

LABORATORY DATA CONSULTANTS, INC.

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August 6, 2008

ERM 2525 Natomas Park Drive, Suite 350

Sacramento, CA 95833

ATTN: Ms. Maria Barajas-Albalawi

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:

SDG#	<u>Fraction</u>
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

	7,022 Pages-CD	Ç										٨	ttachr	Attachment 1																	
	80/20) 	;#18	LDC #19098 (ERM-Sacramento / BRC Tronox, Parcel G)	(ER	M-S	acre	ımer) 	BRC	E	ouc	J.	arce	(5)											
ГРС	*DQ*	DATE REC'D	(3) DATE DUE (VOA (8260B)	A)B)	SVOA (8270C)	(8)	Pest. (8081A)	PCBs (8082)		Metals (SW846)	GRO (8015)		DRO (8015)	PAHs (8310)		Dioxins (8290)	등 등 등	mide mine orate	Bromide Chloride Bromine Chlorine Chlorate Fluoride	g e g	0 00 0 0 0 0 0	SO ₄		0&G (9071B)						
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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.
- 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 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 (≥0.05)	All water samples in SDG F8F050256	J (all detects) UJ (all non-detects)	А
5/28/08 (MICAL)	Acetonitrile 2-Butanone	0.00984 (≥0.05) 0.03111 (≥0.05)	All water samples in SDG F8F050256	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А
5/21/08 (GICALBRC)	Ethanol	0.00086 (≥0.05)	All soil samples in SDG F8F050256	J (all detects) UJ (all non-detects)	А

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)	А

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)	А
5/28/08 (MICV7100)	lodomethane Nonanal	28.47470 40.60652	All water samples in SDG F8F050256	J+ (all detects) J+ (all detects)	А

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 (≥0.05)	All soil samples in SDG F8F050256	J (all detects) UJ (all non-detects)	А
6/10/08	Acetonitrile 2-Butanone	0.00933 (≥0.05) 0.02516 (≥0.05)	All water samples in SDG F8F050256	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А

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	Reported	Modified Final
	TIC (RT in minutes)	Concentration	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)	Р

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:

	Concentrat	tion (ug/Kg)	222	D:#		
Compound	TSB-GJ-09-0'	TSB-GJ-09-0'-FD	RPD (Limits)	Difference (Limits)	Flags	A or P
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)	А	Initial calibration (RRF)
F8F050256	TB-4	Acetonitrile 2-Butanone	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А	Initial calibration (RRF)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Acetonitrile	J+ (all detects)	А	Continuing calibration (%D)
F8F050256	TB-4	Dichlorodifluoromethane Bromomethane	J+ (all detects) J+ (all detects)	А	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)	А	Continuing calibration (ICV %D)
F8F050256	TB-4	lodomethane Nonanal	J+ (all detects) J+ (all detects)	А	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)	А	Continuing calibration (RRF)
F8F050256	TB-4	Acetonitrile 2-Butanone	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А	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	Α

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

No Sample Data Qualified in this SDG

LDC #:19098A1	VALIDATION COMPLETENESS WORKSHEET	Date: 7/20/08
SDG #: <u>F8F050256</u>	_ Level III	Page: /of /
Laboratory: Test America		Reviewer: 5
METHOD: GC/MS Volatiles (E	EPA SW 846 Method 8260B)	2nd Reviewer:

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

	Validation Area		Comments
1.	Technical holding times	Δ	Sampling dates: 6/4/08
II.	GC/MS Instrument performance check	Δ	
III.	Initial calibration	SW	10 RSD, 12 ZO.990
IV.	Continuing calibration/ICV	SW	
V.	Blanks	رسى	
VI.	Surrogate spikes	رسى	
VII.	Matrix spike/Matrix spike duplicates	SW	TSB-FJ-06-2-0'
VIII.	Laboratory control samples	હ્ય	LCSID
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

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank
EB = Equipment blank

Validated Samples: SOIL + water

	5011 T						
11	TSB-GJ-09-0'	17/	F8F090000-367	21		31	
2 /	TSB-GJ-09-0'-FD	122	F8F090000-367	22	8/65280	32	
3 /	TSB-GJ-08-0'	13 3	FK. FO60250 -0/5	23	8168097	33	
42	3=2003 TB-4	14	FXF160000 - 097	24		34	
5		15		25		35	
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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 choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chioroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFF. Acrolein
E. Methylene chloride	Y, 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2.Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2.Dichloroethane	FF. Styrene	22. 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	0000.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	dada
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC, tert-Butylbenzene	www. Ethanol	0000
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanoi	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	1111.
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.

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LDC #:	SDG #:

VALIDATION FINDINGS WORKSHEET

Initial Calibration

Page: __of__ 2nd Reviewer: Reviewer:

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". AN NA

Did the laboratory perform a 5 point calibration prior to sample analysis?

Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?

Did the initial calibration meet the acceptance criteria? NON/A A/N/ N/

N/A

A/N Z

Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF?

							T				T		T				
Qualifications		water 3/43 /A		1/42/A	7	111111	4/02/2										
Associated Samples		FX F13000-320 + Allwater		F8F130000-20	All water	7/2 0000 00000	18101000-561,	4/150/15									
Finding RRF (Limit: >0.05)		0.0036/		0.00 984	11180.0	0.00000	e Conne										
Finding %RSD (Limit: <30.0%)	, and the second se																
Compound	Fodonkthank	www		EEEE	×		3										
Standard ID	MICAL	MICAL BRC		MICAL		GICAL BRC											
Date	2/28/08	89/24/5	•	00/m/s		84161	20/21										
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LDC #: 1909831 SDG#:

VALIDATION FINDINGS WORKSHEET

Continuing Calibration

Page: 2nd Reviewer: Reviewer:

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". NN N/A

Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF?

YN N/A

Standard ID Compound Climit Standard ID Compound Climit Standard ID St	%D Finding RRF Associated Samples Qualifications			1918 F8 F09000-367, J+/A det	1 A 1/501/5			0/4/		1652 + A1/water L		9324/ F8F09000-367, J+/Adet	+ A1/50i/5	0.00079 V J/UJ/A		405 F8F130000-280 1+ /Add		0.00933	0.025/6	
2008 3008 3008 3008 3008 3008 3008 3008						/		Ca-1- 22 - 1 hour h	40domerium	Nonana/				4777					M	
2008 3008 3008 3008	Standard ID	GIECH		GIEN 1844				COULTY	10 C C C C C C C C C C C C C C C C C C C			0461705		GEAL194/BRC		MCAL 7269				
	# Date		,	5/23/08	•			Chr. 100	00/80/0			80/6/9		996/9	•	90/01/9	, ,			

2nd Reviewer:_ Reviewer: `& |\ Was a method blank analyzed at least once every 12 hours for each matrix and concentration? Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Sample Identification Sample Identification Was there contamination in the method blanks? If yes, please see the qualifications below. VALIDATION FINDINGS WORKSHEET Associated Samples: Associated Samples: Blanks Was a method blank associated with every sample in this SDG? W METHOD! GC/MS VOA (EPA SW 846 Method 8260B) F8 F09000 Blank ID Blank ID Ó 0 the court VICTIONE FRANK WC#: / 70 784 Sonc. units: 449 150 B/ank analysis date: Compound Compound Blank analysis date: Methylene chloride Cone. units: YN NA Y N N/A Y/N N/A SDG #: Acetone **testone**

All results were qualified using the criteria stated below except those circled.

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

1881	3
190	111
LDC#:	SDG#

VALIDATION FINDINGS WORKSHEET Field Blanks

Reviewer: Page: / of/

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

Were target compounds detected in the fleid blanks? Y/N N/A Blank units:

Bfank units: ルタル Associated sample units: ルタル Field blank type! (circle one) Field Blank / Rinsate / Trip Blank / Other:

X0\$1 50:16 1/40X Sample identification Associated Samples: 13 Blank ID Blank ID 4 80/1/9 0.29 ó R 2.1 rchloro methane Compound Chloroform Acetone CROL

Blank units: Associated sample units: Associated Sample units: Associated Stank / Rinsate / Trip Blank / Other:

Associated Samples:

Fleid blank type: (clicle one) Fleid blank / Killsate / 111p blank / Other	I FIEIG DIATIK	/ Killsale / Til	TIP BIRTIN / OTHER;	
Compound	Blank ID	Blank ID	Sample Identification	
	#			
∥ €				
Acetone				
Chlomform				
CROL				
15				

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

1486061 LDC #:_ SDG #:

VALIDATION FINDINGS WORKSHEET Surrogate Spikes

, of Page: Reviewer: 2nd Reviewer:

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 Were all surrogate %R within QC limits?

If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R out of outside of criteria?

Qualifications	J+/Pdet																	
its)	(3/1-62)	·	(^)	(<u> </u>	(·	((((-	((
%Recovery (Limits)	124))))))))	
Surrogate	BFB																	
Sample ID	F8F140000-097																	
Date																		
*																		

QC Limits (Water)	88-110	86-115	80-120	86-118
QC Limits (Soil)	81-117	74-121	80-120	9 80-120
	SMC1 (TOL) = Toluene-d8	SMC2 (BFB) = Bromofluorobenzene	SMC3 (DCE) = 1,2-Dichloroethane-d4	SMC4 (DFM) = Dibromofluoromethane

3

1404841	Le cone
LDC #:	SDG #:

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

৾৽ Page: Reviewer: 2nd Reviewer:

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

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

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

N N/A

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

	_					-	
Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	TSB-FJ-06-2-0	F	(CS/-0E) 95/		()	Last	NO CA
	015M	X	()	(05/-hE) /5/	()		_
		EFEE	()	()	34 (20)		
		HΗ	()	()	(OZ)8h	~	-3
			()	()	()		
			()	()	()		
			()	()	()		
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			()	()	()		
			()	()	()		5
			() ·	()	()		
			()	()	()		Service (Constitution) (Service)
	Compound	pur	QC EM	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (W#(@?)
	1,1-Dichloroethene		90	58-172%	< 22%	61-145%	< 14%
	Trichloroethene		2	567.7	< 24%	71-120%	۷۱ م
	Benzene		-	Table 1	≥ 21%	76:87%	Λ1
CC.	Toluene					2.43.42	
30	Chlorobenzene			i contra	3 11	5-150%	381 V

一大きたろう SDG #:

VALIDATION FINDINGS WORNSHEET Laboratory Control Samples (LCS)

rage: or Reviewer: 2nd Reviewer:

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 LCS required? Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

ı —	10 (7	T=	Т	T	ī	T		T		ī	Γ				П					· . 				
Qualifications	no out lespin	1									-													
Associated Samples	P8F130000-280	7																						
RPD (Limits)	()	. ()		((()	()	(()	()	()	()	()	()	()	()	()	()	()		()	()	()	()
LCSD %R (Limits)		()	(()		(()		()	()	()	()		()	()	()	()	()	()	()	()	()
LCS %R (Limits)	(211-81) 081	(hel-hl) sel	()		· ·	()	()	()	())	()	()	()	()	(()	()	()	()	()	()		()	()
Compound	N	В																						
TCS/TCSD ID	OK21-08250/8																							
# Date																								

LDC#:_	190	98 A	/
SDG#:_			

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:____of___ Reviewer:__ 2nd reviewer:

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

Y	N	N/A
V	N	N/A

	Concentration	n ng/kg	
Compound	/	J	RPD
F	15	9-8	5-2 = 21 2
Dichloromethane	16	15	1.0 5 5.2
	Concentration	<u> </u>	
Compound			RPD
	Concentration	<u> </u>	=
Compound			RPD
	Concentration	14	-
Compound			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 semivolatile 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 (≥0.05)	All samples in SDG F8F050256	J (all detects) UJ (all non-detects)	А

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) UJ (all non-detects)	А
	n-(Hydroxymethyl)phthalimide	46.18722		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) UJ (all non-detects)	А

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)	А
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)	А

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)	А	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)	А	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)	А	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)	А	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
Laborato	ory: Test America	

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
1.	Technical holding times	Δ	Sampling dates: 6/4/08/
=	GC/MS Instrument performance check	Δ	
111.	Initial calibration	SW	% psD, 1 2 20.990
IV.	Continuing calibration/ICV	SW	1CV E 25
V.	Blanks	۵	
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	NP	R = Rinsate / SDG # F8 F05025

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						
<u>–</u> 1	TSB-GJ-09-0'	11	F8F060000-173	21	8158173	31	KPG6WIAA
21	TSB-GJ-09-0'-FD	12		22		32	
4 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-Nitrophenoi⁺	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. Butylbenzyiphthalate	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-Trichlorophenoi	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TIT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF, Di-n-octylphthalate**	ດດດ
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG, Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

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

LDC #:

VALIDATION FINDINGS WORKSHEET Initial Calibration

METHODY GC/MS BNA (EPA SW 846 Method 8270)

2nd Reviewer:_ Reviewer:_

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

Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's? Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?

Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?

Did the initial calibration meet the acceptance criteria?

X N N/A

Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF?

Qualifications Associated Samples 0284B (Limit: >0.05) Finding RRF Ö Finding %RSD (Limit: <30.0%) Ph Halic Acid Compound KICALSPEC Standard ID 不是 80/4/08 Date

19098 AZ LDC #:

VALIDATION FINDINGS WORKSHEET

Reviewer:_ 2nd Reviewer.

Continuing Calibration

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ? Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

Y N N/A

r <u> </u>							 										
Qualifications	1/4/4	1-/42 14															
Associated Samples	A117 B11/2		7														
Finding RRF (Limit: >0.05)	0.0//86																
Finding %D (Limit: <25.0%)	•	58. 34 sol	46.18722														
Compound	Phthalic Acid	4	N/Hydroxymethy!)	ph thall made	/												
Standard ID	ECAL 5872																
# Date	80/21/9		1														

19098A2 LDC #: SDG #:

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

Page: Reviewer: 2nd Reviewer:

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

Y N N/A

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

YN N/A

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water. Was a MS/MSD analyzed every 20 samples of each matrix? Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

Qualifications Ź Associated Samples BO RPD (Limits) 35 45-104 MSD %R (Umits) (hal-sh) MS %R (Umits) 3 Compound AAA TRX-410-04-0' MS/MSD ID MSD Date

	Compound	QC Umits (Soil)	RPD (Soll)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soif)	RPD (Soll)	QC Limits (Water)	RPD (Water)
Ϋ́	Phenol	26-90%	< 35%	12-110%	< 42%	GG.	Acenaphthene	31-137%	≥ 19%	46-118%	< 31%
Ö	2-Chlorophenol	25-102%	≥ 50%	27-123%	< 40%	l ≓	4-Nitrophenol	11-114%	> 50%	10-80%	× 20%
шi	1,4-Dichlorobenzene	28-104%	≥ 27%	. 36-97%	≥ 28%	폿	2,4-Dinitrotoluene	28-89%	≥ 47%	24-96%	≥ 38%
ب	N-Nitroso-di-n-propylamine	41-126%	%8€ >	41-116%	≥ 38%	Ë	Pentachiorophenol	17-109%	< 47%	9-103%	%0g >
αċ	1,2,4-Trichlorobenzene	38-107%	≥ 23%	39-98%	< 28%	72	Pyrene	35-142%	%9€ ⋝	26-127%	≥ 31%
>	4-Chloro-3-methylphenol	26-103%	%8€ ⋝	23-97%	< 42%						

1909842	Let cover
*	#
2	SDG

VALIDATION FINDINGS WORKSHEET Internal Standards

2nd Reviewer:_ Page: Reviewer:

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

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

X N/A

Were all internal standard area counts within -50 to +100 of the associated calibration standard?

Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

*	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
			PRY	9640801-K110LE) OL6901	(96)	J/WJ/P ourt
						1
		3	PRY	265070 (1/41/p ourse

ISI (DCB) = 1,4-Dichlorobenzene-d4 IS2 (NPT) = Naphthalene-d8 IS3 (ANT) = Acenaphthene-d10 * QC limits are advisory

IS4 (PHN) = Phenanthrena-d10 IS5 (CRY) = Chrysena-d12 IS6 (PRY) = Perylena-d12

INTST.2S

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

Date	Standard	Channel	Compound	%D	Associated Samples	Flag	A or P
6/30/08	KCAL943	В	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)	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:

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

SDG Labor METI The s	#: 19098A3a #: F8F050256 ratory: Test America HOD: GC Chlorinated Pe samples listed below were ation findings worksheets	- sticid	— es (EPA SV	l V 846 Metl	_evel hod 8081/	•		on find	Date:
	Validation	Area					Comm	ents	
1.	Technical holding times			Δ	Sampling of	lates: 6	14/08		
II.	GC/ECD Instrument Perforr	nance	Check	Δ			•		
111.	Initial calibration			Α					
IV.	Continuing calibration/ICV			SW					
V.	Blanks			4					
VI.	Surrogate spikes			SW					
VII.	Matrix spike/Matrix spike du	plicate	s	JW	TRX	- HR-0	4-0'		
VIII.	Laboratory control samples			A	10	>			
IX.	Regional quality assurance	and qu	ality control	N					
Xa.	Florisil cartridge check			N					
Xb.	GPC Calibration			N					
XI.	Target compound identificat	ion		N					
XII.	Compound quantitation and	report	ed CRQLs	N					
XIII.	Overall assessment of data			A					
XIV.	Field duplicates			SW	ρ	= 1+2		,	
XV.	Field blanks			ND	R=	Rinsale	1 SP	G#	F8F050756
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ted Samples:	•	R = Rin	o compound sate eld blank		D = Dup TB = Tri			
1	TSB-GJ-09-0'	11	87		21			31	
2+	TSB-GJ-09-0'-FD	12			22			32	
<i>3</i> ^t	TSB-GJ-08-0'	13		·	23			33	
4	F8F060000-174	14	815817	14	24			34	
5	4	15			25			35	
6		16			26			36	
7		17			27			37	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

		.55		HH.					77		KK						ww.		22
	Y. Aroclor-1242		7 Arrelandand	- Cociol-1248		AA. Aroclor-1254		BB. Aroclor-1280		200	CC. DB 608		DD. DB 1701			ui W			<u>.</u>
O Enden Late			K. Endrin aldehyde		S. alpha-Chlordane		T. oamma.Chiosata			U. Toxaphene		\ \	*. August 1016		W. Aroclor-1221			X. Aroclor-1232	
I. Dieldrin		J. 4,4'-DDE		K. Endrin			L. Endosulfan II		M. 4,4'-DDD			N. Endosulfan sulfate		0.44.007			P. Methoxychior		
A. alpha-BlfC	B. beta.Bur			C. delta-BHC		D. gamma-BHC		Henry L			F. Aldrin			G. Heptachlor epoxide		1			

Notes:

LDC # 19098 439 SDG # 44 COM

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: Reviewer:

2nd Reviewer:

METHOD: VGC HPLC

V N N/A V N/N/A Level IV Only

Y N MA

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

bun (Liming / / S. / S		1	1	T	T	┰	T	$\overline{}$	1	$\overline{}$	T	T	T	T	T	T	T	T	T	7	1	7-	T
Detector Compound (Limits 15.0) RT (limit)	Qualifications	J* /A det																					\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Detector Compound WD / RPD	Associated Samples	F8 F060000-174,	r						,		1,7),
Detector Compound WD / RPD			_	-	1-	-	1-	1-	_	_	-	-	_	1-	-	1-	-	-	-	-	1-	1-	1-
Detector Compound Column Compound	RT (limit)))	J))))))))))))))))))	
Detector Compoun	%D / RPD (Limit ≤ 15.0)	15.4	15.6	15.7	6.9/	16.2	/:5/	13.1	16.4		0.21	20.5	20.0	7.87	1:51	19.5	8.21	1.28	2:31	18.3	15.3	5.8/	17.8
	Compound	D	H	\mathcal{I}	W	7	ď	N	8		۷	O	ઇ	E	7	6	7	Н	7	I	Х	M	7
KeAL 892	Detector/ Column	ch A																					
	Standard ID	KeAL 892									K CA1943												
Date 6/3/08 C/13/08	Date	6/13/08									6/13/08												
				-		_													- 1		T	T	

METHOD: CG HPLC LDC #: 19098 K34 AL COM SDG#:

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Reviewer:

2nd Reviewer: ___

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 _ 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 <15.0%? — Level IV Only _ Were the retention times for all calibrated compounds within their respective acceptance w

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

Date Standard ID Detector Compound WD/RPD RT (limit) Associated Samples G/3の k CA L 7 C	Qualifications	1+ 10 20	3 / 124 23															
Standard ID Detector Compound W.D / RPD	Associated Samples	7 /	7			3												
Standard ID Detector Compound Rep. 1943 Ch B D R R R R R R R R R R R R R	RT (limit)						()	(()	()	(
Standard ID Column Rep 1943 Ch B Column Col	%D / RPD (Limit ≤ 15.0)	7.71	7.9	18.3	15.4	5.61												
Standard ID REAL 943	Compound	a	P	#	T	2												
	Detector/ Column	Ch B																
Date 6/3068	Standard ID	KeA1943																
		8908/9	,															

100 #: 1009 8 €3¢ SDG #: 10 com

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

Page: 2nd Reviewer: Reviewer.

Are surrogates required by the method? Yes____ or No___. Please see qualifications are identified as "N/A".

Were surrogates spiked into all samples and blanks? Y N MA

Did all surrogate recoveries (%R) meet the QC limits?

#	Ω	Column	מנסג/	Surrogate		%R (Limits)	77		
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	Surrogate Compound	_	Surrogat	Surrogate Compound		Surrogate Compound		Surrogate Compound	punod
4	Chlorobenzene (CB2)	ပ	Octa	Octacosane	Σ	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	enzene Y Tetrachloro-m- xylene
В	4-Bromofluorobenzene (BFB)	I	Ortho	Ortho-Terphenyl	z	Terphenyl-D14	1	3,4-Dinitrotoluene	
O	a,a,a-Trifluorotoluene	-	Fluorobe	Fluorobenzene (FBZ)	0	Decachlorobiphenyl (DCB)	n	Tripentyltin	
a	Bromochlorobenene	1	n-Tri	n-Triacontane	Д	1-methylnaohthalene	^	Tri-n-propyltin	n
ш	1,4-Dichlorobutane	×	Tex	Нехасоѕале	0	Dichlorophenyl Acetic Acid (DCAA)	*	Tributyl Phosphate	hate
ш	1.4-Diffuorobenzene (DFB)	-	Brom	Bromobenzene	ď	4-Nitrophenol	X	Triphenyl Phosphate	phate

LDC # 1909 8 F3 SDG#:

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

ノot/ 2nd Reviewer:__ Reviewer:__

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

Vere a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed? Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

Qualifications 3 Associated Samples RPD (Limits) CAN % MSD %R (Limits) Ľ 3 earmoun MS %R (Limits) 3 T Compound TRX-#8-04-0 MS/MSD ID nsp Y N N/A N/N/A/N/A

LDC #: 190918 A39 SDG #: Les cons

VALIDATION FINDINGS WORKSHEET

Page: Reviewer: 2nd reviewer:

Field Duplicates

METHOD:GCHPLCY N N/AWere field duplicate pairs identified in this SDG?Y N N/AWere target compounds detected in the field dupl

Were target compounds detected in the field duplicate pairs?

- Friedrich C	Concentration (" g / kg)	oday,	Qualification
pripodico	/		D' person	Parent only / All Samples
8	185	1 h	8.8 > 0.4	
	16		a.0 € 8.8	
θ	17		3.0 4 8.8	
Parada	Concentration ((%RPD	Qualification
			Limit	Parent only / All Samples
	-			
			1	

FLDUPNew.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:

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.
- 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 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

_DC #:19098A3b	VALIDATION COMPLETENESS WORKSHEET	Date: 7/
SDG #: <u>F8F050256</u>	Level III	Page: /of/
_aboratory: <u>Test America</u>		Reviewer: 🤛
		2nd Reviewer:
METHOD: GC Polychlorinated	Biphenyls (EPA SW 846 Method 8082)	7

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

	Validation Area		Comments
l.	Technical holding times	Δ	Sampling dates: 6/4/0%
II.	GC/ECD Instrument Performance Check	NA	
111.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	ICV = K
V.	Blanks	4	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	75B-PR-02-02-0'
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	ND	0=1+2
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: COIL

	SOIL	>c	10			
1/	TSB-GJ-09-0'	11		21	31	
21	TSB-GJ-09-0'-FD	12		22	32	
3 /	TSB-GJ-08-0'	13		23	33	
4		14		24	 34	
5	F8F09000-208	15	8/6/208	25	 35	
6		16		26	36	
7		17		27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	

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VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Reviewer: Page: 2nd Reviewer:

N-N/A

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

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

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

	_			_		-		_		,		_	-	, :- :=			,	_	_		-	-	_		_
Qualifications	no out																								
Associated Samples	$\mathcal{C}_{\mathcal{A}}$																								
RPD (Limits)		()		()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	(
MSD %R (Limits)	De1-85, 014	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()		()	()	()	()	()	()	()
MS %R (Limits)	JOSY- 139-150	()	()	()	()	())	()	()	()	())	()	()	()	()	()		()	()	()	()	(()	
Compound	BB																								
MS/MSD ID	TSB-FR-02-	aa-oms/D																							
) #						П	П																		

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.
- 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

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 Antimony Barium Chromium Cobalt Copper Nickel Niobium Potassium Selenium Tungsten Vanadium Zirconium	72.8 (75-125) 47.7 (75-125) 70.6 (75-125) 72.0 (75-125) 72.4 (75-125) 69.3 (75-125) 44.1 (75-125) 59.5 (75-125) 74.5 (75-125) 63.7 (75-125) 70.8 (75-125) 52.8 (75-125)	56.6 (75-125) - - - 50.7 (75-125) - - - - - - - - - - - - -	- - - - - - - -	J- (all detects) UJ (all non-detects)	А
TRX-HR-04-0' (All samples in SDG F8F050256)	Magnesium Zinc	43.2 (75-125) 53.0 (75-125)	144.7 (75-125) 131.6 (75-125)	<u>-</u> -	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А
TRX-HR-04-0' (All samples in SDG F8F050256)	Silicon Phosphorus	221.9 (75-125)	336.9 (75-125) 128.2 (75-125)	- -	J+ (all detects) J+ (all detects)	A
TRX-HR-04-0' (All samples in SDG F8F050256)	Strontium	20.7	-	<u>-</u>	J- (all detects) R (all non-detects)	А

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 (≤10) 11.4 (≤10)	All samples in SDG F8F050256	J (all detects) J (all detects)	А

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:

	Concentra	tion (mg/Kg)				
Analyte	TSB-GJ-09-0'	TSB-GJ-09-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Aluminum	6680	7890	17 (≤50)	-	-	-
Arsenic	3.2	3.3	-	0.1 (≤2.1)	-	-
Barium	230	211	9 (≤50)	-	-	-
Beryllium	0.46	0.55	-	0.09 (≤0.21)	-	-
Boron	8	10.3	-	2.3 (≤20.7)	- .	•
Cadmium	0.098	0.11	<u>-</u>	0.012 (≤0.10)	-	-
Calcium	47500	42400	11 (≤50)	-	-	-
Chromium	8.1	10.3	24 (≤50)	-	-	-
Cobalt	7.9	6.9	14 (≤50)	-	-	-

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

	Concentration (mg/Kg)					
Analyte	TSB-GJ-09-0'	TSB-GJ-09-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Sulfur	1740	1410	-	330 (≤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)	А	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)	А	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)	А	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)	А	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)	А	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	Α

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

No Sample Data Qualified in this SDG

### Action Part Par	SDG i	#:19098A4 #:F8F050256 atory:_Test America	VALIDATIC		PLETEN Level III	ESS WORI	KSHEET		Page: 1 of 1 Reviewer:
The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attache validation findings worksheets. Validation Area	METH	IOD: Metals (EPA SW 8	46 Method 6020	/6010B/70	00)				2nd Reviewer:
Technical holding times	The s	amples listed below were	e reviewed for ea		•	alidation area	s. Validatio	n findings	are noted in attached
Technical holding times		Validation	Area				Comm	ents	
II. Calibration	1.	Technical holding times		A,	Sampling of	dates: 6/4			/
ICP Interference Check Sample (ICS) Analysis	II.								
V. Matrix Spike Analysis SNS / MSD VI. Duplicate Sample Analysis A VII. Laboratory Control Samples (LCS) A LC> VIII. Internal Standard (ICP-MS) V M↑ + MS / MS IX. Furnace Atomic Absorption QC N M↑ + MS / MS XI. Sample Result Verification N XII. Overall Assessment of Data A XIII. Field Duplicates SW / (1, x) XIV. Field Blanks V Ideterminent See worksheet ND = No compounds detected R = Rinsate FB = Field blank D = Duplicate TB = Trip blank EB = Equipment blank Falidated Samples: Qor Y 1 TSB-GJ.09-0*-FD 12 21 31 2 TSB-GJ.08-0* 13 23 33 3 TSB-GJ.08-0* 13 23 33 4 PC 14 24 34 5 15 25 35 6 16 26 36 7 17	III.	Blanks		,					
No. Duplicate Sample Analysis No. Lc> Lc> No. Lc> No.	IV.	ICP Interference Check Sar	nple (ICS) Analysis	A					
VII. Laboratory Control Samples (LCS)	V.	Matrix Spike Analysis		SW	- M5	lusn			
Note	VI.	Duplicate Sample Analysis		N	7	++ <i>y</i>			
IX Furnace Atomic Absorption QC	VII.	Laboratory Control Samples	s (LCS)	4	Les				
IX Furnace Atomic Absorption QC	VIII.	Internal Standard (ICP-MS)		Ñ	Mt	ren' ense J			
X. ICP Serial Dilution GW XI. Sample Result Verification N XIII. Overall Assessment of Data A XIII. Field Duplicates SW (), ✓) XIV. Field Blanks V Iote: N = Acceptable Not provided/applicable SW = See worksheet ND = No compounds detected R = Rinsate FB = Trip blank EB = Equipment blank (alidated Samples: (0.7) 11 21 31 1 TSB-GJ-09-0° 11 21 31 2 TSB-GJ-08-0° 13 23 33 3 TSB-GJ-08-0° 13 23 33 4 P IS 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	łX.	Furnace Atomic Absorption	QC	N	Wit .	105th con			
XIII. Overall Assessment of Data A	X.	ICP Serial Dilution		SW		8.			
XIII. Overall Assessment of Data A	XI.	Sample Result Verification		N					
XIII. Field Duplicates XW (), X XIV. Field Blanks V Iote: A = Acceptable N = Not provided/applicable SW = See worksheet FB = Field blank Yellow SW = See worksheet SW = Field blank Yellow SW = See worksheet SW = Field blank Yellow SW = See worksheet SW = Field blank Yellow SW = See worksheet Yellow SW = See worksheet	XII.		1	A					
Note A = Acceptable N = Not provided/applicable SW = See worksheet FB = Field blank FB = Field blank FB = Equipment blank				1 /	(1,2)			
ND = No compounds detected ND = No possible N				1 1/		·•			
1 TSB-GJ-09-0' 11 2 21 31 31 22 TSB-GJ-09-0'-FD 12 22 32 32 33 33 34 \$\frac{1}{5}\$ 14 24 34 34 55 35 36 36 7 27 37 37 88 18 28 38 38 99 19 29 39 40		N = Not provided/applicable SW = See worksheet ed Samples:	R = Rir	nsate	s detected	TB = Tri	p blank		· · · · · · · · · · · · · · · · · · ·
2 TSB-GJ-09-0'-FD 12 22 32 33 33 TSB-GJ-08-0' 13 23 33 34 55 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1		11		21		in the second	31	
4 PF 14 24 25 35 6 16 7 17 8 18 9 19 10 29 30 30	2	TSB-GJ-09-0'-FD	12		22				
5 15 25 35 6 16 26 36 7 17 27 37 8 18 28 38 9 19 29 39 10 20 30 40	3	TSB-GJ-08-0'	13		23			33	
5 15 25 35 6 16 26 36 7 17 27 37 8 18 28 38 9 19 29 39 10 20 30 40	4	PB	14		24			34	
6 16 26 36 7 17 27 37 8 18 28 38 9 19 29 39 10 20 30 40	5		15		25				
7 17 27 37 8 18 28 38 9 19 29 39 10 20 30 40	6		16		26				
8 18 28 38 9 19 29 39 10 20 30 40	7		17						
9 19 29 39 10 10 20 30 40	8								
10 20 30 40									
					······				
lotes:	lotes:				1 2			<u> </u>	

LDC#: 19078 And SDG#: Sel cover

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page: of / Reviewer: MM 2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
(-3,	505	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si,
1->	547	(Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, <u>Zr.)</u>
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
	T T	Analysis Method
CP		Li, S ₁)
CP-MS		Al, Sb, As, Ba, Be, Cd, Ca. Cr. Co, Cu, Fe, Pb, Mg, Mn, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si
CP-MS		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Zr
SEAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN

Comments: Mercury by CVAA if performed

Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

LDC #: 19098A4 SDG #: See Cover

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000) Sample Concentration units, unless otherwise noted: mg/Kg_

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

PB/ICB/CCB QUALIFIED SAM Soil preparation factor applied: _____Associated Samples: All

Page: of the Reviewer:

									-									

L																		
ntification																		
Sample Identification																		
S											,							
																1		
	1				0.098 / 0.10													
	Blank Action																	
en e	Maximum ICB/CCB ^a	2.7	1.0		0.2	1.9	3.0											
	Maximum PB ^a																	
	Maximum PB ^a (mα/Kα)			0.20														
	Analyte	Sb	As	Ва	g	×	>			:								

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

2nd Reviewer:__

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

of 4 or more, no action was taken.

Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

Y (N) N/A We LEVEL IV ONLY:

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	GI USM/SM	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	10-04-20T	ξο,	<i>V</i>	9218			<u>A</u>	J-/45/A
<u>-</u> [1 1 1		5h	41,7	56.6		-	
			Ba	9,04				
<u>L_</u>			Z	0,51				
<u>L</u>			Sp	カ・モル				<u> </u>
<u> </u>			3	<i>†</i> ,° <i>t</i>)
<u>_</u>			Ma	43,12	44.7			7/m1/D
			ρ,, N	69.3	, h'a5			J-/NJ/A
			a _N	44.	,			
<u> </u>			×	7.65				
<u> </u>			\$\$	747				, ,
<u> </u>			1,5	6/55	336.9			7+ 4+/A
1_			2~	7.0%				J-/R/A
<u></u>			3	(3,4)				J-/WI/3
<u></u>			<u> </u>	8.0%				-)
<u>L_</u>			4.5	53.0	9-16)			J/wz/4
<u> </u>			4	8,52	9.99		,	7-/45/4
<u></u>			4		2,82		~~	サイナ
<u>_</u>								
<u>L_</u>								
<u> </u>								
L								
ع ا) W	C. T.	7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7	メカヘ・シ				
3		+	_	†				
1								

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

Page: 2 of 2 2nd Reviewer:_

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples? of 4 or more, no action was taken.

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. EVEL IX ONLY: Y (D) N/A

*	OI OSW/SW	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	TRX-48-04-01	ll .	こ			かな	A-1)	No good (LCS72~)
			46			5/4		
			\.\.\.\.\.\.			24.1		
			43			24.8		
			7-			23,7		
			المو			<i>ት</i> ' ε<		
			Мид			ሳን' ሲ		
			\prec			メング		
			λζ			インプ		
			1)			26.8		
			Λ			20,5		
			£10			34.3	/	
			5.>			24.8	,	3
L_								
<u> </u>								
<u> </u>								
<u> </u>								
<u> </u>								
Ш								
3	Colline IIIs.							

43606) LDC #: SDG#:

VALIDATION FINDINGS WORKSHEET ICP Serial Dilution

2nd Reviewer: Page: Reviewer:

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

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

If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed? N N/A Y AD N/A

Were ICP serial dilution percent differences (%D) <10%?

Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data. LEVEL IN ONLY:

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

Qualifications	7747	1												
Associated Samples	M	7												
%D (Limits)	14.3	カミ												
Analyte	F	SY												
Matrix	Sor													
Diluted Sample ID	[RX-HR-04-0]													
# Date													-	

Comments:

LDC#:	19098A4
SDG#:	See Cover

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page:_	(_of_	2
Reviewer:		١ —	_
2nd Reviewer:		L	
		\neg	

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

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

	Concentration	on (mg/kg)	(≤50)	(mg/Kg)	(mg/Kg)	Qualifications
Compound	1	2	RPD	Difference	Limits	(Parent Only)
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 <u>Field Duplicates</u>

Page:_	<u> —</u> of	~
Reviewer:		
2nd Reviewer:		1

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

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

	Concentrati	on (mg/kg)	(≤50)	(mg/Kg)	(mg/Kg)	Qualifications
Compound	1	2	RPD	Difference	Limits	(Parent Only)
Silicon	133	158		25	(≤51.7)	
Silver	0.14	0.18		0.04	(≤0.18)	
Sodium	1810	1720	5	-0.06	£40.12	
Strontium	287	267	7			
Tin	0.43	0.49		0.06	(≤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	(≤20.7)	
Lithium	24.0	20.4		3.6	(≤51.7	
Sulfur	1740	1410		330	(≤1030)	

V:\FIELD DUPLICATES\FD_inorganic\19098A4.wpd

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, Chorine, 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.
- 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

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)	Р

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:

	Concentra	tion (mg/Kg)				
Analyte	TSB-GJ-09-0'	TSB-GJ-09-0'-FD	RPD (Limits)	Difference (Limits)	Flag	A or P
Bromide	8.5	5.1	-	3.4 (≤2.6)	J (all detects)	А
Bromine	17.1	10.1	-	7 (≤5.2)	J (all detects)	А
Chlorate	253	185	31 (≤50)	-	-	-
Chloride	7960	5740	32 (≤50)	-	-	-
Chlorine	15900	10900	37 (≤50)	-	•	-
Fluoride	0.43	0.57	-	0.14 (≤1.0)	•	-
Nitrate as N	156	102	42 (≤50)	-	-	-
Sulfate	3310	2160	42 (≤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)	Р	Calibration
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD	Bromide Bromine	J (all detects) J (all detects)	А	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 #: <u>19</u> SDG #: <u>F8</u> Laboratory:		VALIDATIO -		LETENES Level III	S WORKSHEET	Date: 7/\sqrt{s} Page: \(_ \) Reviewer: \(_ \) 2nd Reviewer: \(_ \)				
METHOD: (A Method 300	Analyte) <u>Bromide, E</u> .0), O & G (EPA SV	Bromine, Chlora V846 Method 90	te, Chloride 071B)	e, Chorine, Flu	uoride, Nitrate, Nitrite,	Orthophosphate-P, Sulfate (EPA				
	s listed below were ndings worksheets.	reviewed for ea	och of the f	ollowing valid	ation areas. Validatio	on findings are noted in attached				
	Validation /	Area			Comm	ents				
I. Techi	nical holding times		A	Sampling dates	s: 6/41.8					
	calibration		A		, ,, -					
Ilb. Calib	ration verification		SW							
III. Blank	(S		A							
IV Matrix	x Spike/Matrix Spike Du	ıplicates	A	2M5/	Dup					
V Dupli	cates		l A							
VI. Labor	ratory control samples		Δ	Les						
VII. Samp	ole result verification		N							
VIII. Overa	all assessment of data		A							
IX. Field	duplicates		SW	(1,2)						
X Field	blanks		/_							
N = N	Acceptable Not provided/applicable = See worksheet	R = Rir	lo compound nsate ield blank	s detected	D = Duplicate TB = Trip blank EB = Equipment blan	ık				
Validated Sam	ples Sar)									
1 TSB-G	J-09-0'	11		21		31				
	J-09-0'-FD	12		22		32				
3 TSB-G		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 #: 19098 Ab SDG #: (se com

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: ____of__/_ Reviewer: _______ 2nd reviewer: _______

All circled methods are applicable to each sample.

Sample ID	Matrix_	Parameter Parameter
1-3	Soi	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+GTPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
	· · · · · · · · · · · · · · · · · · ·	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO₃ NO₂ SO₄ O-PO₄ Chlorate ClO₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
	,	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
·		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH

Comments:	

94860b1 LDC # SDG #:

VALIDATION FINDINGS WORKSHEET Calibration

Page: 2nd Reviewer:__ Reviewer:_

METHOD: Inorganics, EPA Method_

Se con

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

N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110%?

N/A Are all correlation coefficients ≥0.995?

LEVEL IV/D ONLY:

Y N MA

Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recaluculation Worksheet for recalulations. Was a balance check conducted prior to the TDS analysis.? Was the titrant normality checked?

N N N

Qualifications	J/ng/ P								5				
Associated Samples	Ē									iber.			
%R													
Analyte	2002	(desorte)											-
II .	No ccvs	1											
# Date	٩												

Comments:

LDC#:_	<u> 19098A6</u>
	See Cover

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:_	of
Reviewer:	<u>~</u>
2nd Reviewer:	0_

Inorganics, Method: See Cover

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

	Concentrati	on (mg/Kg)				Qualification	
Analyte	1 2		RPD (≤50)	Difference	Limits	(Parent only)	
Bromide	8.5	5.1		3.4	(≤2.6)	J det / A	
Bromine	17.1	10.1		7	(≤5.2)	J det / A	
Chlorate	253	185	31				
Chloride	7960	5740	32				
Chlorine	15900	10900	37				
Fluoride	0.43	0.57		0.14	(≤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.
- 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) 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

SDG#	: 19098A7 #: F8F050256 atory: Test America	VA - -	LIDATION		PLETE Level		ΞT	Date: 1/22 Page:of _/ Reviewer: 2nd Reviewer:		
METH	IOD: GC Gasoline Range	e Orç	janics (EPA	SW846 N	/lethod	8015	5B)			Zilu Keviewei.
	amples listed below were tion findings worksheets.		ewed for eac	ch of the fo	ollowin	ng val	idation a	reas. Valida	ation find	ings are noted in attached
	Validation	Area						Con	nments	
l.	Technical holding times			A	Sampli	ing dat	tes:	6/4/08	7	
lla.	Initial calibration			Δ				7		
IIb.	Calibration verification/ICV			A	10	:V <u>≤</u>	15			
III.	Blanks			Δ						
IVa.	Surrogate recovery			A						
IVb.	Matrix spike/Matrix spike dup	s	A	TS	B-7	2R - 0.	2-02-	o'		
IVc.	Laboratory control samples		Ą	L	cs/	D				
V.	Target compound identificati	ion		N						
VI.	Compound Quantitation and	I CRQ	Ls	N						
VII.	System Performance			N						
VIII.	Overall assessment of data			A						
IX.	Field duplicates			ND	<u> </u>	D	= /4	12		
X.	Field blanks			\sim						
Note: Validate	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		= Rinsate	o compound eld blank	is detect	ted TB	= Trip blan	= Duplicate ik = Equipment b	olank	
1	TSB-GJ-09-0'	11				21			31	
	TSB-GJ-09-0'-FD	12]	22			32	
	TSB-GJ-08-0'	13];	23			33	
4		14				24			34	
	F8F120000-169	15	814416	9		25			35	
5 6		16				26			36	
7		17			;	27			37	
8		18				28			38	
9		19				29			39	

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.
- 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) 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

SDG#	:19098A8 ::F8F050256 atory:_Test America	VA	LIDATIO	Date: 7/20 Page: 1/of / Reviewer: 75 2nd Reviewer: 2						
METH	OD: GC Diesel Range	Organi	cs (EPA S\	/V846 Met	thod 801	5B)				7
	amples listed below were ion findings worksheets		wed for ea	ch of the f	ollowing	validat	ion areas	. Validatio	n findi	ings are noted in attached
	Validation	Area						Comm	ents	
1.	Technical holding times			Δ	Samplin	g dates:	61	4108		
lla.	Initial calibration			Δ						
IIb.	Calibration verification/ICV			A	1	cr =	15			
III.	Blanks			A						
IVa.	Surrogate recovery			sW						
IVb.	Matrix spike/Matrix spike du	uplicates	3	SW						
IVc.	Laboratory control samples					<u>ر</u> ح				
V.	Target compound identifica	N								
VI.	Compound Quantitation an		s	N						
VII.	System Performance			N						
VIII.	Overall assessment of data	1		A						
IX.	Field duplicates			NP	D		1+2			
X.	Field blanks			N						
Note: Validate	A = Acceptable N = Not provided/applicab SW = See worksheet ad Samples:	le R =	Rinsate	o compound eld blank	is detecte	d TB = Tri		icate iipment blar	ık	·
1	TSB-GJ-09-0'	11			2		.,		31	
2 .	TSB-GJ-09-0'-FD	12			2:	2			32	
3 7	TSB-GJ-08-0' /ø メ	13			2:	3			33	
4		14	8 161	207	24	1			34	
5		15			2	5			35	
6		16			20	3			36	
7		17			2.	,			37	
8		18			28	3			38	
9		19			25	,			39	
		1							140	

Notes:___

KN86061 # 201 SDG #: 10 cm

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

Page: Reviewer: 2nd Reviewer:_

METHOD: // GC HPLC
Are surrogates required by the method? Yes or No or No No applicable questions are identified as "N/A".

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

Were surrogates spiked into all samples and blanks?

Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Dete Colt	Detector/ Column	Surrogate Compound		%R (Limits)			Qualifications
	6-1	fou	may hel	, H) Od	73-150	01 (02)	9
)			
1					$-\parallel$			(
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					\dashv			(
)		(
T)			
					-			(
)		(
	Surrogate Compound		Surrogat	Surrogate Compound		Surrogate Compound		Surrogate Compound	P
∀	Chlorobenzene (CBZ)	0	Octa	Octacosane	Σ	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	e Y Tetrachloro-m-xylene
<u></u>	4-Bromofluorobenzene (BFB)	I	Ortho	Ortho-Terphenyl	z	Terphenyl-D14	⊢	3,4-Dinitrotoluene	
U	a,a,a-Trifluorotoluene	-	Fluorob	Fluorobenzene (FBZ)	0	Decachlorobiphenyl (DCB)	⊃	Tripentyltin	
١,	Bromochlorobenene	-	n-Tri	n-Triacontane	а	1-methylnaphthalene	7	Tri-n-propyltin	
<u>"</u>	1,4-Dichlorobutane	Y	Hex	Нехасоѕапе	o	Dichlorophenyl Acetic Acid (DCAA)	≩	Tributyl Phosphate	
	1.4-Difluorobenzene (DFB)	1	Brom	Bromobenzene	B	4-Nitrophenol	×	Triphenyl Phosphate	

be coner 8486061 SDG#: LDC #:_

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

2nd Reviewer:__

Page: Reviewer:

МЕТНОD: Устину метнов интерества и метнов и м

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

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

Qualifications	m que	1																							
Associated Samples	MA																								
RPD (Limits)	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()		())
MSD %R (Limits)	111 (55-104)	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	
MS %R (Limits)	114 (55-104)	()	()	()	()		()	()	()	()	()		()	()	()	()	()		()	()	()	()		()	
Compound	DRO																								
	75B-FA-02-02	-0/ws/D																							
) #																									

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)	А

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)	А

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)	А	Continuing calibration (%D)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD TSB-GJ-08-0'	Benzo(k)fluoranthene	J+ (all detects)	А	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

DG # abora	:19098A9 ::F8F050256 atory:_Test America	-		L	evel II	l	SS WORKSHEET		Date: 7/20/02 Page: _/of _/ Reviewer: 2nd Reviewer:
he sa	OD: GC Polynuclear Aro amples listed below were ion findings worksheets.							on find	/ lings are noted in attached
	Validation	Area					Comp	nents	
1.	Technical holding times			4	Sampling	da	tes: 6/4/6	8	
lla.	Initial calibration			Δ			,		
IIb.	Calibration verification/ICV			BW	w	۷	= 15		
III.	Blanks			Δ					
IVa.	Surrogate recovery			Δ					
IVb.	Matrix spike/Matrix spike dup	licates	S	SW	TSB	_	PR-02-02-C	Ms/	10
IVc.	Laboratory control samples			Α	10				
V.	Target compound identificati	on		N					
VI.	Compound Quantitation and	CRQL	.s	N_					
VII.	System Performance			N					
VIII.	Overall assessment of data			A					
IX.	Field duplicates			ND	1	2	= 1+2		
X.	Field blanks			N					
lote:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compounds sate eld blank	s detected	1	D = Duplicate TB = Trip blank EB = Equipment bla	nk	
/alidate	ed Samples:							- 	
71	TSB-GJ-09-0'	11	F8F09	90000-2	21	\perp	8161209	31	
	TSB-GJ-09-0'-FD	12			22			32	
3 /	TSB-GJ-08-0'	13			23			33	
4	F& F090000-20X	14	81612	28	24			34	
5		15	8.		25			35	
6		16			26			36	
7		17			27	<u> </u>		37_	
8		18			28			38	
9		19			29			39	
10		20			30	,		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC HPLC

8310	8330	8151	8141	8141 _(Con't)	8021B
A. Acenaphthene	А. НМХ	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	1
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	
E. Benzo(a)pyrene	E. Tetryl	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,l)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-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowi	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methy!	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. Suiprofos	
O. Phenanthrene	0.		O. Chlorpyrifos		
P. Pyrene	ė.		P. Fenthion		
Ċ.	Ö		Q. Parathion-ethyl		
č			R. Trichloronate		
Š			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:

LDC # 1909849 Ay com SDG#:

METHOD: VGC_HPLC

VALIDATION FINDINGS WORKSHEET Continuing Calibration

\	6
Page:	Reviewer:

4 2nd Reviewer:

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

V N N/A N/A

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

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Qualifications	J' / Adut				1.777.	1	7																	
Associated Salliples	A11+ B1K				FAKFARISH - 209	1 4 41 x Block	- lustin + link										A CONTRACTOR OF THE CONTRACTOR							
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18 TO 1168	04/14/80				6CA L837																			
14/60	02/1				90/11/0	,																		
	WAR STANTS IN III III	4/08 STCV768 not spuijed H 16.6 () All+BIK	4/08 STCV768 not specified # 16.6	4/08 STCV768 not grafied # 16.6 () All+BIK	4/08 STCV768 not yndijed H 16.6 () All+BIK	4/06 & tav768 not spuilled # 16.6 () All + BIK	4/06 & CAL837 4 D 15.5 () FERCOSPORTOR	4/06 & tav 768 not spuilled # 16.6 () All + BIK () All + BIK () All + BIA () All + BIAnK	4/06 & tav768 not spuiled # 16.6 () All + BIK [4]00 & aca1837	4/06 & tav768 not spuiled # 16.6 () All + BlK [4]00 & tal.837	4/06 StcV768 not spuiled # 16.6 () All+BlK [4]00 ScAL837	4/08 & TCV768 not quilled # 16.6 () All FBIK [4]08 & CAL837	4/08 STCV768 not quijed # 16.6 () All + B/K [4/08 SCAL837 & D 15.5 () R&ROGGOOD=209- [4/08 SCAL837 & D 15.2 () All + Blank () () All + Blank	4/08 \$\$\$\$\$\text{4/08}\$\$ \$\text{not } \text{1/1/2} \\ \te	4/06 STCV768 not quilled H 16.6 () All tolk [4/06 SCAL837 & D 15.5 () R&RCOA/000-209- [4/06 SCAL837 & D 15.2 () R&RCOA/000-209- [4/06 SCAL837 & D 15.5 () R&RCOA/000-209- [4/06 SCAL837 & R&RCOA/000-209-	4/06 & C C V 768 not quilled # 16.6 () All tolk [4/06 & CA L & 37	4/66 & ECV768 not quality # 16.6 () All + 8/K [4/60 & CAL837	4/66 & £ c V768 not quilled # 16.6 () All t BIK [4/66 & CAL&37 & D 5.5 ()	4/66 & CRICV768 not grafied # 16.6 () All + BIK (1) All + BIK (1) RECORPORATION (1) RECORPORATION (1) All + Blank (1) (1) All + Blank (1) (1) (1) (1) (1) (1)	4/66 & COTOR not quelled # 16.6 () All + BlAK 10/66 & CALVEST & D S.S () FOREGORPHOD=209T 10/68 & CALVEST & D S.S () S.S () FOREGORPHOD=209T 10/68 & CALVEST & D S.S () FOREGORPHOD=209T 10/68 & CALVEST & D S.S () FOREGORPHOD=209T 10/68 & CALVEST & D S.S () FOREGORPHOD=209T 10/68 & CALVEST & D S.S () FOREGORPHOD=209T 10/68 & CALVEST & D S.S () FOREGORPHOD=209T 10/68 & CALVEST & D S.S	4/66 \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$	4/66 & tev768 not quilted # 16.6 () All + BIK (1) Recorded - 209- (1) Recorded - 209- (2.2 () Recorded - 209- (4.1) All + Blank (6.1) () () () () () () () () () (4/66 & \$ C 4 L \(\) \(\	4/68 \$TCV768 not quifted # 16.6 () All folk [11/68 &CAL837

el cones LDC #: 1909 8A9 SDG#:

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

2nd Reviewer: Page: Reviewer:

> METHOD: GC HPLC
> Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".
> | Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".
> | N/A N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed? Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

Qualifications 3 **Associated Samples** 3 RPD (Limits) O MSD %R (Limits) empounde MS %R (Limits) Leverd Compound TSB-FR-02-02 MS/MSD ID d/sw,o

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.
- 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. 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	¹³ 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'	¹³ C-1,2,3,7,8-PeCDD ¹³ C-1,2,3,6,7,8-HxCDD ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD ¹³ C-1,2,3,7,8-PeCDF ¹³ C-1,2,3,4,7,8-HxCDF ¹³ C-1,2,3,4,6,7,8-HpCDF	33 (40-135) 35 (40-135) 26 (40-135) 16 (40-135) 36 (40-135) 35 (40-135) 25 (40-135)	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 1,2,3,6,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HyCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 0CDF	J (all detects) UJ (all non-detects)	Р

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:

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

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)	Р	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 1,2,3,4,6,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,6,7,8-HpCDF 0CDF	J (all detects) UJ (all non-detects)	Р	Internal standards (%R)
F8F050256	TSB-GJ-09-0' TSB-GJ-09-0'-FD	OCDD	J (all detects)	А	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)	А	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

SDG#	: 19098A21 t: F8F050256 atory: Test America	VA 	LIDATI		LETENES Level III	S WORKSHE	EΤ	Date: 7/19/10 Page: 1 of 1 Reviewer: 7/4 2nd Reviewer: 1
The sa	OD: HRGC/HRMS Di amples listed below we ion findings workshee	ere revie		•			dation findin	ngs are noted in attache
	Validatio	on Area				Co	mments	
l.	Technical holding times			A	Sampling date	s: 6/4/08		
II.	GC/MS Instrument perfor	mance cl	neck	4				
111.	Initial calibration	•		A	:			
IV.	Routine calibration/ICV	lov		SWA				
V.	Blanks	•		4				
VI.	Matrix spike/Matrix spike	duplicate	s	H	dient	specified		
VII.	Laboratory control sample	es		4	109		·	
VIII.	Regional quality assurance	ce and qu	ality control	N	:			
IX.	Internal standards		SW					
X.	Target compound identifi		N					
XI.	Compound quantitation a	s	N					
XII.	System performance			N				
XIII.	Overall assessment of da	ata		4				
XIV.	Field duplicates			SW	D=1+:	2.		
XV.	Field blanks		,	7	1			
Note: /alidate	A = Acceptable N = Not provided/applica SW = See worksheet ed Samples:	ıble	R = F	No compound Rinsate Field blank	s detected	D = Duplicate TB = Trip blank EB = Equipmen	t blank	
1 -	TSB-GJ-09-0'	11	81654	>5	21		31	
	TSB-GJ-09-0'-FD	12			22		32	
	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	

SDG #: F8F050256 LDC #: 1909842/

VALIDATION FINDINGS WORKSHEET Routine Calibration

of of

Page: Reviewer: 2nd Reviewer:

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

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

Was a routine calibration was performed at the beginning and end of each 12 hour period?

Were all percent differences (%D) of RRFs \leq 20% for unlabeled compounds and \leq 30% for labeled? Did all routine calibration standards meet the Ion Abundance Ratio criteria? (F) N/A N N/A

		Auaiiiications	(#) d/57	# 1 A A A A A A A A A A A A A A A A A A	NA SA														Ion Abundance Ratio	O GE O OO	1 20 4 70	0/1.76.1	1.05-1.43	0.43-0.59	0.37-0.51	0.88-1.20	0.76-1.02
	Associated Samples	\parallel	AN SA																Selected ions (m/z)	M/M+2	M+2/M+4		M+2/M+4	M/M+2	M/M+2	M+2/M+4	M+2/M+4
Finding lon	Abundance Ratio										-							Dobr		Tetra-	Penta-	Hexa-	Hexe-13C-Hyone asy	Henta-13 C. Hache 461	Hort-	- iebia-	Octa-
Finding %D	ا	57.3																	0 65 0 80	4 30 4 70	1.32-1.78	1.03-1.43	0.43-0.59	0.37-0.51	0.88-1.20	0.78.1.00	701-02
•	_!_	12-37.6-10p																Selected ions (m/z) Ion Ab	M/M+2					M/M+2	M+2/M+4	M+2/M+4	
Standard ID	מייים ביותטע ודרט	2-71-88(07>70	(まれんりん)	10														PCDDs Selec					(S) Olly	Or (IS) only			
# Date	1/3/00	02/																	letra-	Penta-	Hexa-	Hexa-13C-HxCDF /IS\ 221.	Hope 13 C 1	riepia- C-ripcur (IS) only	Hepta-	Octa-	
-	<u> </u>				_	<u> </u>	<u></u>	<u> </u>	\perp	 <u> </u>	<u></u>	\perp	JL	L						- 1							

0.76-1.02

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	a. 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. Iolal People
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
100				
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	V Total HnChE

Notes:

SDG # F8F050 255 LDC #: 19098 12

VALIDATION FINDINGS WORKSHEET

Internal Standards

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

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

Are all internal standard recoveries were within the 40-135% criteria? Was the S/N ratio all internal standard peaks \geq 10?

	Date Lab ID/Reference	Internal Standard		% Recovery (Limit: 40-135%) (: 40-135%) ((\(\(\(\(\(\(\(\) \) \) \))	Qualifications $3/45/P (B-G, 1-a)$
		L- -		26 26 16		
		40		26		
		m		35		
		ტ		55	(7)	7
					()	
					()	
					()	
					()	
					()	
	Internal Standards	Check Standard Used		ul	Internal Standards	Check Standard Used
2,3	¹³ C-2,3,7,8-TCDF			1. 13C-OCDD		
رب س	¹³ C-2,3,7,8-TCDD			K. ¹³ C-1,2,3,4-TCDD	7 (17) (17)	
5	¹³ C-1,2,3,7,8-PeCDF				CDD	
걸	¹³ C-1,2,3,7,8-PeCDD			M		
7	¹³ C-1,2,3,4,7,8-HxCDF		_	Ž		
7,	¹³ C-1,2,3,6,7,8-HxCDD			ó		
걸	¹³ C-1,2,3,4,6,7,8-HpCDF			ď.		
- 13	¹³ C-1.2.3.4.6.7.8-HpCDD					

LDC #: 19098421 SDG #: F8 F05025

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: ______ of ____ Reviewer: ______ 2nd reviewer: ______

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

X	N	N/A
Y/	N	N/A

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

-	Concentratio		
Compound	(2	RPD ± 50
C	31	10	102 (=50) Jets /A
14	4.0	2.6	42 -
1	2.9	1.8 U	1.1 (=1.8) -
7	2,5	1.24	1.3 (=1.2)]/47/4
LK	5.0	2.5U	2.5 (= 2.5) -

	Concentration	1()	
Compound			RPD
	2.7	1.44	1.3 (41.4) -
0	7.7	2,54	5.2 (=2.5) J/J/
P	2.8	1.24	1.6 (=1.2)
Q	19	4.14	14.9 (=4.1)

	Concentration ()	
Compound		RPD

	Concentration ()	
Compound		RPD