

**LABORATORY DATA CONSULTANTS, INC.**

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ERM  
2525 Natomas Park Drive, Suite 350  
Sacramento, CA 95833  
ATTN: Ms. Maria Barajas-Albalawi

August 6, 2008

SUBJECT: BRC Tronox Parcel G, Data Validation

Dear Ms. Barajas-Albalawi

Enclosed are the final validation reports for the fractions listed below. This SDG was received on July 14, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

**LDC Project # 19098:**

<b><u>SDG #</u></b>	<b><u>Fraction</u></b>
F8F050256	Volatiles, Semivolatiles, Chlorinated Pesticides, Polychlorinated Biphenyls, Metals, Wet Chemistry, Gasoline Range Organics, Diesel Range Organics, Polynuclear Aromatic Hydrocarbons, Dioxins/Dibenzofurans

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely,

Erlinda T. Rauto  
Operations Manager/Senior Chemist



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

**Project/Site Name:** BRC Tronox Parcel G

**Collection Date:** June 4, 2008

**LDC Report Date:** July 23, 2008

**Matrix:** Soil/Water

**Parameters:** Volatiles

**Validation Level:** EPA Level III

**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** F8F050256

TSB-GJ-09-0'

TSB-GJ-09-0'-FD

TSB-GJ-08-0'

TB-4

## Introduction

This data review covers 3 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 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section 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.
- 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.
- 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 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination ( $r^2$ ) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds and system performance check compounds (SPCCs) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
5/28/08 (MICALBRC)	Ethanol	0.00361 ( $\geq 0.05$ )	All water samples in SDG F8F050256	J (all detects) UJ (all non-detects)	A
5/28/08 (MICAL)	Acetonitrile 2-Butanone	0.00984 ( $\geq 0.05$ ) 0.03111 ( $\geq 0.05$ )	All water samples in SDG F8F050256	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
5/21/08 (GICALBRC)	Ethanol	0.00086 ( $\geq 0.05$ )	All soil samples in SDG F8F050256	J (all detects) UJ (all non-detects)	A

#### 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).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
6/9/08 (GCAL1940)	Acetonitrile	25.93241	All soil samples in SDG F8F050256	J+ (all detects)	A
6/10/08 (MCAL7269)	Dichlorodifluoromethane Bromomethane	25.94405 33.13188	All water samples in SDG F8F050256	J+ (all detects) J+ (all detects)	A

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

Date	Compound	%D	Associated Samples	Flag	A or P
5/23/08 (GICV1844)	Dichlorodifluoromethane Tetrachloroethene Nonanal	49.46918 34.40890 74.79276	All soil samples in SDG F8F050256	J+ (all detects) J+ (all detects) J+ (all detects)	A
5/28/08 (MICV7100)	Iodomethane Nonanal	28.47470 40.60652	All water samples in SDG F8F050256	J+ (all detects) J+ (all detects)	A

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
6/9/08	Ethanol	0.00079 ( $\geq 0.05$ )	All soil samples in SDG F8F050256	J (all detects) UJ (all non-detects)	A
6/10/08	Acetonitrile 2-Butanone	0.00933 ( $\geq 0.05$ ) 0.02516 ( $\geq 0.05$ )	All water samples in SDG F8F050256	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

## V. Blanks

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

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
F8F090000-367	6/9/08	Dichloromethane	1.1 ug/Kg	All soil samples in SDG F8F050256

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
TSB-GJ-08-0'	Dichloromethane	11 ug/Kg	11U ug/Kg

Sample TB-4 was identified as a trip blank. No volatile contaminants were found in this blank with the following exceptions:

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB-4	6/4/08	Dichloromethane Acetone Chloroform	0.29 ug/L 0.85 ug/L 0.11 ug/L	All soil samples in SDG F8F050256

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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
F8F160000-097	Bromofluorobenzene	124 (79-115)	All TCL compounds	J+ (all detects)	P

## 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. Although the percent recoveries for some compounds in the LCS were not within QC limits, the LCSD percent recoveries (%R) were within QC limits and no data were qualified.

### 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. Compound Quantitation and CRQLs

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 of Data

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

### XVI. Field Duplicates

Samples TSB-GJ-09-0' and TSB-GJ-09-0'-FD were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flags	A or P
	TSB-GJ-09-0'	TSB-GJ-09-0'-FD				
Acetone	15	9.8	-	5.2 (≤21)	-	-
Dichloromethane	16	15	-	1.0 (≤5.2)	-	-



**BRC Tronox Parcel G  
Volatiles - Data Qualification Summary - SDG F8F050256**

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0' TB-4	Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
F8F050256	TB-4	Acetonitrile 2-Butanone	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Acetonitrile	J+ (all detects)	A	Continuing calibration (%D)
F8F050256	TB-4	Dichlorodifluoromethane Bromomethane	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Dichlorodifluoromethane Tetrachloroethene Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (ICV %D)
F8F050256	TB-4	Iodomethane Nonanal	J+ (all detects) J+ (all detects)	A	Continuing calibration (ICV %D)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
F8F050256	TB-4	Acetonitrile 2-Butanone	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

**BRC Tronox Parcel G  
Volatiles - Laboratory Blank Data Qualification Summary - SDG F8F050256**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8F050256	TSB-GJ-08-0'	Dichloromethane	11U ug/Kg	A

**BRC Tronox Parcel G**  
**Volatiles - Field Blank Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A1  
 SDG #: F8F050256  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**

Level III

Date: 7/20/08  
 Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

**METHOD:** GC/MS Volatiles (EPA SW 846 Method 8260B)

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: 6/4/08
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	% RSD, r <sup>2</sup> 20.990
IV.	Continuing calibration/ICV	SW	
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	TSB-FJ-06-2-0'
VIII.	Laboratory control samples	SW	LCS/D
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 = 142
XVII.	Field blanks	SW	TB=4

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 + water*

1	TSB-GJ-09-0'	11	F8F090000-367	21	8161367 /	31
2	TSB-GJ-09-0'-FD	12	F8F130000-280	22	8165280	32
3	TSB-GJ-08-0'	13	<del>F8F050000-015</del>	23	8168097	33
4	<i>3 = 2 only</i> TB-4      W	14	F8F160000-097	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-Dichloroethane	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. Diisopropyl 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.



**VALIDATION FINDINGS WORKSHEET**  
Continuing Calibration

**METHOD:** GC/MS VOA (EPA SW 846 Method 8260B)

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

- Y/N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
- Y/N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
- Y/N N/A Were all %D and RRFs within the validation criteria of  $\leq 25\%$  %D and  $\geq 0.05$  RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$ )	Finding RRF (Limit: $\geq 0.05$ )	Associated Samples	Qualifications
	<u>5/23/08</u>	<u>GICN1844</u>					
+	<u>5/23/08</u>	<u>GICN1844</u>	<u>JJ</u>	<u>49.46918</u>		<u>F8F090000-367,</u>	<u>J+/A det</u>
+			<u>AA</u>	<u>34.40890</u>		<u>+ All soils</u>	<u>↓</u>
+			<u>Nonanal</u>	<u>74.79276</u>		<u>↓</u>	
+	<u>5/23/08</u>	<u>MTCV7100</u>	<u>Dodometane</u>	<u>28.47470</u>		<u>F8F130000-280,</u>	<u>J+/A det</u>
+			<u>Nonanal</u>	<u>40.60652</u>		<u>+ All water</u>	<u>↓</u>
+	<u>6/9/08</u>	<u>GCAL1940</u>	<u>EEEE</u>	<u>25.93241</u>		<u>F8F090000-367,</u>	<u>J+/A det</u>
						<u>+ All soils</u>	
	<u>6/9/08</u>	<u>GCAL1941BRC</u>	<u>wwwt</u>		<u>0.00079</u>	<u>↓</u>	<u>J/UJ/A</u>
+	<u>6/10/08</u>	<u>MCAL7269</u>	<u>JJ</u>	<u>25.94405</u>		<u>F8F130000-280,</u>	<u>J+/A det</u>
+			<u>B</u>	<u>33.13158</u>		<u>+ All water</u>	<u>↓</u>
			<u>EEEE</u>		<u>0.00933</u>	<u>↓</u>	<u>J/UJ/A</u>
			<u>M</u>		<u>0.02516</u>	<u>↓</u>	<u>↓</u>



METHOD: GC/MS VOA (EPA SW 846 Method 8260B)  
 Y/N/N/A Were field blanks identified in this SDG?  
 Y/N/N/A Were target compounds detected in the field blanks?

Blank units: ug/L Associated sample units: ug/kg  
 Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: TB Associated Samples: All soils 7#0X

Compound	Blank ID 4	Blank ID	Sample Identification
<del>Substance</del>	6/4/08		
Methylene chloride	0.27		
Acetone	0.85		
Chloroform	0.11		
CRQL			

Blank units: \_\_\_\_\_ Associated sample units: \_\_\_\_\_  
 Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: \_\_\_\_\_ Associated Samples: \_\_\_\_\_

Compound	Blank ID	Blank ID	Sample Identification
<del>Substance</del>			
Methylene chloride			
Acetone			
Chloroform			
CRQL			

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:  
 Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".









LDC #: 19098A1  
 SDG #: *see cover*

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**

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

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

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

Compound	Concentration ( <i>ug/kg</i> )		RPD
	1	2	
<i>F</i>	<i>15</i>	<i>9.8</i>	<i>5.2 ≤ 21 Difference</i>
<i>Dichloromethane</i>	<i>16</i>	<i>15</i>	<i>1.0 ≤ 5.2</i>

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

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

**Project/Site Name:** BRC Tronox Parcel G

**Collection Date:** June 4, 2008

**LDC Report Date:** July 23, 2008

**Matrix:** Soil

**Parameters:** Semivolatiles

**Validation Level:** EPA Level III

**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** F8F050256

**Sample Identification**

TSB-GJ-09-0'  
TSB-GJ-09-0'-FD  
TSB-GJ-08-0'

## 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 a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section 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.
- 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 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination ( $r^2$ ) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all semivolatiles target compounds and system performance check compounds (SPCCs) were greater than or equal to 0.05 as required with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
6/4/08	Phthalic acid	0.02848 ( $\geq 0.05$ )	All samples in SDG F8F050256	J (all detects) UJ (all non-detects)	A

## 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).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
6/12/08	Phthalic acid	58.34506	All samples in SDG F8F050256	J- (all detects)	A
	n-(Hydroxymethyl)phthalimide	46.18722		UJ (all non-detects)	
				J- (all detects)	
				UJ (all non-detects)	

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

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
6/12/08	Phthalic acid	0.01186 (≥0.05)	All samples in SDG F8F050256	J (all detects)	A
				UJ (all non-detects)	

## V. Blanks

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

Sample "RINSATE 1" (from SDG F8F050256) was identified as a rinsate. 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 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 with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-GJ-09-0'	Perylene-d12	106970 (270174-1080696)	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
TSB-GJ-08-0'	Perylene-d12	265070 (270174-1080696)	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A

## XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

## XII. Compound Quantitation and CRQLs

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 of Data

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

## **XVI. Field Duplicates**

Samples TSB-GJ-09-0' and TSB-GJ-09-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

**BRC Tronox Parcel G  
Semivolatiles - Data Qualification Summary - SDG F8F050256**

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Phthalic acid	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Phthalic acid n-(Hydroxymethyl)phthalimide	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Phthalic acid	J- (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
F8F050256	TSB-GJ-09-0' TSB-GJ-08-0'	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A	Internal standards (area)

**BRC Tronox Parcel G  
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Semivolatiles - Field Blank Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A2

**VALIDATION COMPLETENESS WORKSHEET**

SDG #: F8F050256

Level III

Laboratory: Test America

Date: 7/20/08

Page: 1 of 1

Reviewer: [Signature]

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	Δ	Sampling dates: 6/4/08
II.	GC/MS Instrument performance check	Δ	
III.	Initial calibration	SW	% RSD, r <sup>2</sup> 20.990
IV.	Continuing calibration/ICV	SW	ICV ≤ 25
V.	Blanks	Δ	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	TRX - HR -04 -0' ms/D
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
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 = 1 + 2
XVII.	Field blanks	ND	R = Rinsate 1 SDG # F8F050256

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	TSB-GJ-09-0'	11	F8F06000-173	21	8158173	31	KPG6W1AA
2	TSB-GJ-09-0'-FD	12		22		32	
3	TSB-GJ-08-0'	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

PRY

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

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:** BRC Tronox Parcel G  
**Collection Date:** June 4, 2008  
**LDC Report Date:** July 22, 2008  
**Matrix:** Soil  
**Parameters:** Chlorinated Pesticides  
**Validation Level:** EPA Level III  
**Laboratory:** TestAmerica, Inc.  
**Sample Delivery Group (SDG):** F8F050256

**Sample Identification**

TSB-GJ-09-0'  
TSB-GJ-09-0'-FD  
TSB-GJ-08-0'

## 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 8081A for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
  - J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
  - J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
  - U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
  - R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
  - UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
  - 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 and multicomponent compounds was 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 all compounds.

## IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Standard	Channel	Compound	%D	Associated Samples	Flag	A or P
6/13/08	KCAL892	A	gamma-BHC	15.4	TSB-GJ-08-0' F8F060000-174	J+ (all detects)	A
			Endosulfan I	15.6		J+ (all detects)	
			Dieldrin	15.7		J+ (all detects)	
			4,4'-DDD	16.9		J+ (all detects)	
			Endosulfan II	16.2		J+ (all detects)	
			Methoxychlor	15.1		J+ (all detects)	
			Endosulfan sulfate	17.1		J+ (all detects)	
			Endrin ketone	16.4		J+ (all detects)	
6/13/08	KCAL943	A	alpha-BHC	17.0	TSB-GJ-09-0' TSB-GJ-09-0'-FD	J+ (all detects)	A
			gamma-BHC	20.5		J+ (all detects)	
			delta-BHC	20.0		J+ (all detects)	
			Heptachlor	18.7		J+ (all detects)	
			Aldrin	15.1		J+ (all detects)	
			Heptachlor epoxide	19.5		J+ (all detects)	
			gamma-Chlordane	17.8		J+ (all detects)	
			Endosulfan I	22.1		J+ (all detects)	
			4,4'-DDE	15.7		J+ (all detects)	
			Dieldrin	18.3		J+ (all detects)	
			Endrin	15.3		J+ (all detects)	
			4,4'-DDD	18.5		J+ (all detects)	
			Endosulfan II	17.8		J+ (all detects)	

Date	Standard	Channel	Compound	%D	Associated Samples	Flag	A or P
6/30/08	KCAL943	B	gamma-BHC delta-BHC Endosulfan I Dieldrin 4,4'-DDD	16.7 17.9 18.3 15.4 19.5	TSB-GJ-09-0' TSB-GJ-09-0'-FD	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% 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 "RINSATE 1" (from SDG F8F050256) was identified as a rinsate. 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. Surrogate recoveries (%R) were not within QC limits for several samples. Since these 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 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. 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. Compound Quantitation and Reported CRQLs

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 TSB-GJ-09-0' and TSB-GJ-09-0'-FD were identified as field duplicates. No chlorinated pesticides were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-09-0'	TSB-GJ-09-0'-FD				
beta-BHC	45	41	-	4.0 ( $\leq 8.8$ )	-	-
4,4'-DDE	16	14	-	2.0 ( $\leq 8.8$ )	-	-
4,4'-DDT	17	14	-	3.0 ( $\leq 8.8$ )	-	-

**BRC Tronox Parcel G  
Chlorinated Pesticides - Data Qualification Summary - SDG F8F050256**

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-GJ-08-0'	gamma-BHC Endosulfan I Dieldrin 4,4'-DDD Endosulfan II Methoxychlor Endosulfan sulfate Endrin ketone	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD	alpha-BHC gamma-BHC delta-BHC Heptachlor Aldrin Heptachlor epoxide gamma-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)

**BRC Tronox Parcel G  
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A3a  
 SDG #: F8F050256  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**  
 Level III

Date: 7/21/08  
 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: 6/4/08
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	TAX-HR-04-0'
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	SW	p = 1+2
XV.	Field blanks	ND	R = Rinsate / SDG# F8F050256

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 <sup>+</sup>	TSB-GJ-09-0'	11	87	21		31	
2 <sup>+</sup>	TSB-GJ-09-0'-FD	12		22		32	
3 <sup>+</sup>	TSB-GJ-08-0'	13		23		33	
4	F8F060000-174	14	8158174	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: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1280	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:

LDC #: 191098A39  
 SDG #: 24 cover

**VALIDATION FINDINGS WORKSHEET**  
Continuing Calibration

Page: 1 of 1  
 Reviewer: PT

METHOD: VGC HPLC

2nd Reviewer: Q

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

What type of continuing calibration calculation was performed?     %D or     RPD

Y N N/A

Were continuing calibration standards analyzed at the required frequencies?  
Y N N/A

Did the continuing calibration standards meet the %D / RPD validation criteria of  $\leq 15.0\%$ ?  
Level IV Only  
Y N N/A

Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit $\leq 15.0$ )	RT (limit)	Associated Samples	Qualifications
1	6/13/08	KCAL892	ch A	D	15.4	( )	F8F06000-174,	J <sup>+</sup> / A det
+				H	15.6	( )	3	
+				I	15.7	( )		
+				M	16.9	( )		
+				L	16.2	( )		
+				P	15.1	( )		
+				N	17.1	( )		
+				Q	16.4	( )		
	6/13/08	KCAL943	ch A	A	17.0	( )	1, 2	
				D	20.5	( )		
				C	20.0	( )		
				E	18.7	( )		
				F	15.1	( )		
				G	19.5	( )		
				T	17.8	( )		
				H	22.1	( )		
				J	15.7	( )		
				I	18.3	( )		
				K	15.3	( )		
				M	18.5	( )		
				L	17.8	( )		







LDC #: 1909X A39  
 SDG #: see cover

VALIDATION FINDINGS WORKSHEET  
Field Duplicates

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

METHOD: GC HPLC

Y N N/A Were field duplicate pairs identified in this SDG?

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

Compound	Concentration ( ng/kg )		%RPD Limit	Qualification Parent only / All Samples
	1	2		
B	45	41	4.0 ≤ 8.8	
J	16	14	2.0 ≤ 8.8	
θ	17	14	3.0 ≤ 8.8	

Compound	Concentration ( )		%RPD Limit	Qualification Parent only / All Samples

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

**Project/Site Name:** BRC Tronox Parcel G  
**Collection Date:** June 4, 2008  
**LDC Report Date:** July 22, 2008  
**Matrix:** Soil  
**Parameters:** Polychlorinated Biphenyls  
**Validation Level:** EPA Level III  
**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** F8F050256

**Sample Identification**

TSB-GJ-09-0'  
TSB-GJ-09-0'-FD  
TSB-GJ-08-0'

## 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 8082 for Polychlorinated Biphenyls.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
  - J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
  - J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
  - U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
  - R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
  - UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
  - 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 multicomponent compounds was performed for the primary (quantitation) column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

## **IV. Continuing Calibration**

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

## **V. Blanks**

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

No field blanks were identified 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**

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. 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. Compound Quantitation and Reported CRQLs**

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 TSB-GJ-09-0' and TSB-GJ-09-0'-FD were identified as field duplicates. No polychlorinated biphenyls were detected in any of the samples.

**BRC Tronox Parcel G  
Polychlorinated Biphenyls - Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG  
F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG  
F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A3b  
 SDG #: F8F050256  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**  
 Level III

Date: 7/20/08  
 Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

**METHOD:** GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

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>6/4/08</u>
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	<u>ICV ≤ 15</u>
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	<u>TSB - FR - 02 - 02 - 0'</u>
VIII.	Laboratory control samples	A	<u>LCS</u>
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	ND	<u>D = 1 + 2</u>
XV.	Field blanks	N	

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 SOIL

1	TSB-GJ-09-0'	11		21		31	
2	TSB-GJ-09-0'-FD	12		22		32	
3	TSB-GJ-08-0'	13		23		33	
4		14		24		34	
5	<u>F8F09000-208</u>	15	<u>8/6/208</u>	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:** BRC Tronox Parcel G

**Collection Date:** June 4, 2008

**LDC Report Date:** July 28, 2008

**Matrix:** Soil

**Parameters:** Metals

**Validation Level:** EPA Level III

**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** F8F050256

**Sample Identification**

TSB-GJ-09-0'

TSB-GJ-09-0'-FD

TSB-GJ-08-0'

## 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 6010B, 6020, and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Mercury, Nickel, Niobium, Palladium, Phosphorus, Platinum, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, Zinc, and Zirconium.

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

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

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

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.
- 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

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

## III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Barium	0.20 mg/Kg	All samples in SDG F8F050256
ICB/CCB	Antimony Arsenic Cadmium Tungsten Vanadium	2.7 ug/L 1.0 ug/L 0.2 ug/L 1.9 ug/L 3.0 ug/L	All samples in SDG F8F050256

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
TSB-GJ-09-0'	Cadmium	0.098 mg/Kg	0.10U mg/Kg

No field blanks were identified in this SDG.

## IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

## V. 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 with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TRX-HR-04-0' (All samples in SDG F8F050256)	Sulfur	72.8 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A
	Antimony	47.7 (75-125)	56.6 (75-125)	-		
	Barium	70.6 (75-125)	-	-		
	Chromium	72.0 (75-125)	-	-		
	Cobalt	72.4 (75-125)	-	-		
	Copper	70.4 (75-125)	-	-		
	Nickel	69.3 (75-125)	50.7 (75-125)	-		
	Niobium	44.1 (75-125)	-	-		
	Potassium	59.5 (75-125)	-	-		
	Selenium	74.5 (75-125)	-	-		
	Tungsten	63.7 (75-125)	-	-		
	Vanadium	70.8 (75-125)	-	-		
	Zirconium	52.8 (75-125)	66.6 (75-125)	-		
TRX-HR-04-0' (All samples in SDG F8F050256)	Magnesium	43.2 (75-125)	144.7 (75-125)	-	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
	Zinc	53.0 (75-125)	131.6 (75-125)	-		
TRX-HR-04-0' (All samples in SDG F8F050256)	Silicon	221.9 (75-125)	336.9 (75-125)	-	J+ (all detects) J+ (all detects)	A
	Phosphorus	-	128.2 (75-125)	-		
TRX-HR-04-0' (All samples in SDG F8F050256)	Strontium	20.7	-	-	J- (all detects) R (all non-detects)	A

## VI. Duplicate Sample Analysis

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

## VII. Laboratory Control Samples (LCS)

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

## VIII. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

## IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

## X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TRX-HR-04-0'L	Iron Strontium	14.3 ( $\leq 10$ ) 11.4 ( $\leq 10$ )	All samples in SDG F8F050256	J (all detects) J (all detects)	A

## XI. Sample Result Verification

Raw data were not reviewed for this SDG.

## XII. Overall Assessment of Data

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

## XIII. Field Duplicates

Samples TSB-GJ-09-0' and TSB-GJ-09-0'-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)	Flag	A or P
	TSB-GJ-09-0'	TSB-GJ-09-0'-FD				
Aluminum	6680	7890	17 ( $\leq 50$ )	-	-	-
Arsenic	3.2	3.3	-	0.1 ( $\leq 2.1$ )	-	-
Barium	230	211	9 ( $\leq 50$ )	-	-	-
Beryllium	0.46	0.55	-	0.09 ( $\leq 0.21$ )	-	-
Boron	8	10.3	-	2.3 ( $\leq 20.7$ )	-	-
Cadmium	0.098	0.11	-	0.012 ( $\leq 0.10$ )	-	-
Calcium	47500	42400	11 ( $\leq 50$ )	-	-	-
Chromium	8.1	10.3	24 ( $\leq 50$ )	-	-	-
Cobalt	7.9	6.9	14 ( $\leq 50$ )	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-09-0'	TSB-GJ-09-0'-FD				
Copper	14	15.3	9 ( $\leq 50$ )	-	-	-
Iron	10800	12200	12 ( $\leq 50$ )	-	-	-
Lead	12.3	10.9	12 ( $\leq 50$ )	-	-	-
Magnesium	11300	13400	17 ( $\leq 50$ )	-	-	-
Manganese	603	447	30 ( $\leq 50$ )	-	-	-
Molybdenum	0.77	0.98	-	0.21 ( $\leq 1.0$ )	-	-
Nickel	13.6	15	10 ( $\leq 50$ )	-	-	-
Palladium	0.6	0.57	-	0.03 ( $\leq 0.21$ )	-	-
Phosphorus	908	868	5 ( $\leq 50$ )	-	-	-
Potassium	1520	1840	19 ( $\leq 50$ )	-	-	-
Silicon	133	158	-	25 ( $\leq 51.7$ )	-	-
Silver	0.14	0.18	-	0.04 ( $\leq 0.18$ )	-	-
Sodium	1810	1720	5 ( $\leq 50$ )	-	-	-
Strontium	287	267	7 ( $\leq 50$ )	-	-	-
Tin	0.43	0.49	-	0.06 ( $\leq 0.41$ )	-	-
Titanium	436	505	15 ( $\leq 50$ )	-	-	-
Uranium	1.5	1.4	7 ( $\leq 50$ )	-	-	-
Vanadium	33.6	37.2	10 ( $\leq 50$ )	-	-	-
Zinc	33.5	35.8	7 ( $\leq 50$ )	-	-	-
Zirconium	18.1	22.2	-	4.1 ( $\leq 20.7$ )	-	-
Lithium	24	20.4	-	3.6 ( $\leq 51.7$ )	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-09-0'	TSB-GJ-09-0'-FD				
Sulfur	1740	1410	-	330 ( $\leq 1030$ )	-	-

**BRC Tronox Parcel G  
Metals - Data Qualification Summary - SDG F8F050256**

SDG	Sample	Analyte	Flag	A or P	Reason
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Sulfur Antimony Barium Chromium Cobalt Copper Nickel Niobium Potassium Selenium Tungsten Vanadium Zirconium	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Magnesium  Zinc	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Silicon Phosphorus	J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Strontium	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Iron Strontium	J (all detects) J (all detects)	A	ICP serial dilution (%D)

**BRC Tronox Parcel G  
Metals - Laboratory Blank Data Qualification Summary - SDG F8F050256**

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8F050256	TSB-GJ-09-0'	Cadmium	0.10U mg/Kg	A

**BRC Tronox Parcel G  
Metals - Field Blank Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A4  
 SDG #: F8F050256  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**  
 Level III

Date: 7/27/08  
 Page: 1 of 1  
 Reviewer: *mm*  
 2nd Reviewer: *[Signature]*

**METHOD:** Metals (EPA SW 846 Method 6020/6010B/7000)

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: 6/4/08
II.	Calibration	A SW	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	3 MS / used
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	MT reviewed
IX.	Furnace Atomic Absorption QC	N	kit utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(1,2)
XIV.	Field Blanks	N	

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	TSB-GJ-09-0'	11		21		31	
2	TSB-GJ-09-0'-FD	12		22		32	
3	TSB-GJ-08-0'	13		23		33	
4	PB	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**  
**Matrix Spike/Matrix Spike Duplicates**

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 Was a matrix spike analyzed for each matrix in this SDG?  
 Y RP 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:**

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limite)	Associated Samples	Qualifications
1	TRX-HR-04-0	Soil	S	72.8			All	J-UI/A
			Sb	47.7	56.6			
			Ba	70.6				
			Cr	72.0				
			Co	72.4				
			Cu	70.4				
			Mg	43.2	144.7			J-UI/A
			Ni	69.3	50.7			J-UI/A
			Nb	44.1				
			K	59.5				
			Se	74.5				
			Si	221.9	336.9			J-UI/A
			Sr	20.7				J-R/A
			W	63.7				J-UI/A
			V	70.8				
			Zn	53.0	131.6			J-UI/A
			Zr	52.8	66.6			J-UI/A
			P		128.2			J-UI/A

Comments: Al, Ca, Fe, Mn, Na, Ti, Zr

**VALIDATION FINDINGS WORKSHEET**  
**Matrix Spike/Matrix Spike Duplicates**

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".

- Y  N  N/A Was a matrix spike analyzed for each matrix in this SDG?
- Y  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.
- Y  N  N/A Were all duplicate sample relative percent differences (RPD)  $\leq$  20% for water samples and  $\leq$  35% for soil samples?
- Y  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
2	TRX-HR-0401	Soil	Li			22.4	A11	No good (LOSTM)
			Al			21.9		
			Cu			24.7		
			Co			24.8		
			Fe			23.7		
			Mg			22.4		
			Mn			22.4		
			K			21.2		
			Sr			25.2		
			Ti			26.8		
			Zn			20.3		
			Si			34.3		
						24.8		

Comments:



LDC#: 19098A4  
 SDG#: See Cover

**VALIDATION FINDINGS WORKSHEET**  
Field Duplicates

Page: 1 of 2  
 Reviewer: ✓  
 2nd Reviewer: f

**METHOD:** Metals (EPA Method 6010B/6020/7000)

Y N NA  
Y N NA

Were field duplicate pairs identified in this SDG?  
 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	
Aluminum	6680	7890	17			
Arsenic	3.2	3.3		0.1	( ≤2.1)	
Barium	230	211	9			
Beryllium	0.46	0.55		0.09	( ≤0.21)	
Boron	8.0	10.3		2.3	( ≤20.7)	
Cadmium	0.098	0.11		0.012	( ≤0.10)	
Calcium	47500	42400	11			
Chromium	8.1	10.3	24			
Cobalt	7.9	6.9	14			
Copper	14.0	15.3	9			
Iron	10800	12200	12			
Lead	12.3	10.9	12			
Magnesium	11300	13400	17			
Manganese	603	447	30			
Molybdenum	0.77	0.98		0.21	( ≤1.0)	
Nickel	13.6	15.0	10			
Palladium	0.60	0.57		0.03	( ≤0.21)	
Phosphorus	908	868	5			
Potassium	1520	1840	19			

LDC#: 17809A4  
 SDG#: See Cover

**VALIDATION FINDINGS WORKSHEET**  
Field Duplicates

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

**METHOD:** Metals (EPA Method 6010B/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)		( $\leq 50$ )	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Silicon	133	158		25	( $\leq 51.7$ )	
Silver	0.14	0.18		0.04	( $\leq 0.18$ )	
Sodium	1810	1720	5	<del>0.06</del> $\leq 0.12$		
Strontium	287	267	7			
Tin	0.43	0.49		0.06	( $\leq 0.41$ )	
Titanium	436	505	15			
Uranium	1.5	1.4	7			
Vanadium	33.6	37.2	10			
Zinc	33.5	35.8	7			
Zirconium	18.1	22.2		4.1	( $\leq 20.7$ )	
Lithium	24.0	20.4		3.6	( $\leq 51.7$ )	
Sulfur	1740	1410		330	( $\leq 1030$ )	

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

**Project/Site Name:** BRC Tronox Parcel G

**Collection Date:** June 4, 2008

**LDC Report Date:** July 28, 2008

**Matrix:** Soil

**Parameters:** Wet Chemistry

**Validation Level:** EPA Level III

**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** F8F050256

**Sample Identification**

TSB-GJ-09-0'

TSB-GJ-09-0'-FD

TSB-GJ-08-0'

## **Introduction**

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate and EPA SW846 Method 9071B for Oil and Grease.

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

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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.
- 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 of each method were met.

### b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable with the following exceptions:

Sample	Analyte	Finding	Criteria	Flag	A or P
All samples in SDG F8F050256	Chlorate	Continuing calibration was not performed for these compounds.	Continuing calibration must be performed for each compound.	J (all detects) UJ (all non-detects)	P

## III. Blanks

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

No field blanks were identified in this SDG.

## IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) 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) were within QC limits.

## VII. Sample Result Verification

Raw data were not reviewed for this SDG.

## VIII. Overall Assessment of Data

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

## IX. Field Duplicates

Samples TSB-GJ-09-0' and TSB-GJ-09-0'-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)	Flag	A or P
	TSB-GJ-09-0'	TSB-GJ-09-0'-FD				
Bromide	8.5	5.1	-	3.4 ( $\leq 2.6$ )	J (all detects)	A
Bromine	17.1	10.1	-	7 ( $\leq 5.2$ )	J (all detects)	A
Chlorate	253	185	31 ( $\leq 50$ )	-	-	-
Chloride	7960	5740	32 ( $\leq 50$ )	-	-	-
Chlorine	15900	10900	37 ( $\leq 50$ )	-	-	-
Fluoride	0.43	0.57	-	0.14 ( $\leq 1.0$ )	-	-
Nitrate as N	156	102	42 ( $\leq 50$ )	-	-	-
Sulfate	3310	2160	42 ( $\leq 50$ )	-	-	-

**BRC Tronox Parcel G  
Wet Chemistry - Data Qualification Summary - SDG F8F050256**

SDG	Sample	Analyte	Flag	A or P	Reason
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Chlorate	J (all detects) UJ (all non-detects)	P	Calibration
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD	Bromide Bromine	J (all detects) J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel G  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Wet Chemistry - Field Blank Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A6  
 SDG #: F8F050256  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**

Level III

Date: 7/21/08

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

**METHOD: (Analyte)** Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate, Nitrite, Orthophosphate-P, Sulfate (EPA Method 300.0), O & G (EPA SW846 Method 9071B)

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: 6/4/08
IIa.	Initial calibration	A	
IIb.	Calibration verification	SW	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	3 MS/Dup
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(1,2)
X	Field blanks	N	

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: [Signature]

1	TSB-GJ-09-0'	11		21		31	
2	TSB-GJ-09-0'-FD	12		22		32	
3	TSB-GJ-08-0'	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#: 19098A6  
SDG#: See Cover

### VALIDATION FINDINGS WORKSHEET

#### Field Duplicates

Page: 1 of 1  
Reviewer:   
2nd Reviewer: 

Inorganics, Method: See Cover

N N A  
 N N A

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

Analyte	Concentration (mg/Kg)		RPD ( $\leq 50$ )	Difference	Limits	Qualification (Parent only)
	1	2				
Bromide	8.5	5.1		3.4	( $\leq 2.6$ )	J det / A
Bromine	17.1	10.1		7	( $\leq 5.2$ )	J det / A
Chlorate	253	185	31			
Chloride	7960	5740	32			
Chlorine	15900	10900	37			
Fluoride	0.43	0.57		0.14	( $\leq 1.0$ )	
Nitrate as N	156	102	42			
Sulfate	3310	2160	42			

V:\FIELD DUPLICATES\FD\_inorganic\19098A6.wpd



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

**Project/Site Name:** BRC Tronox Parcel G  
**Collection Date:** June 4, 2008  
**LDC Report Date:** July 22, 2008  
**Matrix:** Soil  
**Parameters:** Gasoline Range Organics  
**Validation Level:** EPA Level III  
**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** F8F050256

**Sample Identification**

TSB-GJ-09-0'  
TSB-GJ-09-0'-FD  
TSB-GJ-08-0'

## 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 8015B for Gasoline Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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.
- 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.
- 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**

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0% .

### **b. Calibration Verification**

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

## **III. Blanks**

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

No field blanks were identified in this SDG.

## **IV. Accuracy and Precision Data**

### **a. Surrogate Recovery**

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

### **b. 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.

### **c. 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.

## **V. Target Compound Identification**

Raw data were not reviewed for this SDG.

## **VI. Compound Quantitation and CRQLs**

Raw data were not reviewed for this SDG.

## **VII. System Performance**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

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

## **IX. Field Duplicates**

Samples TSB-GJ-09-0' and TSB-GJ-09-0'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

**BRC Tronox Parcel G  
Gasoline Range Organics - Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG  
F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG  
F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A7  
 SDG #: F8F050256  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**

Level III

Date: 7/20/08  
 Page: 1 of 1  
 Reviewer: \_\_\_\_\_  
 2nd Reviewer: RA

**METHOD:** GC Gasoline Range Organics (EPA SW846 Method 8015B)

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>6/4/08</u>
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	<u>ICV ≤ 15</u>
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	<u>TSB-FR-02-02-0'</u>
IVc.	Laboratory control samples	A	<u>LCS/D</u>
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	<u>D = 142</u>
X.	Field blanks	N	

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	TSB-GJ-09-0'	11		21		31	
2	TSB-GJ-09-0'-FD	12		22		32	
3	TSB-GJ-08-0'	13		23		33	
4		14		24		34	
5	<u>F8F120000-169</u>	15	<u>8164169</u>	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:** BRC Tronox Parcel G  
**Collection Date:** June 4, 2008  
**LDC Report Date:** July 22, 2008  
**Matrix:** Soil  
**Parameters:** Diesel Range Organics  
**Validation Level:** EPA Level III  
**Laboratory:** TestAmerica, Inc.

**Sample Delivery Group (SDG):** F8F050256

**Sample Identification**

TSB-GJ-09-0'  
TSB-GJ-09-0'-FD  
TSB-GJ-08-0'

## 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 8015B for Diesel Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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.
- 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.
- 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**

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0% .

### **b. Calibration Verification**

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

## **III. Blanks**

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

No field blanks were identified in this SDG.

## **IV. Accuracy and Precision Data**

### **a. Surrogate Recovery**

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for samples TSB-GJ-09-0' and TSB-GJ-08-0'. Since these samples were diluted out, no data were qualified.

### **b. 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.

**c. Laboratory Control Samples**

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

**V. Target Compound Identification**

Raw data were not reviewed for this SDG.

**VI. Compound Quantitation and CRQLs**

Raw data were not reviewed for this SDG.

**VII. System Performance**

Raw data were not reviewed for this SDG.

**VIII. Overall Assessment of Data**

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

**IX. Field Duplicates**

Samples TSB-GJ-09-0' and TSB-GJ-09-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

**BRC Tronox Parcel G  
Diesel Range Organics - Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG  
F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Diesel Range Organics - Field Blank Data Qualification Summary - SDG  
F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A8  
 SDG #: F8F050256  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**

Level III

Date: 7/20/08  
 Page: 1 of 1  
 Reviewer: B  
 2nd Reviewer: G

**METHOD:** GC Diesel Range Organics (EPA SW846 Method 8015B)

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: 6/4/08
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	ICV = 15
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	NP	D = 1 + 2
X.	Field blanks	N	

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:

1	TSB-GJ-09-0'	11		21		31	
2	TSB-GJ-09-0'-FD	12		22		32	
3	TSB-GJ-08-0' 10x	13		23		33	
4		14	8161207	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:** BRC Tronox Parcel G  
**Collection Date:** June 4, 2008  
**LDC Report Date:** July 22, 2008  
**Matrix:** Soil  
**Parameters:** Polynuclear Aromatic Hydrocarbons  
**Validation Level:** EPA Level III  
**Laboratory:** TestAmerica, Inc.  
**Sample Delivery Group (SDG):** F8F050256

**Sample Identification**

TSB-GJ-09-0'  
TSB-GJ-09-0'-FD  
TSB-GJ-08-0'

## 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 8310 for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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.
- 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

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

### b. Calibration Verification

Calibration verification was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Detector	Compound	%D	Associated Samples	Flag	A or P
6/11/08	Not specified	Benzo(a)anthracene Benzo(k)fluoranthene	15.5 15.2	All samples in SDG F8F050256	J+ (all detects) J+ (all detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Detector	Compound	%D	Associated Samples	Flag	A or P
6/4/08	Not specified	Benzo(k)fluoranthene	16.6	All samples in SDG F8F050256	J+ (all detects)	A

## III. Blanks

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

No field blanks were identified in this SDG.

## **IV. Accuracy and Precision Data**

### **a. Surrogate Recovery**

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

### **b. 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.

### **c. Laboratory Control Samples**

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

## **V. Target Compound Identification**

Raw data were not reviewed for this SDG.

## **VI. Compound Quantitation and CRQLs**

Raw data were not reviewed for this SDG.

## **VII. System Performance**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

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

## **IX. Field Duplicates**

Samples TSB-GJ-09-0' and TSB-GJ-09-0'-FD were identified as field duplicates. No polynuclear aromatic hydrocarbons were detected in any of the samples.

**BRC Tronox Parcel G  
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG F8F050256**

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Benzo(a)anthracene Benzo(k)fluoranthene	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Benzo(k)fluoranthene	J+ (all detects)	A	Continuing calibration (ICV %D)

**BRC Tronox Parcel G  
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary  
- SDG F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary -  
SDG F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A9  
 SDG #: F8F050256  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**  
 Level III

Date: 7/20/08  
 Page: 1 of 1  
 Reviewer: F  
 2nd Reviewer: J

**METHOD:** GC Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8310)

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>6/4/08</u>
IIa.	Initial calibration	Δ	
IIb.	Calibration verification/ICV	BW	ICV $\leq 15$
III.	Blanks	Δ	
IVa.	Surrogate recovery	Δ	
IVb.	Matrix spike/Matrix spike duplicates	SW	TSB-PR-02-02-0MS/D
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D = 142
X.	Field blanks	N	

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	TSB-GJ-09-0'	11	<u>F8F090000-209</u>	21	<u>8161209</u>	31	
2	TSB-GJ-09-0'-FD	12		22		32	
3	TSB-GJ-08-0'	13		23		33	
4	<u>F8F090000-208</u>	14	<u>8161208</u>	24		34	
5		15	<u>8</u>	25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

VALIDATION FINDINGS WORKSHEET

METHOD: GC HPLC

8310	8330	8151	8141	8141(Cont)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetra	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2,4,6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	O.		O. Chlorpyrifos		
P. Pyrene	P.		P. Fenthion		
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichloronate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:





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

**Project/Site Name:** BRC Tronox Parcel G  
**Collection Date:** June 4, 2008  
**LDC Report Date:** July 23, 2008  
**Matrix:** Soil  
**Parameters:** Dioxins/Dibenzofurans  
**Validation Level:** EPA Level III  
**Laboratory:** TestAmerica, Inc.  
**Sample Delivery Group (SDG):** F8F050256

**Sample Identification**

TSB-GJ-09-0'  
TSB-GJ-09-0'-FD  
TSB-GJ-08-0'



## 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 8290 for Polychlorinated Dioxins/Dibenzofurans.

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

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- 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.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

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

## II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

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

## III. Initial Calibration

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

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

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

## IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

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

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
7/3/08	<sup>13</sup> C-2,3,7,8-TCDF	57.3	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	2,3,7,8-TCDF	J (all detects) UJ (all non-detects)	P

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

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

## V. Blanks

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

No field blanks were identified in this SDG.

## VI. Matrix Spike/Matrix Spike Duplicates

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

## VII. Laboratory Control Samples (LCS)

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

## VIII. Regional Quality Assurance and Quality Control

Not applicable.

## IX. Internal Standards

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

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-GJ-09-0'	<sup>13</sup> C-1,2,3,7,8-PeCDD	33 (40-135)	1,2,3,7,8-PeCDD	J (all detects) UJ (all non-detects)	P
	<sup>13</sup> C-1,2,3,6,7,8-HxCDD	35 (40-135)	1,2,3,4,7,8-HxCDD		
	<sup>13</sup> C-1,2,3,4,6,7,8-HpCDD	26 (40-135)	1,2,3,6,7,8-HxCDD		
	<sup>13</sup> C-OCDD	16 (40-135)	1,2,3,7,8,9-HxCDD		
	<sup>13</sup> C-1,2,3,7,8-PeCDF	36 (40-135)	1,2,3,4,6,7,8-HpCDD		
	<sup>13</sup> C-1,2,3,4,7,8-HxCDF	35 (40-135)	OCDD		
	<sup>13</sup> C-1,2,3,4,6,7,8-HpCDF	25 (40-135)	1,2,3,7,8-PeCDF		
			2,3,4,7,8-PeCDF		
		1,2,3,4,7,8-HxCDF			
		1,2,3,6,7,8-HxCDF			
		2,3,4,6,7,8-HxCDF			
		1,2,3,7,8,9-HxCDF			
		1,2,3,4,6,7,8-HpCDF			
		1,2,3,4,7,8,9-HpCDF			
			OCDF		

## X. Target Compound Identifications

Raw data were not reviewed for this SDG.

## XI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

## XII. System Performance

Raw data were not reviewed for this SDG.

## XIII. Overall Assessment of Data

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

## XIV. Field Duplicates

Samples TSB-GJ-09-0' and TSB-GJ-09-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-09-0'	TSB-GJ-09-0'-FD				
OCDD	31	10	102 ( $\leq 50$ )	-	J (all detects)	A
2,3,7,8-TCDF	4.0	2.6	42 ( $\leq 50$ )	-	-	-
1,2,3,7,8-PeCDF	2.9	1.8U	-	1.1 ( $\leq 1.8$ )	-	-
2,3,4,7,8-PeCDF	2.5	1.2U	-	1.3 ( $\leq 1.2$ )	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDF	5.0	2.5U	-	2.5 ( $\leq 2.5$ )	-	-
1,2,3,6,7,8-HxCDF	2.7	1.4U	-	1.3 ( $\leq 1.4$ )	-	-
1,2,3,4,6,7,8-HpCDF	7.7	2.5U	-	5.2 ( $\leq 2.5$ )	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8,9-HpCDF	2.8	1.2U	-	1.6 ( $\leq 1.2$ )	J (all detects) UJ (all non-detects)	A
OCDF	19	4.1U	-	14.9 ( $\leq 4.1$ )	J (all detects) UJ (all non-detects)	A

**BRC Tronox Parcel G  
Dioxins/Dibenzofurans - Data Qualification Summary - SDG F8F050256**

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	2,3,7,8-TCDF	J (all detects) UJ (all non-detects)	P	Routine calibration (%D)
F8F050256	TSB-GJ-09-0'	1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD	OCDD	J (all detects)	A	Field duplicates (RPD)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD	2,3,4,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel G  
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG  
F8F050256**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel G  
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG F8F050256**

No Sample Data Qualified in this SDG

LDC #: 19098A21  
 SDG #: F8F050256  
 Laboratory: Test America

**VALIDATION COMPLETENESS WORKSHEET**

Level III

Date: 7/19/08  
 Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>6/4/08</u>
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration <del>#CV</del> <u>1CV</u>	<u>SW</u> A	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	N	<u>client specified</u>
VII.	Laboratory control samples	A	<u>LCS</u>
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	<u>SW</u>	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	<u>SW</u>	<u>D = 1 + 2</u>
XV.	Field blanks	N	

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	TSB-GJ-09-0'	11	<u>816542C</u>	21		31	
2	TSB-GJ-09-0'-FD	12		22		32	
3	TSB-GJ-08-0'	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# VALIDATION FINDINGS WORKSHEET

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

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

Notes:

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LDC #: 19098A21  
 SDG #: F8F05025

**VALIDATION FINDINGS WORKSHEET**  
**Field Duplicates**

Page: 1 of 1  
 Reviewer: KG  
 2nd reviewer: \_\_\_\_\_

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

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>PS</u> / <u>g</u> )		RPD $\leq 50$
	1	2	
C	31	10	102 ( $\leq 50$ ) J data / A
H	4.0	2.6	42 ↓ -
I	2.9	1.84	1.1 ( $\leq 1.8$ ) -
J	2.5	1.24	1.3 ( $\leq 1.2$ ) J / UJ / A
K	5.0	2.54	2.5 ( $\leq 2.5$ ) -

Compound	Concentration ( )		RPD
L	2.7	1.44	1.3 ( $\leq 1.4$ ) -
O	7.7	2.54	5.2 ( $\leq 2.5$ ) J / UJ / A
P	2.8	1.24	1.6 ( $\leq 1.2$ ) ↓
Q	19	4.14	14.9 ( $\leq 4.1$ ) ↓

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD