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

March 19, 2008

SUBJECT: BRC Tronox Parcel H, Data Validation

Dear Ms. Barajas-Albalawi

Enclosed are the final validation reports for the fractions listed below. This SDG was received on March 3, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 18386:

SDG #	Fraction
F8A250221, F8A290158	Volatiles, Semivolatiles, Chlorinated Pesticides, Polychlorinated Biphenyls, Metals, Gasoline Range Organics, Diesel Range Organics, Dioxins/Dibenzofurans, Wet Chemistry

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

12,990 Pages-CD

Attachment 1

80/20

LDC #18386 (ERM-Sacramento / BRC Tronox Parcel H)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		SVOA (8270C)		Pest. (8081A)		PCBs (8082)		Metals (SW846)		GRO (8015)		DRO (8015)		Dioxins (8290)		Bromide Bromine Chlorate		Chloride Chloride Fluoride		NO_3 NO_2 O-OP_4		CLO_4 (314.0)		O&G (9071B)									
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	F8A250221	03/03/08	03/24/08	3	12	0	12	0	12	0	12	0	12	0	12	0	12	0	10	0	12	0	12	0	12	0	12	0	12								
A	F8A250221	03/03/08	03/24/08	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3								
B	F8A290158	03/03/08	03/24/08	4	9	1	9	1	9	1	9	1	9	1	9	1	10	1	9	1	9	1	9	1	9	1	9	1	9								
Total	T/LR			7	24	1	24	1	24	1	24	1	24	1	24	1	25	1	24	1	24	1	24	1	24	1	24	1	24	0	0	0	0	0	0	0	332

Shaded cells indicate Level IV validation (all other cells are Level IIII validation). These sample counts do not include MS/MSD, and DUPs

18386ST.wpd

BRC Tronox Parcel H
Data Validation Reports
LDC# 18386

Volatiles

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 24, 2008

LDC Report Date: March 14, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A250221

TSB-HJ-05-10'
TSB-HJ-05-0'
TSB-HR-04-10'
TSB-HJ-04-0'
TSB-HR-04-0'**
TSB-HJ-04-10'
TSB-HR-07-0'
TSB-HR-07-10'**
TSB-HR-06-0'
TSB-HR-06-10'
TSB-HJ-07-0'**
TSB-HJ-07-0'-FD
TSB-HJ-07-10'
TSB-HR-08-0'
TSB-HR-08-10'
TSB-TB-3
TSB-TB-2
TSB-TB-1
TSB-HR-08-0'MS
TSB-HR-08-0'MSD
TSB-HR-08-10'MS
TSB-HR-08-10'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 19 soil samples and 3 water samples 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.

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

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

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
1/21/08	Dibromomethane	0.04510 (≥0.05)	All water samples in SDG F8A250221	J (all detects) UJ (all non-detects)	A
1/30/08	Ethanol	0.00855 (≥0.05)	All water samples in SDG F8A250221	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
2/4/08	Ethanol Acetonitrile	0.00291 (≥0.05) 0.01869 (≥0.05)	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-0'MS TSB-HR-08-0'MSD 8038049-Blank	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
2/6/08	Ethanol	0.00366 (≥0.05)	TSB-HJ-07-0'-FD TSB-HR-08-10' TSB-HR-08-10'MS TSB-HR-08-10'MSD 8038277-Blank	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

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

Date	Compound	%D	Associated Samples	Flag	A or P
1/30/08	Bromomethane	48.37592	All water samples in SDG F8A250221	J+ (all detects)	A

Date	Compound	%D	Associated Samples	Flag	A or P
2/5/08 (09:12)	1,1-Dichloroethane Iodomethane Carbon tetrachloride 2-Nitropropane	89.46153 32.31122 28.82024 33.49971	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-0'MS TSB-HR-08-0'MSD 8038049-Blank	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A

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

Date	Compound	%D	Associated Samples	Flag	A or P
1/21/08	Iodomethane Vinyl acetate	33.60319 31.00872	All water samples in SDG F8A250221	J+ (all detects) J+ (all detects)	A
2/4/08	1,1-Dichloroethane	72.08435	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-0'MS TSB-HR-08-0'MSD 8038049-Blank	J+ (all detects)	A
2/6/08	Bromomethane	34.53645	TSB-HJ-07-0'-FD TSB-HR-08-10' TSB-HR-08-10'MS TSB-HR-08-10'MSD 8038277-Blank	J+ (all detects)	A
2/6/08	Acetonitrile	27.60270	TSB-HJ-07-0'-FD TSB-HR-08-10' TSB-HR-08-10'MS TSB-HR-08-10'MSD 8038277-Blank	J- (all detects) UJ (all non-detects)	a

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

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
1/30/08	Dibromomethane	0.04735 (≥0.05)	All water samples in SDG F8A250221	J (all detects) UJ (all non-detects)	A
2/5/08 (09:12)	Acetonitrile	0.01921 (≥0.05)	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-0'MS TSB-HR-08-0'MSD 8038049-Blank	J (all detects) UJ (all non-detects)	A
2/5/08 (10:14)	Ethanol	0.00259 (≥0.05)	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-0'MS TSB-HR-08-0'MSD 8038049-Blank	J (all detects) UJ (all non-detects)	A

V. Blanks

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

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
8031135-Blank	1/30/08	Dichloromethane	0.16 ug/L	All water samples in SDG F8A250221
8032877-Blank	2/6/08	Dichloromethane	2.8 ug/Kg	TSB-HJ-07-0'-FD TSB-HR-08-10'

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-TB-3	Dichloromethane	0.20 ug/L	1.0U ug/L
TSB-TB-2	Dichloromethane	0.14 ug/L	1.0U ug/L
TSB-TB-1	Dichloromethane	0.18 ug/L	1.0U ug/L
TSB-HJ-07-0'-FD	Dichloromethane	6.1 ug/Kg	6.1U ug/Kg
TSB-HR-08-10'	Dichloromethane	4.2 ug/Kg	5.5U ug/Kg

Samples TSB-TB-3, TSB-TB-2, and TSB-TB-1 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
TSB-TB-3	1/24/08	Dichloromethane Acetone	0.20 ug/L 4.3 ug/L	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10'
TSB-TB-2	1/24/08	Dichloromethane	0.14 ug/L	TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10'
TSB-TB-1	1/24/08	Dichloromethane Acetone	0.18 ug/L 4.9 ug/L	TSB-HJ-07-0'** TSB-HJ-07-0'-FD TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-10'

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-HJ-05-0'	Acetone	17 ug/Kg	21U ug/Kg
TSB-HR-04-0'**	Acetone	6.8 ug/Kg	21U ug/Kg
TSB-HJ-04-10'	Acetone	14 ug/Kg	21U ug/Kg
TSB-HJ-07-10'	Acetone	19 ug/Kg	21U ug/Kg
TSB-HR-08-0'	Acetone	7.4 ug/Kg	21U ug/Kg

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
8036136-Blank	Bromofluorobenzene	126 (66-115)	All TCL compounds	J+ (all detects)	P
TSB-TB-3	Bromofluorobenzene	120 (66-115)	Nonanal	J+ (all detects)	A

VII. Matrix Spike/Matrix Spike Duplicates

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

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

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

XVI. Field Duplicates

Samples TSB-HJ-07-0'** and TSB-HJ-07-0'-FD were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HJ-07-0'**	TSB-HJ-07-0'-FD				
Dichloromethane	5.8	6.1	-	0.3 (≤5.4)	-	-
1,2,4-Trimethylbenzene	0.41	5.3U	-	4.89 (≤5.4)	-	-

BRC Tronox Parcel H
Volatiles - Data Qualification Summary - SDG F8A250221

SDG	Sample	Compound	Flag	A or P	Reason
F8A250221	TSB-TB-3 TSB-TB-2 TSB-TB-1	Dibromomethane Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
F8A250221	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0'	Ethanol Acetonitrile	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
F8A250221	TSB-HJ-07-0'-FD TSB-HR-08-10'	Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
F8A250221	TSB-TB-3 TSB-TB-2 TSB-TB-1	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
F8A250221	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0'	1,1-Dichloroethane Iodomethane Carbon tetrachloride 2-Nitropropane	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
F8A250221	TSB-TB-3 TSB-TB-2 TSB-TB-1	Iodomethane Vinyl acetate	J+ (all detects) J+ (all detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
F8A250221	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0'	1,1-Dichloroethane	J+ (all detects)	A	Continuing calibration (ICV %D)
F8A250221	TSB-HJ-07-0'-FD TSB-HR-08-10'	Bromomethane	J+ (all detects)	A	Continuing calibration (ICV %D)
F8A250221	TSB-HJ-07-0'-FD TSB-HR-08-10'	Acetonitrile	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
F8A250221	TSB-TB-3 TSB-TB-2 TSB-TB-1	Dibromomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
F8A250221	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
F8A250221	TSB-TB-3	Nonanal	J+ (all detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel H
Volatiles - Laboratory Blank Data Qualification Summary - SDG F8A250221

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A250221	TSB-TB-3	Dichloromethane	1.0U ug/L	A
F8A250221	TSB-TB-2	Dichloromethane	1.0U ug/L	A
F8A250221	TSB-TB-1	Dichloromethane	1.0U ug/L	A

LDC #: 18386A1
SDG #: F8A250221
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 3/10/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	%RSD, r^2
IV.	Continuing calibration/ICV	SW	ICV ≤ 25
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 11 + 12
XVII.	Field blanks	SW	TB = 16, 17, 18

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: ** Indicates sample underwent Level IV validation

Soil + Water

1	3	TSB-HJ-05-10'	1	11	3	TSB-HJ-07-0'**	3	21	4	TSB-HR-08-10'MS	31	1	8031135-Blank	1/30
2	3	TSB-HJ-05-0'	1	12	4	TSB-HJ-07-0'-FD	3	22	4	TSB-HR-08-10'MSD	32	2	8036136-Blank	2/4
3	3	TSB-HR-04-10'	1	13	3	TSB-HJ-07-10'	3	23			33	3	8038049-Blank	2/5/08
4	3	TSB-HJ-04-0'	1	14	3	TSB-HR-08-0'	3	24			34	4	8038277-Blank	2/6/08
5	3	TSB-HR-04-0'**	1	15	4	TSB-HR-08-10'	3	25			35	5	~~8031135-Blank~~	1/30
6	3	TSB-HJ-04-10'	1	16	1	TSB-TB-3	W 1	26			36			
7	3	TSB-HR-07-0'	2	17	1	TSB-TB-2	2	27			37			
8	3	TSB-HR-07-10'**	2	18	1	TSB-TB-1	3	28			38			
9	3	TSB-HR-06-0'	2	19	3	TSB-HR-08-0'MS		29			39			
10	3	TSB-HR-06-10'	2	20	3	TSB-HR-08-0'MSD		30			40			

Batch #4 analyzed after ICAL

LDC #: 18386A1
SDG #: per cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: FD
2nd Reviewer: LC

Method: Volatiles (EPA SW 846 Method 8260B)

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

LDC #: 18386A1
SDG #: all cover

VALIDATION FINDINGS CHECKLIST

Reviewer: PR
2nd Reviewer: W

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

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

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

LDC #: 18386A1
SDG #: pre cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: B
2nd Reviewer:

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

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

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	1/21/08	ICAL	RR		0.04510	803135-Blank,	J/UJ/A
			~~wwww~~		~~0.00977~~	All water	↓
	1/30/08	ICAL	wwww		0.00855	↓	↓
	2/4/08	ICAL	~~wwwwRL~~		0.00291	803849-Blank,	J/UJ/A
			Acetonitrile (EEEE)		0.01869	1 → 14, 19, 20	
						13, 14	
	2/6/08	ICAL	wwww		0.00366	8038277-Blank,	J/UJ/A
						12, 15, 21, 22	

LDC #: 18386A1
SDG #: pre cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: P
2nd Reviewer: [illegible]

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

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

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

#	Date	Standard ID	Compound	Finding %D (Limit: <25.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
+	1/21/08	ICV	Iodomethane	33.60319		803135-Blank + all water	J+/A dit
+			HH	31.00877			
+	1/30/08 14:32	CCV	B	48.37592		↓	J+/A dit
			RR		0.04735		J/UJ/A
+	2/4/08	ICV	I	72.08435		803849-Blank, 1→11, 19, 20 13, 14	J+/A dit
	2/6/08	ICV	B	34.53645		8038277-Blank, 12, 15, 21, 23	J+/A dit
			EEEE	27.60270			J-/UJ/A

CONCAL.1SB

LDC #: 18386A1
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

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

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

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

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

#	Date	Standard ID	Compound	Finding %D (Limit: <25.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
+	2/5/08	ccv	I	89.46153		803849 - Blank,	J+/A dt
†	9:12		Iodomethane	32.31122		1-4, 11, 13, 14,	
+			Ø	28.82024		19, 20	
†			2-Nitropropane	33.49971		↓	
			EEEE		0.01921		J/UJ/A
	2/5/08 10.14	ccv	WWW	~~0.0075~~	0.00259	↓	J/UJ/A

CONCAL.1SB

LDC #: 18386A1
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Blanks

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

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

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

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

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

Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 1/30/08

Conc. units: ng/L

Associated Samples: All water

Compound	Blank ID	Sample Identification								
	8031135-Blank	16	17	18					
Dichloromethane Methylene chloride	0.16	0.20/1.0U	0.14/1.0U	0.18/1.0U					
Acetone									
CRQL									

Blank analysis date: 2/6/08

Conc. units: ng/kg

Associated Samples: 12, 15

Compound	Blank ID	Sample Identification								
	8038277-Blank	12	15							
Dichloromethane Methylene chloride	2.8	6.1/U	4.2/5.5U							
Acetone										
CRQL										

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".

LDC #: 18386A1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: F
2nd Reviewer:

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

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

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

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Associated Samples: 1 → 6 (ND + 75X) others

Compound	Blank ID 16	Blank ID	Sample Identification							
Sample ID	1/24/08		2	5	6					
Dichloromethane Methylene chloride	0.20		-	-	-					
Acetone	4.3		17 /2 | 4	6.8 /2 | 4	14 /2 | 4					
Chloroform										
CRQL										

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

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Associated Samples: 7 → 10 (ND + 75X)

Compound	Blank ID 17	Blank ID	Sample Identification							
Sample ID	1/24/08									
Dichloromethane Methylene chloride	0.14									
Acetone										
Chloroform										
CRQL										

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

LDC #: 18386A1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer:

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

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

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

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: 11 → 15 (ND + 75X others)

Compound	Blank ID 18	Blank ID	Sample Identification							
Sample Date	1/24/08		13	14						
Dichloromethane (Methylene chloride)	0.18		–	–						
Acetone	4.9		19/21H	7.4/21H						
Chloroform										
CRQL										

Blank units: _____ **Associated sample units:** _____

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: _____

Compound	Blank ID	Blank ID	Sample Identification							
Sample Date										
Methylene chloride										
Acetone										
Chloroform										
CRQL										

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

LDC #: 18386A1
SDG #: pre cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Reviewer: D
2nd Reviewer:

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

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

Y N N/A Were all surrogate %R within QC limits?

Y N N/A 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?

#	Date	Sample ID	Surrogate	%Recovery (Limits)	Qualifications
		8036136 - Blank	BFB	124 (~~63-132~~)	J+/P dil
				(66-115)	
				( )	
		16	BFB	120 (66-115)	J+/A dil qual Nonanal only
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

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

LDC #: 18386A1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: EM
2nd Reviewer: L

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		19+20	I	198 (55-139)	( )	42 (30)	14	NO QUALS IN
			EEEE	263 (30-150)	( )	75 (20)	↓	↓
			HH	( )	( )	48 (20)		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		21+22	AA	152 (25-150	151 ( )	( )	15	NO QUALS IN
			EEEE	( )	( )	31 (20)	↓	↓
		Iodomethane		( )	( )	32 (20)		
			HH	( )	( )	50 (20)		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
H.	1,1-Dichloroethene	59-172%	< 22%	61-145%	< 14%
S.	Trichloroethene	62-137%	< 24%	71-120%	< 14%
V.	Benzene	66-142%	< 21%	76-127%	< 11%
CC.	Toluene	59-139%	< 21%	76-125%	< 13%
DD.	Chlorobenzene	60-133%	< 21%	75-130%	< 13%

LDC #: 18386A1
SDG #: see Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

[✓ Y] N N/A Was a LCS required?
Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		8038049-LCS	2-Nitropropane	142 (40-140)	( )	( )	803849-Blank,	no QUAL MS/D n
				( )	( )	( )	1→11, 13, 14	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18386A1
SDG #: See cover ✓

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

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

Compound	Concentration (ug/kg)		Difference RPD
	11	12	
dichloromethane	5.8	6.1	0.3 (≤ 5.4)
DDD	0.41	5.34	4.89 (≤ 5.4)

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 18386A1
SDG #: pre cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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

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

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (20 std)	Recalculated RRF (20 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	2/4/08	Vinyl chloride (1st internal standard)	0.77522	0.77522	0.73013	0.73013	6.16160	6.16160
			Ethyl Benzene (2nd internal standard)	1.79313	1.79313	1.80952	1.80952	4.27181	4.27181
			1,2-DCB (3rd internal standard)	1.53477	1.53477	1.54561	1.54561	3.54081	3.54081
2			WWW (1st internal standard)	0.00342	0.00342	0.00291	0.00291	11.51035	11.51035
			Dimethyl Disulfide (2nd internal standard)	0.50639	0.50639	0.54575	0.54575	13.72254	13.72254
			1,3,5-~~Trimethyl Benzene~~ Trichlorobenzene (3rd internal standard)	0.88190	0.88190	0.89971	0.89971	9.47511	9.47511
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						

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

LDC #: 18386A1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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

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

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV	2/5/08 9:12	Vinyl chloride (1st internal standard)	0.773013	0.82926	0.82926	13.5751	13.5751
			Ethyl Benzene (2nd internal standard)	1.80952	1.87688	1.87688	3.72271	3.72271
			1,2-DCB (3rd internal standard)	1.54561	1.53180	1.53180	0.89307	0.89307
2	CCV	2/5/08 10:14	WWW (1st internal standard)	0.00291	0.00259	0.00259	11.1321	11.1321
			Dimethyl Disulfide (2nd internal standard)	0.54575	0.58269	0.58269	6.76765	6.76765
			1,3,5-Trichlorobenzene (3rd internal standard)	1.07630	1.09104	1.09104	1.36954	1.36954
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					

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

LDC #: 18386A1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

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

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #5

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	50	54.6314	109	109	0
Bromofluorobenzene	↓	52.9992	106	106	↓
1,2-Dichloroethane-d4	↓	48.7043	97	97	↓
Dibromofluoromethane	↓	48.6525	97	97	↓

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8					
Bromofluorobenzene					
1,2-Dichloroethane-d4					
Dibromofluoromethane					

LDC #: 18386A1
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

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

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

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSDC I * 2/(MSC + MSDC) MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 19 + 20

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	52.8	52.9	ND	58.3	59.7	110	110	113	113	2.4	2.4
Trichloroethene	↓	↓	↓	50.4	55.1	96	96	104	104	8.8	8.8
Benzene				56.0	54.0	106	106	102	102	3.6	3.6
Toluene				54.2	55.3	103	103	105	105	1.9	2.0
Chlorobenzene				53.0	54.2	100	100	103	103	2.2	2.2

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

LDC #: 18386A1
SDG #: all cancer

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

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

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

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

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 8038049-LCS

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	50.0	NA	49.5	NA	99	99				
Trichloroethene			47.1		94	94				
Benzene			48.2		96	96				
Toluene			48.4		97	97				
Chlorobenzene			48.2		96	96	NA			

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

LDC #: 18386A1
SDG #: pw cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: PJ
2nd reviewer:

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

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

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

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample pruged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. #5 , Acetone

Conc. = ( ) ( ) ( ) / ( ) ( ) ( ) ( )

=

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification
		$\frac{X}{50} = \left(\frac{10043}{619429}\right)\left(\frac{1}{0.06192}\right)$	-0.13125		
		$X = 6.529$			
		final $= \frac{6.529}{0.959} = 6.8$ ug/kg			

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 28, 2008

LDC Report Date: March 12, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A290158

TSB-HJ-10-0'
TSB-HJ-10-10'
TSB-HR-06-0'
TSB-HR-06-0'-FD
TSB-HR-06-10'
TSB-HJ-08-0'
TSB-HJ-08-10'
TSB-HR-05-0'
TSB-HR-05-10'
TSB-TB-1-1/28/08
TSB-TB-2-1/28/08
RINSATE-2
TSB-TB-03-1/28/08
TSB-HR-05-10'MS
TSB-HR-05-10'MSD

Introduction

This data review covers 11 soil samples and 4 water samples 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
1/21/08	Dibromomethane	0.04510 (≥0.05)	All water samples in SDG F8A290158	J (all detects) UJ (all non-detects)	A
1/30/08	Ethanol	0.00855 (≥0.05)	All water samples in SDG F8A290158	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

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

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

Date	Compound	%D	Associated Samples	Flag	A or P
1/30/08	Bromomethane	48.37592	All water samples in SDG F8A290158	J+ (all detects)	A
2/11/08	Ethanol 2-Methylhexane 3-Ethylpentane n-Heptane	28.63874 27.07574 25.56456 26.94019	All soil samples in SDG F8A290158	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A

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

Date	Compound	%D	Associated Samples	Flag	A or P
1/21/08	Iodomethane Vinyl acetate	33.60319 31.00872	All water samples in SDG F8A290158	J+ (all detects) J+ (all detects)	A
2/11/08	Acetonitrile 4-Methyl-2-pentanone 4-Chlorotoluene	27.39844 27.93055 25.96800	All soil samples in SDG F8A290158	J+ (all detects) J+ (all detects) J+ (all detects)	A

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

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
1/30/08	Dibromomethane	0.04735 (≥0.05)	All water samples in SDG F8A290158	J (all detects) UJ (all non-detects)	A
2/11/08	Ethanol	0.00649 (≥0.05)	All soil samples in SDG F8A290158	J (all detects) UJ (all non-detects)	A

V. Blanks

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

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
8031135-Blank	1/30/08	Dichloromethane	0.16 ug/L	All water samples in SDG F8A290158

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-TB-1-1/28/08	Dichloromethane	0.21 ug/L	1.0U ug/L
TSB-TB-2-1/28/08	Dichloromethane	0.19 ug/L	1.0U ug/L
TSB-TB-03-1/28/08	Dichloromethane	0.22 ug/L	1.0U ug/L

Samples TSB-TB-1-1/28/08, TSB-TB-2-1/28/08, and TSB-TB-03-1/28/08 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
TSB-TB-1-1/28/08	1/28/08	Dichloromethane Acetone	0.21 ug/L 4.0 ug/L	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10'
TSB-TB-2-1/28/08	1/28/08	Dichloromethane Acetone	0.19 ug/L 5.1 ug/L	TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'
TSB-TB-03-1/28/08	1/28/08	Dichloromethane Acetone	0.22 ug/L 4.4 ug/L	RINSATE-2

Sample "RINSATE-2" was identified as a rinsate. No volatile contaminants were found in this blank with the following exceptions:

Rinsate Blank ID	Sampling Date	Compound	Concentration	Associated Samples
RINSATE-2	1/28/08	Dichloromethane Acetone	12 ug/L 8.0 ug/L	All soil samples in SDG F8A290158

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-HJ-10-0'	Dichloromethane	6.1 ug/Kg	6.1U ug/Kg
TSB-HJ-10-10'	Dichloromethane	3.9 ug/Kg	5.2U ug/Kg
TSB-HR-06-0'	Dichloromethane	7.4 ug/Kg	7.4U ug/Kg
TSB-HR-06-0'-FD	Dichloromethane	3.0 ug/Kg	5.4U ug/Kg
TSB-HR-06-10'	Dichloromethane	7.3 ug/Kg	7.3U ug/Kg
TSB-HJ-08-0'	Dichloromethane	8.8 ug/Kg	8.8U ug/Kg
TSB-HJ-08-10'	Dichloromethane	5.8 ug/Kg	5.8U ug/Kg
TSB-HR-05-0'	Dichloromethane Acetone	7.8 ug/Kg 15 ug/Kg	7.8U ug/Kg 15U ug/Kg
TSB-HR-05-10'	Dichloromethane	6.5 ug/Kg	6.5U ug/Kg
RINSATE-2	Acetone	8.0 ug/L	8.0U 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
8036136-Blank	Bromofluorobenzene	126 (66-115)	All TCL compounds	J+ (all detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times.

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

XVI. Field Duplicates

Samples TSB-HR-06-0' and TSB-HR-06-0'-FD were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HR-06-0'	TSB-HR-06-0'-FD				
Dichloromethane	7.4	3.0	-	4.4 (≤5.4)	-	-
Toluene	0.54	5.4U	-	4.86 (≤5.4)	-	-

BRC Tronox Parcel H
Volatiles - Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Flag	A or P	Reason
F8A290158	TSB-TB-1-1/28/08 TSB-TB-2-1/28/08 RINSATE-2 TSB-TB-03-1/28/08	Dibromomethane Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
F8A290158	TSB-TB-1-1/28/08 TSB-TB-2-1/28/08 RINSATE-2 TSB-TB-03-1/28/08	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Ethanol 2-Methylhexane 3-Ethylpentane n-Heptane	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
F8A290158	TSB-TB-1-1/28/08 TSB-TB-2-1/28/08 RINSATE-2 TSB-TB-03-1/28/08	Iodomethane Vinyl acetate	J+ (all detects) J+ (all detects)	A	Continuing calibration (ICV %D)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Acetonitrile 4-Methyl-2-pentanone 4-Chlorotoluene	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (ICV %D)
F8A290158	TSB-TB-1-1/28/08 TSB-TB-2-1/28/08 RINSATE-2 TSB-TB-03-1/28/08	Dibromomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

BRC Tronox Parcel H
Volatiles - Laboratory Blank Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A290158	TSB-TB-1-1/28/08	Dichloromethane	1.0U ug/L	A
F8A290158	TSB-TB-2-1/28/08	Dichloromethane	1.0U ug/L	A
F8A290158	TSB-TB-03-1/28/08	Dichloromethane	1.0U ug/L	A

BRC Tronox Parcel H
Volatiles - Field Blank Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Modified Final Concentration	A or P
F8A290158	TSB-HJ-10-0'	Dichloromethane	6.1U ug/Kg	A
F8A290158	TSB-HJ-10-10'	Dichloromethane	5.2U ug/Kg	A
F8A290158	TSB-HR-06-0'	Dichloromethane	7.4U ug/Kg	A
F8A290158	TSB-HR-06-0'-FD	Dichloromethane	5.4U ug/Kg	A
F8A290158	TSB-HR-06-10'	Dichloromethane	7.3U ug/Kg	A
F8A290158	TSB-HJ-08-0'	Dichloromethane	8.8U ug/Kg	A
F8A290158	TSB-HJ-08-10'	Dichloromethane	5.8U ug/Kg	A
F8A290158	TSB-HR-05-0'	Dichloromethane Acetone	7.8U ug/Kg 15U ug/Kg	A
F8A290158	TSB-HR-05-10'	Dichloromethane	6.5U ug/Kg	A
F8A290158	RINSATE-2	Acetone	8.0U ug/L	A

LDC #: 18386B1
SDG #: F8A290158
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3/7/08
Page: 1 of 1
Reviewer: P
2nd Reviewer: W

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/28/08
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	%RSD, $r^2 \geq 0.990$
IV.	Continuing calibration/ICV	SW	ICV ≤ 25
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 3, 4
XVII.	Field blanks	SW	R = 12 TB = 10 ~~TB=~~ = 11, 13

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

Validated Samples: Soil + Water

1	3	TSB-HJ-10-0'	1	11	1	TSB-TB-2-1/28/08	W	2	21	1	8031135	31		1/30
2	3	TSB-HJ-10-10'	1	12	1	RINSATE-2		3	22	2	8036136	32	normal only	2/4
3	3	TSB-HR-06-0'	D 1	13	1	TSB-TB-03-1/28/08		3	23	3	8043263	33		2/11
4	3	TSB-HR-06-0'-FD	D 1	14		TSB-HR-05-10'MS			24		-8	34		
5	3	TSB-HR-06-10'	1	15		TSB-HR-05-10'MSD			25			35		
6	3	TSB-HJ-08-0'	1	16					26			36		
7	3	TSB-HJ-08-10'	1	17					27			37		
8	3	TSB-HR-05-0'	1	18					28			38		
9	3	TSB-HR-05-10'	1	19					29			39		
10	1	TSB-TB-1-1/28/08	W 1	20					30			40		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

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

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

LDC #: 1X386B1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

- (Y) N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
- (Y) N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
- (Y) N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?________
- (Y) N N/A Did the initial calibration meet the acceptance criteria?
- Y (N) N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	1/21/08	ICAL	RR		0.04510	8031135-Blank,	J/UJ/A
			~~WWW~~		~~0.00977~~	All water	↓
	1/30/08	ICAL	WWW		0.00855	↓	↓

LDC #: L8386B1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

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

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

#	Date	Standard ID	Compound	Finding %D (Limit: <25.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
+	1/21/08	ICV	Iodomethane	33.60319		8031135-Blank,	J+/A det
+			HH	31.00872		All water	↓
+	1/30/08	CCV	B	48.37592		↓	J+/A det
	14:32		RR		0.04735	↓	J/UJ/A
	2/11/08	CCV	WWW		0.00649	804 3263-Blank	J/UJ/A
+	18:16		WWW	28.63874		All soils	J+/A det
+			2-Methylhexane	27.07574		↓	↓
+			3-Ethylpentane	25.56456			
+			n-heptane	26.94019			
+	2/11/08	New ICV	EEEE	27.39844			J+/A det
+	16:50		Y	27.93055			↓
+			BBB	25.96800			

LDC #: 18386B1
SDG #: All Cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y/N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 1/30/08
Conc. units: ug/L
Associated Samples: 10 → 13 (all water samples)

Compound	Blank ID	Sample Identification								
	803135-BlankK	10	11	12	13					
Dichloromethane ~~Methylene chloride~~	0.16	0.21/1.0U	0.19/1.0U	(12)	0.22/1.0U					
~~Acetone~~										
CRQL										

Blank analysis date:
Conc. units:
Associated Samples:

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
CRQL										

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".

LDC #: 1X386B1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

Blank units: ug/L **Associated sample units:** ug/kg
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: All soils

Compound	Blank ID 12	Blank ID	Sample Identification							
Sampling Date	1/28/08		1	2	3	4	5	6	7	8
Dichloromethane ~~Methylene chloride~~	12		6.1/U	3.9/5.2J	7.4/U	3.0/5.4J	7.3/U	8.8/U	5.8/U	B 7.8/U
Acetone	8.0		-	-	-	-	-	-	-	15/U
~~Chloroform~~										
CRQL										

Blank units: ug/L **Associated sample units:** ug/kg
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: All soils

Compound	Blank ID 12	Blank ID	Sample Identification							
Sampling Date	1/28/08		9							
Dichloromethane ~~Methylene chloride~~	12		6.5/U							
Acetone	8.0		~~6.5/U~~ -							
~~Chloroform~~										
CRQL										

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

LDC #: 18286B1
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

Blank units: ug/L **Associated sample units:** ug/kg
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Associated Samples: 1 → 5 710X + ND

Compound	Blank ID 10	Blank ID	Sample Identification								
Dichlorodifluoromethane	1/28/08		1	2							
Dichloromethane Methylene chloride	0.21		-								
Acetone	4.0										
Chloroform											
CRQL											

Blank units: ug/L **Associated sample units:** ug/kg
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Associated Samples: 6 → 9 (710X + ND except #8)

Compound	Blank ID 11	Blank ID	Sample Identification								
Dichlorodifluoromethane	1/28/08		8								
Dichloromethane Methylene chloride	0.19		-								
Acetone	5.1		15/4								
Chloroform											
CRQL											

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

LDC #: 18386B1
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

Blank units: ug/L **Associated sample units:** ug/L
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples: 12

Compound	Blank ID 13	Blank ID	Sample Identification							
Sampling Date	1/28/08		12							
Dichloromethane (Methylene chloride)	0.22		(12)							
Acetone	4.4		8.0/U							
Chloroform										
CRQL										

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

Compound	Blank ID	Blank ID	Sample Identification							
Sampling Date										
Methylene chloride										
Acetone										
Chloroform										
CRQL										

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

LDC #: 18386B1
SDG #: pre cover

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

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

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

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

Y (N) N/A Were all surrogate %R within QC limits?

Y (N) N/A 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?

#	Date	Sample ID	Surrogate	%Recovery (Limits)	Qualifications
		8036136-Blank	BFB	~~128~~ 126 (~~63-133~~ 66-115)	J+/P det
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

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

LDC #: 18386B1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: EM
2nd Reviewer: [illegible]

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

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

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		14 + 15	Dichloromethane	157 (47-145)	( )	( )	9	no qual LCSin
			AA	163 (25-150)	160 (25-150)	( )	↓	↓
			HH	( )	( )	25 (20)	↓	↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
H.	1,1-Dichloroethene	59-172%	< 22%	61-145%	< 14%
S.	Trichloroethene	62-137%	< 24%	71-120%	< 14%
V.	Benzene	66-142%	< 21%	76-127%	< 11%
CC.	Toluene	59-139%	< 21%	76-125%	< 13%
DD.	Chlorobenzene	60-133%	< 21%	75-130%	< 13%

LDC #: 18386B1
SDG #: See cover ✓

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: KT
2nd reviewer:

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

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

Compound	Concentration ( ) 3	Concentration ( ) 4	Difference RPD
Dichloromethane	7.4	3.0	4.4 (≤ 5.4)
Toluene	0.54	5.4 U	4.86 (≤ 5.4)

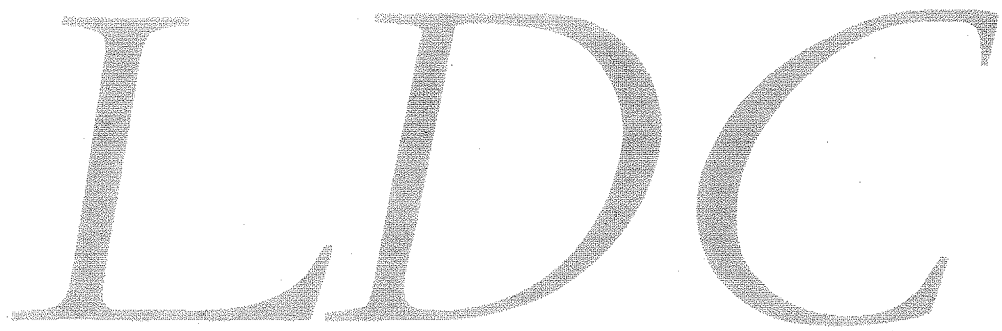
Compound	Concentration ( )	Concentration ( )	RPD

Compound	Concentration ( )	Concentration ( )	RPD

Compound	Concentration ( )	Concentration ( )	RPD

BRC Tronox Parcel H
Data Validation Reports
LDC# 18386

Semivolatiles



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 24, 2008

LDC Report Date: March 12, 2008

Matrix: Soil

Parameters: Semivolatiles

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A250221

Sample Identification

TSB-HJ-05-10'
TSB-HJ-05-0'
TSB-HR-04-10'
TSB-HJ-04-0'
TSB-HR-04-0'**
TSB-HJ-04-10'
TSB-HR-07-0'
TSB-HR-07-10'**
TSB-HR-06-0'
TSB-HR-06-10'
TSB-HJ-07-0'**
TSB-HJ-07-0'-FD
TSB-HJ-07-10'
TSB-HR-08-0'
TSB-HR-08-10'
TSB-HR-08-0'MS
TSB-HR-08-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 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.

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

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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.

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) with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/6/08	Pentachlorophenol	22.53156	All samples in SDG F8A250221	None	P

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.

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.

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
8029394-Blank	1/29/08	Unknown aldol condensate (4.254)	8600 ug/Kg	All samples in SDG F8A250221

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-HJ-05-10'	Unknown aldol condensate (4.2676)	8400 ug/Kg	8400U ug/Kg
TSB-HJ-05-0'	Unknown aldol condensate (4.2526)	7600 ug/Kg	7600U ug/Kg
TSB-HR-04-10'	Unknown aldol condensate (4.2534)	7800 ug/Kg	7800U ug/Kg
TSB-HJ-04-0'	Unknown aldol condensate (4.2519)	9400 ug/Kg	9400U ug/Kg
TSB-HR-04-0'**	Unknown aldol condensate (4.2572)	7700 ug/Kg	7700U ug/Kg
TSB-HJ-04-10'	Unknown aldol condensate (4.2632)	8300 ug/Kg	8300U ug/Kg
TSB-HR-07-0'	Unknown aldol condensate (4.2583)	8000 ug/Kg	8000U ug/Kg
TSB-HR-07-10'**	Unknown aldol condensate (4.2472)	9300 ug/Kg	9300U ug/Kg
TSB-HR-06-0'	Unknown aldol condensate (4.2524)	8200 ug/Kg	8200U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-HR-06-10'	Unknown aldol condensate (4.2627)	9400 ug/Kg	9400U ug/Kg
TSB-HJ-07-0'**	Unknown aldol condensate (4.2678)	9600 ug/Kg	9600U ug/Kg
TSB-HJ-07-0'-FD	Unknown aldol condensate (4.269)	8600 ug/Kg	8600U ug/Kg
TSB-HJ-07-10'	Unknown aldol condensate (4.2555)	9200 ug/Kg	9200U ug/Kg
TSB-HR-08-0'	Unknown aldol condensate (4.2578)	9300 ug/Kg	9300U ug/Kg
TSB-HR-08-10'	Unknown aldol condensate (4.2595)	9100 ug/Kg	9100U ug/Kg

No field blanks were identified in this SDG.

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. 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.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

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

XI. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

All tentatively identified compounds were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIV. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XV. Overall Assessment of Data

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

XVI. Field Duplicates

Samples TSB-HJ-07-0'** and TSB-HJ-07-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

BRC Tronox Parcel H
Semivolatiles - Data Qualification Summary - SDG F8A250221

SDG	Sample	Compound	Flag	A or P	Reason
F8A250221	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-0'-FD TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-10'	Pentachlorophenol	None	P	Continuing calibration (CCC %D)

BRC Tronox Parcel H
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG F8A250221

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A250221	TSB-HJ-05-10'	Unknown aldol condensate (4.2676)	8400U ug/Kg	A
F8A250221	TSB-HJ-05-0'	Unknown aldol condensate (4.2526)	7600U ug/Kg	A
F8A250221	TSB-HR-04-10'	Unknown aldol condensate (4.2534)	7800U ug/Kg	A
F8A250221	TSB-HJ-04-0'	Unknown aldol condensate (4.2519)	9400U ug/Kg	A
F8A250221	TSB-HR-04-0'**	Unknown aldol condensate (4.2572)	7700U ug/Kg	A
F8A250221	TSB-HJ-04-10'	Unknown aldol condensate (4.2632)	8300U ug/Kg	A
F8A250221	TSB-HR-07-0'	Unknown aldol condensate (4.2583)	8000U ug/Kg	A
F8A250221	TSB-HR-07-10'**	Unknown aldol condensate (4.2472)	9300U ug/Kg	A
F8A250221	TSB-HR-06-0'	Unknown aldol condensate (4.2524)	8200U ug/Kg	A
F8A250221	TSB-HR-06-10'	Unknown aldol condensate (4.2627)	9400U ug/Kg	A
F8A250221	TSB-HJ-07-0'**	Unknown aldol condensate (4.2678)	9600U ug/Kg	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A250221	TSB-HJ-07-0'-FD	Unknown aldol condensate (4.269)	8600U ug/Kg	A
F8A250221	TSB-HJ-07-10'	Unknown aldol condensate (4.2555)	9200U ug/Kg	A
F8A250221	TSB-HR-08-0'	Unknown aldol condensate (4.2578)	9300U ug/Kg	A
F8A250221	TSB-HR-08-10'	Unknown aldol condensate (4.2595)	9100U ug/Kg	A

BRC Tronox Parcel H
Semivolatiles - Field Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

LDC #: 18386A2 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/11/08
SDG #: F8A250221 Level III/IV Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD, r^2 ≥0.990
IV.	Continuing calibration/ICV	SW	ICV ≤25
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation/CRQLs	A	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Overall assessment of data	A	
XVI.	Field duplicates	NP	D = 11 + 12
XVII.	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: ** Indicates sample underwent Level IV validation

					SOIL		
1	TSB-HJ-05-10'	11	TSB-HJ-07-0'**	21	8029394-BLK	31	
2	TSB-HJ-05-0'	12	TSB-HJ-07-0'-FD	22		32	
3	TSB-HR-04-10'	13	TSB-HJ-07-10'	23		33	
4	TSB-HJ-04-0'	14	TSB-HR-08-0'	24		34	
5	TSB-HR-04-0'**	15	TSB-HR-08-10'	25		35	
6	TSB-HJ-04-10'	16	TSB-HR-08-0'MS	26		36	
7	TSB-HR-07-0'	17	TSB-HR-08-0'MSD	27		37	
8	TSB-HR-07-10'**	18		28		38	
9	TSB-HR-06-0'	19		29		39	
10	TSB-HR-06-10'	20		30		40	

LDC #: 18386A2
SDG #: pw cover

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer: [illegible]

Method: Semivolatiles (EPA SW 846 Method 8270C)

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

LDC #: 18386A2
SDG #: au cover

VALIDATION FINDINGS CHECKLIST

Reviewer: MJ
2nd Reviewer: V

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

VALIDATION FINDINGS WORKSHEET

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

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

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

LDC #: 18386A2
SDG #: pre conv

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

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

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	2/6/08 20:45	CCV	TT (ccc)	22.53156		All + Blk	no/P

CONCAL.2S

LDC #: 18386A2
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer:
2nd 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".

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

Blank extraction date: 1/29/08 **Blank analysis date:** 2/6/08
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
	8029394-Blank	1	2	3	4	5	6	7	8	9
TIC Unknown Aldol concentration	8600 (4.254)	8400 (4.2676)	7600 (4.2526)	7800 (4.2534)	9400 (4.2519)	7700 (4.2572)	8300 (4.2632)	8000 (4.2583)	9300 (4.2472)	8200 (4.2524)
		10								

Blank extraction date: 1/29/08 **Blank analysis date:** 2/6/08
Conc. units: ug/K Associated Samples: All

Compound	Blank ID	Sample Identification								
	8029394-Blank	10	11	12	13	14	15			
↓	8600 (4.254)	9400 (4.2627)	9600 (4.2678)	8600 (4.269)	9200 (4.2555)	9300 (4.2578)	9100 (4.2595)			

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above 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".

LDC #: 18386A2
SDG #: pre cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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".

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		16 + 17	HH	4 (10-91)	0 (10-91)	200 (30)	14	no QUAL LCS in
			PP	4 (16-99)	3 (16-99)	( )	↓	↓ ↓
				( )	( )	( )		
				( )	( )	( )	— — —	—
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 18386A2
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: RT
2nd Reviewer: [illegible]

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

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

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50 std)	Recalculated RRF (50 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	1/29/09	Phenol (1st internal standard)	2.66254	2.66254	2.69741	2.69741	6.25349	6.25349
			Naphthalene (2nd internal standard)	1.10277	1.10277	1.09527	1.09527	10.39092	10.39092
			Fluorene (3rd internal standard)	1.36978	1.36978	1.34878	1.34878	14.54450	14.54450
			Pentachlorophenol (4th internal standard)	0.15602	0.15602	0.15050	0.15050	11.84795	11.84795
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.80769	0.80769	0.81456	0.81456	7.06979	7.06979
			Benzo(a)pyrene (6th internal standard)	1.21257	1.21257	1.18939	1.18939	3.60258	3.60258
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

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

LDC #: 18386A2
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

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

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

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	KCAL4350	2/6/08	Phenol (1st internal standard)	2.69741	2.64086	2.64086	2.09649	2.09649
			Naphthalene (2nd internal standard)	1.09527	1.09989	1.09989	0.42132	0.42132
			Fluorene (3rd internal standard)	1.34878	1.34529	1.34529	0.25866	0.25866
			Pentachlorophenol (4th internal standard)	0.15050	0.18441	0.18441	22.53156	22.53156
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.81456	0.79530	0.79530	2.36440	2.3644
			Benzo(a)pyrene (6th internal standard)	1.18939	1.19972	1.19972	0.86823	0.86823
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

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

LDC #: 18386A2
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

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

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #5

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	50.0	36.4457	73	73	0
2-Fluorobiphenyl		37.8084	76	76	
Terphenyl-d14		46.5125	93	93	
Phenol-d5		54.5673	73	73	
2-Fluorophenol		50.0891	67	67	
2,4,6-Tribromophenol		54.1507	72	72	
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

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

Sample ID:

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

LDC #: 18386A2
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

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

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

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MS - MSD I * 2/(MS + MSD) MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 16 + 17

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	3540	3470	NP	2540	2400	72	72	69	69	5.5	5.5
N-Nitroso-di-n-propylamine				2880	2750	81	81	79	79	4.8	4.8
4-Chloro-3-methylphenol				2710	2550	77	77	73	73	6.0	6.0
Acenaphthene				2570	2370	73	73	68	68	7.9	7.9
Pentachlorophenol				581	661	16	16	19	19	13	13
Pyrene				2830	2650	80	80	76	76	6.6	6.6

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

LDC #: 18380A2
SDG #: all cover

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

Page: 6f 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

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

RPD = I LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 8029394-LCS

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	3330	NA	2300	NA	69	69				
N-Nitroso-di-n-propylamine			2480		74	74				
4-Chloro-3-methylphenol			2520		76	76				
Acenaphthene			2410		72	72				
Pentachlorophenol			2690		81	81				
Pyrene			2620		79	79	NA			

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

LDC #: 18386A2
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

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

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

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

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

Example:

Sample I.D. _____, _____:

Conc. = $\frac{(\quad)(\quad)(\quad)(\quad)(\quad)(\quad)}{(\quad)(\quad)(\quad)(\quad)(\quad)(\quad)}$

= ND

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 28, 2008

LDC Report Date: March 12, 2008

Matrix: Soil/Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A290158

Sample Identification

TSB-HJ-10-0'
TSB-HJ-10-10'
TSB-HR-06-0'
TSB-HR-06-0'-FD
TSB-HR-06-10'
TSB-HJ-08-0'
TSB-HJ-08-10'
TSB-HR-05-0'
TSB-HR-05-10'
RINSATE-2
TSB-HR-05-10'MS
TSB-HR-05-10'MSD

Introduction

This data review covers 11 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 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.

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.

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) with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/8/08	Pentachlorophenol	22.52510	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10' RINSATE-2 TSB-HR-05-10'MS TSB-HR-05-10'MSD 8031299-Blk	None	P
2/6/08	Pentachlorophenol	22.53156	8029233-Blk	None	P

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
2/8/08 (KCAL4410)	N-Hydroxymethylphthalimide	74.84218	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10' RINSATE-2 TSB-HR-05-10'MS TSB-HR-05-10'MSD 8031299-Blk	J+ (all detects)	A

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.

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
8031299-Blank	1/31/08	Unknown (3.8408) Unknown aldol condensate (4.2522) Unknown aldol condensate (4.749)	1100 ug/Kg 20000 ug/Kg 320 ug/Kg	All soil samples in SDG F8A290158

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 TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-HJ-10-0'	Unknown aldol condensate (4.2487) Unknown aldol condensate (4.7401)	22000 ug/Kg 350 ug/Kg	22000U ug/Kg 350U ug/Kg
TSB-HJ-10-10'	Unknown aldol condensate (4.2597) Unknown aldol condensate (4.7565)	21000 ug/Kg 350 ug/Kg	21000U ug/Kg 350U ug/Kg
TSB-HR-06-0'	Unknown aldol condensate (4.2595) Unknown aldol condensate (4.751)	23000 ug/Kg 380 ug/Kg	23000U ug/Kg 380U ug/Kg
TSB-HR-06-0'-FD	Unknown aldol condensate (4.2594) Unknown aldol condensate (4.7509)	22000 ug/Kg 360 ug/Kg	22000U ug/Kg 360U ug/Kg
TSB-HR-06-10'	Unknown aldol condensate (4.2583) Unknown aldol condensate (4.7497)	23000 ug/Kg 370 ug/Kg	23000U ug/Kg 370U ug/Kg
TSB-HJ-08-0'	Unknown aldol condensate (4.2624) Unknown aldol condensate (4.7486)	23000 ug/Kg 380 ug/Kg	23000U ug/Kg 380U ug/Kg
TSB-HJ-08-10'	Unknown aldol condensate (4.2588) Unknown aldol condensate (4.7443)	23000 ug/Kg 380 ug/Kg	23000U ug/Kg 380U ug/Kg
TSB-HR-05-0'	Unknown aldol condensate (4.2682) Unknown aldol condensate (4.7597)	22000 ug/Kg 350 ug/Kg	22000U ug/Kg 350U ug/Kg
TSB-HR-05-10'	Unknown aldol condensate (4.247) Unknown aldol condensate (4.7438)	22000 ug/Kg 370 ug/Kg	22000U ug/Kg 370U ug/Kg

Sample "RINSATE-2" 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 within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS percent recovery (%R) was not within QC limits for one compound, the MS/MSD percent recoveries (%R) were within QC limits and no data were qualified.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

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

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

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

XVI. Field Duplicates

Samples TSB-HR-06-0' and TSB-HR-06-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

BRC Tronox Parcel H
Semivolatiles - Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Flag	A or P	Reason
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10' RINSATE-2	Pentachlorophenol	None	P	Continuing calibration (CCC %D)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10' RINSATE-2	N-Hydroxymethylphthalimide	J+ (all detects)	A	Continuing calibration (%D)

BRC Tronox Parcel H
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A290158	TSB-HJ-10-0'	Unknown aldol condensate (4.2487) Unknown aldol condensate (4.7401)	22000U ug/Kg 350U ug/Kg	A
F8A290158	TSB-HJ-10-10'	Unknown aldol condensate (4.2597) Unknown aldol condensate (4.7565)	21000U ug/Kg 350U ug/Kg	A
F8A290158	TSB-HR-06-0'	Unknown aldol condensate (4.2595) Unknown aldol condensate (4.751)	23000U ug/Kg 380U ug/Kg	A
F8A290158	TSB-HR-06-0'-FD	Unknown aldol condensate (4.2594) Unknown aldol condensate (4.7509)	22000U ug/Kg 360U ug/Kg	A
F8A290158	TSB-HR-06-10'	Unknown aldol condensate (4.2583) Unknown aldol condensate (4.7497)	23000U ug/Kg 370U ug/Kg	A
F8A290158	TSB-HJ-08-0'	Unknown aldol condensate (4.2624) Unknown aldol condensate (4.7486)	23000U ug/Kg 380U ug/Kg	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
F8A290158	TSB-HJ-08-10'	Unknown aldol condensate (4.2588) Unknown aldol condensate (4.7443)	23000U ug/Kg 380U ug/Kg	A
F8A290158	TSB-HR-05-0'	Unknown aldol condensate (4.2682) Unknown aldol condensate (4.7597)	22000U ug/Kg 350U ug/Kg	A
F8A290158	TSB-HR-05-10'	Unknown aldol condensate (4.247) Unknown aldol condensate (4.7438)	22000U ug/Kg 370U ug/Kg	A

BRC Tronox Parcel H
Semivolatiles - Field Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

LDC #: 18386B2 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/6/08
SDG #: F8A290158 Level III Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD ; r^2 ≥ 0.990
IV.	Continuing calibration/ICV	SW	ICV ≤ 25
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	~~SW~~ A	
VIII.	Laboratory control samples	SW	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	D = 3,4
XVII.	Field blanks	ND	R = 10

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: ** Indicates sample underwent Level IV validation

Soil + Water

1	TSB-HJ-10-0'	11	TSB-HR-05-10'MS	21	8029233-Blank	31	
2	TSB-HJ-10-10'	12	TSB-HR-05-10'MSD	22	8031299-Blank	32	
3	TSB-HR-06-0'	13		23		33	
4	TSB-HR-06-0'-FD	14		24		34	
5	TSB-HR-06-10'	15		25		35	
6	TSB-HJ-08-0'	16		26		36	
7	TSB-HJ-08-10'	17		27		37	
8	TSB-HR-05-0'	18		28		38	
9	TSB-HR-05-10'	19		29		39	
10	RINSATE-2 W	20		30		40	

VALIDATION FINDINGS WORKSHEET

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

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

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

LDC #: 18386B2
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

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

#	Date	Standard ID	Compound	Finding %D (Limit: <25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	2/8/08 15:24	KCAL4408	TT (ccc)	22.52510		8031299-BLK, + All samples, 11, 12	none/P
+	2/8/08 16:18	KCAL4410	N-(Hydroxymethyl) phthalimide	74.84218		↓	J+/A det
	2/6/08 20:45	KCAL4350	TT (ccc)	22.53156		8029233-BLK	none/P

CONCAL.2S

LDC #: 18386B2
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

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".

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

Blank extraction date: 1/31/08 **Blank analysis date:** 2/08/08
Conc. units: ug/kg Associated Samples: All soils

Compound	Blank ID	Sample Identification								
	8031299-Blank	1	2	3	4	5	6	7	8	9
unknown (TIC)	1100 (3.8408)	-	-	-	-	-	-	-	-	-
unknown aldol condensate	20000 (4.2522)	22000 (4.2487)	21000 (4.2597)	23000 (4.2595)	22000 (4.2594)	23000 (4.2583)	23000 (4.2624)	23000 (4.2588)	22000 (4.2682)	22000 (4.247)
unknown aldol condensate	320 (4.749)	350 (4.7401)	350 (4.7565)	380 (4.751)	360 (4.7509)	370 (4.7497)	380 (4.7486)	380 (4.7443)	350 (4.7597)	370 (4.7438)

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

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above 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".

LDC #: 18386B2
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of ___
Reviewer: B
2nd 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".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		8029233-LCS	HH	25 (30-92)	( )	( )	8029233-Blank,	no QUAL MSD in
				( )	( )	( )	#10	
				( )	( )	( )	— — —	—
				( )	( )	( )		
				( )	( )	( )		
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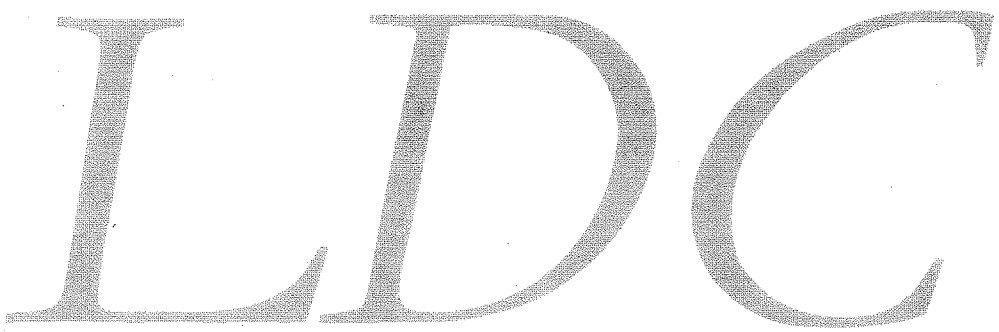
BRC Tronox Parcel H
Data Validation Reports
LDC# 18386

Chlorinated Pesticides



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 24, 2008

LDC Report Date: March 13, 2008

Matrix: Soil

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A250221

Sample Identification

TSB-HJ-05-10'
TSB-HJ-05-0'
TSB-HR-04-10'
TSB-HJ-04-0'
TSB-HR-04-0'**
TSB-HJ-04-10'
TSB-HR-07-0'
TSB-HR-07-10'**
TSB-HR-06-0'
TSB-HR-06-10'
TSB-HJ-07-0'**
TSB-HJ-07-0'-FD
TSB-HJ-07-10'
TSB-HR-08-0'
TSB-HR-08-10'
TSB-HR-08-0'MS
TSB-HR-08-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 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.

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

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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.

Retention time windows were evaluated and considered technically acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

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	Column	Compound	%D	Associated Samples	Flag	A or P
2/8/08	KCAL587	RTX-CLP1	Toxaphene	29.5	TSB-HJ-07-0'-FD	J+ (all detects)	A
2/8/08	KCAL587	RTX-CLP2	Toxaphene	27.4	TSB-HJ-07-0'-FD	J+ (all detects)	A
2/9/08	KCAL661	RTX-CLP1	Toxaphene	25.4	TSB-HJ-05-0' TSB-HJ-05-10' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** 8029397-Blank	J+ (all detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
2/9/08	KCAL677	RTX-CLP1	Toxaphene	31.6	TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-0'MS TSB-HR-08-0'MSD	J+ (all detects)	A
2/9/08	KCAL689	RTX-CLP1	Toxaphene Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Endrin ketone	16.8 16.0 15.2 15.6 17.6 19.4	TSB-HR-08-10'	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A
2/9/08	KCAL691	RTX-CLP1	Toxaphene	32.8	TSB-HR-08-10'	J+ (all detects)	A
2/9/08	KCAL692	RTX-CLP1	2,4'-DDE 2,4'-DDD	16.1 16.6	TSB-HR-08-10'	J+ (all detects) J+ (all detects)	A

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

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide 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-HJ-05-0'	Not specified	Decachlorobiphenyl	128 (63-117)	All TCL compounds	J+ (all detects)	P

Sample	Column	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-HR-08-10'	Not specified	Decachlorobiphenyl	123 (63-117)	All TCL compounds	J+ (all detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. 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

All target compound identifications were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which an EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-HJ-07-0'** and TSB-HJ-07-0'-FD were identified as field duplicates. No chlorinated pesticides were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HJ-07-0'**	TSB-HJ-07-0'-FD				
beta-BHC	1.8U	3.4	-	1.6 (≤1.8)	-	-

BRC Tronox Parcel H
Chlorinated Pesticides - Data Qualification Summary - SDG F8A250221

SDG	Sample	Compound	Flag	A or P	Reason
F8A250221	TSB-HJ-07-0'-FD TSB-HJ-05-0' TSB-HJ-05-10' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-10' TSB-HR-08-0'	Toxaphene	J+ (all detects)	A	Continuing calibration (%D)
F8A250221	TSB-HR-08-10'	Toxaphene Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Endrin ketone 2,4'-DDE 2,4'-DDD	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
F8A250221	TSB-HJ-05-0' TSB-HR-08-10'	All TCL compounds	J+ (all detects)	P	Surrogate spikes (%R)

BRC Tronox Parcel H
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

LDC #: 18386A3a
SDG #: F8A250211
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 3/10/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation and reported CRQLs	A	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 11 and 12
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: ** Indicates sample underwent Level IV validation

SOIL

1	TSB-HJ-05-10'	11	TSB-HJ-07-0'**	21	8029397-Blank	31	
2	TSB-HJ-05-0'	12	TSB-HJ-07-0'-FD	22		32	
3	TSB-HR-04-10'	13	TSB-HJ-07-10'	23		33	
4	TSB-HJ-04-0'	14	TSB-HR-08-0'	24		34	
5	TSB-HR-04-0'**	15	TSB-HR-08-10'	25		35	
6	TSB-HJ-04-10'	16	TSB-HR-08-0'MS	26		36	
7	TSB-HR-07-0'	17	TSB-HR-08-0'MSD	27		37	
8	TSB-HR-07-10'**	18		28		38	
9	TSB-HR-06-0'	19		29		39	
10	TSB-HR-06-10'	20		30		40	

LDC #: 18386A3a
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Reviewer: FR
2nd Reviewer: W

Method: Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/ECD instrument performance check				
Was the instrument performance found to be acceptable?	✓			
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) $\leq$ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
Were the required standard concentrations analyzed in the initial calibration?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ___%D or ___%R	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis?	✓			
Were endrin and 4,4'-DDT breakdowns $\leq$ 15%.0 for individual breakdown in the Evaluation mix standards?	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) $\leq$ 15%.0 or percent recovieries 85-115%?		✓		
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Were extract cleanup blanks analyzed with every batch requiring clean-up?			✓	
Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?		✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	✓			
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	

LDC #: 18386A3a
SDG #: all cores

VALIDATION FINDINGS CHECKLIST

Reviewer: M
2nd Reviewer: ✓

Validation Area	Yes	No	NA	Findings/Comments
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?			✓	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

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

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 18386A3a
SDG #: pw cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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? ___%D or ___RPD
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (limit)	Associated Samples	Qualifications
+	2/8/08	KCAL587	RTX-CLP1	U	29.5	( )	12	J+/A det
			RTX-CLP2	U	27.4	( )	↓	↓
						( )		
						( )		
						( )		
+	2/9/08	KCAL661	RTX-CLP1	~~U~~ U	25.4	( )	8029397-Blank,	J+/A det
						( )	1, ~~2~~, 3, 4, 5 (1→5)	
						( )		
						( )		
+	2/9/08	KCAL677	RTX-CLP1	U	31.6	( )	6→~~11~~, 16, 17	J+/A det
						( )	13, 14	
						( )		
						( )		
+	2/9/08	KCAL689	RTX-CLP1	U	16.8	( )	15	J+/A det
+				L	16.0	( )		
+				O	15.2	( )		
+				R	15.6	( )		
+				N	17.6	( )		
+				Q	19.4	( )		
						( )		
						( )		
						( )		

LDC #: 18386A3a
SDG #: pw cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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? ___%D or ___RPD

Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (limit)	Associated Samples	Qualifications
	2/9/08	KCAL691	RTX-CLP1	4	32.8	( )	15	J+/A dit
						( )		
						( )		
						( )		
	2/9/08	KCAL692	RTX-CLP1	2,4'-PDE	16.1	( )	15	
			↓	2,4'-DPD	16.6	( )	15	J+/A dit
						( )		↓
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		
						( )		
						( )		
						( )		
						( )		

LDC #: 18386A3a
SDG #: see cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: __ GC __ HPLC

Are surrogates required by the method? Yes___ or No___.

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

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	2	not specified	DCB	128 (63 - 117)	J+/P det
				( )	
				( )	
	15	↓	↓	123 (↓)	J+/P det
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18386A3a
SDG #: All covered

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: / GC __ HPLC

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

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

Compound	Concentration (ug/kg)		%RPD Limit Difference	Qualification Parent only / All Samples
	11	12		
B	1.8 U	3.4	1.6 < 1.8	

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

LDC #: 18386A3a
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

METHOD: GC_____ / HPLC_____

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

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (0.625 std)	Recalculated CF (0.625 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	2/7/09	endosulfan I RTXCLP1	568745040	568745040	572386340	572386340	6.294	6.294
			methoxychlor ↓	240546960	240546960	245012540	245012540	6.787	6.787
			RTXCLP2	264234520	264234520	265059470	265059470	5.585	5.585
2			↓	53596400	53596400	55334490	55334490	4.736	4.736
3									
4									

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

LDC #: 18386A3a
SDG #: all cases

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer:
2nd Reviewer:

METHOD: GC / HPLC

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

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	KCAL659	2/9/08	endosulfan I (RTX-CLP)	0.0250	0.0262	0.0262	4.9	4.9
			methoxychlor ↓	↓	0.0269	0.0269	7.4	7.4
	KCAL675	2/9/08	RTX-CLP-1		0.0275	0.0275	10.0	10.0
2			↓ ↓	↓	0.0274	0.0274	9.8	9.8
3								
4								

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

LDC #: 18386A3a
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer:
2nd reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 5

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene	RTX-CLP1	0.02	0.02117	106	106	106
Decachlorobiphenyl	↓	↓	0.02272	114	114	114
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Notes:

LDC #: 18386A3a
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 1
2nd Reviewer:

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

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

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery; MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 16 & 17

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	-	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC	17.6	17.3	0	18.6	17.1	106	106	98	98	8.9	8.9
4,4'-DDT	↓	17.3	0	21.4	19.1	122	122	110	110	11	11

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

LDC #: 18386A3a
SDG #: per cover

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

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

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

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: LCS

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	16.7	NA	17.2	NA	103	103				
4,4'-DDT	↓	↓	18.7	↓	112	112	NA			

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

LDC #: 18386 A3a
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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

Example:

Sample I.D. _____ _____:

Conc. = (_____)
(_____)

= ND

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 28, 2008

LDC Report Date: March 14, 2008

Matrix: Soil/Water

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A290158

Sample Identification

TSB-HJ-10-0'
TSB-HJ-10-10'
TSB-HR-06-0'
TSB-HR-06-0'-FD
TSB-HR-06-10'
TSB-HJ-08-0'
TSB-HJ-08-10'
TSB-HR-05-0'
TSB-HR-05-10'
RINSATE-2
TSB-HR-05-10'MS
TSB-HR-05-10'MSD

Introduction

This data review covers 11 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 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.

Retention time windows were evaluated and considered technically acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

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	Column	Compound	%D	Associated Samples	Flag	A or P
2/8/08	KCAL617	RTX-CLP1	Toxaphene	21.7	TSB-HJ-10-0' 8035062-BLK	J+ (all detects)	A
2/8/08	KCAL631	RTX-CLP1	Toxaphene	22.4	TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10' TSB-HR-05-10'MS TSB-HR-05-10'MSD	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%.

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

V. Blanks

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

Sample "RINSATE-2" 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-HJ-10-0'	Not specified	Tetrachloro-m-xylene Decachlorobiphenyl	119 (55-115) 126 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HJ-10-10'	Not specified	Decachlorobiphenyl	126 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HR-06-0'	Not specified	Decachlorobiphenyl	121 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HR-06-0'-FD	Not specified	Tetrachloro-m-xylene Decachlorobiphenyl	122 (55-115) 127 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HR-06-10'	Not specified	Tetrachloro-m-xylene Decachlorobiphenyl	121 (55-115) 129 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HJ-08-0'	Not specified	Tetrachloro-m-xylene Decachlorobiphenyl	126 (55-115) 132 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HJ-08-10'	Not specified	Tetrachloro-m-xylene Decachlorobiphenyl	119 (55-115) 123 (63-117)	All TCL compounds	J+ (all detects)	P
TSB-HR-05-0'	Not specified	Tetrachloro-m-xylene Decachlorobiphenyl	124 (55-115) 130 (63-117)	All TCL compounds	J+ (all detects)	P
8035062-Blank	Not specified	Decachlorobiphenyl	124 (63-117)	All TCL compounds	J+ (all detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

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

b. GPC Calibration

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

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-HR-06-0' and TSB-HR-06-0'-FD were identified as field duplicates. No chlorinated pesticides were detected in any of the samples.

BRC Tronox Parcel H
Chlorinated Pesticides - Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Flag	A or P	Reason
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Toxaphene	J+ (all detects)	A	Continuing calibration (%D)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0'	All TCL compounds	J+ (all detects)	P	Surrogate spikes (%R)

BRC Tronox Parcel H
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

LDC #: 18386B3a
SDG #: F8A290158
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3/6/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/28/08
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	~~A~~ SW SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	ND	D = 3 + 4
XV.	Field blanks	NP	R = 10

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

Validated Samples: Soil + Water

1	TSB-HJ-10-0'	11	TSB-HR-05-10'MS	21	8029304	31	
2	TSB-HJ-10-10'	12	TSB-HR-05-10'MSD	22	8035062	32	
3	TSB-HR-06-0' D	13		23		33	
4	TSB-HR-06-0'-FD D	14		24		34	
5	TSB-HR-06-10'	15		25		35	
6	TSB-HJ-08-0'	16		26		36	
7	TSB-HJ-08-10'	17		27		37	
8	TSB-HR-05-0'	18		28		38	
9	TSB-HR-05-10'	19		29		39	
10	RINSATE-2 W	20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 18386B3c
SDG #: pw cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: F7
2nd Reviewer: LA

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? ___%D or ___RPD
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (limit)	Associated Samples	Qualifications
+	2/8/08	KCAL617	RTX-CLP1	M	21.7	( )	#1, 803562-BIK	J+/A det
						( )		
						( )		
						( )		
+	2/8/08	KCAL631	↓	↓	22.4	( )	# 2-9, 11, 12	J+/A det
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

LDC #: 18386B3a
SDG #: w covered

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: ✓ GC ___ HPLC

Are surrogates required by the method? Yes____ or No____.

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

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1	not specified	Y	119 (55-115)	J+/P dut
			θ	126 (63-117)	↓
				( )	
	2	↓	θ	126 (63-117)	J+/P dut
				( )	
	3	↓	θ	121 (↓)	J+/P dut
				( )	
	4	↓	Y	122 (55-115)	J+/P dut
		↓	θ	127 (63-117)	↓
				( )	
	5	↓	↓	121 (↓)	↓
		↓	↓	129 (↓)	↓
	5			( )	
	6	↓	↓	126 (↓)	J+/P dut
		↓	↓	132 (↓)	
				( )	
	7	↓	↓	119 (↓)	J+/P dut
		↓	↓	123 (↓)	
				( )	
	8	↓	↓	124 (↓)	J+/P dut
		↓	↓	130 (↓)	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18386B3a
SDG #: All Covered

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: ~~GC~~ __ HPLC

Are surrogates required by the method? Yes____ or No____.

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

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	SB035062-Blank	not specified	O	124 (63-117)	J+/P det
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

BRC Tronox Parcel H
Data Validation Reports
LDC# 18386

Polychlorinated Biphenyls

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 24, 2008

LDC Report Date: March 11, 2008

Matrix: Soil

Parameters: Polychlorinated Biphenyls

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A250221

Sample Identification

TSB-HJ-05-10'
TSB-HJ-05-0'
TSB-HR-04-10'
TSB-HJ-04-0'
TSB-HR-04-0'**
TSB-HJ-04-10'
TSB-HR-07-0'
TSB-HR-07-10'**
TSB-HR-06-0'
TSB-HR-06-10'
TSB-HJ-07-0'**
TSB-HJ-07-0'-FD
TSB-HJ-07-10'
TSB-HR-08-0'
TSB-HR-08-10'
TSB-HR-08-0'MS
TSB-HR-08-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 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.

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

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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.

Retention time windows were evaluated and considered technically acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

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.

Retention times (RT) of all compounds in the calibration standards were within QC limits for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples on which a Level III review was performed.

V. Blanks

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

No field blanks were identified in this SDG.

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS percent recovery (%R) was not within QC limits for one compound, the MS/MSD percent recoveries (%R) and relative percent differences (RPD) were within QC limits and no data were qualified.

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

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Compound Quantitation and Reported CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-HJ-07-0'** and TSB-HJ-07-0'-FD were identified as field duplicates. No polychlorinated biphenyls were detected in any of the samples.

BRC Tronox Parcel H
Polychlorinated Biphenyls - Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

LDC #: 18386A3b
SDG #: F8A250221
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 3/7/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	ICV ≤ 15
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation and reported CRQLs	A	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	ND	D = 11 & 12
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: ** Indicates sample underwent Level IV validation

1	TSB-HJ-05-10'	11	TSB-HJ-07-0'**	21	8029396-Blank	31	
2	TSB-HJ-05-0'	12	TSB-HJ-07-0'-FD	22		32	
3	TSB-HR-04-10'	13	TSB-HJ-07-10'	23		33	
4	TSB-HJ-04-0'	14	TSB-HR-08-0'	24		34	
5	TSB-HR-04-0'**	15	TSB-HR-08-10'**	25		35	
6	TSB-HJ-04-10'	16	TSB-HR-08-0'MS	26		36	
7	TSB-HR-07-0'	17	TSB-HR-08-0'MSD	27		37	
8	TSB-HR-07-10'**	18		28		38	
9	TSB-HR-06-0'	19		29		39	
10	TSB-HR-06-10'	20		30		40	

LDC #: 18386A36
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ____%R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		

LDC #: 18386A36
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?			✓	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.				
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.		✓		
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 18386A3b
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

METHOD: [✓ GC] ___ HPLC

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

[✓ Y] N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y [✓ N] N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

[✓ Y] N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	8029396-LCS	V	118 (80-116)	( )	( )	All + BK	~~J+/P det~~ no QUAL
			( )	( )	( )		MS ID in
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 18386A36
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:
2nd Reviewer:

METHOD: GC ✓ HPLC ____

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

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (500 std)	Recalculated CF (50 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	9/6/07	Aroclor 1260 - 1 RTX CLP1	12182	12182	11502	11502	9.589	9.589
			Aroclor 1260 - 1 RTX-CLP2	11265	11265	11104	11104	8.799	8.799
2									
3									
4									

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

LDC #: 18386A3b
SDG #: eu cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

METHOD: GC ✓ HPLC ____

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

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	~~ICAL~~	~~9/6/07~~	Aroclor 1260-1 RTX cvp1	1000.00	1006.6919	1006.69	0.7	0.7
	CCV	1/31/08	Aroclor 1260-1 RTX cvp2	1000.00	1098.2936	1098.29	9.8	9.8
2								
3								
4								

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

LDC #: 18386A3b
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC __ HPLC

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #5

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
DCB	RTX CLP1	20	19.7627	99	99	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 18386A36
SDG #: pw cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: __GC __HPLC

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

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked sample concentration SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 16 + 17

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Aroclor 1260	176	174	0	212	211	120	120	121	121	0.90	0.5

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

LDC #: L8386A36
SDG #: pw cover

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

Reviewer: P
2nd Reviewer:

METHOD: ___ GC / HPLC

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

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked concentration, SA = Spike added, SC = Sample concentration

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100 LCS = Laboratory Control Sample percent recovery LCSD = Laboratory Control Sample duplicate percent recovery

LCS/LCSD samples: 8029396-LCS

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	---	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Aroclor 1260	167	NA	0	179	NA	107	107	NA			

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

LDC #: 18386A3b
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: X GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID._____ Compound Name _____

Concentration =_____

ND

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

SAMPCALew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 28, 2008

LDC Report Date: March 11, 2008

Matrix: Soil/Water

Parameters: Polychlorinated Biphenyls

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A290158

Sample Identification

TSB-HJ-10-0'
TSB-HJ-10-10'
TSB-HR-06-0'
TSB-HR-06-0'-FD
TSB-HR-06-10'
TSB-HJ-08-0'
TSB-HJ-08-10'
TSB-HR-05-0'
TSB-HR-05-10'
RINSATE-2
TSB-HR-05-10'MS
TSB-HR-05-10'MSD

Introduction

This data review covers 11 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 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 with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
2/4/08	PCAL541	RTX-CLP1	Aroclor-1016	16.8	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD	Aroclor-1016 Aroclor-1221 Aroclor-1232	J+ (all detects) J+ (all detects) J+ (all detects)	A

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

V. Blanks

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

Sample RINSATE-2 was identified as a rinsate. No polychlorinated biphenyl 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
8031455-Blank	Not specified	Dichlorophenyl acetic acid	269 (51-150)	All TCL compounds	J+ (all detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

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

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS percent recovery (%R) was not within QC limits for one compound, the MS/MSD percent recoveries (%R) and relative percent differences (RPD) were within QC limits and no data were qualified.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

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

b. GPC Calibration

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

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-HR-06-0' and TSB-HR-06-0'-FD were identified as field duplicates. No polychlorinated biphenyls were detected in any of the samples.

BRC Tronox Parcel H
Polychlorinated Biphenyls - Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Flag	A or P	Reason
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD	Aroclor-1016 Aroclor-1221 Aroclor-1232	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)

BRC Tronox Parcel H
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

LDC #: 18386B3b
SDG #: F8A290158
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3/6/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/28/08
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	ICV ≤ 15
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	ND	D = 3+4
XV.	Field blanks	ND	R = 10

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

Validated Samples:

Soil + water

1	TSB-HJ-10-0'	11	TSB-HR-05-10'MS	21	1 802934G-B1k	31	
2	TSB-HJ-10-10'	12	TSB-HR-05-10'MSD	22	2 803145-B1/C	32	
3	TSB-HR-06-0' D	13		23		33	
4	TSB-HR-06-0'-FD D	14		24		34	
5	TSB-HR-06-10'	15		25		35	
6	TSB-HJ-08-0'	16		26		36	
7	TSB-HJ-08-10'	17		27		37	
8	TSB-HR-05-0'	18		28		38	
9	TSB-HR-05-10'	19		29		39	
10	RINSATE-2 R W	20		30		40	

VALIDATION FINDINGS WORKSHEET

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

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes: _____

LDC #: 18386B3b
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: F7
2nd Reviewer: L

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? __%D or __RPD

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

Y [✓ N] N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?

Level IV Only

Y N [✓ N/A] Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (limit)	Associated Samples	Qualifications
+	2/4/08	PCAL541	RTX-clP1	V	16.8	( )	1→4	J+/A det
						( )		QUAL V, W, X
						( )		
						( )		
						( )		
						( )		
						( )		
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						( )		

LDC #: 18386B3b
SDG #: see cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: __ GC __ HPLC

Are surrogates required by the method? Yes____ or No____.

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

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	803145-Blank	not specified	O	269 (51-150)	J/Pdet
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18386B3b
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: __ GC __ HPLC

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

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?
Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only
Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	803/455-LCS	V	120 (80-116)	( )	( )	803/455 - B/K,	no qual
			( )	( )	( )	+ All soils	ms/D in
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		

BRC Tronox Parcel H
Data Validation Reports
LDC# 18386

Metals

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 24, 2008

LDC Report Date: March 11, 2008

Matrix: Soil

Parameters: Metals

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A250221

Sample Identification

TSB-HJ-05-10'
TSB-HJ-05-0'
TSB-HR-04-10'
TSB-HJ-04-0'
TSB-HR-04-0'**
TSB-HJ-04-10'
TSB-HR-07-0'
TSB-HR-07-10'**
TSB-HR-06-0'
TSB-HR-06-10'
TSB-HJ-07-0'**
TSB-HJ-07-0'-FD
TSB-HJ-07-10'
TSB-HR-08-0'
TSB-HR-08-10'
TSB-HR-08-0'MS
TSB-HR-08-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 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.

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

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

III. Blanks

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

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Aluminum Boron Calcium Chromium Iron Niobium Phosphorus Potassium Sodium Tin	3.1 mg/Kg 2.4 mg/Kg 14.0 mg/Kg 0.33 mg/Kg 5.6 mg/Kg 1.4 mg/Kg 3.0 mg/Kg 3.9 mg/Kg 8.2 mg/Kg 0.067 mg/Kg	All samples in SDG F8A250221
ICB/CCB	Cadmium Chromium Cobalt Nickel Niobium Thallium Titanium Tungsten Lithium	0.036 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 6.8 ug/L 0.4 ug/L 0.6 ug/L 0.9 ug/L 7.6 ug/L	All samples in SDG F8A250221

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-HJ-05-10'	Cadmium	0.063 mg/Kg	0.54U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HJ-05-0'	Cadmium Lithium	0.099 mg/Kg 14.7 mg/Kg	0.26U mg/Kg 21.0U mg/Kg
TSB-HR-04-10'	Niobium	5.5 mg/Kg	6.6U mg/Kg
TSB-HJ-04-0'	Cadmium Niobium Lithium	0.10 mg/Kg 4.8 mg/Kg 10.7 mg/Kg	0.55U mg/Kg 5.5U mg/Kg 21.8U mg/Kg
TSB-HR-04-0'**	Cadmium Niobium Tungsten Lithium	0.076 mg/Kg 3.3 mg/Kg 0.29 mg/Kg 14.3 mg/Kg	0.13U mg/Kg 5.2U mg/Kg 1.3U mg/Kg 20.9U mg/Kg
TSB-HJ-04-10'	Boron Cadmium Niobium	15.3 mg/Kg 0.064 mg/Kg 5.7 mg/Kg	53.2U mg/Kg 0.27U mg/Kg 6.7U mg/Kg
TSB-HR-07-0'	Cadmium Niobium Lithium	0.069 mg/Kg 4.0 mg/Kg 17.3 mg/Kg	0.27U mg/Kg 5.4U mg/Kg 21.4U mg/Kg
TSB-HR-07-10'**	Niobium	4.4 mg/Kg	6.7U mg/Kg
TSB-HR-06-0'	Cadmium Niobium Lithium	0.11 mg/Kg 3.8 mg/Kg 12.0 mg/Kg	0.28U mg/Kg 5.5U mg/Kg 22.2U mg/Kg
TSB-HR-06-10'	Cadmium Niobium	0.068 mg/Kg 3.4 mg/Kg	0.55U mg/Kg 5.5U mg/Kg
TSB-HJ-07-0'**	Niobium Lithium	3.4 mg/Kg 10.2 mg/Kg	5.4U mg/Kg 21.7U mg/Kg
TSB-HJ-07-0'-FD	Cadmium Niobium Lithium	0.081 mg/Kg 3.5 mg/Kg 12.0 mg/Kg	0.27U mg/Kg 5.3U mg/Kg 21.2U mg/Kg
TSB-HJ-07-10'	Niobium Lithium	3.3 mg/Kg 20.6 mg/Kg	5.4U mg/Kg 21.5U mg/Kg
TSB-HR-08-0'	Cadmium Niobium Lithium	0.099 mg/Kg 3.1 mg/Kg 9.4 mg/Kg	0.27U mg/Kg 5.3U mg/Kg 21.2U mg/Kg
TSB-HR-08-10'	Cadmium Niobium	0.076 mg/Kg 4.9 mg/Kg	0.55U mg/Kg 5.5U 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
TSB-HR-08-0'MS/MSD (All samples in SDG F8A250221)	Antimony	60.6 (75-125)	54.7 (75-125)	-	J- (all detects) UJ (all non-detects)	A
	Phosphorus	31.3 (75-125)	62.5 (75-125)	-	J- (all detects) UJ (all non-detects)	
TSB-HR-08-0'MS/MSD (All samples in SDG F8A250221)	Barium	173.6 (75-125)	150.6 (75-125)	-	J+ (all detects)	A
	Calcium	335.9 (75-125)	411.7 (75-125)	-	J+ (all detects)	
	Chromium	144.1 (75-125)	134.7 (75-125)	-	J+ (all detects)	
	Lead	150.5 (75-125)	-	-	J+ (all detects)	
	Magnesium	160.5 (75-125)	-	-	J+ (all detects)	
	Niobium	190.9 (75-125)	186.9 (75-125)	-	J+ (all detects)	
	Silicon	281.6 (75-125)	225.0 (75-125)	-	J+ (all detects)	
	Strontium	169.6 (75-125)	160.2 (75-125)	-	J+ (all detects)	
	Vanadium	146.9 (75-125)	137.0 (75-125)	-	J+ (all detects)	
	Zinc	131.4 (75-125)	-	-	J+ (all detects)	

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 with the following exceptions:

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS	Palladium	120.5 (80-120)	All samples in SDG F8A250221	J+ (all detects)	P
	Platinum	121.9 (80-120)		J+ (all detects)	

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which a Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

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.

XI. Sample Result Verification

All sample result verifications were acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

XII. Overall Assessment of Data

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

XIII. Field Duplicates

Samples TSB-HJ-07-0'** and TSB-HJ-07-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HJ-07-0'**	TSB-HJ-07-0'-FD				
Aluminum	7780	8820	13 (≤50)	-	-	-
Arsenic	2.3	1.5	-	0.8 (≤2.2)	-	-
Barium	121	198	48 (≤50)	-	-	-
Beryllium	0.58	0.66	-	0.08 (≤1.1)	-	-
Cadmium	0.054U	0.081	-	0.027 (≤0.54)	-	-
Calcium	29900	13600	75 (≤50)	-	J (all detects)	A

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HJ-07-0'**	TSB-HJ-07-0'-FD				
Chromium	8.2	9.8	-	1.6 (≤2.2)	-	-
Cobalt	6.1	6.0	2 (≤50)	-	-	-
Copper	16.7	17.5	-	0.8 (≤10.8)	-	
Iron	13000	14600	12 (≤50)	-	-	-
Lead	6.6	10.4	45 (≤50)	-	-	-
Magnesium	9270	7540	21 (≤50)	-	-	-
Manganese	282	402	35 (≤50)	-	-	-
Molybdenum	0.37	0.57	-	0.2 (≤1.1)	-	-
Nickel	14.0	13.5	4 (≤50)	-	-	-
Niobium	3.4	3.5	-	0.1 (≤5.4)	-	-
Palladium	0.33	0.42	-	0.09 (≤1.1)	-	-
Phosphorus	1350	1480	9 (≤50)	-	-	-
Potassium	1720	2530	38 (≤50)	-	-	-
Silicon	98.9	188	-	89.1 (54.1)	J (all detects)	A
Sodium	266	181	-	85 (≤217)	-	-
Strontium	157	189	18 (≤50)	-	-	-
Titanium	512	636	22 (≤50)	-	-	-
Uranium	0.93	0.82	-	0.11 (≤1.1)	-	-
Vanadium	32.1	40.2	22 (≤50)	-	-	-
Zinc	24.2	31.8	27 (≤50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HJ-07-0'**	TSB-HJ-07-0'-FD				
Zirconium	16.5	21.3	-	4.8 (≤21.7)	-	-
Lithium	10.2	12.0	-	1.8 (≤21.7)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HJ-07-0'**	TSB-HJ-07-0'-FD				
Mercury	20.2	7.1U	-	13.1 (≤36.1)	-	-

BRC Tronox Parcel H
Metals - Data Qualification Summary - SDG F8A250221

SDG	Sample	Analyte	Flag	A or P	Reason
F8A250221	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-0'-FD TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-10'	Antimony Phosphorus	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A250221	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-0'-FD TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-10'	Barium Calcium Chromium Lead Magnesium Niobium Silicon Strontium Vanadium Zinc	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A250221	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-0'-FD TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-10'	Palladium Platinum	J+ (all detects) J+ (all detects)	P	Laboratory control samples (%R)
F8A250221	TSB-HJ-07-0'** TSB-HJ-07-0'-FD	Calcium	J (all detects)	A	Field duplicates (RPD)
F8A250221	TSB-HJ-07-0'** TSB-HJ-07-0'-FD	Silicon	J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel H
Metals - Laboratory Blank Data Qualification Summary - SDG F8A250221

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A250221	TSB-HJ-05-10'	Cadmium	0.54U mg/Kg	A
F8A250221	TSB-HJ-05-0'	Cadmium Lithium	0.26U mg/Kg 21.0U mg/Kg	A
F8A250221	TSB-HR-04-10'	Niobium	6.6U mg/Kg	A
F8A250221	TSB-HJ-04-0'	Cadmium Niobium Lithium	0.55U mg/Kg 5.5U mg/Kg 21.8U mg/Kg	A
F8A250221	TSB-HR-04-0'**	Cadmium Niobium Tungsten Lithium	0.13U mg/Kg 5.2U mg/Kg 1.3U mg/Kg 20.9U mg/Kg	A
F8A250221	TSB-HJ-04-10'	Boron Cadmium Niobium	53.2U mg/Kg 0.27U mg/Kg 6.7U mg/Kg	A
F8A250221	TSB-HR-07-0'	Cadmium Niobium Lithium	0.27U mg/Kg 5.4U mg/Kg 21.4U mg/Kg	A
F8A250221	TSB-HR-07-10'**	Niobium	6.7U mg/Kg	A
F8A250221	TSB-HR-06-0'	Cadmium Niobium Lithium	0.28U mg/Kg 5.5U mg/Kg 22.2U mg/Kg	A
F8A250221	TSB-HR-06-10'	Cadmium Niobium	0.55U mg/Kg 5.5U mg/Kg	A
F8A250221	TSB-HJ-07-0'**	Niobium Lithium	5.4U mg/Kg 21.7U mg/Kg	A
F8A250221	TSB-HJ-07-0'-FD	Cadmium Niobium Lithium	0.27U mg/Kg 5.3U mg/Kg 21.2U mg/Kg	A
F8A250221	TSB-HJ-07-10'	Niobium Lithium	5.4U mg/Kg 21.5U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A250221	TSB-HR-08-0'	Cadmium Niobium Lithium	0.27U mg/Kg 5.3U mg/Kg 21.2U mg/Kg	A
F8A250221	TSB-HR-08-10'	Cadmium Niobium	0.55U mg/Kg 5.5U mg/Kg	A

BRC Tronox Parcel H
Metals - Field Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

LDC #: 18386A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/5/08
SDG #: F8A250221 Level III/IV Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	3MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	SW	LCS
VIII.	Internal Standard (ICP-MS)	A	Not reviewed for Level 3
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(11, 12)
XIV.	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: ** Indicates sample underwent Level IV validation

Soil

1	TSB-HJ-05-10'	11	TSB-HJ-07-0'**	21		31	
2	TSB-HJ-05-0'	12	TSB-HJ-07-0'-FD	22		32	
3	TSB-HR-04-10'	13	TSB-HJ-07-10'	23		33	
4	TSB-HJ-04-0'	14	TSB-HR-08-0'	24		34	
5	TSB-HR-04-0'**	15	TSB-HR-08-10'	25		35	
6	TSB-HJ-04-10'	16	TSB-HR-08-0'MS	26		36	
7	TSB-HR-07-0'	17	TSB-HR-08-0'MSD	27		37	
8	TSB-HR-07-10'**	18	PB	28		38	
9	TSB-HR-06-0'	19		29		39	
10	TSB-HR-06-10'	20		30		40	

Notes: _____

LDC #: 18786A4
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MH
2nd Reviewer: 9/14

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

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury and 85-115% for cyanide) QC limits?	✓			
Were all initial calibration correlation coefficients ≥ 0.995? (Level IV only)	✓			
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
IV. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.		✓		
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?		✓		
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients > 0.995?			✓	
Do all applicable analysies have duplicate injections? (Level IV only)			✓	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			✓	
Were analytical spike recoveries within the 85-115% QC limits?			✓	

LDC #: 18386A4
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer: MM

Validation Area	Yes	No	NA	Findings/Comments
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			710 X MDL for ICP/MS
Were all percent differences (%Ds) < 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
VIII. Internal Standards (EPA SW 846 Method 6020)				
Were all the percent recoveries (%R) within the 30-120% of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 18386A4
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer:
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-15	soil	[✓ 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, ___ ___
~16,17	soil	[✓ 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, ___ ___
1-15	soil	[✓ Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,] ___ ___
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr, ___ ___
~16,17	soil	[✓ 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		
ICP		[✓ Li, S,] ___ ___
ICP-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,] ___
ICP-MS		[✓ Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Zr,] ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻

Comments: [✓ Mercury by CVAA if performed]
Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

LDC #: 18356A4
SDG #: See Cover
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: 6-12/~~13~~

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	1	2	3	4	5	6	7	8	9	10
Al	3.1													
B	2.4									15.3 / 53.2				
Ca	14.0													
Cd			0.036		0.063 / 0.54	0.099 / 0.26		0.10 / 0.55	0.076 / 0.13	0.064 / 0.27	0.069 / 0.27		0.11 / 0.28	0.068 / 0.55
Cr	0.33		0.5											
Co			0.5											
Fe	5.6													
Ni			0.5											
Nb	1.4		6.8				5.5 / 6.6	4.8 / 5.5	3.3 / 5.2	5.7 / 6.7	4.0 / 5.4	4.4 / 6.7	3.8 / 5.5	3.4 / 5.5
P	3.0													
K	3.9													
Na	8.2													
Tl			0.4											
Ti	0.067		0.6											
W			0.9						0.29 / 1.3					
Li			7.6			14.7 / 21.0		10.7 / 21.8	14.3 / 20.9		17.3 / 21.4		12.0 / 22.2	

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.

LDC #: 18356A4
SDG #: See Cover
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: 6-~~12~~ AM

Reviewer: VV
2nd Reviewer: MG

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	11	12	13	14	15					
Al	3.1													
B	2.4													
Ca	14.0													
Cd			0.036			0.081 / 0.27		0.099 / 0.27	0.076 / 0.55					
Cr	0.33		0.5											
Co			0.5											
Fe	5.6													
Ni			0.5											
Nb	1.4		6.8		3.4 / 5.4	3.5 / 5.3	3.3 / 5.4	3.1 / 5.3	4.9 / 5.5					
P	3.0													
K	3.9													
Na	8.2													
Tl			0.4											
Ti	0.067		0.6											
W			0.9											
Li			7.6		10.2 / 21.7	12.0 / 21.2	20.6 / 21.5	9.4 / 21.2						

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.

LDC #: 18386A4
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MM
2nd Reviewer: MK

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

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

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

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

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	16/17	Soil	Sb	60.6	54.7		All	J-/UJ/A
			Ba	173.6	150.6			J+/J+/A
			Ca	335.9	411.7			
			Cr	144.1	134.7			
			Pb	150.5				
			Mg	160.5				
			Nb	190.9	186.9			
			P	31.3	62.5			J-/UJ/A
			Si	28.6	225.0			J+/J+/A
			Sr	169.6	160.2			
			V	146.9	137.0			
			Zn	131.4				
			Mn			22.9 (≤20)		No qual (LCS in)

Comments: ~~DR. EK.~~

LDC #: 18386A4
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: MH
2nd Reviewer: MH

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 laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

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

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	LCS	Soil	Pd	120.5 (80-120)	All	J+ J+ /p
			Pt	121.9 ↓	↓	↓

Comments:

LDC#: 18386A4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

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

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

Compound	Concentration (mg/kg)		(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	11	12				
Aluminum	7780	8820	13			
Arsenic	2.3	1.5		0.8	(≤2.2)	
Barium	121	198	48			
Beryllium	0.58	0.66		0.08	(≤1.1)	
Cadmium	0.054U	0.081		0.027	(≤0.54)	
Calcium	29900	13600	75			J det / A
Chromium	8.2	9.8		1.6	(≤2.2)	
Cobalt	6.1	6.0	2			
Copper	16.7	17.5		0.8	(≤10.8)	
Iron	13000	14600	12			
Lead	6.6	10.4	45			
Magnesium	9270	7540	21			
Manganese	282	402	35			
Molybdenum	0.37	0.57		0.2	(≤1.1)	
Nickel	14.0	13.5	4			
Niobium	3.4	3.5		0.1	(≤5.4)	
Palladium	0.33	0.42		0.09	(≤1.1)	
Phosphorus	1350	1480	9			
Potassium	1720	2530	38			

LDC#: 18386A4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: V
2nd Reviewer: AMH

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

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

Compound	Concentration (mg/kg) 11	Concentration (mg/kg) 12	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Silicon	98.9	188		89.1	(≤54.1)	J det / A
Sodium	266	181		85	(≤217)	
Strontium	157	189	18			
Titanium	512	636	22			
Uranium	0.93	0.82		0.11	(≤1.1)	
Vanadium	32.1	40.2	22			
Zinc	24.2	31.8	27			
Zirconium	16.5	21.3		4.8	(≤21.7)	
Lithium	10.2	12.0		1.8	(≤21.7)	
Mercury (ug/Kg)	20.2	7.1U		13.1	(≤36.1)	

LDC #: 18386A4
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: MY
2nd Reviewer: MM

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

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

%R = Found x 100 / True

Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
ICV	ICP (Initial calibration)	S	39620	40000	99.1	99.1	Y
	GFAA (Initial calibration)						
ICV	CVAA (Initial calibration)	Hg	2.51	2.5	100.4	100.4	Y
CCV	ICP (Continuing calibration)	Li	3995	4000	99.9	99.9	↓
	GFAA (Continuing calibration)						
CCV	CVAA (Continuing calibration)	Hg	5.06	5.0	101.2	101.2	Y
ICV	ICP/MS (Initial calibration)	SN	201.35	200	100.7	100.7	↓
CCV	ICP/MS (Continuing calibation)	Cu	216.73	200	108.4	108.4	↓

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

LDC #: 18386A4
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MY
2nd Reviewer: MY

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

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

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

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

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

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	Sb	97.93	100	97.9	97.9	Y
LCS	Laboratory control sample	Li	215.4	200	107.7	107.7	
16	Matrix spike	Mo	(SSR-SR) 58.586	53.079	110.4	110.3	
16/17	Duplicate	Hg	182	186	2.2	1.9	
14	ICP serial dilution	Al	5777.43	5555.05	4.0	4.0	Y

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

LDC #: 183844
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: MY
2nd reviewer: GMK

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

Detected analyte results for 5 were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)(\%S)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

$$Mn = \frac{861.2\ mg/L \times 0.1\ L \times 2}{0.5\ g \times 0.959} = 359.2\ mg/kg$$

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
5	Li	14.3	14.3	Y
	Al	7860	7860	
	As	1.3	1.3	
	Ba	145	145	
	Be	0.55	0.55	
	Cd	0.076	0.076	
	Ca	12600	12600	
	Cr	10.4	10.4	
	Co	6.5	6.5	
	Cu	16.4	16.4	
	Fe	12700	12700	
	Pb	7.0	7.0	
	Mg	7460	7460	
	Mn	359	359	
	Mo	0.41	0.40	
	Ni	17.3	17.3	
	Nb	3.3	3.3	
	Pd	0.25	0.25	
	P	1010	1000	
	K	1840	1840	
	Si	112	112	
	Na	203	203	

LDC #: 18386A4
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: MH
2nd reviewer: MH

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 Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
(Y) N N/A Are all detection limits below the CRDL?

Detected analyte results for 5 were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)(\%S)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor
%S = Decimal percent solids

Recalculation:

$$V = \frac{84.7394 \times 0.1\,\ell \times 2}{0.5g \times 0.959} = 35.34\ mg/kg$$

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
5	Sr	122	122	Y
	Sn	0.084	0.084	
	Ti	5.6	5.6	
	W	0.29	0.29	
	U	0.90	0.90	
	V	35.3	35.3	
	Zn	31.7	31.7	
	Hg (mg/kg)	13.6	13.6	

LDC Report# 18386B4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 28, 2008

LDC Report Date: March 6, 2008

Matrix: Soil/Water

Parameters: Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A290158

Sample Identification

TSB-HJ-10-0'
TSB-HJ-10-10'
TSB-HR-06-0'
TSB-HR-06-0'-FD
TSB-HR-06-10'
TSB-HJ-08-0'
TSB-HJ-08-10'
TSB-HR-05-0'
TSB-HR-05-10'
RINSATE-2
TSB-HR-05-10'MS
TSB-HR-05-10'MSD
RINSATE-2MS
RINSATE-2MSD

Introduction

This data review covers 11 soil samples and 3 water 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
2/5/08	CCV (10:28)	Silver	111.4 (90-110)	PBW	J+ (all detects)	P
2/5/08	CCV (21:53)	Boron Niobium Silver	112.3 (90-110) 111.8 (90-110) 112.6 (90-110)	All water samples in SDG F8A290158	J+ (all detects) J+ (all detects) J+ (all detects)	P
2/6/08	CCV (1:47)	Silver	112.7 (90-110)	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' PBS	J+ (all detects)	P
2/6/08	CCV (3.57)	Silver	112.4 (90-110)	TSB-HR-05-0' TSB-HR-05-10' TSB-HR-05-10'MS TSB-HR-05-10'MSD	J+ (all detects)	P
2/6/08	CCV (18:59)	Palladium	113.6 (90-110)	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' PBS	J+ (all detects)	P

III. Blanks

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

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Boron Cadmium Molybdenum Niobium Sodium Thallium Tin Titanium Tungsten	22.4 ug/L 0.029 ug/L 0.37 ug/L 20.1 ug/L 5.5 ug/L 1.4 ug/L 0.72 ug/L 0.80 ug/L 1.9 ug/L	All water samples in SDG F8A290158
ICB/CCB	Antimony Cadmium Molybdenum Niobium Titanium Tungsten	0.2 ug/L 0.1 ug/L 0.2 ug/L 6.1 ug/L 1.2 ug/L 0.6 ug/L	All water samples in SDG F8A290158
PB (prep blank)	Aluminum Barium Chromium Phosphorus Potassium Silver Sodium Thallium Tin Titanium Zinc	1.9 mg/Kg 0.052 mg/Kg 0.15 mg/Kg 1.4 mg/Kg 1.5 mg/Kg 0.13 mg/Kg 3.4 mg/Kg 0.073 mg/Kg 0.054 mg/Kg 0.077 mg/Kg 1.3 mg/Kg	All soil samples in SDG F8A290158
ICB/CCB	Boron Cadmium Niobium Potassium Thallium Tin Titanium Tungsten	10.6 ug/L 0.1 ug/L 6.1 ug/L 7.3 ug/L 0.5 ug/L 0.2 ug/L 0.9 ug/L 0.7 ug/L	All soil samples in SDG F8A290158

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
RINSATE-2	Cadmium Niobium Sodium Tin Titanium Tungsten	0.027 ug/L 6.3 ug/L 21.0 ug/L 0.51 ug/L 1.0 ug/L 0.67 ug/L	0.50U ug/L 25.0U ug/L 50.0U ug/L 2.0U ug/L 2.0U ug/L 5.0U ug/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HJ-10-0'	Boron Cadmium Silver Tungsten	10.4 mg/Kg 0.094 mg/Kg 0.072 mg/Kg 0.74 mg/Kg	26.5U mg/Kg 0.13U mg/Kg 0.53U mg/Kg 1.3U mg/Kg
TSB-HJ-10-10'	Boron Cadmium Niobium Silver Tin Tungsten	6.7 mg/Kg 0.090 mg/Kg 4.7 mg/Kg 0.092 mg/Kg 0.50 mg/Kg 0.46 mg/Kg	26.2U mg/Kg 0.13U mg/Kg 6.6U mg/Kg 0.52U mg/Kg 0.52U mg/Kg 1.3U mg/Kg
TSB-HR-06-0'	Boron Niobium Silver Tungsten	4.6 mg/Kg 2.1 mg/Kg 0.090 mg/Kg 0.36 mg/Kg	26.1U mg/Kg 6.5U mg/Kg 0.52U mg/Kg 1.3U mg/Kg
TSB-HR-06-0'-FD	Boron Cadmium Silver Tin	3.9 mg/Kg 0.094 mg/Kg 0.094 mg/Kg 0.46 mg/Kg	27.0U mg/Kg 0.14U mg/Kg 0.54U mg/Kg 0.54U mg/Kg
TSB-HR-06-10'	Boron Cadmium Silver Tin Tungsten	5.2 mg/Kg 0.077 mg/Kg 0.10 mg/Kg 0.47 mg/Kg 0.35 mg/Kg	26.6U mg/Kg 0.13U mg/Kg 0.53U mg/Kg 0.53U mg/Kg 1.3U mg/Kg
TSB-HJ-08-0'	Boron Cadmium Silver Tin Tungsten	4.6 mg/Kg 0.10 mg/Kg 0.11 mg/Kg 0.52 mg/Kg 0.28 mg/Kg	27.0U mg/Kg 0.14U mg/Kg 0.54U mg/Kg 0.54U mg/Kg 1.4U mg/Kg
TSB-HJ-08-10'	Boron Cadmium Silver Tin Tungsten	5.3 mg/Kg 0.10 mg/Kg 0.11 mg/Kg 0.50 mg/Kg 0.33 mg/Kg	27.0U mg/Kg 0.14U mg/Kg 0.54U mg/Kg 0.54U mg/Kg 1.4U mg/Kg
TSB-HR-05-0'	Cadmium Sodium	0.14 mg/Kg 138 mg/Kg	0.54U mg/Kg 218U mg/Kg
TSB-HR-05-10'	Boron Cadmium Silver Tin Tungsten	4.9 mg/Kg 0.071 mg/Kg 0.11 mg/Kg 0.50 mg/Kg 0.27 mg/Kg	26.8U mg/Kg 0.13U mg/Kg 0.54U mg/Kg 0.54U mg/Kg 1.3U mg/Kg

Sample "RINSATE-2" was identified as a rinsate. No metal contaminants were found in this blank with the following exceptions:

Rinsate ID	Sampling Date	Analyte	Concentration	Associated Samples
RINSATE-2	1/28/08	Cadmium Calcium Iron Magnesium Niobium Sodium Strontium Tin Titanium Tungsten	0.027 ug/L 72.3 ug/L 32.9 ug/L 9.2 ug/L 6.3 ug/L 21.0 ug/L 0.67 ug/L 0.51 ug/L 1.0 ug/L 0.67 ug/L	All soil samples in SDG F8A290158

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HJ-10-0'	Cadmium Tungsten	0.094 mg/Kg 0.74 mg/Kg	0.13U mg/Kg 1.3U mg/Kg
TSB-HJ-10-10'	Cadmium Niobium Tin Tungsten	0.090 mg/Kg 4.7 mg/Kg 0.50 mg/Kg 0.46 mg/Kg	0.13U mg/Kg 6.6U mg/Kg 0.52U mg/Kg 1.3U mg/Kg
TSB-HR-06-0'	Niobium Tungsten	2.1 mg/Kg 0.36 mg/Kg	6.5U mg/Kg 1.3U mg/Kg
TSB-HR-06-0'-FD	Cadmium Tin	0.094 mg/Kg 0.46 mg/Kg	0.14U mg/Kg 0.54U mg/Kg
TSB-HR-06-10'	Cadmium Tin Tungsten	0.077 mg/Kg 0.47 mg/Kg 0.35 mg/Kg	0.13U mg/Kg 0.53U mg/Kg 1.3U mg/Kg
TSB-HJ-08-0'	Cadmium Tin Tungsten	0.10 mg/Kg 0.52 mg/Kg 0.28 mg/Kg	0.14U mg/Kg 0.54U mg/Kg 1.4U mg/Kg
TSB-HJ-08-10'	Cadmium Tin Tungsten	0.10 mg/Kg 0.50 mg/Kg 0.33 mg/Kg	0.14U mg/Kg 0.54U mg/Kg 1.4U mg/Kg
TSB-HR-05-0'	Cadmium Sodium	0.14 mg/Kg 138 mg/Kg	0.54U mg/Kg 218U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HR-05-10'	Cadmium Tin Tungsten	0.071 mg/Kg 0.50 mg/Kg 0.27 mg/Kg	0.13U mg/Kg 0.54U mg/Kg 1.3U mg/Kg

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
TSB-HR-05-10'MS/MSD (All soil samples in SDG F8A290158)	Antimony	54.5 (75-125)	57.9 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-HR-05-10'MS/MSD (All soil samples in SDG F8A290158)	Barium	41.2 (75-125)	4.8 (75-125)	-	J- (all detects) R (all non-detects)	A
TSB-HR-05-10'MS/MSD (All soil samples in SDG F8A290158)	Niobium Palladium Magnesium	169.4 (75-125) 127.7 (75-125) -	210.0 (75-125) 128.3 (75-125) 131 (75-125)	- - -	J+ (all detects) J+ (all detects) J+ (all 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 with the following exceptions:

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS	Palladium	119.7 (85-115)	All water samples in SDG F8A290158	J+ (all detects)	P

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS	Platinum	124.4 (80-120)	All soil samples in SDG F8A290158	J+ (all detects)	P

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
TSB-HR-05-10'L	Manganese Strontium	10.1 (≤10) 10.6 (≤10)	All soil samples in SDG F8A290158	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 have been summarized at the end of this report if data has been qualified.

XIII. Field Duplicates

Samples TSB-HR-06-0' and TSB-HR-06-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HR-06-0'	TSB-HR-06-0'-FD				
Aluminum	7800	7880	1 (≤50)	-	-	-
Antimony	0.16	0.15	-	0.01 (≤1.4)	-	-
Arsenic	2.1	1.7	-	0.4 (≤2.7)	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HR-06-0'	TSB-HR-06-0'-FD				
Barium	161	110	38 (≤50)	-	-	-
Beryllium	0.49	0.56	-	0.07 (≤0.27)	-	-
Boron	4.6	3.9	-	0.7 (≤27.0)	-	-
Cadmium	0.14	0.094	-	0.046 (≤0.14)	-	-
Calcium	10800	17100	45 (≤50)	-	-	-
Chromium	8.9	13.3	40 (≤50)	-	-	-
Cobalt	7.6	8.2	8 (≤50)	-	-	-
Copper	14.5	14.3	1 (≤50)	-	-	-
Iron	13100	12400	5 (≤50)	-	-	-
Lead	9.4	7.6	21 (≤50)	-	-	-
Magnesium	9570	9060	5 (≤50)	-	-	-
Manganese	390	296	27 (≤50)	-	-	-
Molybdenum	0.58	0.36	-	0.22 (≤1.4)	-	-
Nickel	15.6	17.3	10 (≤50)	-	-	-
Niobium	2.1	2.0U	-	0.1 (≤6.8)	-	-
Palladium	0.22	0.21	-	0.01 (≤0.54)	-	-
Phosphorus	1600	1250	25 (≤50)	-	-	-
Potassium	1970	1960	1 (≤50)	-	-	-
Silicon	194	83.7	-	110.3 (≤67.5)	J (all detects)	A
Silver	0.090	0.094	-	0.004 (≤0.54)	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HR-06-0'	TSB-HR-06-0'-FD				
Sodium	232	184	-	48 (≤54.0)	-	-
Strontium	111	115	4 (≤50)	-	-	-
Tin	0.55	0.46	-	0.09 (≤0.54)	-	-
Titanium	623	488	24 (≤50)	-	-	-
Tungsten	0.36	0.27U	-	0.09 (≤1.4)	-	-
Uranium	0.72	0.66	-	0.06 (≤0.27)	-	-
Vanadium	34.2	34.4	1 (≤50)	-	-	-
Zinc	34.8	34.5	1 (≤50)	-	-	-
Zirconium	20.9	16.3	-	4.6 (≤27.0)	-	-
Lithium	5.7	3.2	-	2.5 (≤10.8)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HR-06-0'	TSB-HR-06-0'-FD				
Mercury	7.0U	9.5	-	2.5 (≤36.0)	-	-

BRC Tronox Parcel H
Metals - Data Qualification Summary - SDG F8A290158

SDG	Sample	Analyte	Flag	A or P	Reason
F8A290158	RINSATE-2	Boron Niobium Silver	J+ (all detects) J+ (all detects) J+ (all detects)	P	Calibration (%R)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Silver	J+ (all detects)	P	Calibration (%R)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0'	Palladium	J+ (all detects)	P	Calibration (%R)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Antimony	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Barium	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Niobium Palladium Magnesium	J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
F8A290158	RINSATE-2	Palladium	J+ (all detects)	P	Laboratory control samples (%R)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Platinum	J+ (all detects)	P	Laboratory control samples (%R)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Manganese Strontium	J (all detects) J (all detects)	A	ICP serial dilution (%D)
F8A290158	TSB-HR-06-0' TSB-HR-06-0'-FD	Silicon	J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel H
Metals - Laboratory Blank Data Qualification Summary - SDG F8A290158

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A290158	RINSATE-2	Cadmium Niobium Sodium Tin Titanium Tungsten	0.50U ug/L 25.0U ug/L 50.0U ug/L 2.0U ug/L 2.0U ug/L 5.0U ug/L	A
F8A290158	TSB-HJ-10-0'	Boron Cadmium Silver Tungsten	26.5U mg/Kg 0.13U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	A
F8A290158	TSB-HJ-10-10'	Boron Cadmium Niobium Silver Tin Tungsten	26.2U mg/Kg 0.13U mg/Kg 6.6U mg/Kg 0.52U mg/Kg 0.52U mg/Kg 1.3U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A290158	TSB-HR-06-0'	Boron Niobium Silver Tungsten	26.1U mg/Kg 6.5U mg/Kg 0.52U mg/Kg 1.3U mg/Kg	A
F8A290158	TSB-HR-06-0'-FD	Boron Cadmium Silver Tin	27.0U mg/Kg 0.14U mg/Kg 0.54U mg/Kg 0.54U mg/Kg	A
F8A290158	TSB-HR-06-10'	Boron Cadmium Silver Tin Tungsten	26.6U mg/Kg 0.13U mg/Kg 0.53U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	A
F8A290158	TSB-HJ-08-0'	Boron Cadmium Silver Tin Tungsten	27.0U mg/Kg 0.14U mg/Kg 0.54U mg/Kg 0.54U mg/Kg 1.4U mg/Kg	A
F8A290158	TSB-HJ-08-10'	Boron Cadmium Silver Tin Tungsten	27.0U mg/Kg 0.14U mg/Kg 0.54U mg/Kg 0.54U mg/Kg 1.4U mg/Kg	A
F8A290158	TSB-HR-05-0'	Cadmium Sodium	0.54U mg/Kg 218U mg/Kg	A
F8A290158	TSB-HR-05-10'	Boron Cadmium Silver Tin Tungsten	26.8U mg/Kg 0.13U mg/Kg 0.54U mg/Kg 0.54U mg/Kg 1.3U mg/Kg	A

BRC Tronox Parcel H
Metals - Field Blank Data Qualification Summary - SDG F8A290158

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A290158	TSB-HJ-10-0'	Cadmium Tungsten	0.13U mg/Kg 1.3U mg/Kg	A
F8A290158	TSB-HJ-10-10'	Cadmium Niobium Tin Tungsten	0.13U mg/Kg 6.6U mg/Kg 0.52U mg/Kg 1.3U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A290158	TSB-HR-06-0'	Niobium Tungsten	6.5U mg/Kg 1.3U mg/Kg	A
F8A290158	TSB-HR-06-0'-FD	Cadmium Tin	0.14U mg/Kg 0.54U mg/Kg	A
F8A290158	TSB-HR-06-10'	Cadmium Tin Tungsten	0.13U mg/Kg 0.53U mg/Kg 1.3U mg/Kg	A
F8A290158	TSB-HJ-08-0'	Cadmium Tin Tungsten	0.14U mg/Kg 0.54U mg/Kg 1.4U mg/Kg	A
F8A290158	TSB-HJ-08-10'	Cadmium Tin Tungsten	0.14U mg/Kg 0.54U mg/Kg 1.4U mg/Kg	A
F8A290158	TSB-HR-05-0'	Cadmium Sodium	0.54U mg/Kg 218U mg/Kg	A
F8A290158	TSB-HR-05-10'	Cadmium Tin Tungsten	0.13U mg/Kg 0.54U mg/Kg 1.3U mg/Kg	A

LDC #: 18386B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/t/08
SDG #: F8A290158 Level III Page: 1 of 1
Laboratory: Test America Reviewer: W
2nd Reviewer: MA

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/28/08
II.	Calibration	SW	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	3 MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	SW	LCS
VIII.	Internal Standard (ICP-MS)	N	Not reviewed
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(3, 4)
XIV.	Field Blanks	SW	R=10

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: All soil except # 10, 13, 14 Aq

1	TSB-HJ-10-0'	11	TSB-HR-05-10'MS	21		31	
2	TSB-HJ-10-10'	12	TSB-HR-05-10'MSD	22		32	
3	TSB-HR-06-0'	13	RINSATE-2MS Aq	23		33	
4	TSB-HR-06-0'-FD	14	RINSATE-2MSD	24		34	
5	TSB-HR-06-10'	15	PB	25		35	
6	TSB-HJ-08-0'	16		26		36	
7	TSB-HJ-08-10'	17		27		37	
8	TSB-HR-05-0'	18		28		38	
9	TSB-HR-05-10'	19		29		39	
10	RINSATE-2 Aq	20		30		40	

Notes:

LDC #: 18386B4
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer:
2nd reviewer: MY

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-10	Soil/Ar	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,
11,12	Soil	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,
13,14	Ar	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,
1-10	Soil/Ar	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
11,12	Soil	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
13,14	Ar	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
ICP		Li, S,
ICP-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,
ICP-MS		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Zr,
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-

Comments: Mercury by CVAA if performed
Nb: Niobium, Pd: Palladium, P: Phosphorus, Pt: Platinum, S: Sulfur, W: Tungsten, U: Uranium, Zr: Zirconium

LDC #: 18386B4
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Calibration

Page: 1 of 1
Reviewer: MM
2nd Reviewer: mg

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 Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

Y (N) N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

Y N (N/A) Was a midrange cyanide standard distilled?

Y N (N/A) Are all correlation coefficients ≥0.995?

Y N (N/A) 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
1	2/5/08	CCV (1078)	Ag	111.4	PBW	J+ UT/P
2	2/5/08	CCV (2153)	B	112.3	All Aa	↓
			Nb	111.8	↓	
			Ag	112.6		
3	2/6/08	CCV (147)	Ag	112.7	1-7. PBS	J+ UT/P
4	2/6/08	CCV (357)	Ag	112.4	8, 9, 11, 12	↓
5	2/6/08	CCV (1859)	Pd	113.6	1-8. ~~PBW~~ PBS	J+ UT/P

Comments:

LDC #: 18356A4
SDG #: See Cover
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X
Associated Samples: All Soil

Reviewer:
2nd Reviewer: QM

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/l)	Maximum ICB/CCB[a] (ug/l)	Blank Action Limit	1	2	3	4	5	6	7	8	9	
Al	1.9													
Ba	0.052													
B			10.6		10.4 / 26.5	6.7 / 26.2	4.6 / 26.1	3.9 / 27.0	5.2 / 26.6	4.6 / 27.0	5.3 / 27.0		4.9 / 26.8	
Cd			0.1		0.094 / 0.13	0.090 / 0.13		0.094 / 0.14	0.077 / 0.13	0.10 / 0.14	0.10 / 0.14	0.14 / 0.54	0.071 / 0.13	
Cr	0.15													
Nb			6.1			4.7 / 6.6	2.1 / 6.5							
P	1.4													
K	1.5		7.3											
Ag	0.13				0.072 / 0.53	0.092 / 0.52	0.090 / 0.52	0.094 / 0.54	0.10 / 0.53	0.11 / 0.54	0.11 / 0.54		0.11 / 0.54	
Na	3.4											138 / 218		
Tl	0.073		0.5											
Sn	0.054		0.2			0.50 / 0.52		0.46 / 0.54	0.47 / 0.53	0.52 / 0.54	0.50 / 0.54		0.50 / 0.54	
Ti	0.077		0.9											
W			0.7		0.74 / 1.3	0.46 / 1.3	0.36 / 1.3		0.35 / 1.3	0.28 / 1.4	0.33 / 1.4		0.27 / 1.3	
U														
Zn	1.3													

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.

LDC #: 18386A4
SDG #: See Cover
METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: ug/L

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied:
Associated Samples: All AQ

Reviewer:
2nd Reviewer:

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/l)	Maximum ICB/CCB[a] (ug/l)	Blank Action Limit	10									
Sb			0.2											
B		22.4												
Cd		0.029	0.1		0.027 / 0.50									
Mo		0.37	0.2											
Nb		20.1	6.1		6.3 / 25.0									
Na		5.5			21.0 / 50.0									
Tl		1.4												
Sn		0.72			0.51 / 2.0									
Ti		0.80	1.2		1.0 / 2.0									
W		1.9	0.6		0.67 / 5.0									

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.

LDC #: 18386A4
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: W
2nd Reviewer: GMA

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)
Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target analytes detected in the field blanks?
Blank units: ug/L **Associated sample units: mg/Kg**
Sampling date: 1 /28 /08 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification										
	10	Action Level	1	2	3	4	5	6	7	8	9	
Cd	0.027		0.094 / 0.13	0.090 / 0.13		0.094 / 0.14	0.077 / 0.13	0.10 / 0.14	0.10 / 0.14	0.14 / 0.54	0.071 / 0.13	
Ca	72.3											
Fe	32.9											
Mg	9.2											
Nb	6.3			4.7 / 6.6	2.1 / 6.5							
Na	21.0									138 / 218		
Sr	0.67											
Sn	0.51			0.50 / 0.52		0.46 / 0.54	0.47 / 0.53	0.52 / 0.54	0.50 / 0.54		0.50 / 0.54	
Ti	1.0											
W	0.67		0.74 / 1.3	0.46 / 1.3	0.36 / 1.3		0.35 / 1.3	0.28 / 1.4	0.33 / 1.4		0.27 / 1.3	

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

LDC #: 18386A4
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

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

Y (N) N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

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

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	11/12	Soil	Sb	54.5	57.9		All Soil	J-/UJ/A
			Ba	41.2	4.8			J-/R/A
			Nb	169.4	210.0			J+/J+/A
			Pd	127.7	128.3			
			Mg		131			
			Mn			44.2 (≤20)		No qual (LCS in)
			Nb			21.4		
			Sr			25.5		

Comments: Hg=MS/MSD for As, a non client sample.

LDC #: 18386B4
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: MH
2nd Reviewer: QA

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 laboratory control sample (LCS) analyzed for each matrix in this SDG?

Y (N) N/A Were all aqueous LCS percent recoveries (%R) within the control limits of 80-120% and all soil LCS %R within laboratory established control limits.

LEVEL IV ONLY:

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

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	LCS	A2	Pd	119.7 (85-115)	A11 A2	J+ UJ+ /P
2	LCS	Soil	Pb	124.4 (80-120)	A11 Soil	↓

Comments:

LDC #: 18386B4
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

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

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".

(Y) N N/A If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y N (N/A) Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

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

#	Date	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
1		9	Soil	Mn	10.1	All Soil	J (+) A
				Sr	10.6		

Comments: Cu, Zn < 100X MDL

SDILICPMS.wpd

LDC#: 18386B4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

Compound	Concentration (mg/kg) 3	Concentration (mg/kg) 4	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Aluminum	7800	7880	1			
Antimony	0.16	0.15		0.01	(≤1.4)	
Arsenic	2.1	1.7		0.4	(≤2.7)	
Barium	161	110	38			
Beryllium	0.49	0.56		0.07	(≤0.27)	
Boron	4.6	3.9		0.7	(≤27.0)	
Cadmium	0.14	0.094		0.046	(≤0.14)	
Calcium	10800	17100	45			
Chromium	8.9	13.3	40			
Cobalt	7.6	8.2	8			
Copper	14.5	14.3	1			
Iron	13100	12400	5			
Lead	9.4	7.6	21			
Magnesium	9570	9060	5			
Manganese	390	296	27			
Molybdenum	0.58	0.36		0.22	(≤1.4)	
Nickel	15.6	17.3	10			
Niobium	2.1	2.0U		0.1	(≤6.8)	
Palladium	0.22	0.21		0.01	(≤0.54)	

LDC#: 18386B4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer: GMH

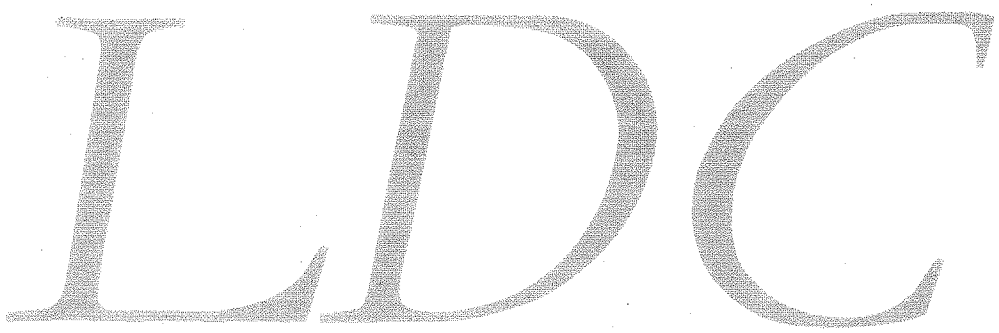
METHOD: Metals (EPA Method 6010B/6020/7000)

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

Compound	Concentration (mg/kg) 3	Concentration (mg/kg) 4	(≤50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
Phosphorus	1600	1250	25			
Potassium	1970	1960	1			
Silicon	194	83.7		110.3	(≤67.5)	J det / A
Silver	0.090	0.094		0.004	(≤0.54)	
Sodium	232	184		48	(≤54.0)	
Strontium	111	115	4			
Tin	0.55	0.46		0.09	(≤0.54)	
Titanium	623	488	24			
Tungsten	0.36	0.27U		0.09	(≤1.4)	
Uranium	0.72	0.66		0.06	(≤0.27)	
Vanadium	34.2	34.4	1			
Zinc	34.8	34.5	1			
Zirconium	20.9	16.3		4.6	(≤27.0)	
Lithium	5.7	3.2		2.5	(≤10.8)	
Mercury (ug/Kg)	7.0U	9.5		2.5	(≤36.0)	

BRC Tronox Parcel H
Data Validation Reports
LDC# 18386

Wet Chemistry



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 24, 2008

LDC Report Date: March 7, 2008

Matrix: Soil

Parameters: Wet Chemistry

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A250221

Sample Identification

TSB-HJ-05-10'
TSB-HJ-05-0'
TSB-HR-04-10'
TSB-HJ-04-0'
TSB-HR-04-0'**
TSB-HJ-04-10'
TSB-HR-07-0'
TSB-HR-07-10'**
TSB-HR-06-0'
TSB-HR-06-10'
TSB-HJ-07-0'**
TSB-HJ-07-0'-FD
TSB-HJ-07-10'
TSB-HR-08-0'
TSB-HR-08-10'
TSB-HJ-05-10'MS
TSB-HJ-05-10'MSD
TSB-HJ-05-10'DUP
TSB-HR-08-0'MS
TSB-HR-08-0'DUP

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 20 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, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 9071B for Oil & 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.

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

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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.

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) 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
TSB-HR-08-0'MS (All samples in SDG F8A250221)	Oil & grease	71 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification

All sample result verifications were acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples TSB-HJ-07-0'** and TSB-HJ-07-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HJ-07-0'**	TSB-HJ-07-0'-FD				
Chloride	18.2	7.7	-	10.5 (≤2.2)	J (all detects)	A
Chlorine	36.4	15.3	-	21.1 (≤4.3)	J (all detects)	A
Fluoride	0.58	0.27U	-	0.31 (≤1.1)	-	-
Nitrate as N	0.66	0.77	-	0.11 (≤0.22)	-	-
Sulfate	8.9	6.8	-	2.1 (≤5.4)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HJ-07-0'**	TSB-HJ-07-0'-FD				
Perchlorate	8.6	12.8	-	4.2 (≤10.8)	-	-

BRC Tronox Parcel H
Wet Chemistry - Data Qualification Summary - SDG F8A250221

SDG	Sample	Analyte	Flag	A or P	Reason
F8A250221	TSB-HJ-05-10' TSB-HJ-05-0' TSB-HR-04-10' TSB-HJ-04-0' TSB-HR-04-0'** TSB-HJ-04-10' TSB-HR-07-0' TSB-HR-07-10'** TSB-HR-06-0' TSB-HR-06-10' TSB-HJ-07-0'** TSB-HJ-07-0'-FD TSB-HJ-07-10' TSB-HR-08-0' TSB-HR-08-10'	Oil & grease	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A250221	TSB-HJ-07-0'** TSB-HJ-07-0'-FD	Chloride Chlorine	J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel H
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Wet Chemistry - Field Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

LDC #: 18386A6
SDG #: F8A250221
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 3/5/08
Page: 1 of 1
Reviewer: W
2nd Reviewer: 9MK

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate, Nitrite, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 7091B) 9071B

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	SW	3 MS/MSD/Dup
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(11, 12)
X	Field blanks	N	

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

Validated Samples: ** Indicates sample underwent Level IV validation

Soil

1	TSB-HJ-05-10'	11	TSB-HJ-07-0'**	21	MB	31	
2	TSB-HJ-05-0'	12	TSB-HJ-07-0'-FD	22		32	
3	TSB-HR-04-10'	13	TSB-HJ-07-10'	23		33	
4	TSB-HJ-04-0'	14	TSB-HR-08-0'	24		34	
5	TSB-HR-04-0'**	15	TSB-HR-08-10'	25		35	
6	TSB-HJ-04-10'	16	TSB-HJ-05-10'MS	26		36	
7	TSB-HR-07-0'	17	TSB-HJ-05-10'MSD	27		37	
8	TSB-HR-07-10'**	18	TSB-HJ-05-10'DUP	28		38	
9	TSB-HR-06-0'	19	TSB-HR-08-0'MS	29		39	
10	TSB-HR-06-10'	20	TSB-HR-08-0'DUP	30		40	

Notes: _____

LDC #: 18386A6
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Reviewer: pm
2nd Reviewer: gm

Method: Inorganics (EPA Method See cover)

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

LDC #: 183846
SDG #: Sed cover

VALIDATION FINDINGS CHECKLIST

Reviewer: MM
2nd Reviewer: AMA

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

LDC #: 18386A6
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-15	Soil	[✓ 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
16-18	Soil	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate [✓ ClO_4] O+G/TPH
19, 20	↓	[✓ 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:

LDC #: 18386A6
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Page: 1 of 1
Reviewer: MM
2nd Reviewer: MM

METHOD: Inorganics, Method See cover

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 (85-115% for Method 300.0)? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

LEVEL IV ONLY:

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

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	TSB-HJ-02-10'	Soil	SO4	44	All	No qual (#19 SO4 = 96% within control limits)
2	19	Soil	O+G	71	All	J-/UJ/A

Comments:

LDC#: 18386A6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	11	12				
Chloride	18.2	7.7		10.5	(≤2.2)	J det / A
Chlorine	36.4	15.3		21.1	(≤4.3)	J det / A
Fluoride	0.58	0.27U		0.31	(≤1.1)	
Nitrate as N	0.66	0.77		0.11	(≤0.22)	
Perchlorate (ug/Kg)	8.6	12.8		4.2	(≤10.8)	
Sulfate	8.9	6.8		2.1	(≤5.4)	

V:\FIELD DUPLICATES\FD_inorganic\18386A6.wpd

LDC #: 18386A6
SDG #: See cover

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Reviewer:
2nd Reviewer:

Method: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of ClO4 was recalculated.Calibration date: 1/20/08

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

%R = Found X 100 / True

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

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ug/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	ClO4	s1	1	0.00316	*0.9999372*	0.999867	Y
		s2	2.5	0.00918			
		s3	5	0.01935			
		s4	10	0.04027			
		s5	20	0.07784			
		s6	40	0.15704			
ccv Calibration verification	ClO4	30	28.0		93.3	NR	~~N~~ Y
ccv Calibration verification	Chloride	4000	3990.6		99.8	NR	Y
ccv Calibration verification	Br	2000	2029.0		101.45	101.45	Y

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

LDC #: 18386A6
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MM
2nd Reviewer: AM

METHOD: Inorganics, Method See Cover

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	NO_3-N	4.056	4.00	101	101	Y
19	Matrix spike sample	0+4	(SSR-SR) 1.008	1+20	71	71	↓
20	Duplicate sample	Cl	4.02	4.08	1.5	1.3 ~~1.5~~	↓

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

LDC #: 18386A6
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MM
2nd reviewer: AM

METHOD: Inorganics, Method See cover

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

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

Compound (analyte) results for 5 reported with a positive detect were recalculated and verified using the following equation:

Concentration = Recalculation:

$$SO_4 = \frac{A_{max} \times \text{Final Volume}}{\cancel{A_{max}} \times 0.124 \times \text{Initial Wt} \times \text{Sol. F}}$$

$$SO_4 = \frac{0.638 \times 40\,ml}{0.124 \times 4\,g \times 0.954} = 53.65\ mg/kg$$

#	Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
1	5	chloride	6.3	6.3	Y
		Cl	130	131	
		Cl_2	261	261	
		F	0.62	0.61	
		NO_3-N	27.2	27.1	
		ClO_4 (ug/kg)	22200	22400	
		SO4	53.7	53.7	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 28, 2008

LDC Report Date: March 7, 2008

Matrix: Soil/Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A290158

Sample Identification

TSB-HJ-10-0'
TSB-HJ-10-10'
TSB-HR-06-0'
TSB-HR-06-0'-FD
TSB-HR-06-10'
TSB-HJ-08-0'
TSB-HJ-08-10'
TSB-HR-05-0'
TSB-HR-05-10'
RINSATE-2
TSB-HJ-10-0'MS
TSB-HJ-10-0'MSD
TSB-HJ-10-0'DUP
TSB-HJ-08-10'MS
TSB-HJ-08-10'DUP
TSB-HR-05-10'MS
TSB-HR-05-10'DUP
RINSATE-2MS
RINSATE-2MSD
RINSATE-2DUP

Introduction

This data review covers 16 soil samples and 4 water 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, EPA Method 314.0 for Perchlorate, and EPA SW 846 Method 9071B and EPA Method 1664A for Oil & 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.

III. Blanks

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

Sample "RINSATE-2" was identified as a rinsate. No contaminant concentrations were found in this blank with the following exceptions:

Rinsate ID	Sampling Date	Analyte	Concentration	Associated Samples
RINSATE-2	1/28/08	Sulfate	0.10 mg/L	All soil samples in SDG F8A250221

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

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-HR-06-0'	Sulfate	4.8 mg/Kg	5.2U mg/Kg

IV. Matrix Spike/Matrix Spike Duplicates

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

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Affected Analyte	Flag	A or P
TSB-HJ-08-10'MS (TSB-HJ-08-10' TSB-HR-05-0')	Chloride	57 (85-115)	-	-	Chloride Chlorine	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A
TSB-HR-05-10'MS (All soil samples in SDG F8A290158)	Oil & grease	68 (75-125)	-	-	Oil and grease	J- (all detects) UJ (all non-detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples TSB-HR-06-0' and TSB-HR-06-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HR-06-0'	TSB-HR-06-0'-FD				
Chloride	0.40	0.81	-	0.41 (≤2.2)	-	-
Chlorine	0.79	1.6	-	0.81 (≤4.3)	-	-
Nitrate as N	0.26	0.68	-	0.42 (≤0.22)	J (all detects)	A
Sulfate	4.8	15.4	-	10.6 (≤5.4)	J (all detects)	A

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HR-06-0'	TSB-HR-06-0'-FD				
Perchlorate	1.9U	2.4	-	0.5 (≤10.8)	-	-

BRC Tronox Parcel H
Wet Chemistry - Data Qualification Summary - SDG F8A290158

SDG	Sample	Analyte	Flag	A or P	Reason
F8A290158	TSB-HJ-08-10' TSB-HR-05-0'	Chloride Chlorine	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A290158	TSB-HJ-10-0' TSB-HJ-10-10' TSB-HR-06-0' TSB-HR-06-0'-FD TSB-HR-06-10' TSB-HJ-08-0' TSB-HJ-08-10' TSB-HR-05-0' TSB-HR-05-10'	Oil and grease	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
F8A290158	TSB-HR-06-0' TSB-HR-06-0'-FD	Nitrate as N Sulfate	J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel H
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Wet Chemistry - Field Blank Data Qualification Summary - SDG F8A290158

SDG	Sample	Analyte	Modified Final Concentration	A or P
F8A290158	TSB-HR-06-0'	Sulfate	5.2U mg/Kg	A

LDC #: 18386B6
SDG #: F8A290158
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3/5/08
Page: 1 of 1
Reviewer: W
2nd Reviewer: AMA

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chorine, Fluoride, Nitrate, Nitrite, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method ~~7091B~~ 9071B / EPA 1664A)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/28/08
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	SW	3 MS/MSD/Dup
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(3,4)
X	Field blanks	SW	R=10

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: All S,W except #10, 18-20 A2

1	TSB-HJ-10-0'	11	TSB-HJ-10-0'MS	21	MB	31	
2	TSB-HJ-10-10'	12	TSB-HJ-10-0'MSD	22		32	
3	TSB-HR-06-0'	13	TSB-HJ-10-0'DUP	23		33	
4	TSB-HR-06-0'-FD	14	TSB-HJ-08-10'MS	24		34	
5	TSB-HR-06-10'	15	TSB-HJ-08-10'DUP	25		35	
6	TSB-HJ-08-0'	16	TSB-HR-05-10'MS	26		36	
7	TSB-HJ-08-10'	17	TSB-HR-05-10'DUP	27		37	
8	TSB-HR-05-0'	18	RINSATE-2MS A2	28		38	
9	TSB-HR-05-10'	19	RINSATE-2MSD	29		39	
10	RINSATE-2 A2	20	RINSATE-2DUP	30		40	

Notes: _____

LDC #: 18386B6
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer:
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-10	Soil/Aq	[✓ 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
18,20	Aq	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
14-17	Soil	[✓ Br] Bromine [✓ Cl] Chlorine [✓ F] [✓ NO_3] [✓ NO_2] [✓ SO_4] [✓ O-PO_4] [✓ Chlorate] ClO_4 O+G/TPH
16,17	↓	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate ClO_4 [✓ O+G]/TPH
11-13	↓	Br Bromine Cl Chlorine F NO_3 NO_2 SO_4 O-PO_4 Chlorate [✓ ClO_4] O+G/TPH
18*,19	Aq	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:

LDC #: 18386B6
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Inorganics, EPA Method See cover

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

Blank units: mg/L **Associated sample units:** mg/kg
Sampling date: 1/28/08 Soil factor applied
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Blank Action Limit	Sample Identification									
	10		3									
SO4	0.10		4.8/5.2									

Blank units: **Associated sample units:**
Sampling date: Soil factor applied
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples:

Analyte	Blank ID	Blank Action Limit	Sample Identification									

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

LDC #: 18386B6
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

Reviewer: MM
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

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 (85-115% for Method 300.0)? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

LEVEL IV ONLY:

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

#	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	14	Soil	Cl	57	7, 8	J-/UJ/A (qual Cl + Cl_2)
2	16	Soil	O+G	68	All Soil	J-/UJ/A

Comments:

LDC#: 18386B6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: W
2nd Reviewer: GME

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤50)	Difference	Limits	Qualification (Parent only)
	3	4				
Chloride	0.40	0.81		0.41	(≤2.2)	
Chlorine	0.79	1.6		0.81	(≤4.3)	
Nitrate as N	0.26	0.68		0.42	(≤0.22)	J det / A
Perchlorate (ug/Kg)	1.9U	2.4		0.5	(≤10.8)	
Sulfate	4.8	15.4		10.6	(≤5.4)	J det / A

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BRC Tronox Parcel H
Data Validation Reports
LDC# 18386

Gasoline Range Organics

LDC

LDC Report# 18386A7

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 24, 2008

LDC Report Date: March 11, 2008

Matrix: Soil

Parameters: Gasoline Range Organics

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A250221

Sample Identification

TSB-HJ-05-10'
TSB-HJ-05-0'
TSB-HR-04-10'
TSB-HJ-04-0'
TSB-HR-04-0'**
TSB-HJ-04-10'
TSB-HR-07-0'
TSB-HR-07-10'**
TSB-HR-06-0'
TSB-HR-06-10'
TSB-HJ-07-0'**
TSB-HJ-07-0'-FD
TSB-HJ-07-10'
TSB-HR-08-0'
TSB-HR-08-10'
TSB-HJ-05-10'MS
TSB-HJ-05-10'MSD
TSB-HR-08-0'MS
TSB-HR-08-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 19 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 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.

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

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

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 all compounds were less than or equal to 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 difference (%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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-HJ-07-0'-FD	a,a,a,-Trifluorotoluene	8.6 (21-146)	Gasoline range organics	J- (all detects) R (all non-detects)	A

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 percent recoveries (%R) and MS/MSD relative percent differences (RPD) were not within QC limits for the gasoline range organics, the MSD 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

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples TSB-HJ-07-0'** and TSB-HJ-07-0'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel H
Gasoline Range Organics - Data Qualification Summary - SDG F8A250221

SDG	Sample	Compound	Flag	A or P	Reason
F8A250221	TSB-HJ-07-0'-FD	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel H
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

LDC #: 18386A7
SDG #: F8A250221
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 3/10/08
Page: 1 of 1
Reviewer: EJ
2nd Reviewer: [illegible]

METHOD: GC Gasoline Range Organics (EPA SW 846 Method 8015)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	ICV = 15
III.	Blanks	ND	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	A	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D= 11+12
X.	Field blanks	N	

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

Validated Samples: ** Indicates sample underwent Level IV validation

1 3	TSB-HJ-05-10'	11 1	TSB-HJ-07-0'**	21 1	8031129-BLK	31	1/31
2 3	TSB-HJ-05-0'	12 2	TSB-HJ-07-0'-FD	22 2	8030151-BLK	32	1/30
3 3	TSB-HR-04-10'	13 2	TSB-HJ-07-10'	23 3	8030149-BLK	33	1/29
4 3	TSB-HJ-04-0'	14 2	TSB-HR-08-0'	24		34	
5 2	TSB-HR-04-0'**	15 2	TSB-HR-08-10'	25		35	
6 2	TSB-HJ-04-10'	16 3	TSB-HJ-05-10'MS	26		36	
7 2	TSB-HR-07-0'	17 3	TSB-HJ-05-10'MSD	27		37	
8 2	TSB-HR-07-10'**	18 2	TSB-HR-08-0'MS	28		38	
9 2	TSB-HR-06-0'	19 2	TSB-HR-08-0'MSD	29		39	
10 2	TSB-HR-06-10'	20		30		40	

Notes: _____

LDC #: 18386A7
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

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

Method: ✓ GC ____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		—		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ____%R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?		✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	✓			
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

LDC #: 18386A7
SDG #: all cover

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?			✓	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.		✓		
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 18386A7
SDG #: see cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: ___ GC ___ HPLC

Are surrogates required by the method? Yes____ or No____.

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

(Y) N N/A Were surrogates spiked into all samples and blanks?

(Y) N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)		Qualifications
	12	not specified	C	8.6	(21 - 146)	J-/R/A
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	
					( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18386A7
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

METHOD: __ GC __ HPLC

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

[✓ Y] N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
[✓ Y] N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y [✓ N] N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	18 + 19	Gasoline Range Organics	17 (20-124)	( )	140 (30)	14	no Qual
			( )	( )	( )		MSD in
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 18386A7
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC ✓ HPLC ____

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

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (1.0 std)	Recalculated CF (1.0 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	1/9/08	gasoline Range Organics	15189023	15189023	15699364	15699364	8.667	8.667
2									
3									
4									

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

LDC #: 18 3586A7
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

METHOD: GC_____ HPLC_____

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

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	CCV	1/30/8	GRO	1.0	0.9486	0.9486	5.1	5.1
	12938							
2	CCV	1/30/8	↓	1.0	0.939138	0.9138	8.6	8.6
	14:54							
3								
4								

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

LDC #: 18386A7
SDG #: all covered

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

METHOD: / **GC** __ **HPLC**

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: R5

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
TFT	not specified	0.04	0.02228	56	57	1

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference

LDC #: 18386A7
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: __GC __HPLC

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

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

Where SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration; MS = Matrix spike; MSD = Matrix spike duplicate

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

MS/MSD samples: 18 & 19

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1.06	1.05	0 ~~0.175~~	0.175 ~~0.175~~	0.994	17	17	94	94	140	140
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

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

LDC #: 18386A7
SDG #: see cover

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

Reviewer: [illegible]
2nd Reviewer: [illegible]

_____METHOD: ___GC ___HPLC

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

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked concentration, SA = Spike added, SC = Sample concentration

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100 LCS = Laboratory Control Sample percent recovery LCSD = Laboratory Control Sample duplicate percent recovery

LCS/LCSD samples: 803051-LCS

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	---	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1.0	NA	0	0.921	NA	92	92	NA			
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

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

LDC #: 18386A7
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer:
2nd Reviewer:

METHOD: ✓ GC ___ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID._____ Compound Name _____

Concentration = _____

ND

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

LDC Report# 18386B7

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 28, 2008

LDC Report Date: March 11, 2008

Matrix: Soil/Water

Parameters: Gasoline Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A290158

Sample Identification

TSB-HJ-10-0'
TSB-HJ-10-10'
TSB-HR-06-0'
TSB-HR-06-0'-FD
TSB-HR-06-10'
TSB-HJ-08-0'
TSB-HJ-08-10'
TSB-HR-05-0'
TSB-HR-05-10'
RINSATE-2
TSB-HR-05-10'MS
TSB-HR-05-10'MSD
RINSATE-2MS
RINSATE-2MSD

Introduction

This data review covers 11 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 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:

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) of calibration factors for all compounds were less than or equal to 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 difference (%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.

Sample "RINSATE-2" was identified as a rinsate. No gasoline range organic contaminants were found in this blank.

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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
RINSATE-2	a,a,a,-Trifluorotoluene	153 (66-150)	Gasoline range organics	J+ (all detects)	P

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) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples TSB-HR-06-0' and TSB-HR-06-0'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel H
Gasoline Range Organics - Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Flag	A or P	Reason
F8A290158	RINSATE-2	Gasoline range organics	J+ (all detects)	P	Surrogate recovery (%R)

BRC Tronox Parcel H
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

LDC #: 18386B7
SDG #: F8A290158
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3/6/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Gasoline Range Organics (EPA SW 846 Method 8015)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/28/08
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	ICV ≤ 15
III.	Blanks	A SW	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D = 3 + 4
X.	Field blanks	ND	R = 10

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

Validated Samples: soil + water

1	TSB-HJ-10-0'	11	TSB-HR-05-10'MS	21	8037078	31	
2	TSB-HJ-10-10'	12	TSB-HR-05-10'MSD	22	8037174	32	
3	TSB-HR-06-0'	13	RINSATE-2MS W	23	8039035	33	
4	TSB-HR-06-0'-FD	14	RINSATE-2MSD W	24		34	
5	TSB-HR-06-10'	15		25		35	
6	TSB-HJ-08-0'	16		26		36	
7	TSB-HJ-08-10'	17		27		37	
8	TSB-HR-05-0'	18		28		38	
9	TSB-HR-05-10'	19		29		39	
10	RINSATE-2 W	20		30		40	

Notes: _____

LDC #: 18386B7
SDG #: see cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: ✓ GC ___ HPLC

Are surrogates required by the method? Yes___ or No___.

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

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	10	not specified	C	153 (66-150)	J+/Pdet
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

BRC Tronox Parcel H
Data Validation Reports
LDC# 18386

Diesel Range Organics

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 24, 2008

LDC Report Date: March 11, 2008

Matrix: Soil

Parameters: Diesel Range Organics

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A250221

Sample Identification

TSB-HJ-05-10'
TSB-HJ-05-0'
TSB-HR-04-10'
TSB-HJ-04-0'
TSB-HR-04-0'**
TSB-HJ-04-10'
TSB-HR-07-0'
TSB-HR-07-10'**
TSB-HR-06-0'
TSB-HR-06-10'
TSB-HJ-07-0'**
TSB-HJ-07-0'-FD
TSB-HJ-07-10'
TSB-HR-08-0'
TSB-HR-08-10'
TSB-HR-08-0'MS
TSB-HR-08-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 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.

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

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-HR-06-10'	ortho-Terphenyl	65 (73-150)	Diesel range organics	J- (all detects) UJ (all non-detects)	A
TSB-HR-08-10'	ortho-Terphenyl	66 (73-150)	Diesel range organics	J- (all detects) UJ (all non-detects)	A

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) were within QC limits.

V. Target Compound Identification

All target compound identifications were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VI. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VII. System Performance

The system performance was acceptable for samples on which a EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by Level III criteria.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples TSB-HJ-07-0'** and TSB-HJ-07-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

BRC Tronox Parcel H
Diesel Range Organics - Data Qualification Summary - SDG F8A250221

SDG	Sample	Compound	Flag	A or P	Reason
F8A250221	TSB-HR-06-10' TSB-HR-08-10'	Diesel range organics	J- (all detects) UJ (all non-detects)	A	Surrogate spikes (%R)

BRC Tronox Parcel H
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Diesel Range Organics - Field Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

LDC #: 18386A8
SDG #: F8A250221
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 3/7/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Diesel Range Organics (EPA SW 846 Method 8015)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	ICV ≤ 15
III.	Blanks	A	8
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	X	Not reviewed for Level III validation.
VI.	Compound Quantitation and CRQLs	A	Not reviewed for Level III validation.
VII.	System Performance	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	NP	P = 11+12
X.	Field blanks	N	

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

Validated Samples: ** Indicates sample underwent Level IV validation

SOIL

1	TSB-HJ-05-10'	11	TSB-HJ-07-0'** D	21	8029395	31	
2	TSB-HJ-05-0'	12	TSB-HJ-07-0'-FD D	22		32	
3	TSB-HR-04-10'	13	TSB-HJ-07-10'	23		33	
4	TSB-HJ-04-0'	14	TSB-HR-08-0'	24		34	
5	TSB-HR-04-0'**	15	TSB-HR-08-10' ✓	25		35	
6	TSB-HJ-04-10'	16	TSB-HR-08-0'MS	26		36	
7	TSB-HR-07-0'	17	TSB-HR-08-0'MSD	27		37	
8	TSB-HR-07-10'**	18		28		38	
9	TSB-HR-06-0'	19		29		39	
10	TSB-HR-06-10' ✓	20		30		40	

Notes:

LDC #: 18386A8
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

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

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		✓		
Did the initial calibration meet the curve fit acceptance criteria?			✓	
Were the RT windows properly established?	✓			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? ____%D or ____%R	✓			
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?		✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	✓			
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			

LDC #: 18386A8
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?			✓	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.		✓		
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

LDC #: 18388B8
SDG #: see cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: ~~GC~~ __ HPLC

Are surrogates required by the method? Yes___ or No___.

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

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	10	not specified	H	65 (73-150)	J-/UJ/A
				( )	
	15	↓	H	66 (↓)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
	10 & 15 - Re-Analysis performed			( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 18386A8
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC ____

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

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (50 std)	Recalculated CF (50 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	1/31/08	Diesel	16699	16699	17265	17265	10.435	10.435
2									
3									
4									

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

INICIAL SB

LDC #: 18386A8
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC / HPLC

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

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	ECAL868	1/31/08	Diesel	1000.00	871.9651	871.9651	12.8	12.8
	879	2/01/08	↓	↓	980.1386	980.1386	2.0	2.0
2	887	2/01/08	↓	1000	1006.5768	1006.5768	0.7	0.7
3								
4								

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

LDC #: 18386A8
SDG #: pet coke

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: ___ GC ___ HPLC

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 5

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
o-terphenyl	not specified	25	19.3267	77	77	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 18386A8
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: __GC __HPLC

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

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

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where

SSC = Spiked sample concentration
SA = Spike added
MS = Matrix spike
SC = Sample concentration
MSD = Matrix spike duplicate

MS/MSD samples: 16 & 17

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	86.7	88.2	0	77.8	82.4	90	90	94	94	5.8	5.8
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

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

LDC #: 18386A8
SDG #: pw cover

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

Reviewer: [illegible]
2nd Reviewer:

METHOD: X GC __HPLC

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

%Recovery = 100 * (SSC - SC)/SA Where SSC = Spiked concentration, SA = Spike added, SC = Sample concentration

RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100 LCS = Laboratory Control Sample percent recovery LCSD = Laboratory Control Sample duplicate percent recovery

LCS/LCSD samples: 8029395-LCS

Compound	Spike Added (mg/kg)		Sample Conc. (mg/kg)	Spike Sample Concentration (mg/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	---	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	83.3	NA	0	76.5	NA	92	92	NA			
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

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

LDC #: 18386A8
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

METHOD: / GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID._____ Compound Name _____

Concentration =_____

ND

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: _____

LDC Report# 18386B8

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 28, 2008

LDC Report Date: March 11, 2008

Matrix: Soil/Water

Parameters: Diesel Range Organics

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A290158

Sample Identification

TSB-HJ-10-0'
TSB-HJ-10-10'
TSB-HR-06-0'
TSB-HR-06-0'-FD
TSB-HR-06-10'
TSB-HJ-08-0'
TSB-HJ-08-10'
TSB-HR-05-0'
TSB-HR-05-10'
TSB-HR-05-10'RE
RINSATE-2
TSB-HJ-10-0'MS
TSB-HJ-10-0'MSD
TSB-HR-05-10'MS
TSB-HR-05-10'MSD

Introduction

This data review covers 14 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 8015 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.

Sample RINSATE-2 was identified as a rinsate. No diesel range organic contaminants were found in this blank.

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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-HR-05-10'	ortho-Terphenyl	71 (73-150)	Diesel range organics	J- (all detects) UJ (all non-detects)	A
8039219-Blank	ortho-Terphenyl	62 (73-150)	Diesel range organics	J- (all detects) UJ (all non-detects)	P

b. Matrix Spike/Matrix Spike Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples TSB-HR-06-0' and TSB-HR-06-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

BRC Tronox Parcel H
Diesel Range Organics - Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Flag	A or P	Reason
F8A290158	TSB-HR-05-10'	Diesel range organics	J- (all detects) UJ (all non-detects)	A	Surrogate spikes (%R)

BRC Tronox Parcel H
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

BRC Tronox Parcel H
Diesel Range Organics - Field Blank Data Qualification Summary - SDG F8A290158

No Sample Data Qualified in this SDG

LDC #: 18386B8 **VALIDATION COMPLETENESS WORKSHEET** Date: 3/6/08
SDG #: F8A290158 Level III Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Diesel Range Organics (EPA SW 846 Method 8015)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/28/08
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	ICV = 15
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCSD
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D = 3, 4
X.	Field blanks	ND	R = 11

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

Validated Samples: soil + water

1	TSB-HJ-10-0'	11	RINSATE-2 W	21	8031303	31	
2	TSB-HJ-10-10'	12	TSB-HJ-10-0'MS	22	8035123	32	
3	TSB-HR-06-0' D	13	TSB-HJ-10-0'MSD	23	~~8032~~9 8039219	33	
4	TSB-HR-06-0'-FD D	14	TSB-HR-05-10'MS	24		34	
5	TSB-HR-06-10'	15	TSB-HR-05-10'MSD	25		35	
6	TSB-HJ-08-0'	16		26		36	
7	TSB-HJ-08-10'	17		27		37	
8	TSB-HR-05-0'	18		28		38	
9	TSB-HR-05-10'	19		29		39	
10	TSB-HR-05-10'RE W	20		30		40	

Notes: _____

LDC #: 18386B8
SDG #: see cover

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

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

METHOD: __ GC __ HPLC

Are surrogates required by the method? Yes____ or No____.

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

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	9	not specified	H	71 (73 - 150)	J-/UJ/A
				( )	
				( )	
	8039219-Blank	↓	↓	62 (↓)	J-/UJ/P
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

BRC Tronox Parcel H
Data Validation Reports
LDC# 18386

Dioxins/Dibenzofurans

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 24, 2008

LDC Report Date: March 12, 2008

Matrix: Soil

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A250221

Sample Identification

TSB-HJ-05-10'**
TSB-HJ-05-0'**
TSB-HR-04-10'
TSB-HJ-04-0'
TSB-HR-04-0'**
TSB-HJ-04-10'
TSB-HR-07-0'
TSB-HR-07-10'**
TSB-HR-06-0'
TSB-HR-06-10'
TSB-HJ-07-0'**
TSB-HJ-07-0'-FD
TSB-HJ-07-10'
TSB-HR-08-0'
TSB-HR-08-10'
TSB-HR-06-0'MS
TSB-HR-06-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 17 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.

Samples indicated by a double asterisk on the front cover underwent EPA Level IV review. EPA Level III review was performed on all of the other samples. Raw data were not evaluated for the samples reviewed by EPA Level III criteria since this review is based on QC data.

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

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% .

The exact mass of 380.9760 of PFK was verified. The static resolving power was at least 10,000 (10% valley definition) for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

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.

The minimum S/N ratio for each target compound was greater than or equal to 2.5 and and greater than or equal to 10 for each recovery and internal standard compound for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

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

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

V. Blanks

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

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
8043106-Blank	2/12/08	1,2,3,7,8-PeCDD OCDD OCDF	0.098 pg/g 0.33 pg/g 0.15 pg/g	All samples in SDG F8A250221

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
TSB-HJ-05-10'**	OCDD OCDF	0.30 pg/g 0.12 pg/g	11U pg/g 11U pg/g
TSB-HR-04-10'	OCDD OCDF	0.24 pg/g 0.17 pg/g	11U pg/g 11U pg/g
TSB-HJ-04-0'	OCDD	0.30 pg/g	11U pg/g
TSB-HR-04-0'**	OCDD	0.19 pg/g	10U pg/g
TSB-HJ-04-10'	OCDD	0.20 pg/g	11U pg/g
TSB-HR-07-0'	OCDD	0.21 pg/g	11U pg/g
TSB-HR-07-10'**	OCDD	0.34 pg/g	11U pg/g
TSB-HR-06-10'	OCDD	0.26 pg/g	11U pg/g
TSB-HJ-07-0'**	OCDD OCDF	0.80 pg/g 0.21 pg/g	11U pg/g 11U pg/g
TSB-HJ-07-0'-FD	OCDD	0.30 pg/g	11U pg/g
TSB-HJ-07-10'	1,2,3,7,8-PeCDD OCDD	0.071 pg/g 0.23 pg/g	5.4U pg/g 11U pg/g
TSB-HR-08-0'	1,2,3,7,8-PeCDD OCDD	0.12 pg/g 0.22 pg/g	5.3U pg/g 11U pg/g
TSB-HR-08-10'	OCDD	0.39 pg/g	11U pg/g

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

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

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. 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.

X. Target Compound Identifications

All target compound identifications were within validation criteria for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XI. Compound Quantitation and CRQLs

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-HR-06-0'	2,3,7,8-TCDF (from DB-225)	Confirmation was not performed for this compound.	All compounds must be confirmed on the 2nd column per the QAPP.	None	P

Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XII. System Performance

The system performance was acceptable for samples on which EPA Level IV review was performed. Raw data were not evaluated for the samples reviewed by EPA Level III criteria.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-HJ-07-0'** and TSB-HJ-07-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HJ-07-0'**	TSB-HJ-07-0'-FD				
OCDD	0.80	0.30	-	0.50 (≤11)	-	-
1,2,3,7,8,9-HxCDF	0.070	0.14	-	0.07 (≤5.4)	-	-
1,2,3,4,6,7,8-HpCDF	0.064	5.3U	-	5.24 (≤5.4)	-	-
OCDF	0.21	11U	-	10.79 (≤11)	-	-

BRC Tronox Parcel H
Dioxins/Dibenzofurans - Data Qualification Summary - SDG F8A250221

SDG	Sample	Compound	Flag	A or P	Reason
F8A250221	TSB-HR-06-0'	2,3,7,8-TCDF (from DB-225)	None	P	Compound quantitation and CRQLs

BRC Tronox Parcel H
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG F8A250221

SDG	Sample	Compound	Modified Final Concentration	A or P
F8A250221	TSB-HJ-05-10'**	OCDD OCDF	11U pg/g 11U pg/g	A
F8A250221	TSB-HR-04-10'	OCDD OCDF	11U pg/g 11U pg/g	A
F8A250221	TSB-HJ-04-0'	OCDD	11U pg/g	A
F8A250221	TSB-HR-04-0'**	OCDD	10U pg/g	A
F8A250221	TSB-HJ-04-10'	OCDD	11U pg/g	A
F8A250221	TSB-HR-07-0'	OCDD	11U pg/g	A
F8A250221	TSB-HR-07-10'**	OCDD	11U pg/g	A
F8A250221	TSB-HR-06-10'	OCDD	11U pg/g	A
F8A250221	TSB-HJ-07-0'**	OCDD OCDF	11U pg/g 11U pg/g	A
F8A250221	TSB-HJ-07-0'-FD	OCDD	11U pg/g	A
F8A250221	TSB-HJ-07-10'	1,2,3,7,8-PeCDD OCDD	5.4U pg/g 11U pg/g	A
F8A250221	TSB-HR-08-0'	1,2,3,7,8-PeCDD OCDD	5.3U pg/g 11U pg/g	A
F8A250221	TSB-HR-08-10'	OCDD	11U pg/g	A

BRC Tronox Parcel H
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG F8A250221

No Sample Data Qualified in this SDG

LDC #: 18386A21
SDG #: F8A250221
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III/IV

Date: 3/11/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/24/08
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	A	
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	
X.	Target compound identifications	A	Not reviewed for Level III validation.
XI.	Compound quantitation and CRQLs	SW	Not reviewed for Level III validation.
XII.	System performance	A	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 11+12
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: ** Indicates sample underwent Level IV validation

SOIL

1	TSB-HJ-05-10'**	11	TSB-HJ-07-0'**	21	8043106-Blank	31	
2	TSB-HJ-05-0'**	12	TSB-HJ-07-0'-FD	22		32	
3	TSB-HR-04-10'	13	TSB-HJ-07-10'	23		33	
4	TSB-HJ-04-0'	14	TSB-HR-08-0'	24		34	
5	TSB-HR-04-0'**	15	TSB-HR-08-10'	25		35	
6	TSB-HJ-04-10'	16	TSB-HR-06-0'MS	26		36	
7	TSB-HR-07-0'	17	TSB-HR-06-0'MSD	27		37	
8	TSB-HR-07-10'**	18		28		38	
9	TSB-HR-06-0'	19		29		39	
10	TSB-HR-06-10'	20		30		40	

Notes:

LDC #: 18386A21
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Reviewer:
2nd Reviewer:

Method: Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers $\leq$ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
III. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) $\leq$ 20% for unlabeled standards and $\leq$ 30% for labeled standards?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound $\geq$ 2.5 and for each recovery and internal standard $\geq$ 10?	✓			
IV. Continuing calibration				
Was a routine calibration performed at the beginning and end of each 12 hour period?	✓			
Were all percent differences (%D) $\leq$ 20% for unlabeled standards and $\leq$ 30% for labeled standards?	✓			
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet?	✓			
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 18386A21
SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 5
2nd Reviewer: 6

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
VIII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
IX. Internal standards				
Were internal standard recoveries within the 40-135% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks $\geq$ 10?	✓			
X. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard $\geq$ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within $\pm$ 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N $\geq$ 2.5, at $\pm$ seconds RT) detected in the corresponding PCDPE channel?	✓			
Was an acceptable lock mass recorded and monitored?	✓			
XI. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			

LDC #: 18386A21
SDG #: fee cover

VALIDATION FINDINGS CHECKLIST

Reviewer: 5
2nd Reviewer: 9

Validation Area	Yes	No	NA	Findings/Comments
Target compounds were detected in the field duplicates.	✓			
XV. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	

VALIDATION FINDINGS WORKSHEET

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

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

Notes:_____

LDC #: 14386A21
SDG #: pre cover

VALIDATION FINDINGS WORKSHEET
Blanks

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

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 Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 2/12/08 **Blank analysis date:** 2/20/08 **Associated samples:** All
Conc. units: pg/g

Compound	Blank ID	Sample Identification								
	8043106 - Blank	1	2	3	4	5	6	7	8	9
B	0.098	-	-	-	-	-	-	-	-	-
G	0.33	0.30/11U	(6.4)	0.24/11U	0.30/11U	0.19/10U	0.20/11U	0.21/11U	0.34/11U	(2.0)
Q	0.15	0.12/11U	(18)	0.17/11U	-	-	-	-	-	(2.8)
	8043106 - Blank		10	11	12	13	14	15		
B	0.098		-	-	~~0.071/5.4U~~	0.071/5.4U	0.12/5.3U	-		
G	0.33		0.26/11U	0.80/11U	0.30/11U	0.23/11U	0.22/11U	0.39/11U		
Q	0.15		-	0.21/11U	-	-	-	-		

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

LDC #: 18386A21
SDG #: pre count

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: B
2nd Reviewer: 4

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

#	Date	~~Sample~~ ID	Finding	Associated Samples	Qualifications
		H	no DB-225 confirmation	9	nme/P

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18386A21
SDG #: full COVER

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: B
2nd reviewer: W

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

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

Compound	Concentration (pg/g)		Difference RPD
	11	12	
G	0.80	0.30	0.50 (≤ 5.4)
N	0.070	0.14	0.07 (≤ 5.4)
O	0.064	5.34	5.24 (≤ 5.4)
Q	0.21	11 U	10.79 (≤ 11)

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

LDC #: 18386A21
SDG #: fue cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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

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

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
$\%RSD = 100 * (S/X)$

A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported RRF (CS3 std)	Recalculated RRF (CS3 std)	Reported %RSD	Recalculated %RSD
1	ICAL	2/15/08	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.045	1.045	1.040	1.040	9.9	9.9
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.07584	1.084	1.075	1.075	11.0	11.0
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.053	1.053	1.070	1.070	7.0	7.0
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.976	0.976	0.977	0.977	7.0	7.0
			OCDF (^{13}C-OCDD)	1.102	1.102	1.118	1.118	8.0	8.0
2	ICAL	3/15/08	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	~~1.179~~	1.179	~~1.205~~	~~1.205~~	4.0	4.0
	DB-225		~~2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)~~	1.081	1.081	1.125	1.125	6.7	6.7
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			~~OCDF (^{13}C-OCDD)~~						
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)						
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDD)						

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

LDC #:_____
SDG #:_____

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: KM
2nd Reviewer:_____

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

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

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	C080225S1	2/25/08	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.125	1.044	1.044	7.2	7.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
2			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					
3			2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)					
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDD)					

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

LDC #: 14386A21
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer: 1
2nd Reviewer: 1

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method TO-9A)

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

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV	2/20/08	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.045	0.984	0.984	5.9	5.9
	A080220S2	12:34	2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.084	1.021	1.021	5.9	5.9
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.053	1.001	1.001	4.9	4.9
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.976	1.030	1.030	5.5	5.5
			OCDF (^{13}C-OCDD)	1.102	1.276	1.276	15.8	15.8
2	CCV	2/22/08	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)		0.996	0.996	4.7	4.7
	A080221S2	23:53	2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)		1.035	1.035	4.5	4.5
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)		1.083	1.023	2.8	2.8
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)		1.021	1.021	4.5	4.5
			OCDF (^{13}C-OCDD)	↓	1.171	1.171	6.3	6.3
3	CCV	2/22/08	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)		0.989	0.989	5.4	5.4
	A080222S1	09:19	2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)		1.055	1.055	2.7	2.7
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)		1.019	1.019	3.2	3.2
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)		1.032	1.032	5.7	5.7
			OCDF (^{13}C-OCDD)	↓	1.170	1.170	6.1	6.1

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

LDC #: 18386A21
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

% Recovery = 100 * (SSR - SR)/SA Where: SSR = Spiked sample result, SR = Sample result; SA = Spike added

RPD = I MSR - MSDR I * 2/(MSR + MSDR) MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 16 + 17

Compound	Spike Added (pg/g)		Sample Concentration (pg/g)	Spiked Sample Concentration (pg/g)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		Reported RPD	Recalculated RPD
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	----	----
2,3,7,8-TCDD	22.2	22.2	ND	22.7	22.4	102	102	101	101	1.5	1.5
1,2,3,7,8-PeCDD	111	111	ND	115	116	103	103	105	105	1.3	1.3
1,2,3,4,7,8-HxCDD	111	111	ND	118	110	106	106	99	99	6.8	6.8
1,2,3,4,7,8,9-HpCDF	111	111	0.45	117	111	105	105	100	100	4.9	4.9
OCDF	222	222	2.8	258	250	115	115	112	112	3.1	3.1

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

LDC #: 18386A21
SDG #: re cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer:
2nd Reviewer:

METHOD: GC/MS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 8043106 - LCS

Compound	Spike Added (pg/g)		Spiked Sample Concentration (pg/g)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
2,3,7,8-TCDD	20.0	NA	20.1	NA	100	100				
1,2,3,7,8-PeCDD	100		105		105	105				
1,2,3,4,7,8-HxCDD	↓		104		104	104				
1,2,3,4,7,8,9-HpCDF	↓		106		106	106				
OCDF	200		240		120	120	NA			

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

LDC #: 18386A21
SDG #: pw cover

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of
Reviewer:
2nd reviewer:

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

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

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

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. #2 , G :

Conc. = $\frac{(52145)(2000)(\quad)}{(173967)(0.976)(10)(0.953)}$

= 6.44 pg/g

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification
		#2 H confirmation			
		= $\frac{8462\ (1000)}{388684\ (1.081)(10)(0.953)}$			
		= 2.1 pg/g			

LDC #:
SDG #:

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification (additional page)

Page: of
Reviewer:

Ions Monitored for HRGC/HRMS Analysis of PCDDs/PCDFs

Descriptor	Accurate mass[a]	Ion ID	Elemental Composition	Analyte	Descriptor	Accurate Mass[a]	Ion ID	Elemental Composition	Analyte
1	303.9016	M	$C_{12}H_4{}^{35}Cl_4O$	TCDF	4	407.7818	M+2	$C_{12}H^{35}Cl_6{}^{37}ClO$	HpCDF
	305.8987	M+2	$C_{12}H_4{}^{35}Cl_3{}^{37}C10$	TCDF		409.7788	M+4	$C_{12}H^{35}Cl_5{}^{37}Cl_2O$	HpCDF
	315.9419	M	$^{13}C_{12}H_4{}^{35}Cl_4O$	TCDF (S)		417.8250	M	$^{13}C_{12}H^{35}Cl_7O$	HpCDF (S)
	317.9389	M+2	$^{13}C_{12}H_4{}^{35}Cl_3{}^{37}ClO$	TCDF (S)		419.8220	M+2	$^{13}C_{12}H^{35}Cl_6{}^{37}ClO$	HpCDF
	319.8965	M	$C_{12}H_4{}^{35}Cl_4O_2$	TCDD		423.7767	M+2	$C_{12}H^{35}Cl_6{}^{37}ClO_2$	HpCDD
	321.8936	M+2	$C_{12}H_4{}^{35}Cl_3{}^{37}C10_2$	TCDD		425.7737	M+4	$C_{12}H^{35}Cl_5{}^{37}Cl_2O_2$	HpCDD
	331.9368	M	$^{13}C_{12}H_4{}^{35}Cl_4O_2$	TCDD (S)		435.8169	M+2	$^{13}C_{12}H^{35}Cl_6{}^{37}ClO_2$	HpCDD (S)
	333.9338	M+2	$^{13}C_{12}H_4{}^{35}Cl_3{}^{37}ClO_2$	TCDD (S)		437.8140	M+4	$^{13}C_{12}H^{35}Cl_5{}^{37}Cl_2O_2$	HpCDD (S)
	375.8364	M+2	$C_{12}H_4{}^{35}Cl_5{}^{37}ClO$	HxCDPE		479.7165	M+4	$C_{12}H^{35}Cl_7{}^{37}Cl_2O$	NCDPE
	[354.9792]	LOCK	C_9F_{13}	PFK		[430.9728]	LOCK	C_9F_{17}	PFK
2	339.8597	M+2	$C_{12}H_3{}^{35}Cl_4{}^{37}ClO$	PeCDF	5	441.7428	M+2	$C_{12}{}^{35}Cl_7{}^{37}ClO$	OCDF
	341.8567	M+4	$C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O$	PeCDF		443.7399	M+4	$C_{12}{}^{35}Cl_6{}^{37}Cl_2O$	OCDF
	351.9000	M+2	$^{13}C_{12}H_3{}^{35}Cl_4{}^{37}C10$	PeCDF (S)		457.7377	M+2	$C_{12}{}^{35}Cl_7{}^{37}ClO_2$	OCDD
	353.8970	M+4	$^{13}C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O$	PeCDF (S)		459.7348	M+4	$C_{12}{}^{35}Cl_6{}^{37}Cl_2O_2$	OCDD
	355.8546	M+2	$C_{12}H_3{}^{35}Cl_4{}^{37}ClO_2$	PeCDD		469.7780	M+2	$^{13}C_{12}{}^{35}Cl_7{}^{37}ClO_2$	OCDD (S)
	357.8516	M+4	$C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O_2$	PeCDD		471.7750	M+4	$^{13}C_{12}{}^{35}Cl_6{}^{37}Cl_2O_2$	OCDD (S)
	367.8949	M+2	$^{13}C_{12}H_3{}^{35}Cl_4{}^{37}ClO_2$	PeCDD (S)		513.6775	M+4	$C_{12}{}^{35}Cl_8{}^{37}Cl_2O$	DCDPE
	369.8919	M+4	$^{13}C_{12}H_3{}^{35}Cl_3{}^{37}Cl_2O_2$	PeCDD (S)		[422.9278]	LOCK	$C_{10}F_{17}$	PFK
	409.7974	M+2	$C_{12}H_3{}^{35}Cl_8{}^{37}ClO$	HpCDPE					
	[354.9792]	LOCK	C_9F_{13}	PFK					
3	373.8208	M+2	$C_{12}H_2{}^{35}Cl_5{}^{37}ClO$	HxCDF					
	375.8178	M+4	$C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O$	HxCDF					
	383.8639	M	$^{13}C_{12}H_2{}^{35}Cl_6O$	HxCDF (S)					
	385.8610	M+2	$^{13}C_{12}H_2{}^{35}Cl_5{}^{37}ClO$	HxCDF (S)					
	389.8156	M+2	$C_{12}H_2{}^{35}Cl_5{}^{37}ClO_2$	HxCDD					
	391.8127	M+4	$C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O_2$	HxCDD					
	401.8559	M+2	$^{13}C_{12}H_2{}^{35}Cl_5{}^{37}ClO_2$	HxCDD (S)					
	403.8529	M+4	$^{13}C_{12}H_2{}^{35}Cl_4{}^{37}Cl_2O_2$	HxCDD (S)					
	445.7555	M+4	$C_{12}H_2{}^{35}Cl_6{}^{37}Cl_2O$	OCDPE					
	[430.9728]	LOCK	C_9F_{17}	PFK					

(a) The following nuclidic masses were used:

H = 1.007825	O = 15.994915
C = 12.000000	^{35}Cl = 34.968853
^{13}C = 13.003355	^{37}Cl = 36.965903
F = 18.9984	

S = internal/recovery standard

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: BRC Tronox Parcel H

Collection Date: January 28, 2008

LDC Report Date: March 12, 2008

Matrix: Soil/Water

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): F8A290158

Sample Identification

TSB-HJ-10-0'
TSB-HJ-10-10'
TSB-HR-06-0'
TSB-HR-06-0'-FD
TSB-HR-06-10'
TSB-HJ-08-0'
TSB-HJ-08-10'
TSB-HR-05-0'
TSB-HR-05-10'
RINSATE-2
TSB-HR-06-0'MS
TSB-HR-06-0'MSD

Introduction

This data review covers 11 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8290 for Polychlorinated Dioxins/Dibenzofurans.

This review follows 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% .

The exact mass of 380.9760 of PFK was verified. The static resolving power was at least 10,000 (10% valley definition).

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.

The minimum S/N ratio for each target compound was greater than or equal to 2.5 and and greater than or equal to 10 for each recovery and internal standard compound.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

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

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

V. Blanks

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

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
8045178-BLK	2/14/08	OCDD	0.19 pg/g	All soil samples in SDG F8A290158
8042278-BLK	2/11/08	1,2,3,7,8-PeCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,4,7,8-PeCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	1.1 pg/L 0.84 pg/L 1.2 pg/L 1.7 pg/L 6.6 pg/L 1.1 pg/L 1.1 pg/L 0.72 pg/L 1.2 pg/L 1.1 pg/L 1.6 pg/L 3.8 pg/L	All water samples in SDG F8A290158

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
TSB-HJ-10-10'	OCDD	0.22 pg/g	10U pg/g
TSB-HR-06-0'-FD	OCDD	0.70 pg/g	11U pg/g
TSB-HR-06-10'	OCDD	0.24 pg/g	11U pg/g
TSB-HJ-08-10'	OCDD	0.26 pg/g	11U pg/g
TSB-HR-05-10'	OCDD	0.40 pg/g	11U pg/g
RINSATE-2	1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF OCDF	0.84 pg/L 3.9 pg/L 0.35 pg/L 0.56 pg/L 1.7 pg/L	50U pg/L 100U pg/L 50U pg/L 50U pg/L 100U pg/L

Sample "RINSATE-2" was identified as a rinsate. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank with the following exceptions:

Rinsate ID	Sampling Date	Compound	Concentration	Associated Samples
RINSATE-2	1/28/08	1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF OCDF	0.84 pg/L 3.9 pg/L 0.35 pg/L 0.56 pg/L 1.7 pg/L	All soil samples in SDG F8A290158

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>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-HJ-10-0'	1,2,3,7,8,9-HxCDF	0.51 pg/g	5.3U pg/g
TSB-HJ-10-10'	OCDD	0.22 pg/g	10U pg/g
TSB-HR-06-0'	1,2,3,4,6,7,8-HpCDD OCDD OCDF	0.16 pg/g 1.5 pg/g 0.62 pg/g	5.2U pg/g 10U pg/g 10U pg/g
TSB-HR-06-0'-FD	OCDD OCDF	0.70 pg/g 0.49 pg/g	11U pg/g 11U pg/g
TSB-HR-06-10'	OCDD	0.24 pg/g	11U pg/g
TSB-HJ-08-0'	OCDD 1,2,3,6,7,8-HxCDF OCDF	1.2 pg/g 0.26 pg/g 1.3 pg/g	11U pg/g 5.4U pg/g 11U pg/g
TSB-HJ-08-10'	OCDD	0.26 pg/g	11U pg/g
TSB-HR-05-0'	1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,6,7,8-HxCDF OCDF	1.6 pg/g 9.2 pg/g 0.16 pg/g 1.7 pg/g	5.4U pg/g 11U pg/g 5.4U pg/g 11U pg/g
TSB-HR-05-10'	OCDD	0.40 pg/g	11U pg/g

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

VII. Laboratory Control Samples (LCS)

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

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-HJ-10-10'	2,3,7,8-TCDF (from DB-225)	Confirmation was not performed for this compound.	All compounds must be confirmed on the 2nd column per the QAPP.	None	P

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-HR-06-0' and TSB-HR-06-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-HR-06-0'	TSB-HR-06-0'-FD				
1,2,3,4,6,7,8-HpCDD	0.16	5.4U	-	5.24 (≤5.4)	-	-
OCDD	1.5	0.70	-	0.8 (≤11)	-	-
1,2,3,4,6,7,8-HpCDF	0.19	0.26	-	0.07 (≤5.4)	-	-
OCDF	0.62	0.46	-	0.13 (≤11)	-	-

BRC Tronox Parcel H
Dioxins/Dibenzofurans - Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Flag	A or P	Reason
F8A290158	TSB-HJ-10-10'	2,3,7,8-TCDF (from DB-225)	None	P	Compound quantitation and CRQLs

BRC Tronox Parcel H
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Modified Final Concentration	A or P
F8A290158	TSB-HJ-10-10'	OCDD	10U pg/g	A
F8A290158	TSB-HR-06-0'-FD	OCDD	11U pg/g	A
F8A290158	TSB-HR-06-10'	OCDD	11U pg/g	A
F8A290158	TSB-HJ-08-10'	OCDD	11U pg/g	A
F8A290158	TSB-HR-05-10'	OCDD	11U pg/g	A
F8A290158	RINSATE-2	1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF OCDF	50U pg/L 100U pg/L 50U pg/L 50U pg/L 100U pg/L	A

BRC Tronox Parcel H
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG F8A290158

SDG	Sample	Compound	Modified Final Concentration	A or P
F8A290158	TSB-HJ-10-0'	1,2,3,7,8,9-HxCDF	5.3U pg/g	A
F8A290158	TSB-HJ-10-10'	OCDD	10U pg/g	A
F8A290158	TSB-HR-06-0'	1,2,3,4,6,7,8-HpCDD OCDD OCDF	5.2U pg/g 10U pg/g 10U pg/g	A

SDG	Sample	Compound	Modified Final Concentration	A or P
F8A290158	TSB-HR-06-0'-FD	OCDD OCDF	11U pg/g 11U pg/g	A
F8A290158	TSB-HR-06-10'	OCDD	11U pg/g	A
F8A290158	TSB-HJ-08-0'	OCDD 1,2,3,6,7,8-HxCDF OCDF	11U pg/g 5.4U pg/g 11U pg/g	A
F8A290158	TSB-HJ-08-10'	OCDD	11U pg/g	A
F8A290158	TSB-HR-05-0'	1,2,3,4,6,7,8-HpCDD OCDD 1,2,3,6,7,8-HxCDF OCDF	5.4U pg/g 11U pg/g 5.4U pg/g 11U pg/g	A
F8A290158	TSB-HR-05-10'	OCDD	11U pg/g	A

LDC #: 18386B21
SDG #: F8A290158
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 3/7/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/28/08
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	A	
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	SW	
VII.	Laboratory control samples	A	LCS ID
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	SW	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D = 3 + 4
XV.	Field blanks	SW	R = 10

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

Validated Samples: soil + water

1	TSB-HJ-10-0'	11	TSB-HR-06-0'MS	21	8042278-BLK	31	
2	TSB-HJ-10-10'	12	TSB-HR-06-0'MSD	22	8045178-BLK	32	
3	TSB-HR-06-0'	13		23		33	
4	TSB-HR-06-0'-FD	14		24		34	
5	TSB-HR-06-10'	15		25		35	
6	TSB-HJ-08-0'	16		26		36	
7	TSB-HJ-08-10'	17		27		37	
8	TSB-HR-05-0'	18		28		38	
9	TSB-HR-05-10'	19		29		39	
10	RINSATE-2	20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

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

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

Notes:

COMPNDL

LDC #: 18386B21
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 2
Reviewer: F
2nd Reviewer: Q

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 Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 2/14/08 **Blank analysis date:** 2/23/08 **Associated samples:** All soils

Conc. units: pg/g

Compound	Blank ID	Sample Identification								
	8045178-BLK	2	4	5	7	9				
G	0.19	0.22 /10u	0.70/11u	0.24/11u	0.26/11u	0.40/11u				
		others >5x								

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

LDC #: 18386B21
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Blanks

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

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 Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was the method blank contaminated?

Blank extraction date: 2/11/08 **Blank analysis date:** 2/15/08 **Associated samples:** All water

Conc. units: pg/L

Compound	Blank ID	Sample Identification								
	804228B-BK		10							
B	1.1		-							
D	0.84		-							
E	1.2		-							
F	1.7		0.84/50U							
G	6.6		3.9/100U							
J	1.1		-							
L	1.1		0.35/50U							
M	0.72		-							
N	1.2		0.56/50U							
O	1.1		-							
P	1.6		-							
Q	3.8		1.7/100U							

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

LDC #: 18386B21
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: B
2nd Reviewer: Q

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

(Y) N N/A Were field blanks identified in this SDG?
Blank units: pg/L **Associated sample units:** pg/g
Sampling date: 1/28/08
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All soils

Compound	Blank ID	Sample Identification								
	10	1	2	3	4	5	6	7	8	9
F	0.84	-	-	0.16/5.2U	-	-	-	-	1.6/5.4U	-
G	3.9	-	0.22/10U	1.5/10U	0.70/11U	0.24/11U	1.2/11U	0.26/11U	9.2/11U	0.40/11U
L	0.35	-	-	-	-	-	0.26/5.4U	-	0.16/5.4U	-
N	0.56	0.51/5.3U	-	-	-	-	-	-	-	-
Q	1.7	-	-	0.62/10U	0.49/11U	-	1.3/11U	-	1.7/11U	-
CRQL										

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								
CRQL										

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

LDC #: 18386B21
SDG #: see cover

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: B
2nd Reviewer: Q

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		11+12	F	130 (70-120)	124 (70-120)	( )	3	no QUAL LCS in
			G	146 (74-124)	133 (74-124)	( )	↓	↓
			K	125 (74-124)	( )	( )		
			O	128 (75-125)	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 18386B21
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
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 Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
Y N N/A Compound quantitation and CRQLs were adjusted to reflect all sample dilutions and dry weight factors (if necessary).

#	Date	~~Sample ID~~ compound	Finding	Associated Samples	Qualifications
		H	no confirmation on DB-225	2	none /p

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18386B21
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: B
2nd reviewer:

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

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

Compound	Concentration (pg/g) 3	4 5.44	Difference RPD
F	0.16	~~[illegible]~~ 5.44	~~10.84~~ 5.28 (≤ 5.4)
G	1.5	0.70	0.8 (≤ 11)
θ	0.19	0.26	0.07 (≤ 5.4)
Q	0.62	0.49	0.13 (≤ 11)

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD