-RZD	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Laboratory Blank Data Qualification Summary - SDG 280-2216-2**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Field Blank Data Qualification Summary - SDG 280-2216-2**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126G6
 SDG #: 280-2216-2
 Laboratory: Test America

Stage 2B

Date: 5/18/10
 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: 4/7/10
IIa.	Initial calibration	A	
IIb.	Calibration verification	SWA	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	A	MS/D (SDG# 280-2280-1)
V.	Duplicates	A	DUP ↓
VI.	Laboratory control samples	A	LCS/D
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	SW ND	FB=4, FB04062010-RZB (280-2131-2)

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: Soil/water

1	RSAR7-4BPC	S	11	PBW	21	31
2	RSAR7-6BPC	↓	12	PBS	22	32
3	RSAR7-8BPC	↓	13		23	33
4	FB-04072010-RZD	W	14		24	34
5			15		25	35
6			16		26	36
7			17		27	37
8			18		28	38
9			19		29	39
10			20		30	40

Notes: _____

VALIDATION FINDINGS WORKSHEET
Field Blanks

LDC #: 23204A6
SDG #: See Cover

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

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?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 4/6/10 **Spike factor applied:** 10x
Field blank type: (circle one) Field Blank / Rinsate / Other:

Reason Code: bf

Associated Samples: All Soil

Analyte	Blank ID	Action Limit	Sample Identification																	
	FB04062010-RZB (SDG#: 280-2131- 28)																			
CIO4	92	9.2																		

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 8, 2010
LDC Report Date: May 24, 2010
Matrix: Soil
Parameters: Perchlorate
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-1

Sample Identification

SSAO5-02-10BPC
SSAO5-02-2BPC
SSAO5-02-4BPC
SSAO5-02-6BPC
SSAO5-02-8BPC
SSAO7-01-1BPC
SSAO7-01-1BPC_FD
SSAO7-01-5BPC
SSAO7-01-5BPCMS
SSAO7-01-5BPCMSD
SSAO7-01-5BPCDUP

Introduction

This data review covers 11 soil 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).

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.

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. 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 EB-04072010-RZC (from SDG 280-2383-1) was identified as an equipment blank. No perchlorate was found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-04072010-RZC	4/8/10	Perchlorate	1.2 ug/L	All samples in SDG 280-2280-1

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

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No perchlorate was found in this blank.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses 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. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-1	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

VIII. Overall Assessment

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

IX. Field Duplicates

Samples SSAO7-01-1BPC and SSAO7-01-1BPC_FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAO7-01-1BPC	SSAO7-01-1BPC_FD				
Perchlorate	110	110	0 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Data Qualification Summary - SDG 280-2280-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2280-1	SSAO5-02-10BPC SSAO5-02-2BPC SSAO5-02-4BPC SSAO5-02-6BPC SSAO5-02-8BPC SSAO7-01-1BPC SSAO7-01-1BPC_FD SSAO7-01-5BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Laboratory Blank Data Qualification Summary - SDG 280-2280-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Equipment Blank Data Qualification Summary - SDG 280-2280-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Field Blank Data Qualification Summary - SDG 280-2280-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126N6
 SDG #: 280-2280-1
 Laboratory: Test America

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: [Signature]

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: 4/8/10
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	A	MS/D
V.	Duplicates	A	DP
VI.	Laboratory control samples	A	LCS/D
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(5,6) (6,7)
X.	Field blanks	SW NB	FB = FB-04072010- RZC (28022802) EB = EB-04072010- RZC (2802383-1)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: Soil

1	SSAO5-02-10BPC	11	SSAO7-01-5BPCDUP	21	PBS	31
2	SSAO5-02-2BPC	12		22		32
3	SSAO5-02-4BPC	13		23		33
4	SSAO5-02-6BPC	14		24		34
5	SSAO5-02-8BPC	15		25		35
6	SSAO7-01-1BPC	16		26		36
7	SSAO7-01-1BPC_FD	17		27		37
8	SSAO7-01-5BPC	18		28		38
9	SSAO7-01-5BPCMS	19		29		39
10	SSAO7-01-5BPCMSD	20		30		40

Notes: _____

LDC #: 23204E6
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
 Reviewer: AR
 2nd Reviewer: R

METHOD: Inorganics, EPA Method. See Cover
 Were field blanks identified in this SDG?
 Y N N/A
 Were target analytes detected in the field blanks?
 Y N N/A
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 4/8/10 Soil factor applied: 10x
Field blank type: (circle one) Field Blank / Rinsate / Other: EB

Reason Code: be

Associated Samples: All ~~SX~~

Analyte	Blank ID	Action Limit	Sample Identification			
	EB-04072010-RZC (SDG#: 280-2383-1)					
ClO4	1.2	0.12				

LDC#: 23126N6

SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: CR
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 (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	6	7				
Perchlorate	110	110	0			

V:\FIELD DUPLICATES\FD_inorganic\23126N6.wpd

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 8, 2010
LDC Report Date: May 24, 2010
Matrix: Soil/Water
Parameters: Perchlorate
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2280-2

Sample Identification

SA104-4BPC
SA104-6BPC
SA104-6BPC_FD
SA104-8BPC
FB-04072010-RZC

Introduction

This data review covers 4 soil samples and one water sample 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).

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.

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. 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 EB-04072010-RZC (from SDG 280-2383-1) was identified as an equipment blank. No perchlorate was found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-04072010-RZC	4/8/10	Perchlorate	1.2 ug/L	All soil samples in SDG 280-2280-2

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

Sample FB-04072010-RZC was identified as a field blank. No perchlorate was found in this blank.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses 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. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2280-2	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

VIII. Overall Assessment

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

IX. Field Duplicates

Samples SA104-6BPC and SA104-6BPC_FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA104-6BPC	SA104-6BPC_FD				
Perchlorate	930	1300	33 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Data Qualification Summary - SDG 280-2280-2**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2280-2	SA104-4BPC SA104-6BPC SA104-6BPC_FD SA104-8BPC FB-04072010-RZC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Laboratory Blank Data Qualification Summary - SDG 280-2280-2**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Equipment Blank Data Qualification Summary - SDG 280-2280-2**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Field Blank Data Qualification Summary - SDG 280-2280-2**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 2312606
 SDG #: 280-2280-2
 Laboratory: Test America

Stage 2B

Date: 5-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: [Signature]

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: 4/8/10
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	A	MS/D (506 * 280-2280-1)
V.	Duplicates	A	DUP ↓
VI.	Laboratory control samples	A	LCS/D
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(2,3)
X.	Field blanks	SW FB	FB=5, EB=04072010-RZC (280-2283-1)

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: Soil/Water

1	SA104-4BPC	S	11	QBS	21	31
2	SA104-6BPC	↓	12	QBW	22	32
3	SA104-6BPC_FD	↓	13		23	33
4	SA104-8BPC	↓	14		24	34
5	FB-04072010-RZC	W	15		25	35
6			16		26	36
7			17		27	37
8			18		28	38
9			19		29	39
10			20		30	40

Notes: _____

LDC #: 23204E6
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 4/8/10 Soil factor applied 10x
Field blank type: (circle one) Field Blank / Rinsate / Other: EB

Reason Code: be

Associated Samples: All Soil

Analyte	Blank ID	Action Limit	Sample Identification			
	EB-04072010-RZC (SDG#: 280-2383-1)		<u>No equals</u>			
C104	1.2	0.12				

LDC#: 2312606

SDG#: See Cover

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer: CR
2nd Reviewer: [Signature]

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 (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	2	3				
Perchlorate	930	1300	33			

V:\FIELD DUPLICATES\FD_inorganic\2312606.wpd

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 12, 2010
LDC Report Date: May 24, 2010
Matrix: Soil
Parameters: Perchlorate
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2352-6

Sample Identification

SSAM7-03-2BPC
SSAM7-03-3BPC
SSAM7-03-4BPC

Introduction

This data review covers 3 soil 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).

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.

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. 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 EB-04122010-RIG2-RZC (from SDG 280-2352-2) was identified as an equipment blank. No perchlorate was found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-04122010-RIG1-RZC	4/12/10	Perchlorate	8.4 ug/L	All samples in SDG 280-2352-6

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

Sample FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No perchlorate was found in this blank.

IV. Matrix Spike/Matrix Spike Duplicates

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

V. Duplicates

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

VI. Laboratory Control Samples

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

VII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2352-6	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

VIII. Overall Assessment

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Data Qualification Summary - SDG 280-2352-6**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2352-6	SSAM7-03-2BPC SSAM7-03-3BPC SSAM7-03-4BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Laboratory Blank Data Qualification Summary - SDG 280-2352-6**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Equipment Blank Data Qualification Summary - SDG 280-2352-6**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
 Perchlorate - Field Blank Data Qualification Summary - SDG 280-2352-6**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

LDC #: 23126S6
 SDG #: 280-2352-6
 Laboratory: Test America

Date: 3-18-10
 Page: 1 of 1
 Reviewer: CR
 2nd Reviewer: [Signature]

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: 4/12/10
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	N	Client specified
V.	Duplicates	N	↓
VI.	Laboratory control samples	A	LCS/D
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	SW	FB = FB-04072010-RZC, EB = EB-04122010-RSG2-R (280-2280-2), (280-2352-2)

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: Soil

1	SSAM7-03-2BPC	11	PBS	21		31	
2	SSAM7-03-3BPC	12		22		32	
3	SSAM7-03-4BPC	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 23204D6
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

METHOD: Inorganics, EPA Method. See Cover

Y Were field blanks identified in this SDG?

N Were target analytes detected in the field blanks?

Y Blank units: ug/L Associated sample units: mg/Kg

N Sampling date: 4/12/10 Soil factor applied: 10x

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

Reason Code: be

Associated Samples: All

Analyte	Blank ID	Action Limit	Sample Identification			
	EB-04122019-RIG2-RZC (SDG#: 280-2352-2)		NO	QUALS		
ClO4	8.4	0.84				

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 9, 2010
LDC Report Date: May 24, 2010
Matrix: Soil
Parameters: Perchlorate
Validation Level: Stage 2B
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2301-1

Sample Identification

SSAM6-01-10BPC
SSAM6-01-2BPC
SSAM6-01-4BPC
SSAM6-01-6BPC
SSAM6-01-8BPC
SSAM6-01-8BPC_FD
RSAM5-4BPC
RSAM5-6BPC
RSAM5-8BPC
SA65-4BPC
SA65-4BPC_FD
SA65-6BPC
SA65-8BPC
SSAM6-01-10BPCMS
SSAM6-01-10BPCMSD
SSAM6-01-10BPCDUP

Introduction

This data review covers 16 soil 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).

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.

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. 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 FB-04072010-RZC (from SDG 280-2280-2) was identified as a field blank. No perchlorate was found in this blank.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
SSAM6-01-10BPCMS/MSD (All samples in SDG 280-2301-1)	Perchlorate	-	74 (75-125)	-	J- (all detects) UJ (all non-detects)	A

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) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2301-1	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

VIII. Overall Assessment

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

IX. Field Duplicates

Samples SSAM6-01-8BPC and SSAM6-01-8BPC_FD and samples SA65-4BPC and SA65-4BPC_FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAM6-01-8BPC	SSAM6-01-8BPC_FD				
Perchlorate	2700	2300	16 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SA65-4BPC	SA65-4BPC_FD				
Perchlorate	1100	1500	31 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Data Qualification Summary - SDG 280-2301-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2301-1	SSAM6-01-10BPC SSAM6-01-2BPC SSAM6-01-4BPC SSAM6-01-6BPC SSAM6-01-8BPC SSAM6-01-8BPC_FD RSAM5-4BPC RSAM5-6BPC RSAM5-8BPC SA65-4BPC SA65-4BPC_FD SA65-6BPC SA65-8BPC	Perchlorate	J- (all detects) UJ (all non-detects)	P	Matrix spike/Matrix spike duplicates (%R) (m)
280-2301-1	SSAM6-01-10BPC SSAM6-01-2BPC SSAM6-01-4BPC SSAM6-01-6BPC SSAM6-01-8BPC SSAM6-01-8BPC_FD RSAM5-4BPC RSAM5-6BPC RSAM5-8BPC SA65-4BPC SA65-4BPC_FD SA65-6BPC SA65-8BPC	All analytes reported below the PQL	J (all detects)	A	Sample result verification (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Laboratory Blank Data Qualification Summary - SDG 280-2301-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Field Blank Data Qualification Summary - SDG 280-2301-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126U6
 SDG #: 280-2301-1
 Laboratory: Test America

Stage 2B

Date: 5-18-10
 Page: 1 of 1
 Reviewer: *CS*
 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: 4/9/10
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	SW	MS/D
V.	Duplicates	N	
VI.	Laboratory control samples	A	LCS/D
VII.	Sample result verification	A N	Not reviewed for level III
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(5,6), (10,11)
X.	Field blanks	ND	FB = FB-04072010 - RZC (2802280-2)

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: *soil*

1	SSAM6-01-10BPC	11	SA65-4BPC_FD	21	<i>QBS</i>	31
2	SSAM6-01-2BPC	12	SA65-6BPC	22		32
3	SSAM6-01-4BPC	13	SA65-8BPC	23		33
4	SSAM6-01-6BPC	14	SSAM6-01-10BPCMS	24		34
5	SSAM6-01-8BPC	15	SSAM6-01-10BPCMSD	25		35
6	SSAM6-01-8BPC_FD	16	SSAM6-01-10BPCDUP	26		36
7	RSAM5-4BPC	17		27		37
8	RSAM5-6BPC	18		28		38
9	RSAM5-8BPC	19		29		39
10	SA65-4BPC	20		30		40

Notes: _____

LDC #: 2312606
 SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

METHOD: Inorganics, EPA Method 314.0

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

- N N/A Was a matrix spike analyzed for each matrix in this SDG?
- Y N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.
- Y N/A Were all duplicate sample relative percent differences (RPD) \leq 20% for water samples and \leq 35% for soil samples?

LEVEL IV ONLY:
 Y N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	<u>14/15</u>	<u>soil</u>	<u>C104</u>		<u>74</u>		<u>All</u>	<u>5-105/A cm</u>

Comments: _____

LDC#: 23126U6

SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of

Reviewer: ce

2nd Reviewer:

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 (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	5	6				
Perchlorate	2700	2300	16			

V:\FIELD DUPLICATES\FD_inorganic\23126U6.wpd

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	10	11				
Perchlorate	1100	1500	31			

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

Project/Site Name: Tronox LLC Facility, PCS, Henderson, Nevada
Collection Date: April 12, 2010
LDC Report Date: May 24, 2010
Matrix: Soil
Parameters: Perchlorate
Validation Level: Stage 2B & 4
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-2352-1

Sample Identification

SA156-3BPC**
SA156-5BPC**
SSAM7-03-1BPC
SSAM7-03-5BPC
SSAM7-03-5BPC_FD
SSAJ3-02-1BPC
SSAJ3-02-5BPC
SSAJ3-02-1BPC-FD
RSAJ2-5BPC_FD
RSAJ2-2BPC
RSAJ2-5BPC
SA156-5BPCMS
SA156-5BPCMSD
SA156-5BPCDUP
SSAJ3-02-5BPCMS
SSAJ3-02-5BPCMSD
SSAJ3-02-5BPCDUP
RSAJ2-2BPCMS
RSAJ2-2BPCMSD
RSAJ2-2BPCDUP

**Indicates sample underwent Stage 4 review

Introduction

This data review covers 20 soil 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).

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.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- 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.

Samples EB-04122010-RIG1-RZB, EB-04122010-RIG2-RZC, and EB-04122010-RIG3-RZD (all from SDG 280-2352-2) were identified as equipment blanks. No perchlorate was found in these blanks with the following exceptions:

Equipment Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
EB-04122010-RIG2-RZC	4/12/10	Perchlorate	8.4 ug/L	SSAM7-03-1BPC SSAM7-03-5BPC SSAM7-03-5BPC_FD

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

Samples FB-04072010-RZC (from SDG 280-2280-2), FB-04072010-RZD (from SDG 280-2216-2), and FB-04062010-RZB (from SDG 280-2131-2) were identified as field blanks. No perchlorate was found in these blanks with the following exceptions:

Field Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FB-04062010-RZB	4/6/10	Perchlorate	92 ug/L	SA156-3BPC** SA156-5BPC**

Sample concentrations were compared to concentrations detected in the field 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) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
RSAJ2-2BPCMS/MSD (SSAJ3-02-1BPC SSAJ3-02-5BPC SSAJ3-02-1BPC-FD RSAJ2-5BPC_FD RSAJ2-2BPC RSAJ2-5BPC)	Perchlorate	136 (75-125)	-	-	J+ (all detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification and Project Quantitation Limit

All sample result verifications were acceptable for samples on which a Stage 4 review was performed.

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 280-2352-1	All analytes reported below the PQL.	J (all detects)	A

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

VIII. Overall Assessment

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

IX. Field Duplicates

Samples SSAM7-03-5BPC and SSAM7-03-5BPC_FD, samples SSAJ3-02-1BPC and SSAJ3-02-1BPC-FD, and samples RSAJ2-5BPC_FD and RSAJ2-5BPC were identified as field duplicates. No perchlorate was detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAM7-03-5BPC	SSAM7-03-5BPC_FD				
Perchlorate	430	450	5 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	SSAJ3-02-1BPC	SSAJ3-02-1BPC-FD				
Perchlorate	1.8	2.1	15 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	RSAJ2-5BPC_FD	RSAJ2-5BPC				
Perchlorate	81	130	46 (≤ 50)	-	-	-

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Data Qualification Summary - SDG 280-2352-1**

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
280-2352-1	SSAJ3-02-1BPC SSAJ3-02-5BPC SSAJ3-02-1BPC-FD RSAJ2-5BPC_FD RSAJ2-2BPC RSAJ2-5BPC	Perchlorate	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R) (m)
280-2352-1	SA156-3BPC** SA156-5BPC** SSAM7-03-1BPC SSAM7-03-5BPC SSAM7-03-5BPC_FD SSAJ3-02-1BPC SSAJ3-02-5BPC SSAJ3-02-1BPC-FD RSAJ2-5BPC_FD RSAJ2-2BPC RSAJ2-5BPC	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (sp)

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Laboratory Blank Data Qualification Summary - SDG 280-2352-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Equipment Blank Data Qualification Summary - SDG 280-2352-1**

No Sample Data Qualified in this SDG

**Tronox LLC Facility, PCS, Henderson, Nevada
Perchlorate - Field Blank Data Qualification Summary - SDG 280-2352-1**

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

VALIDATION COMPLETENESS WORKSHEET

LDC #: 23126Y6
 SDG #: 280-2352-1
 Laboratory: Test America

Stage 2B / 4

Date: 5-18-10
 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: 4/12/10
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV.	Matrix Spike/Matrix Spike Duplicates	SW	MS/D
V.	Duplicates	A	DUP
VI.	Laboratory control samples	A	LCSD
VII.	Sample result verification	N	Not reviewed for level 4
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(4,5), (6,8), (9,11)
X.	Field blanks	SW	FB=FB-04072010-RZC, FB-04072010-RZD, FB=FB04067201-RZC, FB=FB04067201-RZD, FB=FB04067201-RZB, FB=FB04067201-RZD

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
 (280-2280-2) (280-2216-2) (280-2131-2)
 * See below

Validated Samples: soil

* level 4

1	SA156-3BPC **	11	RSAJ2-5BPC	21	31	PBS
2	SA156-5BPC **	12	SA156-5BPCMS	22	32	PBS
3	SSAM7-03-1BPC	13	SA156-5BPCMSD	23	33	
4	SSAM7-03-5BPC	14	SA156-5BPCDUP	24	34	
5	SSAM7-03-5BPC_FD	15	SSAJ3-02-5BPCMS	25	35	
6	SSAJ3-02-1BPC	16	SSAJ3-02-5BPCMSD	26	36	
7	SSAJ3-02-5BPC	17	SSAJ3-02-5BPCDUP	27	37	
8	SSAJ3-02-1BPC-FD	18	RSAJ2-2BPCMS	28	38	
9	RSAJ2-5BPC_FD	19	RSAJ2-2BPCMSD	29	39	
10	RSAJ2-2BPC	20	RSAJ2-2BPCDUP	30	40	

Notes: * EB = EB-04122010-RIG2-RZC (280-2352-2)
 EB-04122010-RIG1-RZB
 EB-04122010-RIG3-RZD

LDC #: 2312696
 SDG #: see cover

VALIDATION FINDINGS CHECKLIST

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

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, MS, MS/DUP, and Duplicate Samples				
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 analyzed 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 #: 2312646
 SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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.	/			

312646
 LDC #: 23204D6
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
 Reviewer: OR
 2nd Reviewer: R

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?
Blank units: ug/L. **Associated sample units:** mg/Kg
Sampling date: 4/12/10 Soil factor applied: 10x
Field blank type: (circle one) Field Blank / Rinsate / Other: (EB)

Reason Code: be
 Associated Samples: 3-5

Analyte	Blank ID	Action Limit	Sample Identification									
	EB-04122019-RIG2-RZC (SDG#: 280-2352-2)		No	Quals								
C104	8.4	0.84										

2312646

LDC #: 23204A6
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Field Blanks

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

METHOD: Inorganics, EPA Method See Cover

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

Blank units: ug/L Associated sample units: mg/Kg
Sampling date: 4/6/10 Soil factor applied: 10x

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

Reason Code: bf

Associated Samples: 1, 2

Analyte	Blank ID	Action Limit	Sample Identification															
	FB04062010-RZB (SDG#: 280-2131- 57)		No Qualifiers															
ClO4	92	9.2																

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

LDC #: 2312646
SDG #: see cover

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

METHOD: Inorganics, EPA Method 314.0

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

- N N/A Was a matrix spike analyzed for each matrix in this SDG?
 - N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.
 - N N/A Were all duplicate sample relative percent differences (RPD) $\leq 20\%$ for water samples and $\leq 35\%$ for soil samples?
- LEVEL IV ONLY:**
 N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	<u>18/19</u>	<u>Soil</u>	<u>CO4</u>	<u>136</u>			<u>6-10/11</u> <u>6-11</u>	<u>5 + det/A (m)</u>

Comments: _____

LDC#: 23126Y6

SDG#: See Cover

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1

Reviewer: CR

2nd Reviewer: [Signature]

Inorganics, Method: See Cover

Y N N A
Y N N A

Were field duplicate pairs identified in this SDG?

Were target analytes detected in the field duplicate pairs?

Analyte	Concentration (ug/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	4	5				
Perchlorate	430	450	5			

V:\FIELD DUPLICATES\FD_inorganic\23126Y6.wpd

Analyte	Concentration (ug/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	6	8				
Perchlorate	1.8	2.1	15			

Analyte	Concentration (ug/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	9	11				
Perchlorate	81	130	46			

LDC #: 2312646
 SDG #: see cover

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method 314.0

The correlation coefficient (r) for the calibration of ClO₄ was recalculated. Calibration date: 4/21/10

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		Reported		Acceptable (Y/N)
					r or r ²	r or r ²			
Initial calibration	ClO ₄	s1	1	0.00161	0.999970	0.999451			Y
		s2	2	0.0045					
		s3	5	0.01238					
		s4	10	0.02615					
		s5	20	0.05474					
		s6	40	0.1095					
Calibration verification		ICV	20	19.475		-			
Calibration verification		CCV	30	30.811		-			
Calibration verification									

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 #: 2312646
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
 Reviewer: ERS
 2nd Reviewer: [Signature]

METHOD: Inorganics, Method See cover

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

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 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		Reported %R / RPD	Acceptable (Y/N)
					%R / RPD	%R / RPD		
107	Laboratory control sample	ClO4	0.0998	0.1	100	99	Y	
12	Matrix spike sample	(SSR-SR)	0.121	0.109	111	112	Y	
14	Duplicate sample		0.097	0.0969	0.001	0.126	Y	

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.

EDD CHECKLIST

LDC #: 23126
 SDG #: 280-2131-1, 280-2131-5, 280-2131-6, 280-2131-8, 280-2131-9
280-2216-1, 280-2216-2, 280-2216-4, 280-2216-5, 280-2216-6
280-2216-7, 280-2270-1, 280-2270-2, 280-2280-1, 280-2280-2
280-2280-4, 280-2280-5, 280-2280-6, 280-2352-6, 280-2280-7
280-2301-1, 280-2301-3, 280-2301-4, 280-2301-7, 280-2352-1
280-2352-4

Tronox Northgate Henderson Worksheet

EDD Area	Yes	No	NA	Findings/Comments
I. Completeness				
Is there an EDD for the associated Tronox validation report?	X			
II. EDD Qualifier Population				
Were all qualifiers from the validation report populated into the EDD?	X			
III. EDD Lab Anomalies				
Were EDD anomalies identified?	X			
If yes, were they corrected or documented for the client?	X			See EDD_discrepancy_ form_LDC23126_052810.doc
IV. EDD Delivery				
Was the final EDD sent to the client?	X			