

LABORATORY DATA CONSULTANTS, INC.

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ERM

August 6, 2008

2525 Natomas Park Drive, Suite 350 Sacramento. CA 95833

ATTN: Ms. Maria Barajas-Albalawi

SUBJECT: BRC Tronox Parcel F, Data Validation

Dear Ms. Barajas-Albalawi

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

LDC Project # 19099:

SDG#	<u>Fraction</u>
F8F050256, F8F110173	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 and Level IV 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

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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

Collection Date:

June 4, 2008

LDC Report Date:

July 24, 2008

Matrix:

Soil/Water

Parameters:

Volatiles

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8F050256

TSB-FR-02-02-0'

TSB-FJ-02-02-0'

TSB-FJ-06-2-0'

TSB-FJ-06-2-0'MS

TSB-FJ-06-2-0'MSD

TB-2

Introduction

This data review covers 5 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 (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
5/28/08 (MICALBRC)	Ethanol	0.00361 (≥0.05)	All water 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	Acetonitrile	25.93241	All soil samples in SDG F8F050256	J+ (all detects)	A
6/10/08	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 (GICV1884)	Dichlorodifluoromethane Tetrachloroethene Nonanal	49.46918 34.4080 74.79276	All soil samples in SDG F8F050256	J+ (all detects) J+ (all detects) J+ (all detects)	A
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
F8F09000-367	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. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported	Modified Final
	TIC (RT in minutes)	Concentration	Concentration
TSB-FJ-06-2-0'	Dichloromethane	11 ug/Kg	11U ug/Kg

Samples TB-2 and TB-4 (from SDG F8F050256) were identified as trip blanks. No volatile contaminants were found in these blanks with the following exceptions:

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB-2	6/4/08	Dichloromethane Chloroform	0.23 ug/L 0.12 ug/L	TSB-FR-02-02-0' TSB-FJ-02-02-0'
TB-4	6/4/08	Dichloromethane Acetone Chloroform	0.29 ug/L 0.85 ug/L 0.11 ug/L	TSB-FJ-06-2-0'

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
TSB-FR-02-02-0'	Chloroform	0.53 ug/L	5.1U ug/L

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
TB-2	Bromofluorobenzene	117 (66-115)	2-Hexanone	J (all detects)	Α

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. 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

No field duplicates were identified in this SDG.

BRC Tronox Parcel F Volatiles - Data Qualification Summary - SDG F8F050256

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TB-2	Acetonitrile 2-Butanone	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А	Initial calibration (RRF)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0' TB-2	Ethanol	J (all detects) UJ (all non-detects)	А	Initial calibration (RRF)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Acetonitrile	J+ (all detects)	А	Continuing calibration (%D)
F8F050256	TB-2	Dichlorodifluoromethane Bromomethane	J+ (all detects) J+ (all detects)	А	Continuing calibration (%D)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Dichlorodifluoromethane Tetrachloroethene Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	А	Continuing calibration (ICV %D)
F8F050256	TB-2	lodomethane Nonanal	J+ (all detects) J+ (all detects)	А	Continuing calibration (ICV %D)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Ethanol	J (all detects) UJ (all non-detects)	А	Continuing calibration (RRF)
F8F050256	TB-2	Acetonitrile 2-Butanone	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А	Continuing calibration (RRF)
F8F050256	TB-2	2-Hexanone	J (all detects)	А	Surrogate recovery (%R)

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

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8F050256	TSB-FJ-06-2-0'	Dichloromethane	11U ug/Kg	А

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

SDG	Sample	Compound	Modified Final Concentration	A or P
F8F050256	TSB-FR-02-02-0'	Chloroform	5.1U ug/L	А

SDG : Labor METH The s	#:19099A1 #:F8F050256 ratory:_Test America HOD: GC/MS Volatiles (E amples listed below were ned validation findings wo	PA S	 W 846 Metl	L nod 8260E	_evel III		S WORKSH			Date: Page: Reviewer: 2nd Reviewer: s are noted in	<i></i>
	Validation	Area						Comme	nts	<u> </u>	
I.	Technical holding times			Д	Sampling	dates:	6/4/	08			
II.	GC/MS Instrument performa	ince ch	neck	Δ		·	, ,				
III.	Initial calibration			ક્ષ	% P.	SD,	(Zo.	. 990	<u> </u>		
IV.	Continuing calibration/ICV			SW	160	٤	25				
V.	Blanks			SW							
VI.	Surrogate spikes			3W							
VII.	Matrix spike/Matrix spike du	olicate	S	SW							
VIII.	Laboratory control samples			SW	Le	الاحا					
IX.	Regional Quality Assurance	and Q	uality Control	N							
X.	Internal standards			A							
XI.	Target compound identificat	ion		N						•	
XII.	Compound quantitation/CRC			N							
XIII.	Tentatively identified compo		TICs)	N							
XIV.	System performance			N							
XV.	Overall assessment of data			A							
XVI.	Field duplicates			^/							
	Field blanks			SW	TE	- (<u> </u>	TB= 7	 B - 5	SDG#	
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	<u> </u>	R = Rin:	o compounds sate eld blank	<u> </u>		D = Duplicate TB = Trip blar EB = Equipme	: nk		F8FO	50254
1 /	TSB-FR-02-02-0'	17	F8 F09	0000-2	67 21	I	8141367		31	 	
1 1	TSB-FJ-02-02-0'	12		0000 -2			8165280)	32		
\$ 1	TSB-FJ-06-2-0'	13	F8 F16	000-0	97 ₂₃		8168097		33		
4 1	TSB-FJ-06-2-0'MS	14	, , ,		24		<u> </u>		34		
5		15			25				35		
1 2	TSB-FJ-06-2-0'MSD 78-200 W	16			26				36		
7		17			27				37		

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. Chloroethane	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	000. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene™	BB. 1,1,2,2-Tetrachloroethane*	W. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Proplonitrile
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	pppp.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	2000.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2.Dichloropropane**	KK. Trichlorofluoromethane	EEE, sec-Butylbenzene	YYY. tert-Butanol	8888.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	222, 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.

LDC #: 140744 / SDG#:

VALIDATION FINDINGS WORKSHEET Initial Calibration

Page: / of / 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".

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

۷ Z A/N N

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

Standar Standar MITCAL B STAAL B	Standard ID Compound (Limit: <30.0%) (Limit: >0.05 KKF / Associated Samples Qualifications	FEFE 0.00784 F	All water	GIGLBAC JULY 0.00086 F8F09000-367 J/43/A	1/1/201//5		MICAL BRE WWW 0.0036/ FYF/3000-30 J/43/A	+ A11 wafes							
	d ID Compound	E	W												- National Section 1

19099A) SDG#: LDC #:_

VALIDATION FINDINGS WORKSHEET Continuing Calibration

2nd Reviewer:_ Page: Reviewer:

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

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

N/A	N/A N/A	was a continuing calibration standard at larged at least office every 12 frouts for each instrument. Were percent differences (%D) and relative response factors (RRF) within method criteria for all CWere all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF?	sion standard analyzed is (%D) and relative res	rat least offce every sponse factors (RRF teria of ∠25 %D and) within method criteri	was a continuing camplation standard analyzed at least office every 1∠ flours 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 ?	
) #	Date	Standard ID	Compound	Finding %D (Limit: <25.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
1	5/25/08	GICV 1844	77	81694.61		PS F09000-367	Jt/Adt
+			44	34. 4080		+411201/5	
+			Honanal	14.19276		1	7
+	SIMIOX	MICVIIOO	Todome Hank	OLhLh . %		0x-0a00 8/=1 x-1	1+ / A det
+			Nonana/	40.60652		+A11 water	
4	80/6/9	GCAL1940	EEEE	145. 7324/		F8 F09000-367	Jt/Adet
						4 A 1/ Soils	
	10/0/01	CHAI IGUIARA	Cumul		0.00019		14/11/14
	20/1/20	7717117171			77000.0	À	1
4	1.1101118	MCAL 72 69	77	Sanne SC		F 8/ F 130000-230	1+1/21.7
+	7		8	33.13188		+ A11 water	
			EEEE		0.00933		J/42/4
			Σ		91500	A	7
=	_		_	-			

LDC #: 19099A/

VALIDATION FINDINGS WORKSHEET

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".

| N/A | N/A | Was a method blank associated with every sample in this SDG?

Was a method blank analyzed at least once every 12 hours for each matrix and concentration?

Was there contamination in the method blanks? If yes, please see the qualifications below. Associated Samples: Conc. units: Mg/Ko Blank analysis date:

4//8//2

			ۆر د	Associated calliples.	pies.	11.	//		
S	Blank ID				Š	Sample Identification	tion	-	
	pot0383		6						
Methylene chloride	1:1		11/11						
Acetone,			,						
CROL									
TICs:		·							
Hexamethyl-cyclotrisiloxane								-	
Octamethyl-cyclotetrasiloxane									
			ż						
					-				
		•							
,									

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".

Field Blanks

VARIABILISM : HABINGS WOUNDINGS

Reviewer:____

7,10 / ORD L

©C∕\	AS VOA (EPA SW 846 Method 8260B) Were field blanks identified in this SDG?	thod 8260B) d in this SDG	č					
Blank units: 49/L Asso	Were target compounds detected in the field blanks? $4/L$ Associated sample units: $4/L$	etected in the le units: 109	field blanks?	(4	
Field blank type? (circle one) Field Blank / Rinsate / Trip Blank / Other:) Field Blank	/ Rinsate / Tří	p'Blank / Other:		Associated Samples:	9S:		l
Compound	Blank ID 6	Blank ID			Sample Id	Sample Identification		
	80/119		/					
Dich and me thank Methylene chloride	6.23		(
Acetone								
Chloroform	6.12		Nrs/85.0					
			-					

Blank units: vg/L Assor	ciated sampl	le units: 2	Blank units: $\frac{19}{16}$ Associated sample units: $\frac{45}{16}$ / Associated Samples: Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: $78 = 78 - 4$ Associated Samples:	(ND + 710x)
Compound	Blank ID [B] Blank ID	Blank ID	Sample Identification	
Control of the second of the s	ii I			
Dichlorome than C. Methylene chloride	6.29			
Acetone	0.85			
Chloroform	0.1/			
CROL				

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

1466061 LDC #: SDG #:

VALIDATION FINDINGS WORKSHEET Surrogate Spikes

ŏ 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". X 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+/P4eT	1+/Adet QUAL Zonly	5																
Limits)	(79-1157)	(5//-99)		()	()	()	()	()	((()	()	()	(()	()	()	(
%Recovery (Limits)	he/	11.7																	
Surrogate	BFB	BFB																	
Sample ID	F8F/40000-097	9																	
Date																			
#																			

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

LDC #: 19099A/ SDG #: LU COUR

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Page: /of / 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".

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

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? associated MS/MSD. Soil / Water. N/N/A

	0:0	0																					200	==
Qualifications	1:0 SW 7 4 MO OU	U'sw /	1 (a/sw /	7 1														TO THE PARTY OF TH	RPD (Water;	< 14%	A VI	A 45.	The second secon	701 V
Associated Samples	/#	1		7															QC Limits (Water)	61-145%	71-120%	76-127%	6.6%	5-130%
RPD (Limits)	()	()	(02) he	(02) 8/	()	``	()	()	()	()	()	()	()	()	()	()	()	()	RPD (Soll)	< 22%	< 24%	> 21%	2.24%	.2
MSD %R (Limits)	()	(QS/-KE) /S/	()	()	()	()	()	()	()	()	()	()	()	())		()	()	QC Limits (Soil)	36-172%	H. A.			
MS %R (Limits)	(Q51-0E) 251	()	()	()	()	(()	()	()	()	()	()	()	()	(()	() ·	()	ac tim	1-65				
Compound	$ \mathcal{Y} $	<u> </u>	EEEE	144															Compound					
ai asw/sw	5 × h																		Сом	1,1-Dichloroethene	Trichloroethene	Benzene	Toluene	Chlorobenzene
Date																				Ξ	Ś	>	00	90
*															<u> </u>	<u></u>							<u></u>	

SDG #: 17071/A/

VALIDATION FINDINGS WORKSTEEL Laboratory Control Samples (LCS)

rage: or 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".

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

	0.0																							1
Qualifications	no augina	7																						
Associated Samples	DR-00008/182	7																						
RPD (Limits))) ()	· ·	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()
LCSD %R (Limits)	()	()	· ·	(()	()	()	()	()	()	()	())	()		()	()	()	()	()	()	()	()	()
LCS %R (Limits)	111-82) 001	hd-hl , sel	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	())))))
Compound	N	ф																						
	d/5220-1651/8																							
Date																								
*																								

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

Collection Date:

June 4, 2008

LDC Report Date:

July 24, 2008

Matrix:

Soil

Parameters:

Semivolatiles

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8F050256

Sample Identification

TSB-FR-02-02-0'

TSB-FJ-02-02-0'

TSB-FJ-06-2-0'

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)	A
	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-FR-02-02-0'	Perylene-d12	83220 (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)	P.

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

No field duplicates were identified in this SDG.

BRC Tronox Parcel F Semivolatiles - Data Qualification Summary - SDG F8F050256

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Phthalic acid	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Phthalic acid n-(Hydroxymethyl)phthalimide	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Phthalic acid	J (all detects) UJ (all non-detects)	А	Continuing calibration (RRF)
F8F050256	TSB-FR-02-02-0'	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)	Р	Internal standards (area)

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

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

Labora	:19099A2 #:F8F050256 atory:_Test America	VALIDATIO		Level III	ESS W	VORKS	HEET	:	Date Page Reviewer 2nd Reviewer	7/20/0.
The sa	amples listed below were red validation findings work	reviewed for ea ksheets.	ch of the f	ollowing va	lidation	n areas. \	√alidation	findings	s are noted in	
	Validation A	rea	1		· · · · · · · · · · · · · · · · · · ·		Comme	<u>its</u>		
I.	Technical holding times		Δ	Sampling da	ates:	6/9	1/08			
II.	GC/MS Instrument performan	ce check	A	, , , , , , , , , , , , , , , , , , , ,			·			
111.	Initial calibration		SW	% P	\$ <i>P</i> ,	1	20.9	90		
IV.	Continuing calibration/ICV		SW							
V.	Blanks		\forall							
VI.	Surrogate spikes		Δ							
VII.	Matrix spike/Matrix spike dupl	icates	SW	TRX	-HR	- OY	1-0'M	Des		
VIII.	Laboratory control samples		A	LCS	>				, ,	
IX.	Regional Quality Assurance a	nd Quality Control	N							
X.	Internal standards		5W							
XI.	Target compound identificatio	n	N							
XII.	Compound quantitation/CRQL	.s	N						·	
XIII.	Tentatively identified compour	nds (TICs)	N							
XIV.	System performance		N							
XV.	Overall assessment of data		A							
XVI.	Field duplicates		N	n	D.	nsate			c d hos	20002
XVII.	Field blanks	· · · · · · · · · · · · · · · · · · ·	ND	R =	2 <i>M</i>	111411		SD	9 # F8F	00034
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Rin	o compound: sate eld blank	s detected	Т) = Duplica B = Trip bl B = Equipr				
/alidate	ed Samples: SOIL									
, [1	11 FX F0	60000	-/7 > 21	C/ / C	8173		31		
		12	60000	22	013	0112	•	32		
~		13		23				33		
		14		24		 		34		
5		15		25				35		

	0012						
1+	TSB-FR-02-02-0'	11	F8 F0 60000-173	21	815 8173	31	
2	TSB-FJ-02-02-0'	12	,	22		32	
3	TSB-FJ-06-2-0'	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

PRY

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-DinItrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene"
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene"	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
i. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	00. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	ກກກ
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	WW.
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.

SDG #: 10 14 %
METHOD:/GC/MS BNA (EPA SW 846 Method 8270)

TION FINDINGS WORKSHEET Initial Calibration

2nd Reviewer:

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

Did the laboratory conduct an acceptable 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?

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

Y N N/A

Qualifications Associated Samples 868000 Finding RRF (Limit: >0.05) Finding %RSD (Limit: <30.0%) Phthalic Compound SPEC Standard ID KICA L 89/*ኩ/*ን Date

1000 LDC #. 1909A7 SDG #:

VALIDATION FINDINGS WORKSHEET

Continuing Calibration

Page: / of / 2nd Reviewer: Reviewer:

> x270C , 8,27*0* METHOD: GC/MS_V/OA (EPA SW 846 Method 8269B)

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

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?

Qualifications (2) **Associated Samples** Finding RRF (Limit: >0.05) 0.01186 46. 18722 Jas 4 8-85 Finding %D (Limit: <25.0%) N-(Hydroxymethyl) Phthalic Aud Compound KCAL 5872 Standard ID 80/21/9

1909947 LDC #: SDG #:

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

2nd Reviewer: 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".

| N/A 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?

Qualifications	NO QUITE	-															
Associated Samples	· ow			-													
RPD (Limits)	106 128	()		(()	()	()		()	()		()	()	()	()	0	,
MSD %R (Umits)	17 (48-104)	()	()	(')	(()	()	()		()	()	()	()	()	()	· ·	
MS %R (Limits)	23 (45-104)	(')	()	()	()	()	()	()	()	()	()	()	()	()	()	()	<u> </u>
Compound	444													·			
MS/MSD ID		MSID											-				
Date												-					
ノ*																	

		QC Limits	RPD	QC Limits	RPD			QC Limits	RPD	QC Limits	RPD
	Compound	(Soil)	(Soil)	(Water)	(Water)		Compound	(Soil)	(Soll)	(Water)	(Water)
Ϋ́	Phenol	26-90%	≥ 35%	12-110%	< 42%	GG.	Acenaphthene	31-137%	≥ 19%	46-118%	≥ 31%
ΰ	2-Chlorophenol	25-102%	%0⊊ ⋝	27-123%	< 40%	=:	4-Nitrophenol	11-114%	≥ 50%	10-80%	%05 ≥
ші	1,4-Dichlorobenzene	28-104%	< 27%	. 36-97%	< 28%	축	2,4-Dinitratoluene	28-89%	< 47%	24-96%	≥ 38%
٦	N-Nitroso-di-n-propylamine	41-126%	%8€ >	41-116%	≥ 38%	Ë	Pentachlorophenol	17-109%	≥ 47%	9-103%	%05 >
œ	1,2,4-Trichlorobenzene	38-107%	%& ⋝	39-98%	< 28%	77	Pyrene	35-142%	%9€ ⋝	26-127%	< 31%
۸.	4-Chloro-3-methylphenol	26-103%	%દ€ ⋝	23-97%	< 42%						

SDG #: 19099 K2

VALIDATION FINDINGS WORKSHEET Internal Standards

2nd Reviewer:

Reviewer:

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

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

929 Qualifications RT (Limits) 270174-108/1696 Area (Limits) 832201 RET PRY Internal Standard Sample ID Date *

IS1 (DCB) = 1,4-Dichlorobenzene-d4 IS2 (NPT) = Naphthalene-d8 IS3 (ANT) = Acenaphthene-d10 * QC limits are advisory

IS4 (PHN) = Phenanthrene-d10 IS5 (CRY) = Chrysene-d12 IS6 (PRY) = Perylene-d12

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

Collection Date:

June 4, 2008

LDC Report Date:

July 24, 2008

Matrix:

Soil

Parameters:

Chlorinated Pesticides

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8F050256

Sample Identification

TSB-FR-02-02-0'

TSB-FR-02-02-0'DL

TSB-FJ-02-02-0'

TSB-FJ-02-02-0'DL

TSB-FJ-06-2-0'

TSB-FJ-06-2-0'DL

Introduction

This data review covers 6 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081A for Chlorinated Pesticides.

This review follows 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-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0' F8F060000-174	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. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-FJ-06-2-0'	Not specified	Decachlorobiphenyl	160 (63-117)	All TCL compounds	J+ (all detects)	А

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

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-FR-02-02-0'	4,4'-DDT	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	А
TSB-FJ-06-2-0'	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
TSB-FJ-02-02-0'	beta-BHC 4,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	А

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	% D	Flag	A or P
TSB-FR-02-02-0'	2,4'-DDE	81.7	J (all detects)	Α
TSB-FJ-06-2-0'	4,4'-DDT	218.5	J (all detects)	А

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

No field duplicates were identified in this SDG.

BRC Tronox Parcel F Chlorinated Pesticides - Data Qualification Summary - SDG F8F050256

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	gamma-BHC Endosulfan I Dieldrin 4,4'-DDD Endosulfan II Methoxychlor Endosulfan sulfate Endrin ketone	J+ (all detects)	A	Continuing calibration (%D)
F8F050256	TSB-FJ-06-2-0'	All TCL compounds	J+ (all detects)	А	Surrogate recovery (%R)
F8F050256	TSB-FR-02-02-0'	4,4'-DDT	J (all detects)	А	Compound quantitation and CRQLs
F8F050256	TSB-FJ-06-2-0'	beta-BHC	J (all detects)	А	Compound quantitation and CRQLs
F8F050256	TSB-FJ-02-02-0'	beta-BHC 4,4'-DDE	J (all detects) J (all detects)	А	Compound quantitation and CRQLs
F8F050256	TSB-FR-02-02-0'	2,4'-DDE	J (all detects)	А	Compound quantitation and CRQLs (%D)
F8F050256	TSB-FJ-06-2-0'	4,4'-DDT	J (all detects)	А	Compound quantitation and CRQLs (%D)

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

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

SDG # _abora	:19099A3a t:F8F050256 atory:_Test America OD: GC Chlorinated Pe		····		Level III		RKSHEE	ĒΤ	Date: 7/2/ Page: / of / Reviewer: 7/2/ 2nd Reviewer: 7/2/
The sa		revi					reas. Valida	ation find	ings are noted in attached
	Validation	Area					Con	nments	
I.	Technical holding times			Δ	Sampling	dates:	6/4/0	<i>s</i>	
II.	GC/ECD Instrument Perforn	nance	Check	Δ					
Ш.	Initial calibration			Δ					
IV.	Continuing calibration/ICV			رىسى	10	V = 1	5		
V.	Blanks			Д					
VI.	Surrogate spikes			Sw/					
VII.	Matrix spike/Matrix spike du	plicate	s	$\&\omega$	TR.	X-HR -	-04-0	<i>'</i>	
VIII.	Laboratory control samples			A	LC	ふ			
IX.	Regional quality assurance	and qu	ality control	N					
Xa.	Florisil cartridge check			N					
Xb.	GPC Calibration			N					
Xł.	Target compound identificat	ion		N					
XII.	Compound quantitation and	report	ed CRQLs	s\W					
XIII.	Overall assessment of data			A	•				
XIV.	Field duplicates			\mathcal{N}					
XV.	Field blanks			NO	R=	Rinsai	te /	SD4 ;	# P8F050x6
lote: /alidate	A = Acceptable N = Not provided/applicable SW = See worksheet d Samples:		R = Rins	o compounds sate eld blank	detected	TB =	Ouplicate Trip blank Equipment b	olank	
	SOIL				<u> </u>			T. I	· · · · · · · · · · · · · · · · · · ·
	FSB-FR-02-02-0' 5#	1			21			31	
	TSB-FR-02-02-0'DL				22			32	
	「SB-FJ-02-02-0' ' / メ・ b 「SB-FJ-02-02-0'DL ***	13			23 24			33	
		14			25			34	
	「SB-FJ-06-2-0' 、 」 B 「SB-FJ-06-2-0'DL	15			26			35	
	F8 F04 00 00-174	16 17	815817	 1 ט	27		·	36 37	
8	-, -4 00-0 1//	18	.84,		28			38	

VALIDATION FINDINGS WORKSHEET

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

		.00		HH.		=	•		11,		7.7			1,1			MM.		NN.
	Y. Aroclor-1242			4. Aroclor-1248		AA. Aroclor-1254		BB Amelian 1999	0871-1030-1-1		CC. DB 608		200 PB 425.	1071 82:52		EE.			r.
Q. Endrin heters			K. Endrin aldehyde		S. alpha-Chlordana		Tomas	. Kaninga-Cujordane		U. Toxaphene			V. Aroclor-1016		W. Araclar-1221			X. Aroclor-1232	
1. Dieldrin		J. 4,4*.DDE		7			L. Endosulfan II		M. 4.4".DDD			N. Endosulfan sulfate			O. 4,4-DDT		P. Methoxychlor		
∕- alpha-BHC	B. bets.BHC			C. delta-BHC		D. gamma-BHC			E. Heptachlor		F. Aldrin			G. Heptachlor epoxide		i i	n. Endosulan I		

C:\docs\Work\Pesilcides\COMPLST-3S.wpd

Notes:

LDC #: 190997732 200 2 SDG #:

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Reviewer:

2nd Reviewer:

METHOD: /GC_ HPLC

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? — "AD or ___ RPD

Were continuing calibration standards analyzed at the required frequencies?

MANA ___ Did the continuing calibration standards meet the "MO / RPD validation criteria of <15.0%?

Were the retention times for all calibrated compounds within their respective acceptance windows? evel 1X On I

Qualifications	1+/Adet							→											
Associated Samples	F8 F060000 -174	1, 3, 5						\											
RT (limit)	()	()	(()	(()	()	()	((((((()	(
%D / RPD (Limit ≤ 15.0)	#-51	15.60	2:31	6.91	7.91	1.51	1.21	16.4	,										
Compound	d	17	Z	W	7	d	N.	4											
Detector/ Column	ch A																		
Standard ID	KeA1892																		
# Date	80/81/2																		

19099432 SDG #: 1909

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

2nd Reviewer:

Page: Reviewer:_

METHOD: __GG __ HPLC
Are surrogates required by the method? Yes__

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

Sample ID	Col	ector/ lumn	Surrogate Compound		%R (Limits)				Qualifications
21 XX	notsp	la, ping	χ			55	- //5	9 53	1
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* 5		<i>*</i>	Φ		160	63	-117	1/+1	A det
N 6		7	>) 00	5.5	(23//	e an	fun
			(Φ		OO	63,	177		7
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Surrogate Compou	pur	Surroga	ite Compound		Surrogate Compound		Surrogate (Sompound	
Chlorobenzene (CB2	S) C	_	acosane	Σ	Benzo(e)Pyrene	S	1-Chloro-3-h	Vitrobenzene	Y Tetrachloro-m- xylene
4-Bromofluorobenzene (I	ВFВ) н		o-Terphenyl	z	Terphenyl-D14	1	3,4-Dinitr	otoluene	
a,a,a-Trifluorotoluene	- -	Fluorot	penzene (FBZ)	0	Decachlorobiphenyl (DCB)	n	Triper	ıtyltin	=
Bromochlorobenene	7	I-u	riacontane	Ъ	1-methylnaohthalene	^	Trl-n-pr	opyltin	
1,4-Dichlorobutane	¥	Ţ	xacosane	σ	Dichlorophenyl Acetic Acid (DCAA)	3	Tributyl P.	hosphate	
1.4-Difluorobenzene (D.	FB) L	Broc	nobenzene	œ	4-Nitropheno!	X	Triphenyl F	hosphate	
	Sample ID X C X C Surrogate Compor Chlorobenzene (CBZ 4-Bromoffluorobenzene (CBZ 4-Bromoffluorobenzene (ABZ 1.4-Dicthorobenzene (DBZ 1.4-Dicthorobenzene (DBZ 1.4-Dicthorobenzene (DBZ 1.4-Dicthorobenzene (DBZ	2 not for month of the compound compound compound compound control (CB2)	Column Column Column Specific Column	Column C	Surrogate Column Column Compound Column Compound Compound Surrogate Compound Compound Compound Compoun	Detector Surrogate Column Compound	Defector Surrogate Surrogate Collimits	Detector Surrogate Surrogate SS - 1	Defector Surrogate SyR (Limits PO (6.3 - 1/7) PO PO PO PO PO PO PO

LDC #: (9099 A34 12 002 SDG#

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

2nd Reviewer: Page: Reviewer:_

Y N/A

МЕТНОD: ____Gc__ HPLC Prease 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?

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? X N N N

Qualifications	ang on	/																							
Associated Samples	rar																								
RPD (Limits)	were)	()		()	()	()	()	()	()	()	()	()	()	()	()	()	()		()	()	()	()	()	()	
MSD %R (Limits)	J889% + 8%	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()		()	()	()	()	()	()	
MS %R (Limits)	Com pounds	outsials and	()	()	()	()	()	()	()	()	()		()	()	()	()) (()	()	()			()	
Compound	feuer																								
di dsw/sw	178X-#13-04-0	0/sw																							

LDC# 1909913a SDG# Lu cons

VALIDATION FINDINGS WORKSHEET Compound Quantitation and Reported CRQLs

METHOD: __GC__ HPLC

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

Level M/D Only
Y N/N/A V

Did the reported results for detected target compounds agree within 10.0% of the recalculated results? Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

#	Compound Name	Finding	Associated Samples	Qualifications
	ф	exceeded cal Pange	- X	1/A ex
	В	*	X	1/4 bt
		,		
	(B , J	A	 	J /B det
	1			

Comments: See sample calculation verification worksheet for recalculations

1DC# 19099A32 SDG# 44 cons

VALIDATION FINDINGS WORKSHEET Compound Quantitation and Reported CRQLs

Page: Of Z Reviewer: 2nd Reviewer:

METHOD: GC HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Level [X/D,Only

Y N N/A
Y N/ N/A

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.? Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

			 	 _		 	 	 	 	
Compound Name Finding 40 2, 4'-00E 81.7 81.7 Ending 40 2, 4'-00E 1, 4'-00E	Qualifications	J/A det			1/Aut					
Compound Name 2, 4' - ODE 4 5 (44'-	Associated Samples	/			2					
Compound Name 2, 4, - DDE # 5	% D Act. A column Finding - 40	2/.7			5,8/6					1,00 -1+2 ear (300-
*	Compound Name	300 -, h't			Ф					# S (42)
<u> </u>	#									

Comments: See sample calculation verification worksheet for recalculations

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

Collection Date:

June 4, 2008

LDC Report Date:

July 24, 2008

Matrix:

Soil

Parameters:

Polychlorinated Biphenyls

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8F050256

Sample Identification

TSB-FR-02-02-0'

TSB-FJ-02-02-0'

TSB-FJ-06-2-0'

TSB-FR-02-02-0'MS

TSB-FR-02-02-0'MSD

Introduction

This data review covers 5 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 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 with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-FR-02-02-0'	Not specified	Decachlorobiphenyl	185 (51-150)	All TCL compounds	J+ (all detects)	Р

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-FJ-06-2-0'	Not specified	Decachlorobiphenyl	189 (51-150)	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 within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Affected Compound	Flag	A or P
TSB-FR-02-02-0'MS/MSD (TSB-FR-02-02-0')	Aroclor-1260	457 (39-150)	-	·	Aroclor-1242 Aroclor-1248 Aroclor-1254 Aroclor-1260	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	А

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. 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

No field duplicates were identified in this SDG.

BRC Tronox Parcel F Polychlorinated Biphenyls - Data Qualification Summary - SDG F8F050256

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-FR-02-02-0' TSB-FJ-06-2-0'	All TCL compounds	J+ (all detects)	Р	Surrogate recovery (%R)
F8F050256	TSB-FR-02-02-0'	Aroclor-1242 Aroclor-1248 Aroclor-1254 Aroclor-1260	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	А	Matrix spike/Matrix spike duplicates (%R)

BRC Tronox Parcel F

Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG F8F050256

No Sample Data Qualified in this SDG

BRC Tronox Parcel F

Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG F8F050256

No Sample Data Qualified in this SDG

_DC #: <u>19099A3b</u>	VALIDATION COMPLETENESS WORKSHEET
SDG #: <u>F8F050256</u>	Level III
_aboratory: <u>Test America</u>	

Date: 7/20/08
Page: <u>/</u> of <u>/</u>
Reviewer:
2nd Reviewer:
L.

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

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

	Validation Area		Comments
l.	Technical holding times	Δ	Sampling dates: 6/4/0 ¥
11.	GC/ECD Instrument Performance Check	Α	1 '
111.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	101 £ 15
V.	Blanks	Δ	
VI.	Surrogate spikes	یسی	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	Δ	ies/P
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	Δ	
XIV.	Field duplicates	N,	
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:

	S	216				
1/	TSB-FR-02-02-0'	11		21	31	
2/	TSB-FJ-02-02-0'	12		22	32	
3 2	TSB-FJ-06-2-0'	13		23	33	
4 /	TSB-FR-02-02-0'MS	14		24	34	
5 /	TSB-FR-02-02-0'MSD	15		25	35	
6		16		26	36	
7	FX090000-208	17	6161208	27	37	
8	F8090000-208	18	8/63/35	28	38	
9		19		29	39	
10		20		30	40	

VALIDATION FINDINGS WORKSHEET

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

			.00		H.	-				77			KK.					MM.		22	
		Y. Aroclor-1242	!	7 4	4. Afocior-1248		AA. Aroclor-1254		000	BB. Aroclor-1260		CC. DR 608			DD. DB 1701		u u			ir.	-
	O. Fodder Voices			R. Endrin aldehyde		S. aloha-Chioda			T. gamma-Chlordane			O. Loxaphene		V. Aroclor-1016			W. Aroclor-1221		X. Aroclor-1232	777	
	I. Dieldrin		J. 4,4"-DDE	•		K. Endrin		L. Endosulfan II			M. 4,4*-DDD			N. Endosulfan sulfate		O. 4,4*-DDT			P. Methoxychior		
A state said	A alpha-BHC				C. delta-BHC			C. gamma-BHC		E. Heptachior			F. Aldrin		G Hariage	C. Heptachior epoxide		H. Endosulfan i			

C:\docs\Work\Pesticides\COMPLST-3S.wpd

Notes:

LDC #: 1909773 b SDG #: 12 Cm

VALIDATION FINDINDS WORKSHEET

Surrogate Recovery

Reviewer: Page:

> METHOD: ___GC __ HPLC
> Are surrogates required by the method? Yes__ METHOD:

Are surrogates required by the method? Yes____ or No____.
Agase see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Did all surrogate recoveries (%R) meet the QC limits? Were surrogates spiked into all samples and blanks? A/Z

Tetrachloro-m- xylene Qualifications Surrogate Compound 1-Chloro-3-Nitrobenzene Tributyl Phosphate 3,4-Dinitrotoluene Tri-n-propyltin Tripentyltin \supset ₹ %R (Limits) Dichlorophenyl Acetic Acid (DCAA) Surrogate Compound Decachlorobiphenyl (DCB) 1-methylnaphthalene Benzo(e)Pyrene Terphenyl-D14 189 78 0 O Σ z ۵ Surrogate Compound Surrogate Compound OCB Fluorobenzene (FBZ) Ortho-Terphenyl n-Triacontane Hexacosane Octacosane Specified Detector/ Column τ ഗ 400 4-Bromofluorobenzene (BFB) Surrogate Compound Chlorobenzene (CBZ) a,a,a-Trifluorotoluene Bromochlorobenene 1,4-Dichlorobutane Sample ID 3

Bromobenzene

1.4-Difluorobenzene (DFB)

Le cons 98466061 SDG#: LDC #:

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Page: Reviewer: 2nd Reviewer:_

 METHOD:
 GC
 HPLC

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

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

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

 N N/A

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?

#	MS/MSD ID	Compound	MS %R (Limits)	s mits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	445	88	Lsh	as1-68)) () # /	1+/Adt
	•		, ,	()))	0	0496 Y. Z,
				())		AA, BB
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

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-FR-02-02-0' TSB-FJ-02-02-0'

TSB-FJ-06-2-0'

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 with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
6/21/08	CCV (18:57)	Platinum	111.1 (85-115)	TSB-FJ-06-2-0'	J (all 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 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
ІСВ/ССВ	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-FR-02-02-0'	Tungsten	0.79 mg/Kg	0.10U mg/Kg
TSB-FJ-02-02-0'	Cadmium	0.093 mg/Kg	0.10U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FJ-06-2-0'	Antimony	0.22 mg/Kg	1.0U mg/Kg
	Tungsten	0.97 mg/Kg	1.0U 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) - - - - - - 66.6 (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)	-	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)	А
TRX-HR-04-0' (All samples in SDG F8F050256)	Strontium	20.7	-	-	J- (all detects) R (all non-detects)	A

VI. Duplicate Sample Analysis

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

VII. Laboratory Control Samples (LCS)

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

VIII. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

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

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

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

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

XIII. Field Duplicates

No field duplicates were identified in this SDG.

BRC Tronox Parcel F Metals - Data Qualification Summary - SDG F8F050256

SDG	Sample	Analyte	Flag	A or P	Reason
F8F050256	TSB-FJ-06-2-0'	Platinum	J (all detects)	Р	Calibration (%R)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Sulfur Antimony Barium Chromium Cobalt Copper Nickel Niobium Potassium Selenium Tungsten Vanadium Zirconium	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	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-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Silicon Phosphorus	J+ (all detects) J+ (all detects)	А	Matrix spike/Matrix spike duplicates (%R)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Strontium	J- (all detects) R (all non-detects)	А	Matrix spike/Matrix spike duplicates (%R)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Iron Strontium	J (all detects) J (all detects)	А	ICP serial dilution (%D)

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

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8F050256	TSB-FR-02-02-0'	Tungsten	0.10U mg/Kg	Α
F8F050256	TSB-FJ-02-02-0'	Cadmium	0.10U mg/Kg	Α
F8F050256	TSB-FJ-06-2-0'	Antimony Tungsten	1.0U mg/Kg 1.0U mg/Kg	Α

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

No Sample Data Qualified in this SDG

SDG#	t: 19099A4 t: F8F050256 atory: Test America	_ VALII 	OITAC		LETEN Level III	ESS WORKS	SHEET	Date: <u>7 / ▽ /</u> Page: <u>(</u> of <u>/</u> Reviewer: 艸ᄊ
METH	IOD: Metals (EPA SW	846 Metho	od 6020/	6010B/700	00)			2nd Reviewer:
The sa		ere reviewe				alidation areas.	Validation findi	ngs are noted in attached
	Validatio	n Area	- ":				Comments	
I.	Technical holding times			A	Sampling o	lates: 6/4/08	?	
II.	Calibration			SWX-				
III.	Blanks			SW				
IV.	ICP Interference Check S	ample (ICS)	Analysis	A				
V.	Matrix Spike Analysis			5W	> ms	1 Man		
VI.	Duplicate Sample Analysi	s		N	, , , , , ,			
VII.	Laboratory Control Samp	les (LCS)		4	Les			
VIII.	Internal Standard (ICP-MS	S)		N	wt	bu'enad		
IX.	Furnace Atomic Absorption	on QC		N	N.+	whiligs.		
X.	ICP Serial Dilution			5W		<u> </u>		
XI.	Sample Result Verificatio	n		N				
XII.	Overall Assessment of Da	ata		A				
XIII.	Field Duplicates			N				
XIV.	Field Blanks			P				
Note:	A = Acceptable N = Not provided/applical SW = See worksheet	ole	R = Rin	o compounds sate eld blank	s detected	D = Duplica TB = Trip b EB = Equip	lank	
√alidate	ed Samples:	· · · · · · · · · · · · · · · · · · ·						
1	TSB-FR-02-02-0'	11			21		31	
2	TSB-FJ-02-02-0'	12			22		32	
3	TSB-FJ-06-2-0'	13	**************************************		23		33	
4	PB	14			24		34	
5		15			25		35	
6		16			26		36	
7		17			27		37	
8		18			28		38	
9		19			29		39	
10		20			30		40	**************************************
Notes:								

LDC #: 1 gog g f y SDG #: Sel cover

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	<u> </u>
Reviewer:_	mul
2nd reviewer:_	L
_	<u> </u>

All circled elements are applicable to each sample.

IT TO THE		
Sample ID	Matrix	Target Analyte List (TAL)
(-3	305	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,
1-3	50,	(Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, <i>Zr.</i>)
	_	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,
		Analysis Method
СР		(Li.s.)
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	1	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Zr
GEAA		Al Sh As Ba Be Cd Ca Cr Co Cu Fe Ph 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

SDG #: LDC #:

VALIDATION FINDINGS WORKSHEET Calibration

2nd Reviewer: Reviewer: Page:

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

Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

| N | N/A | Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
| N | N/A | Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 9

120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Was a midrange cyanide standard distilled? Y N M/A

Are all correlation coefficients >0.995?

Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

. [
*	Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data
	9	(65:8)) 100	す	(` 1)	3	J-1776
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5	- SI IDIII 187					

LDC #: <u>19099A4</u> SDG #: <u>See Cover</u> METHOD: Trace Metals (EPA SW 846 N

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

Page: of Reviewer:

			T		T					Ī		Ī	1			Ī		T	
																			Ī
										,		-							
																			-
tification												-							
Sample Identification																			
														-					
	3	0.22 / 1.0				0.97 / 1.0													
	2	0			0.093 / 0.10	0													
	-				0	0.79 / 1.0													
	Blank Action I imit																		
	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	Sp	As	Ba	පු	>	>												

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.

see contr LDC #: 19 095 A 4

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

Page: of 2 2nd Reviewer:_ Reviewer:

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". $\overline{\text{MNNA}}$ Was a matrix spike analyzed for each matrix in this SDG?

Y DON/A

Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor

of 4 or more, no action was taken. Were all duplicate samples and \leq 35% for soil samples?

YN N/A We LEVEL JV ONLY:

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

#	QI QSW/SW	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	芦	(105	5	9218			<u> </u>	J-/41/4
<u> </u>			Sb	41,7	6.95			
			Ba	9,00				
			Z	92.0				
			<i>P</i> 92	η2,4				
			75	ب.° را				À
Ц			Αğ.	43,12	144,7			0/tm/D
<u></u>			ร [ั] ก	69,3	lias			J-/45/4
<u> </u>			q_N	44.1	,			
<u> </u>			У	59.F				
			φÇ	741				7
<u></u>			(15	9/122	336.9			7+17 to
			۸5	16,00				J-/R/A
Ш			<u>.</u> ک	63.17				J-/41/A
<u></u>			>	8.0%				->
<u> </u>			42	53.0	9-16)			4/5W/D
<u> </u>			イチ	8×25	9.99			J-/42/4
	-		Δ.		12812		ľ.	なながる
ပိ	Comments: A C	Ca. Fe	Mn Na	ンサ×、」				
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Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

Page: 2 of L Reviewer: 2nd Reviewer:

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

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

| Y/N | N/A | Was a matrix spike analyzed for each matrix in this SDG?
| Y/N | N/A | Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor

of 4 or more, no action was taken.

Were all dupiicate sample relative percent differences (RPD) \leq 20% for water samples and \leq 35% for soil samples? X (V)

Y N NA W

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

*	OI OSM/SM	Matrix	Analyte	MS *Recovery	MSD %Recovery	RPD (Limites)	Associated Samples	Qualifications
7	F	L	ت			かな	A1)	No que (LCS72~)
<u> </u>	1		46			6/14		,
<u> </u>			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			ኦሢሳ		
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<u> </u>			-f			23,7		
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(9999AY LDC#: SDG #:

VALIDATION FINDINGS WORKSHEET ICP Serial Dilution

Page: Reviewer: 2nd 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

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	747													
Associated Samples	P	7												
%D (I imits)	14.3	カニ												
Analyte	T,E	Sr												
Matrix	Sor													
Diluted Sample ID	[RX-HR-04-01													
Date														
#	_					<u> </u>								

Comments:

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

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-FR-02-02-0'

TSB-FJ-02-02-0'

TSB-FJ-06-2-0'

TSB-FR-02-02-0'DUP

Introduction

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

No field duplicates were identified in this SDG.

BRC Tronox Parcel F Wet Chemistry - Data Qualification Summary - SDG F8F050256

SDG	Sample	Analyte	Flag	A or P	Reason
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Chlorate	J (all detects) UJ (all non-detects)	Р	Calibration

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

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

SDG # _abora METH Metho The sa	d 300.0), O & G (EPA	SW846 I	Method 90	e, Chloride 71B)		·		Date: 7/00/00 Page:of Reviewer: 2nd Reviewer: nosphate-P, Sulfate (EPA
	Validatio	n Area					Comments	
1.	Technical holding times			A	Sampling da			
lla.	Initial calibration			A	,			
IIb.	Calibration verification			sw/			,	
III.	Blanks			A				
IV	Matrix Spike/Matrix Spike	Duplicates	3	Δ) M	5/1 wx	,	
V	Duplicates			A	7	/ - /		
VI.	Laboratory control sample	es		A	LUS			
VII.	Sample result verification			N				
VIII.	Overall assessment of da			A				
IX.	Field duplicates			N				
X	Field blanks	-		N				
Note: /alidate	A = Acceptable N = Not provided/applica SW = See worksheet ed Samples: 5 1	ble	R = Rin	o compounds sate eld blank	s detected	D = Duplicate TB = Trip bla EB = Equipm	nk	
1	TSB-FR-02-02-0'	11			21		31	
	TSB-FJ-02-02-0'	12			22		32	
	TSB-FJ-06-2-0'	13			23		33	
	TSB-FR-02-02-0'DUP	14			24		34	
5	MB	15			25		35	
6		16			26		36	
7		17			27		37	
8		18			28		38	
9		19			29		39	
10		20			30		40	

LDC #: (9099 Ab SDG #: Sel com

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: __of _/ Reviewer: _____ 2nd reviewer: _____

All circled methods are applicable to each sample.

Sample ID	<u>Matrix</u>	Parameter
[-3	Spr	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
m4	501	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
		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:

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(9	SDG #:

VALIDATION FINDINGS WORKSHEET

Calibration

o	<u>}</u>	A
Page:	Reviewer:	2nd Reviewer:

METHOD: Inorganics, EPA Method

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

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

Note all correlation coefficients >0.995?

LEVEL IV/D ONLY:

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 M N N N/A

<u> </u>	*	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications	
<u></u>	╟	8-141/9	No cc/s	6002		Ąį	7 /zv/7	T T
<u>L</u>	_			(death)				
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3	Comments:	nis:						1

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

Collection Date:

June 4, 2008

LDC Report Date:

July 24, 2008

Matrix:

Soil

Parameters:

Gasoline Range Organics

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8F050256

Sample Identification

TSB-FR-02-02-0'

TSB-FJ-02-02-0'

TSB-FJ-06-2-0'

TSB-FR-02-02-0'MS

TSB-FR-02-02-0'MSD

Introduction

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

The following are definitions of the data qualifiers:

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

- 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

No field duplicates were identified in this SDG.

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

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

LDC #: 19099A7	VALIDATION COMPLETENESS WORKSHEET
SDG #: F8F050256	Level III
Laboratory: Test America	
-	

Date: 7/20/0 \rangle
Page: / of/
Reviewer: 7
2nd Reviewer: 4

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

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

	Validation Area		Comments
l.	Technical holding times	Д	Sampling dates: 6/4/0 ¥
lla.	Initial calibration	Δ	, ,
IIb.	Calibration verification/ICV	A	1cv ≤ 15
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	Α	
IVc.	Laboratory control samples	A	LCS 11)
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N_	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

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

Valida	ated Samples: S	012				
1	TSB-FR-02-02-0'	11		21	31	
2	TSB-FJ-02-02-0'	12		22	32	
3	TSB-FJ-06-2-0'	13		23	33	
4	TSB-FR-02-02-0'MS	14		24	34	
5	TSB-FR-02-02-0'MSD	15		25	35	
6		16		26	36	
7		17	8164169	27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	

Notes:				

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

Collection Date:

June 4, 2008

LDC Report Date:

July 24, 2008

Matrix:

Soil

Parameters:

Diesel Range Organics

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8F050256

Sample Identification

TSB-FR-02-02-0' TSB-FJ-02-02-0'

TSB-FJ-06-2-0'

TSB-FR-02-02-0'MS

TSB-FR-02-02-0'MSD

Introduction

This data review covers 5 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 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. 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. Although the MS/MSD percent recovery (%R) was not within QC limits for one compound, the LCS percent recovery (%R) was within QC limits and 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

No field duplicates were identified in this SDG.

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

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

SDG # Labora	#: 19099A8 #: F8F050256 atory: Test America	_	LIDATION	L	Leve	el III		≀KSHEET		Date: 7/20/ Page: /of / Reviewer: /5/ 2nd Reviewer:
The sa	HOD: GC Diesel Range C amples listed below were tion findings worksheets.	e revie	•					as. Validatio	on find	lings are noted in attached
	Validation	Area						Comm	nents_	
I.	Technical holding times			Δ	Samr	pling da	ates:	6/4/07	<u>/</u>	
lla.	Initial calibration			Δ				<u> </u>		
Ilb.	Calibration verification/ICV			A		Icv	1 = 15			
III.	Blanks			A						
IVa.	Surrogate recovery			A	<u> </u>					
IVb.	Matrix spike/Matrix spike dup	plicate	s	5W	<u> </u>					
IVc.	Laboratory control samples			A	L'	دے				
V.	Target compound identificati	ion		N						
VI.	Compound Quantitation and	I CRQI	_s	N	<u> </u>					
VII.	System Performance			N						
VIII.	Overall assessment of data			Δ.						
IX.	Field duplicates			<i>N</i>						
X.	Field blanks			N				Manual VIII		
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		= Rinsate	o compounds eld blank	s detec		3 = Trip blank	Ouplicate Equipment blar	ık 	
III I	TSB-FR-02-02-0'	11	8-16-12			21			31	
4.	TSB-FJ-02-02-0'	12	<u> </u>	70000 - 8			816126	 o 7	32	
4	TSB-FJ-06-2-0'	13				23			33	
	TSB-FR-02-02-0'MS	14				24	l		34	
	TSB-FR-02-02-0'MSD	15				25			35	
		10				100			26	

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Notes:_

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406	ee
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LDC 3	SDG

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

Page: Reviewer: 2nd Reviewer:

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

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

METHOD:

		-	==	_	_		_	_		-			_						_			_				=
Ouslifications	1, 201 /4,0 00																									
Associated Samples	# /	7.4																								
RPD (Limits)			()	()	())	()	()	()	()	()	()		()	()	()	()	()		()	()	()	()	()	()	
MSD %R (Limits)	11/ (55-1/11/		()		()	()	(()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	
MS %R (Limits)	1110 55-104		()		()	()	()	(()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	,
Compound	080																									
MS/MSD ID	9+7																									
) #																										

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

Collection Date:

June 4, 2008

LDC Report Date:

July 24, 2008

Matrix:

Soil

Parameters:

Polynuclear Aromatic Hydrocarbons

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): F8F050256

Sample Identification

TSB-FR-02-02-0'

TSB-FJ-02-02-0'

TSB-FJ-06-2-0'

TSB-FR-02-02-0'MS

TSB-FR-02-02-0'MSD

Introduction

This data review covers 5 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 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)	A

III. Blanks

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

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

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

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Although the MS/MSD percent recoveries (%R) and relative percent differences (RPD) were not within QC limits for some compounds, the LCS percent recoveries (%R) were within QC limits and 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

No field duplicates were identified in this SDG.

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

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Benzo(a)anthracene Benzo(k)fluoranthene	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	Benzo(k)fluoranthene	J+ (all detects)	А	Continuing calibration (ICV %D)

BRC Tronox Parcel F

Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG F8F050256

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

Laboi METI The s	#: F8F050256 ratory: Test America HOD: GC Polynuclear	Aromati	c Hydrocark	oons (EPA	Level III A SW 846	Method 83			Date: 1/20 Page:of/ Reviewer: 2nd Reviewer: ings are noted in attached
	Validatio					 	Com	ments	
1.	Technical holding times			Δ	Sampling of	ates:	6/4/02	_	
lla.	Initial calibration			Δ			/ /		
llb.	Calibration verification/IC	.v		SIN	ICV	£ / S	-		
III.	Blanks			A					
IVa.	Surrogate recovery			A					
IVb.	Matrix spike/Matrix spike	duplicate	s	500					
IVc.	Laboratory control sample	les		A	165				
V.	Target compound identifi	ication		N					
VI.	Compound Quantitation	and CRQ	Ls	N					
VII.	System Performance			N					
VIII.	Overall assessment of da	ata		4					
IX.	Field duplicates			N.					
X.	Field blanks			N N					
Note:	A = Acceptable N = Not provided/applica SW = See worksheet	able	R = Rin	o compound sate eld blank	ls detected	TB =	Duplicate Trip blank Equipment bl	ank	
Validat	ted Samples:								
<i>†1</i>	TSB-FR-02-02-0'	11	F8F09	0000-	209 21	8/6/2	.09	31	
2/	TSB-FJ-02-02-0'	12			22		, , , , , , , , , , , , , , , , , , ,	32	
1 /3	TSB-FJ-06-2-0'	13			23			33	
4	TSB-FR-02-02-0'MS	14			24			34	
5	TSB-FR-02-02-0'MSD	15			25			35	
6		16			26			36	
7		17	81612	08	27			37	
8		18			28			38	
6 7 8 9		19			29			39	
10		20			30			40	

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: GC HPLC

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	7
B. Acenaphthylene	B. RDX	B 24.DB	D Martin		v. Delizene
C. Anthracene	1 2 K + 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		b. Mevinphos	W. Bolstar	CC. Toluene
	C. 1,3,3-1 mitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP.Xvlene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xvlene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	1. 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. Prowl	
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. Sulprofos	·
O. Phenanthrene	o.		O. Chiorpyrifos		
P. Pyrene	.d		P. Fenthion		
Ċ	ø		Q. Parathion-ethyl		
'n.			R. Trichloronate		
· vi			S. Merphos		
			T. Stirofos		
			U. Tokuthlon		

Notes:

1909949 LDC #: _/

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: Reviewer:

2nd Reviewer:

GC HPLC METHOD:

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

evel IV Only

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

	7	T	Т	T	Τ-	T	T	T	 	T	T	Ţ	T	T	Т	T	T	T	1	T	T	T
Ouglifications	(+ / A / +					A																
Accoriated Samples	A//+ B/K	1/2/				>																
RT (limit))		())	(· ·										
%D / RPD (Limit < 15.0)	15.6				15.5	15.2																
Compound	# /				0	#																
Detector/ Column	not specified	1 1			7										,							
Standard ID	Q#C1/268				6/11/08 SCAL837																	
Date	80/1/9	`			11/08																	
#	+				4	<u>+</u>																

LDC #: 19099 A 9 SDG#:

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

 METHOD:
 Ge
 HPLC

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

2nd Reviewer:_

Page: Reviewer:

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?

N N N M/N/M

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

							-		_									 						=
Qualifications	10 au AL	145,10																						
Associated Samples	/#/																							
œ	*	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()		()	
MSD %R (Limits)	parley 0/6) R	()	()	()		()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	
MS %R (Limits)	compainds,		()	()	()	()	()	()	()	()	()			()	()	()	()	()	()	()	()		()	
Compound	several	,																						
di ds/msd #	445	•																						

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

BRC Tronox Parcel F

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-FR-02-02-0'

TSB-FJ-02-02-0'

TSB-FJ-06-2-0'

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-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	2,3,7,8-TCDF	J+ (all 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-FJ-02-02-0'	¹³ C-2,3,7,8-TCDD 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-2,3,7,8-TCDF ¹³ C-1,2,3,7,8-PeCDF ¹³ C-1,2,3,4,6,7,8-HxCDF ¹³ C-1,2,3,4,6,7,8-HpCDF	23 (40-135) 20 (40-135) 16 (40-135) 9.4 (40-135) 4.6 (40-135) 30 (40-135) 20 (40-135) 15 (40-135) 8.6 (40-135)	All TCL compounds	J (all detects) UJ (all non-detects)	Р
TSB-FJ-06-2-0'	¹³ C-OCDD	36 (40-135)	OCDD	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	Р
TSB-FR-02-02-0'	¹³ C-2,3,7,8-TCDF	147.4 (40-135)	2,3,7,8-TCDF	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

No field duplicates were identified in this SDG.

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

SDG	Sample	Compound	Flag	A or P	Reason
F8F050256	TSB-FR-02-02-0' TSB-FJ-02-02-0' TSB-FJ-06-2-0'	2,3,7,8-TCDF	J+ (all detects)	Р	Routine calibration (%D)
F8F050256	TSB-FJ-02-02-0'	All TCL compounds	J (all detects) UJ (all non-detects)	Р	Internal standards (%R)
F8F050256	TSB-FJ-06-2-0'	OCDD	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	Р	Internal standards (%R)
F8F050256	TSB-FR-02-02-0'	2,3,7,8-TCDF	J (all detects) UJ (all non-detects)	Р	Internal standards (%R)

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

No Sample Data Qualified in this SDG

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

No Sample Data Qualified in this SDG

DG#	: 19099A21 #: F8F050256 atory: Test America	. VA - 	LIDA	ΊO		PLET Level		SS WOF	RKSHEE ⁻	Γ	Date: 7/19/ Page: _(of _ Reviewer: _bt_
he sa	IOD: HRGC/HRMS Diox amples listed below were tion findings worksheets.	e revie			•				eas. Validat	ion find	2nd Reviewer:
	Validation	Area							Comi	ments	
I.	Technical holding times				A	Samp	ling da	ates: 6/	108		
II.	GC/MS Instrument performa	ance cl	neck		4						
III.	Initial calibration				4						
IV.	Routine calibration/ICV	cv			SWX					·····	
V.	Blanks				À						
VI.	Matrix spike/Matrix spike du	plicate	s		N	ناله	ènt.	spenji	el		
VII.	Laboratory control samples				4	LC	<u> </u>	, 0			
VIII.	Regional quality assurance	and qu	ality con	rol	N						
IX.	Internal standards				SW						
Χ.	Target compound identificat	tions			N						
XI.	Compound quantitation and	CRQL	.s		N						
XII.	System performance				N						
XIII.	Overall assessment of data				1						
XIV.	Field duplicates				N			-			
XV.	Field blanks				Ü						
lote:	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		R	= Rir	lo compound nsate ield blank	ds detec	eted	TB = 1	uplicate Trip blank Equipment bla	ank	
1	TSB-FR-02-02-0'	11	8165	42	ζ		21			31	
2	TSB-FJ-02-02-0'	12					22			32	
3	TSB-FJ-06-2-0'	13					23			33	
4		14					24			34	
5		15					25			35	
6		16					26			36	
7		17					27			37	
8		18					28			38	
9		19					29			39	
10		20					30			40	

Notes:

VALIDATION FINDINGS WORKSHEET

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

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

Notes:

SDG #: F8F050256 LDC #: 1909 922

VALIDATION FINDINGS WORKSHEET Routine Calibration

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". N 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?

N/N/A

Finding %D (Limit: <30.0%) (Limit: <30.0%) (20.0					2				•							Ratio							
Standard ID Compound Finding \$\text{times} Abundance Ratio Associated Samples		Qualifications) 4													Ion Abundance	0.65-0.89	1.32-1.78	4 05 4 40	1.03-1.43	0.43-0.59	0.37-0.51	
Compound	Associated Samples	╢	2													Selected ions (m/z)	M/M+2	M+2/M+4	M+2/M+4	CTWW	C+W/M	Z±101/01	
Standard ID Compound	Finding Ion Abundance Ratio																Tetra-	Penta-	Неха-	Hexa- ¹³ C-HxCDF (IS) only	Hepta-13C-HpCDF (IS) only	6 (-)	Torte
Standard D Compound	Finding %D (Limit: ≤30.0%)														the state of the s	Ser of	0.05-0.08	1.32-1.78	1.05-1.43	0.43-0.59	0.37-0.51	0 80 4 00	07:1-00:0
PCDS PCDDS PCDS PCDDS PCDD	Compound	1	- 1												\parallel	╫	M+2/M+A	11 1 Z/WITT	M+2/M+4	M/M+2	M/M+2	M+2/M+4	
Date 7/3/08 T/3/08 Perta-Perta	Standard ID	027LOGBIDS 520	10000	(evania))F (IS) only	DF (IS) only		
	Date	80/4/2													P	Tetra-	Penta-	Heya.	11 130 11 05	Hexa-"C-HXCL	Hepta-"C-HpC	Hepta-	_

0.76-1.02

SDG #: FSFOSTO XCB LDC #: 1909942

VALIDATION FINDINGS WORKSHEET Internal Standards

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

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

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

Y N/ N/A

Are all internal standard recoveries were within the 40-135% criteria? Y N N/A

Was the S/N ratio all internal standard peaks ≥ 10?

#	Date	Lab ID/Reference	Internal Standard	% R	% Recovery (Limit: 40-135%)		Qualifications
		٧	26	23	区)-91)		5MJP (MB,1-Q)
			7	20)	(
			#	191)	(
			<i>)†</i>	9.4 9.4	36 (_	
				97)	(
			4	30 22)	(
			ಲ	20)		
,			巾	2))		
			9	8.6	•	^	
)	_	
		3	+1	36	\	((G, Q)
)	_	
			A	147.4	\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-		(†1)
	# >	, h)		Complete Com
						(
)	(
)	_	
)	_	
)	_	
)	•	
		Internal Standards	Check Standard Used		Recovery Standards	dards	Check Standard Used
Ϋ́	¹³ C-2,3,7,8-TCDF	DF		K. 1 ¹³ C	¹³ C-1,2,3,4-TCDD		
В.	¹³ C-2,3,7,8-TCDD	DD		L. 13C	¹³ C-1,2,3,7,8,9-HxCDD		
Ö	¹³ C-1,2,3,7,8-PeCDF	eCDF		M.			
٥.	¹³ C-1,2,3,7,8-PeCDD	eCDD	The second secon	z			
Щ	¹³ C-1,2,3, 8 ,7,8-HxCDF	-нхсрғ		ö			
ıı:	¹³ C-1,2,3,6,7,8-HxCDD	-HxCDD		ď.			
Ö	¹³ C-1,2,3,4,6,7,8-HpCDF	,8-HpCDF		ö			
ï	¹³ C-1,2,3,4,6,7,8-HpCDD	,8-HpCDD		œ			
	13C-OCDD						