

LABORATORY DATA CONSULTANTS, INC.

7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

ERM

February 20, 2008

2525 Natomas Park Drive, Suite 350

Sacramento, CA 95833

ATTN: Ms. Maria Barajas-Albalawi

SUBJECT: BRC Tronox Parcel C/D/F/G, Data Validation

Dear Ms. Barajas-Albalawi

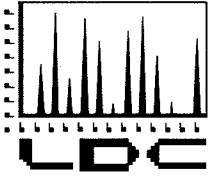
Enclosed is the revised data validation reports for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

<u>SDG#</u>	<u>LDC#</u>	<u>Fraction</u>
TRNC-D-4	18100D1	Volatiles

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

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist



LABORATORY DATA CONSULTANTS, INC.

7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

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

February 11, 2008

SUBJECT: BRC Tronox Parcel C/D/F/G, Data Validation

Dear Ms. Barajas-Albalawi

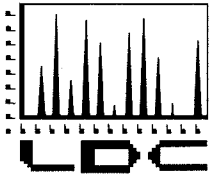
Enclosed are the revised data validation reports for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

<u>SDG#</u>	<u>LDC#</u>	<u>Fraction</u>
TRNC-D-2	18100B1	Volatiles
TRNC-D-3	18100C1	Volatiles
TRNC-D-4	18100D1	Volatiles
TRNC-D-5	18100E1	Volatiles
TRNC-D-6	18100F1	Volatiles
TRNC-D-7	18100G1	Volatiles

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

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist



LABORATORY DATA CONSULTANTS, INC.

7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

ERM

February 8, 2008

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

SUBJECT: BRC Tronox Parcel C/D/F/G, Data Validation

Dear Ms. Barajas-Albalawi

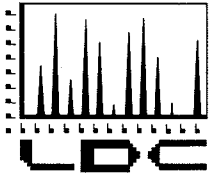
Enclosed is the revised data validation report for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

<u>SDG#</u>	<u>LDC#</u>	<u>Fraction</u>
TRNC-D-6	18100F1	Volatiles
TRNC-D-7	18100G1	Volatiles
TRNC-D-3	18100C4	Metals

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

Sincerely,

Erlinda T. Rauto
Operations Manager/Senior Chemist



LABORATORY DATA CONSULTANTS, INC.

7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

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

February 6, 2008

SUBJECT: BRC Tronox Parcel C/D/F/G, Data Validation

Dear Ms. Barajas-Albalawi

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on January 8, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 18100:

<u>SDG #</u>	<u>Fraction</u>
TRNC-D-1, TRNC-D-2, TRNC-D-3, TRNC-D-4, TRNC-D-5, TRNC-D-6, TRNC-D-7	Volatiles, Semivolatiles, Chlorinated Pesticides, Polychlorinated Biphenyls, Metals, Wet Chemistry, Gasoline Range Organics, Diesel Range Organics, Dioxins/Dibenzofurans

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

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- 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

**BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100**

Volatiles

LDC

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 9, 2007
LDC Report Date: January 24, 2008
Matrix: Soil/Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TRIP BLANK
TB1
TB2
TSB-CJ-04-0'MS
TSB-CJ-04-0'MSD

Introduction

This data review covers 13 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.

All samples were received in good condition with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TB1 TB2	All TCL compounds	A headspace was apparent in the sample containers.	There should be no headspace in the sample containers.	J- (all detects) UJ (all non-detects)	A

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
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥0.05) 0.04730 (≥0.05)	All soil samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥0.05)	All soil samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects)	A
11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane Iodomethane	0.04881 (≥0.05) 0.03735 (≥0.05) 0.03359 (≥0.05)	All water samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects)	A
11/16/07	Ethanol	0.00331 (≥0.05)	All water samples in SDG TRNC-D-1	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
11/17/07 (FCAL7971)	Trichlorofluoromethane	27.11258	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-04-0'MS TSB-CJ-04-0'MSD 7322075MB	J+ (all detects)	A
11/18/07 (FCAL7996)	Acetonitrile	38.20584	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' 7323521MB	J+ (all detects)	A
11/19/07 (LCAL6874)	Bromomethane	31.45374	All water samples in SDG TRNC-D-1	J+ (all detects)	A

Date	Compound	%D	Associated Samples	Flag	A or P
11/19/07 (FCAL8041)	Chloromethane Acetonitrile	27.59986 40.91991	TSB-CJ-08-0' 7324674MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-1	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
11/17/07 (FCAL7971)	Acetonitrile	0.01102 (≥ 0.05)	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-04-0'MS TSB-CJ-04-0'MSD 7322075MB	J (all detects) UJ (all non-detects)	A
11/18/07 (FCAL7996)	Acetonitrile	0.01288 (≥ 0.05)	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' 7323521MB	J (all detects) UJ (all non-detects)	A
11/18/07 (FCAL7997)	Ethanol	0.00180 (≥ 0.05)	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' 7323521MB	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6872)	Ethanol	0.00314 (≥ 0.05)	All water samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥ 0.05) 0.04404 (≥ 0.05) 0.04664 (≥ 0.05) 0.03391 (≥ 0.05)	All water samples in SDG TRNC-D-1	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/19/07 (FCAL8041)	Acetonitrile	0.01313 (≥ 0.05)	TSB-CJ-08-0' 7324674MB	J (all detects) UJ (all non-detects)	A
11/19/07 (FCAL8042)	Ethanol	0.00142 (≥ 0.05)	TSB-CJ-08-0' 7324674MB	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
7322075MB	11/17/07	Toluene 1,2,4-Trimethylbenzene	1.3 ug/Kg 0.36 ug/Kg	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10'
7323521MB	11/18/07	Toluene 1,2,4-Trimethylbenzene	0.55 ug/Kg 0.42 ug/Kg	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'
7324674MB	11/19/07	1,2,4-Trimethylbenzene	0.45 ug/Kg	TSB-CJ-08-0'

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-CR-07-0'	1,2,4-Trimethylbenzene	0.45 ug/Kg	5.0U ug/Kg
TSB-CR-07-10'	1,2,4-Trimethylbenzene	0.53 ug/Kg	5.5U ug/Kg
TSB-CJ-08-0'-FD	1,2,4-Trimethylbenzene	0.55 ug/Kg	5.2U ug/Kg
TSB-CJ-08-10'	1,2,4-Trimethylbenzene	0.50 ug/Kg	5.4U ug/Kg
TSB-CJ-04-10'	1,2,4-Trimethylbenzene	0.51 ug/Kg	5.4U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-CJ-07-0'	1,2,4-Trimethylbenzene	0.54 ug/Kg	5.2U ug/Kg
TSB-CJ-07-10'	1,2,4-Trimethylbenzene	0.50 ug/Kg	5.6U ug/Kg
TSB-CJ-03-0'	1,2,4-Trimethylbenzene	0.44 ug/Kg	5.3U ug/Kg
TSB-CJ-03-10'	1,2,4-Trimethylbenzene	0.50 ug/Kg	5.4U ug/Kg
TSB-CJ-08-0'	1,2,4-Trimethylbenzene	0.61 ug/Kg	5.2U ug/Kg

Samples TRIP BLANK, TB1, and TB2 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
TRIP BLANK	11/9/07	Dichloromethane Acetone	0.86 ug/L 1.5 ug/L	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' RINSATE 1
TB1	11/9/07	Dichloromethane	1.2 ug/L	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' RINSATE 1

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB2	11/9/07	Dichloromethane	0.81 ug/L	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' RINSATE 1

Sample "RINSATE 1" was identified as a rinsate. No volatile contaminants were found in this blank with the following exceptions:

Rinsate ID	Sampling Date	Compound	Concentration	Associated Samples
RINSATE 1	11/9/07	Styrene	0.34 ug/L	All soil samples in SDG TRNC-D-1

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-CR-07-10'	Acetone	7.0 ug/Kg	22U ug/Kg
TSB-CJ-07-10'	Acetone	9.1 ug/Kg	22U ug/Kg
TSB-CJ-03-10'	Acetone	9.6 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.

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 relative percent differences (RPD) were not within QC limits for some compounds, the MS/MSD percent recoveries (%R) were within QC limits and no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7323521LCS (TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' 7323521MB)	Vinyl acetate	167 (56-115)	-	-	J+ (all detects)	P
7324674LCS (TSB-CJ-08-0' 7324674)	Vinyl acetate	161 (56-115)	-	-	J+ (all detects)	P
7325161LCS/D (All water samples in SDG TRNC-D-1)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P

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

XVI. Field Duplicates

Samples TSB-CJ-08-0' and TSB-CJ-08-0'-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-CJ-08-0'	TSB-CJ-08-0'-FD				
1,2,4-Trimethylbenzene	0.61	0.55	-	0.06 (≤ 5.2)	-	-

BRC Tronox Parcel C/D/F/G
Volatiles - Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TB1 TB2	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Sample condition (headspace)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Bromochloromethane 1,2-Dibromo-3-chloropropane Iodomethane Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10'	Trichlorofluoromethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Acetonitrile	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-08-0'	Chloromethane Acetonitrile	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10'	Acetonitrile	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-1	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' TSB-CJ-08-0'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-1	TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10' TSB-CJ-08-0'	Vinyl acetate	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-1	RINSATE 1 TRIP BLANK TB1 TB2	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)

**BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-1	TSB-CR-07-0'	1,2,4-Trimethylbenzene	5.0U ug/Kg	A
TRNC-D-1	TSB-CR-07-10'	1,2,4-Trimethylbenzene	5.5U ug/Kg	A
TRNC-D-1	TSB-CJ-08-0'-FD	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-1	TSB-CJ-08-10'	1,2,4-Trimethylbenzene	5.4U ug/Kg	A
TRNC-D-1	TSB-CJ-04-10'	1,2,4-Trimethylbenzene	5.4U ug/Kg	A
TRNC-D-1	TSB-CJ-07-0'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-1	TSB-CJ-07-10'	1,2,4-Trimethylbenzene	5.6U ug/Kg	A
TRNC-D-1	TSB-CJ-03-0'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-1	TSB-CJ-03-10'	1,2,4-Trimethylbenzene	5.4U ug/Kg	A
TRNC-D-1	TSB-CJ-08-0'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A

BRC Tronox Parcel C/D/F/G

Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-1	TSB-CR-07-10'	Acetone	22U ug/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Acetone	22U ug/Kg	A
TRNC-D-1	TSB-CJ-03-10'	Acetone	21U ug/Kg	A

LDC #: 18100A1
 SDG #: TRNC-D-1
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 11/15/08
 Page: 6 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/9/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	PSD - Y2
IV.	Continuing calibration/ICV	SW	ICV ≤ 25/0
V.	Blanks	SW	
VI.	Surrogate spikes	A	
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	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 = 13, 14, 15

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

Validated Samples:

1	TSB-CR-07-0'	11	TSB-CJ-03-10'	21	7322075MB	31
2	TSB-CR-07-10'	12	RINSATE 1	22	7323521MB	32
3	TSB-CJ-08-0'	13	TRIP BLANK	23	7324674MB	33
4	TSB-CJ-08-0'-FD	14	TB1	24	7325761MB (W)	34
5	TSB-CJ-08-10'	15	TB2	25		35
6	TSB-CJ-04-0'	16	TSB-CJ-04-0'MS	26		36
7	TSB-CJ-04-10'	17	TSB-CJ-04-0'MSD	27		37
8	TSB-CJ-07-0'	18		28		38
9	TSB-CJ-07-10'	19		29		39
10	TSB-CJ-03-0'	20		30		40

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. 2-Nitropropanol
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. p-Cymene
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Isodimethane
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.

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VALIDATION FINDINGS WORKSHEET
Technical Holding Times

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

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)							
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
14-15	W	headspace					N/A

TECHNICAL HOLDING TIME CRITERIA

- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soil: Both within 14 days of sample collection.

VALIDATION FINDINGS WORKSHEET
Initial Calibration

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

- Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
- N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
 - N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 - N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? _____
 - 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: $\leq 30.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/13/07	1CAZ (F)	EEEE NAN		0.00932 0.04730	MM 8015, 7322075MB 7323521MB 7324674MB	\checkmark UN / A
	11/17/07	1CAZ (F)	WWN		0.00164		\checkmark UN / A
	11/16/07	1CAZ (L)	PP MM PPPP		0.04881 0.03735 0.05359	MM 1125, 7325161MB	\checkmark UN / A
	11/16/07	1CAZ (L)	WWN		0.00331		\checkmark UN / A

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

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

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

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

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/16/07	LCAL6847 (ICV)	Nonanal	32.75684		MH=0 7325761MB	✓ + delete / A
	11/17/07	FCA47971	HC EEEE	27.11258	0.01102	1-2.4-7.16-17 7322075MB	✓ + delete / A ✓ MH / A
	11/18/07	FCA47996	EEEE EEEE	38.20584	0.01288 0.00180	8-11.73235MB	✓ + delete / A ✓ MH / A
	11/19/07	LCAL6873 LCAL6874	NNNN B PPPP PP RR MM	31.45374	314 0.00298 0.002835 0.04404 0.04664 0.03391	MH=0 7325761MB	✓ MH / A ✓ + delete / A ✓ MH / A
	11/19/07	FCA48041	A EEEE EEEE	27.59986 40.91991		3.7324674MB	✓ + delete / A ✓ MH / A
	11/19/07	FCA48042	NNNN		0.01313 0.00142		✓ MH / A ✓ MH / A

LDC #: 18/001
 SDG #: TRAC-D-1

VALIDATION FINDINGS WORKSHEET
Blanks

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

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

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

Blank analysis date: 11/17/07

Conc. units: µg/L Associated Samples: 1-3, 4-7

Compound	Blank ID	Sample Identification						
Methylene chloride	73220754B	1	2	4	5	6	7	
Acetone								
CC	1.3							
DDD	0.36							
CRQL								

Blank analysis date: 11/18/07
 Conc. units: µg/L

Associated Samples: 8-11

Compound	Blank ID	Sample Identification			
Methylene chloride	73235214B	8	9	10	11
Acetone					
CC	0.55				
DDD	0.42				
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".

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VALIDATION FINDINGS WORKSHEET

Blanks

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
Y N N/A
Y N N/A

Was a method blank associated with every sample in this SDG?

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

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

Blank analysis date: 11/19/07

Conc. units: ug/L Associated Samples: 3

Compound	Blank ID	Sample Identification
	<u>7824674413</u>	<u>3</u>
Methylene chloride		
Acetone	<u>0.45</u>	<u>06/5/07</u>
<u>DDD</u>		
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".

VALIDATION FINDINGS WORKSHEET
Field Blanks

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LDC #: 18100A /
SDG #: Secon

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

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: 174 Associated sample units: 149 / 128

Sampling date: 11/19/07

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

Associated Samples: All soils (NO)

Compound	Blank ID	Sample Identification
	12	
Methylene chloride		
Acetone		
Chloroform		
FF	0.34	
CRQL		

Blank units: 174 Associated sample units: 149 / 128

Sampling date: 11/19/07

Field blank type: (circle one) Field Blank (Rinsate / Trip Blank) / Other: 12

Compound	Blank ID	Blank ID	Blank ID	Sample Identification
	13	14	15	2 6 9 11
Di-nomethane	0.86	1.2	0.81	
Methylene chloride				
Acetone	1.5	7.0/22	1.00	9.1/22 9.6/22 9.6/24
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".

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

- N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.
- N N/A Was a MS/MSD analyzed every 20 samples of each matrix?
- 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	RPD out several	() ()	() ()	() ()	6	No Qual (see iii)
Compound								
H.		1,1-Dichloroethene		59-172%		≤ 22%	61-145%	RPD (Water) ≤ 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 #: 18/00A1
 SDG #: Sec Conn

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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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
		7322075 LCS / D	HH	155 (56-115)	165 (56-115)	() ()	1-2.4-7. 7322075 MB	No Control (MS/MSD in)
		7323521 LCS	HH	167 (56-115)	() ()	() ()	8-11, 7323521 MB	↓ + dots / AP
			NN	146 (65-132)	() ()	() ()		No Control (MS/MSD in)
		7324674 LCS	HH	161 (56-115)	() ()	() ()	3.7324674 MB	↓ + dots / AP
		7325161 LCS / D	B	150 (38-140)	144 (38-140)	() ()	all notes	↓ + dots / P
			F	() ()	() ()	21 (≤ 20)	3 Blk	No Control
			NN	() ()	() ()	24 ()		↓
				() ()	() ()	34 ()		(20 R in)
				() ()	() ()	() ()		
				() ()	() ()	() ()		
				() ()	() ()	() ()		
				() ()	() ()	() ()		
				() ()	() ()	() ()		
				() ()	() ()	() ()		
				() ()	() ()	() ()		
				() ()	() ()	() ()		

LDC #: 18100A1
 SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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 Reviewer: Q
 2nd reviewer: W

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

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

Compound	Concentration (<u>ug/g</u>)		D RPD
	3	4	
DDD	0.61	0.55	0.06 ($\leq 5\%$) <i>No Qual</i>

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 12, 2007

LDC Report Date: February 11, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

TSB-CJ-02-0'**	TSB-CR-01-0'MSD
TSB-CJ-02-10'**	TSB-CJ-06-0'MS
TSB-CJ-01-0'**	TSB-CJ-06-0'MSD
TSB-CJ-01-10'**	
TSB-CJ-01-0'-FD**	
TSB-CR-02-0'**	
TSB-CR-02-10'	
TSB-CR-01-0'	
TSB-CR-01-0'DL	
TSB-CR-01-10'	
TSB-CR-03-0'	
TSB-CR-03-10'	
TSB-CJ-05-0'	
TSB-CJ-05-10'	
TSB-CJ-06-0'	
TSB-CJ-06-0'-FD	
TSB-CJ-06-0'-FDDL	
TSB-CJ-06-10'	
TB	
TSB-CR-01-0'MS	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 22 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

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

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

*III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

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

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

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

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>*Iodomethane</u> Ethanol	0.04881 (≥ 0.05) 0.03735 (≥ 0.05) 0.03359 (≥ 0.05) 0.00331 (≥ 0.05)	All water samples in SDG TRNC-D-2	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥ 0.05) 0.04730 (≥ 0.05)	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7323521MB 7324674MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥ 0.05)	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7323521MB 7324674MB	J (all detects) UJ (all non-detects)	A

*Corrected compound from Nonanal to Iodomethane in above finding for water samples.

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
11/19/07 (LCAL6874)	Bromomethane	31.45374	All water samples in SDG TRNC-D-2	J+ (all detects)	A
11/19/07 (FCAL8041)	Chloromethane Acetonitrile	27.59986 40.91991	TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7324674MB	J+ (all detects) J+ (all detects)	A
11/18/07 (FCAL7996)	Acetonitrile	38.20584	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CR-01-0' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7323521MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-2	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
11/19/07 (LCAL6873)	Ethanol	0.00314 (≥ 0.05)	All water samples in SDG TRNC-D-2	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥ 0.05) 0.04881 (≥ 0.05) 0.04664 (≥ 0.05) 0.03391 (≥ 0.05)	All water samples in SDG TRNC-D-2	J (all detects) UJ (all non-detects)	A
11/19/07 (FCAL8041)	Acetonitrile	0.01313 (≥ 0.05)	TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7324674MB	J (all detects) UJ (all non-detects)	A
11/19/07 (FCAL8042)	Ethanol	0.00142 (≥ 0.05)	TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CJ-06-0'MS TSB-CJ-06-0'MSD 7324674MB	J (all detects) UJ (all non-detects)	A
11/18/07 (FCAL7996)	Acetonitrile	0.01288 (≥ 0.05)	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CR-01-0' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7323521MB	J (all detects) UJ (all non-detects)	A
11/18/07 (FCAL7997)	Ethanol	0.00180 (≥ 0.05)	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CR-01-0' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7323521MB	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
7330403MB	11/25/07	Acetone	8.0 ug/Kg	TSB-CR-01-0'DL TSB-CJ-06-0'-FDDL
7323521MB	11/18/07	Toluene 1,2,4-Trimethylbenzene	0.55 ug/Kg 0.42 ug/Kg	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CR-01-0'
7324674MB	11/19/07	1,2,4-Trimethylbenzene	0.45 ug/Kg	TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'

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-CR-01-0'DL (5x)	Acetone	320 ug/Kg	320U ug/Kg
TSB-CJ-06-0'-FDDL (5x)	Acetone	260 ug/Kg	260U ug/Kg
TSB-CJ-02-0'***	1,2,4-Trimethylbenzene	0.45 ug/Kg	5.3U ug/Kg
TSB-CJ-02-10'***	1,2,4-Trimethylbenzene	0.47 ug/Kg	5.2U ug/Kg
TSB-CJ-01-0'***	1,2,4-Trimethylbenzene	0.40 ug/Kg	5.2U ug/Kg
TSB-CJ-01-10'***	1,2,4-Trimethylbenzene	0.54 ug/Kg	5.3U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-CJ-01-0'-FD**	1,2,4-Trimethylbenzene	0.55 ug/Kg	5.2U ug/Kg
TSB-CR-02-0'***	1,2,4-Trimethylbenzene	0.54 ug/Kg	5.1U ug/Kg
TSB-CR-02-10'	1,2,4-Trimethylbenzene	0.49 ug/Kg	5.3U ug/Kg
TSB-CR-01-10'	1,2,4-Trimethylbenzene	0.41 ug/Kg	5.2U ug/Kg
TSB-CR-03-0'	1,2,4-Trimethylbenzene	0.72 ug/Kg	5.1U ug/Kg
TSB-CR-03-10'	1,2,4-Trimethylbenzene	0.46 ug/Kg	5.2U ug/Kg
TSB-CJ-05-0'	1,2,4-Trimethylbenzene	0.55 ug/Kg	5.2U ug/Kg
TSB-CJ-05-10'	1,2,4-Trimethylbenzene	0.52 ug/Kg	5.4U ug/Kg
TSB-CJ-06-0'	1,2,4-Trimethylbenzene	1.3 ug/Kg	5.1U ug/Kg
TSB-CJ-06-10'	1,2,4-Trimethylbenzene	0.60 ug/Kg	5.7U ug/Kg

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

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB	11/12/07	Dichloromethane	0.79 ug/L	All soil samples in SDG TRNC-D-2

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.

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 with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-CR-01-0'MS/MSD (TSB-CR-01-0')	Vinyl acetate	1.4 (10-150)	0.0 (10-150)	200 (≤ 20)	J (all detects) UJ (all non-detects)	A
TSB-CJ-06-0'MS/MSD (TSB-CJ-06-0')	Vinyl acetate	0.0 (10-150)	0.0 (10-150)	-	J- (all detects) UJ (all non-detects)	A

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 with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7323521LCS (TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CR-01-0' 7323521MB)	Vinyl acetate	167 (56-115)	-	-	J+ (all detects)	P
7324674LCS (TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' 7324674MB)	Vinyl acetate	161 (56-115)	-	-	J+ (all detects)	P
7325161LCS/D (All water samples in SDG TRNC-D-2)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P

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 with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-CR-01-0' TSB-CJ-06-0'-FD	Acetone	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable for samples on which a 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-CJ-01-0'*** and TSB-CJ-01-0'-FD**, samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD, and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FDDL 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-CJ-01-0'***	TSB-CJ-01-0'-FD**				
1,2,4-Trimethylbenzene	0.40	0.55	-	0.15 ug/Kg (≤ 5.2)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Acetone	40	310	-	270 ug/Kg (≤ 20)	J (all detects)	A
1,2,4-Trimethylbenzene	1.3	3.4	-	2.1 ug/Kg (≤ 5.1)	-	-
m,p-Xylenes	0.87	1.5	-	0.63 ug/Kg (≤ 5.1)	-	-
1,3,5-Trimethylbenzene	5.1U	1.2	-	3.9 ug/Kg (≤ 5.1)	-	-
Xylenes, total	10U	1.5	-	8.5 ug/Kg (≤ 10)	-	-
Methyl ethyl ketone	20U	11	-	9 ug/Kg (≤ 20)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FDDL				
Acetone	40	260	-	220 ug/Kg (≤ 20)	J (all detects)	

***BRC Tronox Parcel C/D/F/G**
Volatiles - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound	Flag	A or P	Reason
*TRNC-D-2	TB	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>Iodomethane</u> Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-2	TB	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-2	TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Chloromethane Acetonitrile	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CR-01-0'	Acetonitrile	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-2	TB	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-2	TB	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CR-01-0'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-2	TSB-CR-01-0'	Vinyl acetate	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R) (RPD)
TRNC-D-2	TSB-CJ-06-0'	Vinyl acetate	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CR-01-0' TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Vinyl acetate	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-2	TB	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-2	TSB-CR-01-0' TSB-CJ-06-0'-FD	Acetone	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-0'-FDDL	Acetone	J (all detects)	A	Field duplicates (Difference)

*Corrected compound in above Initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-2	TSB-CR-01-0'DL (5x)	Acetone	320U ug/Kg	A
TRNC-D-2	TSB-CJ-06-0'-FDDL (5x)	Acetone	260U ug/Kg	A
TRNC-D-2	TSB-CJ-02-0'***	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-2	TSB-CJ-02-10'***	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CJ-01-0'***	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CJ-01-10'***	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-2	TSB-CJ-01-0'-FD**	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CR-02-0'***	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-2	TSB-CR-02-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-2	TSB-CR-01-10'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CR-03-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-2	TSB-CR-03-10'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CJ-05-0'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-2	TSB-CJ-05-10'	1,2,4-Trimethylbenzene	5.4U ug/Kg	A
TRNC-D-2	TSB-CJ-06-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-2	TSB-CJ-06-10'	1,2,4-Trimethylbenzene	5.7U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

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: 11/12/07
II.	GC/MS Instrument performance check	A
III.	Initial calibration	TW RSD. 1 ²
IV.	Continuing calibration/ICV	TW KEV ≤ 7570
V.	Blanks	TW
VI.	Surrogate spikes	A
VII.	Matrix spike/Matrix spike duplicates	TW
VIII.	Laboratory control samples	TW LCS 10
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	TW Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N 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	TW 3 D = 15 + 16. 15 + 17
XVII.	Field blanks	TW TB = 19

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

Validated Samples: ** Indicates sample underwent Level IV validation

1	1	TSB-CJ-02-0 ^{**}	11	2	TSB-CR-03-0'	21	1	TSB-CR-01-0'MSD	31	1	T32752 MB
2	1	TSB-CJ-02-10 ^{**}	12	2	TSB-CR-03-10'	22	2	TSB-CJ-06-0'MS	32	2	T324674 MB
3	1	TSB-CJ-01-0 ^{**}	13	2	TSB-CJ-05-0'	23	1	TSB-CJ-06-0'MSD	33	3	T325161 MB W
4	1	TSB-CJ-01-10 ^{**}	14	2	TSB-CJ-05-10'	24			34	4	T330403 MB
5	2	TSB-CJ-01-0'-FD ^{**}	15	2	TSB-CJ-06-0'	25			35		
6	2	TSB-CR-02-0 ^{**}	16	2	TSB-CJ-06-0'-FD	26			36		
7	2	TSB-CR-02-10'	17	4	TSB-CJ-06-0'-FDDL	27			37		
8	1	TSB-CR-01-0'	18	2	TSB-CJ-06-10'	28			38		
9	4	TSB-CR-01-0'DL	19	3	TB	29	W		39		
10	2	TSB-CR-01-10'	20	1	TSB-CR-01-0'MS	30	S		40		

LDC #: 18100 B1
 SDG #: See COV-01

VALIDATION FINDINGS CHECKLIST

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Method: Volatiles (EPA SW 846 Method 8260B)

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

LDC #: 18002B1
 SDG #: See cover

VALIDATION FINDINGS CHECKLIST

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 2nd Reviewer: [Signature]

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 $\pm 20\%$ between the sample and the reference spectra?			/	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?		/		
System Performance				
System performance was found to be acceptable.	/			
Overall Assessment of Data				
Overall assessment of data was found to be acceptable.	/			
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 chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,1,2-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. <i>1,4-dimethane</i>
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. <i>Dichloromethane</i>
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. <i>Acetone</i>
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. <i>Dimethyl Disulfide</i>
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Diisopropyl ether	RRRR. <i>2-Nitropropane</i>
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 #: 18100P1
 SDG #: See notes

VALIDATION FINDINGS WORKSHEET

Initial Calibration

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

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
 N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 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: $\leq 30.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	1/16/07	1CAC (-)	PP LM		0.04881 0.03735	MH-15, B3561MB	N/A ↓
	1/16/07	1CAC (-)	PP WVW		0.03359 0.00331		↓
	1/17/07	1CAC (F)	EEE NN		0.00932 0.04730	MH-15, 1-8.10-16 18.20-23	N/A ↓
	1/17/07	1CAC	WVW		0.00164	T333521MB T324674MB	↓

LDC #: 1300B
 SDG #: 200001

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
 N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 Y (N) N/A Were all %D and RRFs within the validation criteria of $\leq 25\%$ %D and ≥ 0.05 RRF?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/16/07	11EVB877 (15V)	Nonanal	38.75684		MH02, T32516MB	↓ dots / A
	11/19/07	11EVB873 11EVB874	WNW NNNN PP RR MM B		0.00314 0.02835 0.04881 0.04664 0.03391	MH02, T32516MB	↓ / MW / A
	11/19/07	11EVB8041	A EEEE EEEE WNW	27.59986 46.91991		5-7-10-16-18 22-23 T324674MB	↓ dots / A ↓ ↓ / MW / A
	11/18/07	11EVB7996 11EVB7997	EEEE WNW	38.20584	0.01313 0.00442	1-4-8-20-21 T327521MB	↓ dots / A ↓ / MW / A

LDC #: 18002
 SDG #: Sealey

VALIDATION FINDINGS WORKSHEET

Blanks

Page: 6 of
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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: 11/5/07
 Conc. units: µg/kg

Associated Samples: 9.17

Compound	Blank ID	Sample Identification
Methylene chloride	730403M1B	9 (S) 17 (S)
Acetone	8.0	320 / U 260 / U
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 #: 18/00B1
SDG #: 200-0000

VALIDATION FINDINGS WORKSHEET
Blanks

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

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: 11/18/07

Conc. units: $\mu\text{g/L}$ Associated Samples: 1-4, 8

Compound	Blank ID	Sample Identification							
Methylene chloride	7325214B	1	2	3	4	8			
Acetone	0.55								
CC	0.42								
DDD									
CRQL									

Blank analysis date: 11/19/07
Conc. units: $\mu\text{g/L}$

Associated Samples: 5-7, 10-16, 18

Compound	Blank ID	Sample Identification										
Methylene chloride	7346744B	5	6	7	10	11	12	13	14	15	16	18
Acetone	0.45											
DDD												
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".

VALIDATION FINDINGS WORKSHEET
Field Blanks

LDC #: 18/00 B1
SDG #: 3er cover

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

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

N/A Were field blanks identified in this SDG?
 N/A Were target compounds detected in the field blanks?
 Blank units: ug Associated sample units: ugFS
 Sampling date: 11/13/07
 Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: all soils

Compound	Blank ID	Sample Identification
	19	
Methylene chloride		
Acetone		
Chloroform		
0000	0.79	
CRQL		

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

Compound	Blank ID	Sample Identification
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".

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

LDC #: 18100B1
 SDG #: 22 cover

Page: 1 of 7
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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".
 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?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		20/21	HH	1.4 (10-150)	0.0 (10-150)	200 (≤ 20)	8	UN/A
			RR and RPD and for some spds	()	()	()		No label (CES m)
		22/23	HH	0.0 (10-150)	0.0 (10-150)	()	15	UN/A
				()	()	()		
				()	()	()		
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		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 #: 18100B/1
SDG #: See COIL

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: G
2nd Reviewer: [signature]

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

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

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
A		T32352/LCS	NN	46 (65-135)	()	()	1-4.8	No Qual (N/A)
			HH	167 (56-115)	()	()	T32352/MB	1+det F
				()	()	()		
				()	()	()		
				()	()	()		
		T32467/LCS	HH	161 (56-115)	()	()	5-7.10-16.18	1+det F
				()	()	()	T32467/MB	
				()	()	()		
		T32516/LCS	B	150 (38-140)	144 (38-140)	()	All FDS	1+det F
			D	()	()	21 (≤ 20)	T32516/MB	No Qual
			F	()	()	24 (√)		
			NN	()	()	37 (√)		(2+R in)
				()	()	()		
				()	()	()		
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				()	()	()		

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

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 NA
 Y N NA

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?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		8,16	F > calibration range	8,16	Vlets / A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100B1
 SDG #: SA00101

VALIDATION FINDINGS WORKSHEET
 Field Duplicates

Page: 1 of 1
 Reviewer: Q
 2nd reviewer: L

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 (<u>µg/kg</u>)		D RPD
	3	5	
DDD	0.40	0.55	0.15 (≤5.0) No Anal

Compound	Concentration (<u>µg/kg</u>)		D RPD
	15	16	
F	40	310	270 (≤20) ↓ det/3/A
DDD	1.3	3.4	2.1 (≤5.1) No Anal
RRR	0.8 U	1.5	0.63 ↓
AAA	5.1 U	1.2	3.9 ↓
EE	10 U	1.5	8.5 (≤10)
NN	20 U	11	9 (≤20) ↓

Compound	Concentration (<u>µg/kg</u>)		D RPD
	15	17	
F	40	260	220 (≤20) ↓ det/3/A

Compound	Concentration ()		RPD

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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:

$RRF = (A_s)(C_{is}) / (A_{is})(C_s)$
 average RRF = sum of the RRFs / number of standards
 $\%RSD = 100 \cdot (S/X)$
 A_s = Area of compound,
 C_s = 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		Recalculated		Reported		Recalculated	
				RRF (50 std)	RRF (50 std)	Average RRF (initial)	Average RRF (initial)	%RSD	%RSD		
1	10AZ	11/13/07	S (1st internal standard)	0.2850	0.2850	0.29152	0.29152	10.9727	10.97		
			CC (2nd internal standard)	0.95833	0.95833	0.97869	0.97869	7.2794	7.2737		
			DD (3rd internal standard)	3.4298	3.4298	3.48429	3.48429	8.9585	8.9518		
2	10AL	11/17/07	WWN (1st internal standard)	0.0053	0.0053	0.00164	0.00164	9.10389	9.98899		
			RRR (2nd internal standard)	0.52462	0.52462	0.52212	0.52212	15.80940	15.8092		
			OOO (3rd internal standard)	1.35801	1.35801	1.34097	1.34097	9.49562	9.49560		
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.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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 = $100 \times (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$
 RRF = $(A_x / C_x) / (A_s / C_s)$
 Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 A_x = Area of compound,
 C_x = Concentration of compound,
 A_s = Area of associated internal standard
 C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	FCAL1996	11/18/07	S (1st internal standard)	0.29152	0.30124	3.33852	3.3337	
			CC (2nd internal standard)	0.97869	1.05751	8.05370	8.054	
			DDD (3rd internal standard)	3.48429	3.66238	5.11109	5.1113	
2	FCAL1997	11/18/07	WWN (1st internal standard)	0.00164	0.00180	9.57365	9.99446	
			AAA (2nd internal standard)	0.52212	0.56625	6.53695	6.5368	
			OOO (3rd internal standard)	1.34097	1.35015	0.68492	0.6846	
3	FCAL8041	11/19/07	S (1st internal standard)	0.29152	0.31477	7.97691	7.9771	
			CC (2nd internal standard)	0.97869	1.06868	9.19513	9.1954	
			DDD (3rd internal standard)	3.48429	3.77160	8.24594	8.2460	
4	FCAL8042	11/19/07	WWN (1st internal standard)	0.00164	0.00142	13.4742	13.4634	
			AAA (2nd internal standard)	0.52212	0.53185	1.86303	1.8629	
			OOO (3rd internal standard)	1.34097	1.23034	8.24952	8.2498	

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 #: 18100B1
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
 Reviewer: 9
 2nd reviewer: h

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: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	50	42.0880	84	84	0
Bromofluorobenzene	↓	40.7257	81	81	↓
1,2-Dichloroethane-d4	↓	48.7276	97	97	↓
Dibromofluoromethane	↓	46.2516	93	93	↓

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					

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

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

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

RPD = $|MSC - MSDC| \cdot 2 / (MSC + MSDC)$ MSC = Matrix spike percent recovery MSDC = Matrix spike duplicate percent recovery

MS/MSD sample: 20/31

Compound	Spike Added (MS/MSD)		Sample Concentration (MS/MSD)	Spiked Sample Concentration (MS/MSD)		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	51.0	50.9	ND	50.0	35.7	98	98	70	70	33	33
Trichloroethene				48.6	33.4	95	95	64	64	40	40
Benzene				49.1	34.1	96	96	67	67	36	36
Toluene				46.2	31.1	91	91	61	61	39	39
Chlorobenzene			✓	45.7	30.0	90	90	59	59	42	42

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 # 1323521
SDG # 303010
VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

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

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

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

$\% \text{ Recovery} = 100 \cdot \text{SSC}/\text{SA}$ Where: SSC = Spiked sample concentration
 SA = Spike added
 $\text{RPD} = | \text{LCS} - \text{LCSD} | \cdot 2 / (\text{LCS} + \text{LCSD})$ LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 1323521

Compound	Spike Added (ppb)		Spiked Sample Concentration		LCS		LCSD		Percent Recovery		Percent Recovery		RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
1,1-Dichloroethene	50	NA	52.5	NA	105	105								
Trichloroethene			49.8		100	100								
Benzene			52.0		104	104								
Toluene			52.9		106	106								
Chlorobenzene			51.2		102	102								

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 #: 18/00 B/
SDG #: Secon W

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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

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?

Y N N/A
Y N N/A

$$\text{Concentration} = \frac{(A_s)(I_s)(DF)}{(A_s)(RRF)(V_o)(\%S)}$$

- A_s = Area of the characteristic ion (EICP) for the compound to be measured
- A_s = 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. = 2 DDD

$$\text{Conc.} = \frac{(3171)(50)(5)(1)}{(100670)(34849)(4.98)(0.95)} \\ = 0.47 \text{ } \mu\text{g/kg}$$

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

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 13, 2007
LDC Report Date: February 11, 2008
Matrix: Soil/Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

TSB-DR-06-0'	RINSTATE-2
TSB-DR-06-10'	TB-1RINSATE
TSB-DR-05-0'	TSB-DR-03-0'MS
TSB-DR-05-0'-FD	TSB-DR-03-0'MSD
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	
TB1-11-13-07	
TB2-11-13-07	
TB3-11-13-07	

Introduction

This data review covers 19 soil samples and 5 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
11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>*Iodomethane</u> Ethanol	0.04881 (≥ 0.05) 0.03735 (≥ 0.05) 0.03359 (≥ 0.05) 0.00331 (≥ 0.05)	All water samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects)	A
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥ 0.05) 0.04730 (≥ 0.05)	All soil samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥ 0.05)	All soil samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects)	A

*Corrected compound from Nonanal to Iodomethane in above finding for water samples.

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
11/19/07 (FCAL8041)	Chloromethane Acetonitrile	27.59986 40.91991	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' 7324674MB	J+ (all detects) J+ (all detects)	A
11/19/07 (LCAL6874)	Bromomethane	31.45374	All water samples in SDG TRNC-D-3	J+ (all detects)	A
11/25/07 (FCAL8262)	Nonanal	26.02663	TSB-CR-05-10' TSB-CR-06-10' 7330403MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-3	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
11/19/07 (FCAL8041)	Acetonitrile	0.01313 (≥ 0.05)	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' 7324674MB	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/19/07 (FCAL8042)	Ethanol	0.00142 (≥ 0.05)	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' 7324674MB	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6872)	Ethanol	0.00314 (≥ 0.05)	All water samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥ 0.05) 0.04881 (≥ 0.05) 0.04664 (≥ 0.05) 0.03391 (≥ 0.05)	All water samples in SDG TRNC-D-3	J (all detects) UJ (all non-detects)	A
11/25/07 (FCAL8261)	Ethanol	0.00138 (≥ 0.05)	TSB-CR-05-10' TSB-CR-06-10' 7330403MB	J (all detects) UJ (all non-detects)	A
11/25/07 (FCAL8262)	Acetonitrile	0.01063 (≥ 0.05)	TSB-CR-05-10' TSB-CR-06-10' 7330403MB	J (all detects) UJ (all non-detects)	A
11/20/07 (FCAL8096)	Acetonitrile Methyl ethyl ketone	0.01136 (≥ 0.05) 0.04919 (≥ 0.05)	TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0' TSB-DR-03-0'MS TSB-DR-03-0'MSD 7325351MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/20/07 (FCAL8097)	Ethanol	0.00143 (≥ 0.05)	TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0' TSB-DR-03-0'MS TSB-DR-03-0'MSD 7325351MB	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
7324674MB	11/19/07	1,2,4-Trimethylbenzene	0.45 ug/Kg	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10'
7325351MB	11/20/07	1,2,4-Trimethylbenzene	0.40 ug/Kg	TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0'
7330403MB	11/25/07	Acetone Toluene	8.0 ug/Kg 1.1 ug/Kg	TSB-CR-05-10' TSB-CR-06-10'

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-DR-06-0'	1,2,4-Trimethylbenzene	0.52 ug/Kg	5.0U ug/Kg
TSB-DR-06-10'	1,2,4-Trimethylbenzene	0.49 ug/Kg	5.3U ug/Kg
TSB-DR-05-0'	1,2,4-Trimethylbenzene	0.63 ug/Kg	5.1U ug/Kg
TSB-DR-05-0'-FD	1,2,4-Trimethylbenzene	1.7 ug/Kg	5.0U ug/Kg
TSB-DR-05-10'	1,2,4-Trimethylbenzene	0.44 ug/Kg	5.5U ug/Kg
TSB-DR-03-0'	1,2,4-Trimethylbenzene	0.33 ug/Kg	5.1U ug/Kg
TSB-DR-03-10'	1,2,4-Trimethylbenzene	0.44 ug/Kg	5.3U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-DJ-01-0'	1,2,4-Trimethylbenzene	0.37 ug/Kg	5.2U ug/Kg
TSB-DJ-01-10'	1,2,4-Trimethylbenzene	0.31 ug/Kg	5.3U ug/Kg
TSB-DR-04-0'	1,2,4-Trimethylbenzene	0.33 ug/Kg	5.1U ug/Kg
TSB-DR-04-10'	1,2,4-Trimethylbenzene	0.29 ug/Kg	5.3U ug/Kg
TSB-CR-04-0'	1,2,4-Trimethylbenzene	0.40 ug/Kg	5.0U ug/Kg
TSB-CR-04-10'	1,2,4-Trimethylbenzene	0.32 ug/Kg	5.6U ug/Kg
TSB-CR-06-0'	1,2,4-Trimethylbenzene	0.91 ug/Kg	5.1U ug/Kg

Samples TB-1RINSATE, TB1-11-13-07, TB2-11-13-07, and TB3-11-13-07 were identified as trip blanks. No volatile contaminants were found in these blanks with the following exceptions:

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB-1RINSATE	11/13/07	Dichloromethane	0.77 ug/L	RINSTATE-2
TB1-11-13-07	11/13/07	Dichloromethane	0.83 ug/L	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10'
TB3-11-13-07	11/13/07	Dichloromethane	0.75 ug/L	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10'

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB2-11-13-07	11/13/07	Acetone Dichloromethane	1.6 ug/L 0.88 ug/L	TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'

Sample "RINSATE-2" was identified as a rinsate. No volatile contaminants were found in this blank.

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-CR-06-0'	Acetone	9.7 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.

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) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7324674LCS (TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' 7324674MB)	Vinyl acetate	161 (56-115)	-	-	J+ (all detects)	P
7325161LCS/D (All water samples in SDG TRNC-D-3)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P
7325351LCS (TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0' 7325351MB)	Vinyl acetate	171 (56-115)	-	-	J+ (all detects)	P

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-DR-05-0' and TSB-DR-05-0'-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-DR-05-0'	TSB-DR-05-0'-FD				
Acetone	11	20U		9 (≤ 20)	-	-
1,2,4-Trimethylbenzene	0.63	1.7	-	1.07 (≤ 5.0)	-	-
Toluene	5.1U	0.51	-	4.59 (≤ 5.1)	-	-
1,3,5-Trimethylbenzene	5.1U	0.29	-	4.81 (≤ 5.1)	-	-
m,p-Xylenes	5.1U	1.1	-	4.0 (≤ 5.1)	-	-

***BRC Tronox Parcel C/D/F/G**
Volatiles - Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound	Flag	A or P	Reason
*TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>*Iodomethane</u> Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10'	Chloromethane Acetonitrile	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-3	TSB-CR-05-10' TSB-CR-06-10'	Nonanal	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-CR-05-10' TSB-CR-06-10'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-3	TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-06-0'	Vinyl acetate	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-3	TB1-11-13-07 TB2-11-13-07 TB3-11-13-07 RINSTATE-2 TB-1RINSATE	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)

*Corrected compound in above Initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G
Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-06-0'	1,2,4-Trimethylbenzene	5.0U ug/Kg	A
TRNC-D-3	TSB-DR-06-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-3	TSB-DR-05-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-3	TSB-DR-05-0'-FD	1,2,4-Trimethylbenzene	5.0U ug/Kg	A
TRNC-D-3	TSB-DR-05-10'	1,2,4-Trimethylbenzene	5.5U ug/Kg	A
TRNC-D-3	TSB-DR-03-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-3	TSB-DR-03-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-3	TSB-DJ-01-0'	1,2,4-Trimethylbenzene	5.2U ug/Kg	A
TRNC-D-3	TSB-DJ-01-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-3	TSB-DR-04-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A
TRNC-D-3	TSB-DR-04-10'	1,2,4-Trimethylbenzene	5.3U ug/Kg	A
TRNC-D-3	TSB-CR-04-0'	1,2,4-Trimethylbenzene	5.0U ug/Kg	A
TRNC-D-3	TSB-CR-04-10'	1,2,4-Trimethylbenzene	5.6U ug/Kg	A
TRNC-D-3	TSB-CR-06-0'	1,2,4-Trimethylbenzene	5.1U ug/Kg	A

BRC Tronox Parcel C/D/F/G
Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-3	TSB-CR-06-0'	Acetone	21U ug/Kg	A

LDC #: 18100C1
 SDG #: TRNC-D-3
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/21/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Validation Area		Comments	
I.	Technical holding times	A	Sampling dates: 11/13/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	W	RSD < 2
IV.	Continuing calibration/ICV	W	ICV < 25%
V.	Blanks	W	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	W	LCS ✓
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A-W	
XVI.	Field duplicates	W	D = 3 + 4
XVII.	Field blanks	W	R = 21* TB = 22, 18, 19, 20

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

*ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

1	TSB-DR-06-0'	S	11	TSB-DR-04-10'	S	21	RINSTATE-2	W	31	732467AMB	S
2	TSB-DR-06-10'		12	TSB-CR-04-0'		22	TB-1RINSATE	W	32	7325161MB	W
3	TSB-DR-05-0'		13	TSB-CR-04-10'		23	TSB-DR-03-0'MS	W	33	7325351MB	S
4	TSB-DR-05-0'-FD		14	TSB-CR-05-0'		24	TSB-DR-03-0'MSD	W	34	7330403MB	W
5	TSB-DR-05-10'		15	TSB-CR-05-10'		25			35		
6	TSB-DR-03-0'		16	TSB-CR-06-0'		26			36		
7	TSB-DR-03-10'		17	TSB-CR-06-10'		27			37		
8	TSB-DJ-01-0'		18	TB1-11-13-07		28			38		
9	TSB-DJ-01-10'		19	TB2-11-13-07		29			39		
10	TSB-DR-04-0'		20	TB3-11-13-07		30			40		

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethane	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethane**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethane	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethane	KKKK. Propionitrile
J. 1,2-Dichloroethane, 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. <i>Isodimethane</i>
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. <i>Dichloromethane</i>
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. <i>Nuvalol</i>
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. <i>Dimethyl Disulfide</i>
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. <i>2-Nitropropane</i>
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. Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	GGG. p-isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

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

VALIDATION FINDINGS WORKSHEET
Initial Calibration

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
 N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 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: $\leq 30.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/16/07	10A	PP		0.04881	M11101s	N/A
		(-)	HM		0.03735	732576MB	N/A
	11/16/07	10A	PP		0.03359		N/A
		(-)	WNW		0.00331		N/A
	11/17/07	10A	EE		0.00932	M1501s, 732457MB	N/A
		(F)	NN		0.04730	732535MB	N/A
	11/17/07	10A	WNW		0.00164	7330403MB	N/A

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

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

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

Y (N) N/A Were all %D and RRFs within the validation criteria of $\leq 25\%$ %D and ≥ 0.05 RRF?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/16/07	FCA48047 (1CN)	Nonanal	39.75684		MH42, 732576MB	✓/UN/A
	11/19/07	FCA48041	A	27.59986		1-5. 732576MB	✓/UN/A
			EEEE	40.91991	0.01313		✓/UN/A
			EEEE		0.00142		✓/UN/A
	11/19/07	FCA48042	NNN				✓/UN/A
	11/19/07	FCA48073	NNN				✓/UN/A
	11/19/07	FCA48074	B	31.45374	0.00314	MH42s 7325161MB	✓/UN/A ✓/UN/A
			NNNN		0.02835		✓/UN/A
			PP		0.04881		✓/UN/A
			RR		0.04864		✓/UN/A
			MM		0.03391		✓/UN/A
	11/25/07	FCA48061	NNN		0.00138	15. 17. 733043MB	✓/UN/A
		FCA48062	Nonanal	26.02663			✓/UN/A
			EEEE		0.01063		✓/UN/A
	11/26/07	FCA48096	EEEE		0.01136	6-14. 16. 3324	✓/UN/A
			NN		0.04919	7325351MB	✓/UN/A
	11/20/07	FCA48097	NNN		0.00143		✓/UN/A

LDC #: 1810001
 SDG #: See copy

VALIDATION FINDINGS WORKSHEET
Blanks

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

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: 11/19/07

Conc. units: ug/L Associated Samples: 1-5

Compound	Blank ID	Sample Identification				
Methylene chloride	0.45	1	2	3	4	5
Methylene chloride						
Acetone						
DDD	0.45			0.49 / 5.0 U	0.63 / 5.1 U	1.7 / 5.0 U 0.45 U
CRQL						

Blank analysis date: 11/20/07
 Conc. units: ug/L Associated Samples: 6-14, 16

Compound	Blank ID	Sample Identification								
Methylene chloride	0.40	6	7	8	9	10	11	12	13	16
Methylene chloride										
Acetone										
DDD	0.40	0.33 / 5.1 U	0.44 / 5.3 U	0.37 / 5.2 U	0.31 / 5.3 U	0.33 / 5.1 U	0.29 / 5.3 U	0.40 / 5.0 U	0.37 / 5.6 U	0.91 / 5.1 U
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 #: 131001
SDG #: See cover

VALIDATION FINDINGS WORKSHEET

Blanks

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

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: 11/25/07

Conc. units: µg/L Associated Samples: 15, 17

Compound	Blank ID	Sample Identification						
Methylene chloride	730413M15							
Acetone	B0							
CC	1.1							
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".

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

Were field blanks identified in this SDG?
 N N/A
 Were target compounds detected in the field blanks?
 N N/A
 Blank units: 104
 Associated sample units: 172
 Sampling date: 11/13/07
 Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank Associated Samples: 172

Compound	Blank ID	Sample Identification
	22	
Methylene chloride		
Acetone		
Chloroform		
Dichloromethane	0.77	
CRQL		

Blank units: 104
 Associated sample units: 172
 Sampling date: 11/13/07
 Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank Associated Samples: 172

Compound	Blank ID	Sample Identification
	18	
Methylene chloride		
Acetone		
Chloroform		
Dichloromethane	0.83	0.75
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".

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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: 149 Associated sample units: 149
Sampling date: 11/20/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Associated Samples: 12-17

Compound	Blank ID	Sample Identification
	19	16
Methylene chloride		
Acetone	1.6	97/2/14
Chloroform		
Dichloromethane	0.88	
CRQL		

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

Compound	Blank ID	Sample Identification
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".

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

N N/A Was a LCS required?
 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
		T32457A LCS	HH	161 (56-115)	()	()	1-5. T32457MB	1+ slots / P
		T32516 LCS	B	150 (38-140)	144 (38-140)	()	MHDS T3251618MB	1+ slots / P No anal
		D	D	()	()	21 (≤ 20)		
		F	F	()	()	24 ()		
		NN	NN	()	()	34 ()		
				()	()	()		(20 R in)
		T32535 LCS	HH	171 (56-115)	()	()	6-14. 16. T325351MB	1+ slots / P
		T330403 LCS	HH	151 (56-115)	152 (56-115)	()	15.17. T330403MB	No Anal (MS/MSD in)
				()	()	()		
				()	()	()		
				()	()	()		
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LDC #: 181001
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: 9
 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 (<u>µg/g</u>)		RPD
	3	4	
F	11	20 u	9 (≤ 20)
DDD	0.63	1.7	1.07 (≤ 5.0)
CC	5.1 u	0.51	4.59 (≤ 5.0)
AAA	↓	0.29	4.81
RRR	↓	1.1	4.0

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 14, 2007

LDC Report Date: March 26, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

TSB-FR-01-0'	TB-1-11-14-07
TSB-FR-01-10'	TB-3-11-14-07
TSB-FJ-07-0'	TSB-FJ-06-10'MS
TSB-FJ-07-0'DL	TSB-FJ-06-10'MSD
TSB-FJ-07-10'	
TSB-FJ-06-0'	
TSB-FJ-06-0'-FD	
TSB-FJ-06-0'-FDDL	
TSB-FJ-06-10'	
TSB-FJ-05-0'	
TSB-FJ-05-10'	
TSB-DR-01-0'	
TSB-DR-01-0'DL	
TSB-DR-01-10'	
TSB-DR-02-0'	
TSB-DR-02-10'	
TSB-DR-02-0'-FD	
JB-NW-DITCH01-0'	
JB-NW-DITCH01-10'	
TB-2-11-14-07	

Introduction

This data review covers 21 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.

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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FJ-06-0'-FDDL TSB-DR-01-0'DL	Acetone	16	14	J- (all detects) UJ (all non-detects)	A

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
11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane Iodomethane Ethanol	0.04881 (≥ 0.05) 0.03735 (≥ 0.05) 0.03359 (≥ 0.05) 0.00331 (≥ 0.05)	All water samples in SDG TRNC-D-4	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥ 0.05) 0.04730 (≥ 0.05)	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' TSB-FJ-06-10'MS TSB-FJ-06-10'MSD 7329017MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥ 0.05)	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' TSB-FJ-06-10'MS TSB-FJ-06-10'MSD 7329017MB	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
11/19/07 (LCAL6874)	Bromomethane	31.45374	All water samples in SDG TRNC-D-4	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-4	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
11/19/07 (LCAL6873)	Ethanol	0.00314 (≥ 0.05)	All water samples in SDG TRNC-D-4	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥ 0.05) 0.04881 (≥ 0.05) 0.04664 (≥ 0.05) 0.03391 (≥ 0.05)	All water samples in SDG TRNC-D-4	J (all detects) UJ (all non-detects)	A
11/24/07 (FCAL821)	Acetonitrile Methyl ethyl ketone	0.01083 (≥ 0.05) 0.04379 (≥ 0.05)	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7329017MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/24/07 (FCAL8209)	Ethanol	0.00141 (≥ 0.05)	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7329017MB	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
7329017MB	11/24/07	Methyl ethyl ketone	1.5 ug/Kg	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'
7330403MB	11/25/07	Acetone	8.0 ug/Kg	TSB-FJ-07-0'DL
7333515MB	11/30/07	Acetone	920 ug/Kg	TSB-FJ-06-0'-FDDL TSB-DR-01-0'DL

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-FJ-07-0'	Methyl ethyl ketone	7.5 ug/Kg	22U ug/Kg
TSB-FJ-06-0'-FD	Methyl ethyl ketone	15 ug/Kg	20U ug/Kg
TSB-DR-01-0'	Methyl ethyl ketone	3.0 ug/Kg	20U ug/Kg
JB-NW-DITCH01-0'	Methyl ethyl ketone	7.0 ug/Kg	21U ug/Kg
TSB-FJ-07-0'DL (2.5x)	Acetone	190 ug/Kg	190U ug/Kg
TSB-FJ-06-0'-FDDL (50x)	Acetone	400 ug/Kg	1000U ug/Kg

Samples TB-2-11-14-07, TB-1-11-14-07, and TB-3-11-14-07 were identified as trip blanks. No volatile contaminants were found in these blanks with the following exceptions:

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB-2-11-14-07	11/14/07	Dichloromethane	0.94 ug/L	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-0'DL TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-0'-FDDL TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10'
TB-1-11-14-07	11/14/07	Dichloromethane	0.90 ug/L	TSB-DR-01-0' TSB-DR-01-0'DL TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'
TB-3-11-14-07	11/14/07	Dichloromethane	0.79 ug/L	All soil samples in SDG TRNC-D-4

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-DR-02-0'	Dichloromethane	3.6 ug/Kg	5.0U 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.

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) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7325161LCS (All water samples in SDG TRNC-D-4)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P

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

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-FJ-07-0' TSB-FJ-06-0'-FD TSB-DR-01-0'	Acetone	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

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

*XVI. Field Duplicates

Samples TSB-FJ-06-0' and TSB-FJ-06-0'-FD, samples TSB-FJ-06-0' and TSB-FJ-06-0'-FDDL, and samples TSB-DR-02-0' and TSB-DR-02-0'-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-FJ-06-0'	TSB-FJ-06-0'-FD				
*Acetone	21U	480	-	474.8 ug/Kg (≤ 21)	J (all detects) UJ (all non-detects)	A
Ethylbenzene	5.2U	0.41	-	4.79 ug/Kg (≤ 5.2)	-	-
2-Hexanone	21U	7.1	-	13.9 ug/Kg (≤ 21)	-	-
Toluene	5.2U	0.47	-	4.73 ug/Kg (≤ 5.2)	-	-
1,2,4-Trimethylbenzene	5.2U	3.2	-	2 ug/Kg (≤ 5.2)	-	-
1,3,5-Trimethylbenzene	5.2U	1.1	-	4.1 ug/Kg (≤ 5.2)	-	-
o-Xylene	5.2U	0.83	-	4.37 ug/Kg (≤ 5.2)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Xylenes, total	10U	2.8	-	7.2 ug/Kg (≤ 10)	-	-
m,p-Xylenes	5.2U	2.0	-	3.2 ug/Kg (≤ 5.2)	-	-
Methyl ethyl ketone	21U	15	-	6 ug/Kg (≤ 21)	-	-

*Corrected the Concentration result and Difference (Limit) for Acetone in the above table.

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FDDL				
*Acetone	<u>21</u> U	400	-	394.8 ug/Kg (≤ 21)	J (all detects) UJ (all non-detects)	A

*Corrected the Concentration result and Difference (Limit) for Acetone in the above table.

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Acetone	13	20U	-	7 ug/Kg (≤ 20)	-	-
Dichloromethane	3.6	5.1U	-	1.5 ug/Kg (≤ 5.1)	-	-

BRC Tronox Parcel C/D/F/G
Volatiles - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FJ-06-0'-FDDL TSB-DR-01-0'DL	Acetone	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Bromochloromethane 1,2-Dibromo-3-chloropropane Iodomethane Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-4	TB-2-11-14-07 TB-1-11-14-07 TB-3-11-14-07	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-4	TSB-FJ-07-0' TSB-FJ-06-0'-FD TSB-DR-01-0'	Acetone	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-0'-FDDL	Acetone	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G**Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-4	TSB-FJ-07-0'	Methyl ethyl ketone	22U ug/Kg	A
TRNC-D-4	TSB-FJ-06-0'-FD	Methyl ethyl ketone	20U ug/Kg	A
TRNC-D-4	TSB-DR-01-0'	Methyl ethyl ketone	20U ug/Kg	A
TRNC-D-4	JB-NW-DITCH01-0'	Methyl ethyl ketone	21U ug/Kg	A
TRNC-D-4	TSB-FJ-07-0'DL (2.5x)	Acetone	190U ug/Kg	A
TRNC-D-4	TSB-FJ-06-0'-FDDL (50x)	Acetone	1000U ug/Kg	A

BRC Tronox Parcel C/D/F/G**Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-4**

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-4	TSB-DR-02-0'	Dichloromethane	5.0U ug/Kg	A

LDC #: 18100D1
 SDG #: TRNC-D-4
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/21/08
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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	W	Sampling dates: 11/14/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	W	RSD. Y ²
IV.	Continuing calibration/ICV	W	10/25/07
V.	Blanks	W	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	W	LCS/7
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	W	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	W	D = 6+7. 6+8. 15+17.
XVII.	Field blanks	W	TB = 20. 21. 22.

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

Validated Samples:
 W/Soils Except # 20-22

1	TSB-FR-01-0'	11	TSB-FJ-05-10'	21	TB-1-11-14-07	W/31	7325161MB
2	TSB-FR-01-10'	12	TSB-DR-01-0'	22	TB-3-11-14-07	V/32	7329017MB S
3	TSB-FJ-07-0'	13	TSB-DR-01-0'DL	23	TSB-FJ-06-10'MS	S/33	7330403MB F
4	TSB-FJ-07-0'DL	14	TSB-DR-01-10'	24	TSB-FJ-06-10'MSD	V/34	7332515MB F
5	TSB-FJ-07-10'	15	TSB-DR-02-0'	25			35
6	TSB-FJ-06-0'	16	TSB-DR-02-10'	26			36
7	TSB-FJ-06-0'-FD	17	TSB-DR-02-0'-FD	27			37
8	TSB-FJ-06-0'-FDDL	18	JB-NW-DITCH01-0'	28			38
9	TSB-FJ-06-10'	19	JB-NW-DITCH01-10'	29			39
10	TSB-FJ-05-0'	20	TB-2-11-14-07	W/30			40

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OC. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropane	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. Tetrachloroethane	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethane**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethane	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethane	KKKK. Propionitrile
J. 1,2-Dichloroethane, 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. <i>Isodimethane</i>
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. <i>Dichloromethane</i>
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. <i>Nonyl alcohol</i>
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. <i>Dimethyl Disulfide</i>
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Diisopropyl ether	RRRR. <i>2-Nitropropane</i>
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropane	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	GGG. p-isopropyltoluene	AAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBB. tert-Amyl methyl ether	VVVV.

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

LDC #: 18100D1
SDG #: Seacoven

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

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

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)							
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
8	S	X	11-14-07	NA	11-30-07	16	17/18/19 H
13	↓	↓	↓	↓	11-30-07	↓	↓ (F)

TECHNICAL HOLDING TIME CRITERIA

- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soil: Both within 14 days of sample collection.

LDC #: 1810011
 SDG #: 2000101

VALIDATION FINDINGS WORKSHEET
Initial Calibration

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

- Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
- N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
 - N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 - N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?
 - 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 $\leq 30\%$ %RSD and ≥ 0.05 RRF?

#	Date	Standard ID	Compound	Finding %RSD (Limit: $\leq 30.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	1/16/07	10AL (L)	PP LM	0.04881 0.03735		MHW-13, 7325-61MB	N/A / A
	1/16/07	10AL (L)	PP / N NWW	0.13359 0.00331			N/A
	1/17/07	10AL (F)	EEE NN	0.00932 0.04730		MHW-13 except 4.8 B	N/A / A
	1/17/07	010AL	NWW	0.00164		7329017 MB	N/A

LDC #: 180001
 SDG #: See CDW

VALIDATION FINDINGS WORKSHEET
 Continuing Calibration

Page: 1 of 1
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METHOD: GC/MS VOA (EPA SW 846 Method 8260)

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

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

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

Y (N) N/A Were all %D and RRFs within the validation criteria of $\leq 25\%$ %D and ≥ 0.05 RRF?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/16/07	11EVE827 (11E1)	Nonanal	39.75684		MH05, T35-16) MB	1/11/07/A
	11/16/07	11CA6873	WINN		0.00314		1/11/07/A
	11/16/07	11CA6877	B	31.45374			1/11/07/A
			NNNN		0.02835		1/11/07/A
			PP		0.0488		
			RR		0.04664		
			MM		0.03391		
	11/16/07	FCA48211	CCCC		0.01083	13.5-7.9-12	1/11/07/A
			NN		0.04399	14-19	
	11/16/07	FCA48209	WINW		0.00141	T32907MB	1/11/07/A

VALIDATION FINDINGS WORKSHEET
Blanks

LDC #: 1810002
SDG #: See cover

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2nd Reviewer: [Signature]

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: 11/24/07
Conc. units: ug/kg
Associated Samples: 1-3, 5-7, 9-12, 14-19

Compound	Blank ID	Sample Identification									
Methylene chloride	<u>73917MB</u>	<u>7</u>	<u>12</u>	<u>18</u>							
Acetone											
<u>N/A</u>	<u>1-5</u>	<u>7.5/22</u>	<u>15/50</u>	<u>30/50</u>	<u>70/50</u>						
CRQL											

Blank analysis date: 11/25/07
Conc. units: ug/kg

Associated Samples: 2, 13, 4

Compound	Blank ID	Sample Identification									
Methylene chloride	<u>73917MB</u>	<u>4 (2.5)</u>									
Acetone	<u>8.0</u>	<u>N/A</u>									
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 #: 1810001
SDG #: See context

VALIDATION FINDINGS WORKSHEET

Blanks

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Reviewer: _____
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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: 11/22/07

Conc. units: ug/L Associated Samples: 8, 13

Compound	Blank ID	Sample Identification									
Methylene chloride	<u>335751/B</u>					<u>8 (50X)</u>					
Acetone	<u>920</u>					<u>100/1000L</u>					
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 #: 181001
SDG #: SE CON

VALIDATION FINDINGS WORKSHEET Field Blanks

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Reviewer: [Signature]
2nd Reviewer: [Signature]

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

N/A Were field blanks identified in this SDG?
 N/A Were target compounds detected in the field blanks?
Blank units: ug/L Associated sample units: ug/L
Sampling date: 11/14/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank

Associated Samples: 1-1

Compound	Blank ID	Sample Identification
Methylene chloride	<u>20</u>	
Acetone		
Chloroform		
<u>Dichloromethane</u>	<u>0.99</u>	
CRQL		

Blank units: ug/L Associated sample units: ug/L
Sampling date: 11/14/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank

Associated Samples: 12-19

Compound	Blank ID	Sample Identification
Methylene chloride	<u>21</u>	<u>#15</u>
Acetone		
Chloroform		
<u>Dichloromethane</u>	<u>0.90</u>	<u>36/5.0</u>
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 #: 182001
SDG #: See Coler

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

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

N/A Were field blanks identified in this SDG?
 N/A Were target compounds detected in the field blanks?
Blank units: µg/L Associated sample units: µg/L
Sampling date: 11/14/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank

Associated Samples: all soils

Compound	Blank ID	Sample Identification
	22	175
Methylene chloride		
Acetone		
Chloroform		
Dichloromethane	0.79	3.6/5.0
CRQL		

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

Compound	Blank ID	Sample Identification
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".

VALIDATION FINDINGS WORKSHEET
 Laboratory Control Samples (LCS)

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

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

N/A 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
		732576/LCS/B	B	150 (38-140)	144 (38-140)		MTDS	No Qual
			D			21 (≤20)	732576/MB	No Qual
			F			24 ()		
			NN			34 ()		
		739017/LCS/D	HH	154 (56-115)	157 (56-115)		1-3, 5-7, 9-12, 14-19, 739017/MB	No Qual (MS/MSD in)

LDC #: 181001
SDG #: 320001

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

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Reviewer: [Signature]
2nd Reviewer: [Signature]

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".
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?
Y N / N/A
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?
Y N / N/A

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		<u>3,7,12</u>	<u>F > calc'd range</u>	<u>3,7,12</u>	<u>lots/A</u>

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100 D2
 SDG # See COVEN

VALIDATION FINDINGS WORKSHEET
 Field Duplicates

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

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

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

Compound	Concentration (µg/kg)		D RPD
	6	7	
F	5.2 U	480	474.8 (≤ 5.2) ↓ / u / 10
EE	↓	0.4	4.79 ↓ No Qual
Z	2 U	7.1	13.9 (≤ 21)
OC	5.2 U	0.47	4.73 (≤ 5.2)
DDD		3.2	2
AAA		1.1	4.1
Compound	Concentration ()		RPD
	↓		
SSS		0.83	4.37 ↓
GG	10.1 U	2.8	7.2 (≤ 10)
RRR	5.2 U	2.0	3.2 (≤ 5.2)
NN	21 U	15	6 (≤ 21) ↓

Compound	Concentration (µg/kg)		D RPD
	6	8	
F	5.2 U	400	394.8 (≤ 5.2) ↓ / u / 10

Compound	Concentration (µg/kg)		D RPD
	15	17	
F	13	20 U	7 (≤ 20) u / 10
Dichloromethane	3.6	5.1 U	1.5 (≤ 5.1) Natural

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 15, 2007

LDC Report Date: February 11, 2008

Matrix: Soil/Water

Parameters: Volatiles

Validation Level: EPA Level III & IV

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

TSB-FJ-03-0'**	RINSATE-3
TSB-FJ-03-0'-FD**	TB-4-11-15-07
TSB-FJ-03-10'**	TSB-FJ-10-0'MS
TSB-FJ-10-0'**	TSB-FJ-10-0'MSD
TSB-FJ-10-0'DL**	TSB-FR-02-0'MS
TSB-FJ-10-10'**	TSB-FR-02-0'MSD
TSB-FJ-04-0'**	
TSB-FJ-04-10'**	
TSB-FJ-02-0'**	
TSB-FJ-02-0'-FD**	
TSB-FJ-02-10'**	
TSB-FR-02-0'**	
TSB-FR-02-10'**	
TSB-FJ-09-0'**	
TSB-FJ-09-10'**	
TSB-FR-03-0'**	
TSB-FR-03-10'**	
TB-01-11-15-07	
TB-02-11-15-07	
TB-03-11-15-07	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 21 soil samples and 5 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD	All TCL compounds	15	14	J- (all detects) UJ (all non-detects)	A
TSB-FR-03-10'**	All TCL compounds	15	14	J- (all detects) UJ (all non-detects)	P

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

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

*III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 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
*11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>*Iodomethane</u> Ethanol	0.04881 (≥0.05) 0.03735 (≥0.05) 0.03359 (≥0.05) 0.00331 (≥0.05)	All water samples in SDG TRNC-D-5	J (all detects) UJ (all non-detects)	A
11/13/07	Acetonitrile Methyl ethyl ketone Ethanol	0.00932 (≥0.05) 0.04730 (≥0.05) 0.00164 (≥0.05)	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-0'*** TSB-FR-02-10'*** TSB-FJ-09-0'*** TSB-FJ-09-10'*** TSB-FR-03-0'*** TSB-FR-03-10'*** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7333508MB 7335121MB 7330403MB	J (all detects) UJ (all non-detects)	A
11/29/07	Acetonitrile 2-Nitropropane	0.00365 (≥0.05) 0.04718 (≥0.05)	TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD 7333515MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

*Corrected compound from Nonanal to Iodomethane in above finding for water samples.

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
11/19/07 (LCAL6874)	Bromomethane	31.45374	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 7325161MB	J+ (all detects)	A
11/20/07 (LCAL6902)	Bromomethane Iodomethane Methyl ethyl ketone	64.95744 85.21601 188	TB-4-11-15-07 7329018MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/29/07 (FCAL8464)	Dichloromethane Acetone Acetonitrile	27.78400 28.94367 33.03338	TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-10'*** TSB-FJ-09-0'*** TSB-FJ-09-10'*** TSB-FR-03-0'*** 7333508MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/30/07 (FCAL8500)	Dichloromethane Acetonitrile Nonanal	32.20394 52.78688 28.28801	TSB-FR-03-10'*** 7335121MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/25/07 (FCAL8262)	Nonanal	26.02663	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FR-02-0'*** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7330403MB	J+ (all detects)	A
11/30/07 (GCAL9455)	Iodomethane Nonanal	50.38991 33.50982	TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD 7333515MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-5	J+ (all detects)	A

Date	Compound	%D	Associated Samples	Flag	A or P
11/29/07 (GICV9430)	Iodomethane Vinyl acetate Nonanal	39.14797 40.79661 227	TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD 7333515MB	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
11/19/07 (LCAL6873)	Ethanol	0.00314 (≥ 0.05)	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 7325161MB	J (all detects) UJ (all non-detects)	A
11/19/07 (LCAL6874)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.02835 (≥ 0.05) 0.04881 (≥ 0.05) 0.04664 (≥ 0.05) 0.03391 (≥ 0.05)	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 7325161MB	J (all detects) UJ (all non-detects)	A
11/20/07 (LCAL6902)	Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.04492 (≥ 0.05) 0.04910 (≥ 0.05) 0.03949 (≥ 0.05)	TB-4-11-15-07 7329018MB	J (all detects) UJ (all non-detects)	A
11/20/07 (LCAL6901)	Ethanol	0.00354 (≥ 0.05)	TB-4-11-15-07 7329018MB	J (all detects) UJ (all non-detects)	A
11/29/07 (FCAL8464)	Acetonitrile Methyl ethyl ketone	0.01239 (≥ 0.05) 0.04487 (≥ 0.05)	TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** 7333508MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/29/07 (FCAL8465)	Ethanol	0.00145 (≥ 0.05)	TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'** TSB-FR-02-10'** TSB-FJ-09-0'** TSB-FJ-09-10'** TSB-FR-03-0'** 7333508MB	J (all detects) UJ (all non-detects)	A
11/30/07 (FCAL8500)	Acetonitrile	0.01423 (≥ 0.05)	TSB-FR-03-10'** 7335121MB	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/30/07 (FCAL8501)	Ethanol	0.00164 (≥ 0.05)	TSB-FR-03-10'*** 7335121MB	J (all detects) UJ (all non-detects)	A
11/25/07 (FCAL8261)	Ethanol	0.00138 (≥ 0.05)	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FR-02-0'*** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7330403MB	J (all detects) UJ (all non-detects)	A
11/25/07 (FCAL8262)	Acetonitrile	0.01063 (≥ 0.05)	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FR-02-0'*** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7330403MB	J (all detects) UJ (all non-detects)	A
11/30/07 (GCAL9455)	Acetonitrile 2-Nitropropane	0.00407 (≥ 0.05) 0.04674 (≥ 0.05)	TSB-FJ-10-0'DL** TSB-FJ-10-0'MS TSB-FJ-10-0'MSD 7333515MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

V. Blanks

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

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
7333515MB	11/30/07	Acetone 2-Hexanone Dichloromethane 1,2,4-Trimethylbenzene	920 ug/Kg 580 ug/Kg 71 ug/Kg 34 ug/Kg	TSB-FJ-10-0'DL**
7330403MB	11/25/07	Acetone Toluene	8.0 ug/Kg 1.1 ug/Kg	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FR-02-0'***

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
7333508MB	11/29/07	Acetone Dichloromethane Toluene	5.6 ug/Kg 5.6 ug/Kg 0.85 ug/Kg	TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-10'*** TSB-FJ-09-0'*** TSB-FJ-09-10'*** TSB-FR-03-0'***

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-FJ-10-0'DL** (50x)	2-Hexanone Dichloromethane	240 ug/Kg 96 ug/Kg	1100U ug/Kg 270U ug/Kg
TSB-FJ-03-0'***	Toluene	0.61 ug/Kg	5.2U ug/Kg
TSB-FJ-03-0'-FD**	Toluene	0.57 ug/Kg	5.3U ug/Kg
TSB-FJ-03-10'***	Toluene	0.51 ug/Kg	5.4U ug/Kg
TSB-FJ-10-0'***	Toluene	1.7 ug/Kg	5.3U ug/Kg
TSB-FJ-10-10'***	Toluene	0.67 ug/Kg	5.2U ug/Kg
TSB-FJ-04-0'***	Toluene	0.80 ug/Kg	5.2U ug/Kg
TSB-FR-02-0'***	Acetone Toluene	64 ug/Kg 0.78 ug/Kg	64U ug/Kg 5.1U ug/Kg
TSB-FJ-02-0'-FD**	Acetone Dichloromethane	6.2 ug/Kg 6.3 ug/Kg	21U ug/Kg 6.3U ug/Kg
TSB-FJ-02-10'***	Acetone Dichloromethane	12 ug/Kg 7.6 ug/Kg	22U ug/Kg 7.6U ug/Kg
TSB-FJ-02-0'***	Acetone Dichloromethane	15 ug/Kg 7.4 ug/Kg	21U ug/Kg 7.4U ug/Kg
TSB-FR-02-10'***	Acetone Dichloromethane	17 ug/Kg 7.0 ug/Kg	22U ug/Kg 7.0U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-FJ-09-0'***	Acetone Dichloromethane	13 ug/Kg 6.4 ug/Kg	21U ug/Kg 6.4U ug/Kg
TSB-FJ-09-10'***	Acetone Dichloromethane	15 ug/Kg 7.5 ug/Kg	22U ug/Kg 7.5U ug/Kg
TSB-FR-03-0'***	Acetone Dichloromethane	22 ug/Kg 6.7 ug/Kg	22U ug/Kg 6.7U ug/Kg

Samples TB-01-11-15-07, TB-02-11-15-07, TB-03-11-15-07, and TB-4-11-15-07 were identified as trip blanks. No volatile contaminants were found in these blanks with the following exceptions:

Trip Blank ID	Sampling Date	Compound	Concentration	Associated Samples
TB-01-11-15-07	11/15/07	Dichloromethane	0.87 ug/L	All soil samples in SDG TRNC-D-5
TB-02-11-15-07	11/15/07	Dichloromethane	1.2 ug/L	TSB-FR-02-0'*** TSB-FR-02-10'*** TSB-FJ-09-0'*** TSB-FJ-09-10'*** TSB-FR-03-0'*** TSB-FR-03-10'***
TB-03-11-15-07	11/15/07	Dichloromethane	0.94 ug/L	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-0'DL** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'***

Sample "RINSATE-3" 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-3	11/15/07	Styrene	0.39 ug/L	All soil samples in SDG TRNC-D-5

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-FJ-02-0'**	Dichloromethane	7.4 ug/Kg	7.4U ug/Kg
TSB-FJ-02-0'-FD**	Dichloromethane	6.3 ug/Kg	6.3U ug/Kg
TSB-FJ-02-10'**	Dichloromethane	7.6 ug/Kg	7.6U ug/Kg
TSB-FR-02-10'**	Dichloromethane	7.0 ug/Kg	7.0U ug/Kg
TSB-FJ-09-0'**	Dichloromethane	6.4 ug/Kg	6.4U ug/Kg
TSB-FJ-09-10'**	Dichloromethane	7.5 ug/Kg	7.5U ug/Kg
TSB-FR-03-0'**	Dichloromethane	6.7 ug/Kg	6.7U 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.

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 relative percent difference (RPD) was not within QC limits for one compound, the MS/MSD percent recoveries (%R) were within QC limits and no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7325161LCS/D (TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 7325161MB)	Bromomethane	150 (38-140)	144 (38-140)	-	J+ (all detects)	P
7329018LCS/D (TB-4-11-15-07 7329018MB)	Bromomethane Vinyl acetate	195 (38-140) 152 (23-140)	177 (38-140) 152 (23-140)	- -	J+ (all detects) J+ (all detects)	P
7329018LCS/D (TB-4-11-15-07 7329018MB)	Iodomethane	232 (33-140)	180 (33-140)	25 (≤ 20)	J (all detects) UJ (all non-detects)	P

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 with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-FJ-10-0**	Acetone	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not evaluated for the samples reviewed by Level III criteria.

XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

XIV. System Performance

The system performance was acceptable for samples on which a 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-FJ-03-0'*** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'*** and TSB-FJ-02-0'-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-FJ-03-0'***	TSB-FJ-03-0'-FD**				
Toluene	0.61	0.57	-	0.04 ug/Kg (≤ 5.2)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'***	TSB-FJ-02-0'-FD**				
Acetone	15	6.2	-	8.8 ug/Kg (≤ 21)	-	-
Methylene chloride	7.4	6.3	-	1.1 ug/Kg (≤ 5.2)	-	-

***BRC Tronox Parcel C/D/F/G**
Volatiles - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-10-0'DL**	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-5	TSB-FR-03-10'***	All TCL compounds	J- (all detects) UJ (all non-detects)	P	Technical holding times
*TRNC-D-5	RINSATE-3 TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 TB-4-11-15-07	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>*Iodomethane</u> Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-0'*** TSB-FR-02-10'*** TSB-FJ-09-0'*** TSB-FJ-09-10'*** TSB-FR-03-0'*** TSB-FR-03-10'***	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-5	TSB-FJ-10-0'DL**	Acetonitrile 2-Nitropropane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-5	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TB-4-11-15-07	Bromomethane Iodomethane Methyl ethyl ketone	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-10'*** TSB-FJ-09-0'*** TSB-FJ-09-10'*** TSB-FR-03-0'***	Dichloromethane Acetone Acetonitrile	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FR-03-10'***	Dichloromethane Acetonitrile Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FR-02-0'***	Nonanal	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-10-0'DL**	Iodomethane Nonanal	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3 TB-4-11-15-07 TSB-FJ-10-0'DL**	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-5	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3	Ethanol Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-5	TB-4-11-15-07	Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-5	TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-10'*** TSB-FJ-09-0'*** TSB-FJ-09-10'*** TSB-FR-03-0'***	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-5	TSB-FR-03-10'*** TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FR-02-0'***	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-10-0'DL**	Acetonitrile 2-Nitropropane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-5	TSB-FJ-10-0'DL**	Iodomethane Vinyl acetate Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (RRF)
TRNC-D-5	TB-01-11-15-07 TB-02-11-15-07 TB-03-11-15-07 RINSATE-3	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-5	TB-4-11-15-07	Bromomethane Vinyl acetate	J+ (all detects) J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-5	TB-4-11-15-07	Iodomethane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)(RPD)
TRNC-D-5	TSB-FJ-10-0'***	Acetone	J (all detects)	A	Compound quantitation and CRQLs

*Corrected compound in above initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G

Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-10-0'DL** (50x)	2-Hexanone Dichloromethane	1100U ug/Kg 270U ug/Kg	A
TRNC-D-5	TSB-FJ-03-0'***	Toluene	5.2U ug/Kg	A
TRNC-D-5	TSB-FJ-03-0'-FD**	Toluene	5.3U ug/Kg	A
TRNC-D-5	TSB-FJ-03-10'***	Toluene	5.4U ug/Kg	A
TRNC-D-5	TSB-FJ-10-0'***	Toluene	5.3U ug/Kg	A
TRNC-D-5	TSB-FJ-10-10'***	Toluene	5.2U ug/Kg	A
TRNC-D-5	TSB-FJ-04-0'***	Toluene	5.2U ug/Kg	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-5	TSB-FR-02-0'***	Acetone Toluene	64U ug/Kg 5.1U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Acetone Dichloromethane	21U ug/Kg 6.3U ug/Kg	A
TRNC-D-5	TSB-FJ-02-10'***	Acetone Dichloromethane	22U ug/Kg 7.6U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'***	Acetone Dichloromethane	21U ug/Kg 7.4U ug/Kg	A
TRNC-D-5	TSB-FR-02-10'***	Acetone Dichloromethane	22U ug/Kg 7.0U ug/Kg	A
TRNC-D-5	TSB-FJ-09-0'***	Acetone Dichloromethane	21U ug/Kg 6.4U ug/Kg	A
TRNC-D-5	TSB-FJ-09-10'***	Acetone Dichloromethane	22U ug/Kg 7.5U ug/Kg	A
TRNC-D-5	TSB-FR-03-0'***	Acetone Dichloromethane	22U ug/Kg 6.7U ug/Kg	A

BRC Tronox Parcel C/D/F/G**Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-5**

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-02-0'***	Dichloromethane	7.4U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Dichloromethane	6.3U ug/Kg	A
TRNC-D-5	TSB-FJ-02-10'***	Dichloromethane	7.6U ug/Kg	A
TRNC-D-5	TSB-FR-02-10'***	Dichloromethane	7.0U ug/Kg	A
TRNC-D-5	TSB-FJ-09-0'***	Dichloromethane	6.4U ug/Kg	A
TRNC-D-5	TSB-FJ-09-10'***	Dichloromethane	7.5U ug/Kg	A
TRNC-D-5	TSB-FR-03-0'***	Dichloromethane	6.7U ug/Kg	A

LDC #: 18100E1
 SDG #: TRNC-D-5
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III/IV

Date: 11/15/07
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 2nd Reviewer: [Signature]

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

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

Validation Area			Comments
I.	Technical holding times	W	Sampling dates: 11/15/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	W	RSD .12
IV.	Continuing calibration/ICV	W	REV ≤ 25%
V.	Blanks	W	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	W	
VIII.	Laboratory control samples	W	LCSD
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	W	Not reviewed for Level III validation.
XIII.	Tentatively identified compounds (TICs)	N	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	W	D = 1 + 2, 9 + 10
XVII.	Field blanks	W	TB = 18, 19, 20, 22*. R = 2

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

Validated Samples: ** Indicates sample underwent Level IV validation

1	3	TSB-FJ-03-0**	11	5	TSB-FJ-02-10**	21	RINSATE-3	31	1	T309018MB W
2	5	TSB-FJ-03-0-FD**	12	3	TSB-FR-02-0**	22	TB-4-11-15-07	32	0	T325161MB W
3	3	TSB-FJ-03-10**	13	5	TSB-FR-02-10**	23	TSB-FJ-10-0*MS	33	3	T330403MB S
4	3	TSB-FJ-10-0**	14	5	TSB-FJ-09-0**	24	TSB-FJ-10-0*MSD	34	1	T333515MB S
5	4	TSB-FJ-10-0*DL**	15	5	TSB-FJ-09-10**	25	TSB-FR-02-0*MS	35	5	T333508MB S
6	3	TSB-FJ-10-10**	16	5	TSB-FR-03-0**	26	TSB-FR-02-0*MSD	36	6	T335121MB S
7	3	TSB-FJ-04-0**	17	6	TSB-FR-03-10**	27		37	7	T334426MB S
8	3	TSB-FJ-04-10**	18	2	TB-01-11-15-07	28		38		
9	5	TSB-FJ-02-0**	19	2	TB-02-11-15-07	29		39		
10	5	TSB-FJ-02-0-FD**	20	2	TB-03-11-15-07	30		40		

LDC #: 18/0021
 SDG #: 502 CDVEX

VALIDATION FINDINGS CHECKLIST

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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) $\leq 30\%$ 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) $\leq 25\%$ 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 duplicate				
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 #: 181021
 SDG #: See cover

VALIDATION FINDINGS CHECKLIST

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

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropane	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. Tetrachloroethane	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethane**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethane	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethane	KKKK. Propionitrile
J. 1,2-Dichloroethane, 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. <i>1,2-dimethane</i>
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. <i>Dichloromethane</i>
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. <i>Muonad</i>
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ. <i>Dimethyl Disulfide</i>
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR. <i>2-Nitropropane</i>
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropane	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBB. tert-Amyl methyl ether	VVVV.

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

LDC #: 1810021
 SDG #: See coler

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

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All circled dates have exceeded the technical holding times.

Y / N / N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)							
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
5, 23, 24	←	↓	11-15-07	N/A	11-30-07	15	JWH
17	↓	↓	↓	↓	↓	↓	JWH
22							

TECHNICAL HOLDING TIME CRITERIA

- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soil: Both within 14 days of sample collection.

VALIDATION FINDINGS WORKSHEET
Initial Calibration

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
 N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all OCC's and SPCC's?
 N N/A Was a curve fit used for evaluation? if yes, what was the acceptance criteria used for evaluation? _____
 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: $\leq 30.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	1/16/07	1CAC	PP		0.04881	MH=03 73290 BMB	→ UN/A
		(←)	MM		0.03735	73290 BMB	↓
			PPP		0.03359	732516 MP	↓
	1/16/07	1CAC	WW		0.00331		
		(←)					
	1/17/07	1CAC	EEE		0.00932	MH=03 14.6-17 73304 BMB	→ UN/A
		(F)	NN		0.04730	73304 BMB	↓
	1/17/07	DIC	WW		0.00164	73304 BMB 733508 MB	
						735121 MB	
						25-26	
	1/19/07	1CAC	EEE		0.00365	5.23-24	→ UN/A
			RRR		0.04718	733351 MB	↓

LDC #: 100001
 SDG #: 300000

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

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

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

Y (N) N/A Were all %D and RRFs within the validation criteria of $\leq 25\%$ %D and ≥ 0.05 RRF?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/16/07	10105827 (1010)	Nonanal	39.75684		MH-1, T3=9018UB T3=5161MB	N/A
	11/19/07	10106873	WNNW		0.00314	10=2, T3=5161MB	N/A
		10106874	NNNN		0.02835		
			PP		0.04881		
			RR		0.04664		
			MM		0.03391		
			B	31.45374			N/A
	11/20/07	10106902	B	64.95744		22. T3=9018UB	N/A
			NNNN	85.21601			
			NN	188			
			PP		0.04492		N/A
			RR		0.04910		
			MM		0.03949		
	11/20/07	10106901	WNNW		0.00354		
	11/29/07	10108464	OOOO	27.18400		9-11.13-16	N/A
			F	38.94367		T333508UB	
			EEEE	33.03338			
			EEEE		0.01239		N/A
			NNN		0.04487		
	11/29/07	10108465	WNNW		0.00145		

LDC #: 131002
 SDG #: 20001001

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 (N) N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
 (N) N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 (N) N/A Were all %D and RRFs within the validation criteria of $\leq 25\%$ %D and ≥ 0.05 RRF?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/30/07	FCA 8500	0000 EEEE PPPP EEEE NNNN	32.20394 52.78688 28.28801	0.01423 0.00164	17-733512MB	↓ Elets / A ↓ W / A
	11/30/07	FCA 8501	0000 EEEE PPPP EEEE NNNN				
	11/25/07	FCA 8261 FCA 8262	NNNN EEEE PPPP	26.02663	0.00138 0.01063	1-4.6-8.12 7330403MB 25-26	↓ W / A ↓ W / A
	11/29/07	FICV9430 (10V)	NNNN HH PPPP	39.14797 40.79661 227		4-23-24 7333515MB	↓ Elets / A ↓ W / A
	11/30/07	FCA 9455	NNNN PPPP EEEE RRRR	50.38991 33.50982	0.00407 0.04674	4-23-24 7333515MB	↓ Elets / A ↓ W / A

LDC #: 181002
 SDG #: Seconex

VALIDATION FINDINGS WORKSHEET
Blanks

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 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: 11/30/07

Conc. units: µg/L Associated Samples: 5

Compound	Blank ID	Sample Identification
Methylene chloride	3513MD 5 (50x)	
Acetone	920	
Z	580	20/100U
Dichloromethane	71	96/370U
DDT	34	
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 #: 18100 E1
SDG #: Sercofen

VALIDATION FINDINGS WORKSHEET
Blanks

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

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: 11/25/07

Conc. units: $\mu\text{g/L}$ Associated Samples: 1-4, 6-8, 12

Compound	Blank ID	Sample Identification							
Methylene chloride	730403MB	1	2	3	4	6	7	8	12
Acetone	8.0								
CC	1.1	0.61/5.2U	0.57/5.3U	0.51/5.4U	1.7/5.3U	0.67/5.3U	8.0/5.4U	0.78/5.1U	0.78/5.1U
CRQL									

Blank analysis date: 11/29/07

Conc. units: $\mu\text{g/L}$ Associated Samples: 9-11, 13-16

Compound	Blank ID	Sample Identification						
Methylene chloride	730508MB	9	10	11	13	14	15	16
Acetone	5.6	15/5.1U	6.2/5.1U	13/5.2U	15/5.1U	17/5.1U	13/5.1U	15/5.1U
Dichloromethane	5.6	6.3/5.1U	6.3/5.1U	7.6/5.1U	7.4/5.1U	7.0/5.1U	6.4/5.1U	7.5/5.1U
CC	0.85							
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".

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

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
Sampling date: 11/15/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank

Associated Samples: all soils

Compound	Blank ID	Sample Identification													
		1	2	3	4	5	6	7	8	9	10				
Methylene chloride	18														
Acetone															
Chloroform															
Dichloromethane	0.87 (96)														
CRQL															

Blank units: ug/L Associated sample units: ug/L
Sampling date: 11/15/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank

Associated Samples: 12-17

Compound	Blank ID	Sample Identification													
		1	2	3	4	5	6	7	8	9	10				
Methylene chloride	19														
Acetone															
Chloroform															
Dichloromethane	1.2														
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".

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

LDC #: 1310021
SDG #: See cover

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

Were field blanks identified in this SDG?
 N N/A
 Were target compounds detected in the field blanks?
 N N/A
 Blank units: 10/2 Associated sample units: 10/2
 Sampling date: 11/15/07
 Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: 1-11

Compound	Blank ID	5	9	10	11	13	14	Sample Identification
Methylene chloride	20							
Acetone								
Chloroform								
Dichloromethane	0.94 (96)		7.7A	6.3A	7.6A	7.0A	6.4A	
CRQL								

Blank units: 10/2 Associated sample units: 10/2
 Sampling date: 11/15/07
 Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: 10/20/13

Compound	Blank ID	21	Sample Identification
Methylene chloride			
Acetone			
Chloroform			
FF	0.39		
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 #: 1810021
 SDG #: ~~2200001~~

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
 Reviewer: g
 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".

N/A Was a LCS required?
 Y/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
		T32516/LCS	B	150 (88-140)	144 (38-140)	()	18-21-T32516 MB	↓ + dete P
			D	()	()	22 (= 20)		No Anal
			F	()	()	24 ()		
			NN	()	()	34 ()		↓
				()	()	()		
		T329018/LCS	B	195 (38-140)	177 (38-140)	()	22-T329018 MB	↓ + dete P
			EEEC	()	()	26 (= 20)		No Anal
			NNNN	232 (33-140)	180 (33-140)	257 ()		↓ + dete P
			HH	152 (33-140)	152 (33-140)	()		↓ + dete P
				()	()	()		
		T330403/LCS	HH	151 (56-115)	152 (56-115)	()	1-4.6-8.12-T330403 MB	No Anal (MS/MSD in)
				()	()	()		
				()	()	()		
		T333508/LCS	HH	146 (56-115)	143 (56-115)	()	9-11.13-16-T333508 MB	No Anal (MS/MSD in)
				()	()	()		
				()	()	()		
		T33512/LCS	HH	154 (56-115)	()	()	17-T33512 MB	No Anal (MS/MSD in)
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		

LDC #: 181001
 SDG #: See copy

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

Page: 6 of 9
 Reviewer: _____
 2nd Reviewer: _____

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?
 Y N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		4	F > calib range	*	delete *

Comments: See sample calculation verification worksheet for recalculations

LDC #: 1810021
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: 9
 2nd reviewer: [Signature]

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

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

Compound	Concentration (<u>µg/g</u>)		D RPD
	1	2	
<u>CC</u>	<u>0.6</u>	<u>0.5T</u>	<u>0.04 (≤5%) No Qual</u>

Compound	Concentration (<u>µg/g</u>)		D RPD
	9	10	
<u>F</u>	<u>15</u>	<u>6.2</u>	<u>8.8 (≤21) No Qual</u>
<u>* 0000</u>	<u>7.4</u>	<u>6.3</u>	<u>1.1 (≤5%) ↓</u>

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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:

$RRF = (A_x / C_x) / (A_s / C_s)$
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_s = Area of associated internal standard
 C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported		Recalculated		Reported		Recalculated	
				RRF (SD std)	RRF (SD std)	RRF (SD std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD	
1	10AL	11/13/07	S (1st internal standard)	0.78500	0.78500	0.29152	0.29152	10.9727	10.97		
			CC (2nd internal standard)	0.95833	0.95833	0.97869	0.97869	7.27374	7.2737		
			MUM (3rd internal standard)	2.45226	2.45226	2.48536	2.48536	4.43510	4.435		
2	10AL	11/17/07	WINN (1st internal standard)	0.00153	0.00153	0.00164	0.00164	9.10389	9.98899		
			BBBA (2nd internal standard)	0.5462	0.52462	0.52212	0.52212	15.8074	15.8092		
			OOO (3rd internal standard)	1.35801	1.35801	1.34097	1.34097	9.49566	9.49566		
3	10AL	11/29/07	S (1st internal standard)	0.42334	0.42334	0.48260	0.48260	8.51866	8.5182		
			CC (2nd internal standard)	1.46695	1.46695	1.43348	1.43348	4.37617	4.37666		
			MUM (3rd internal standard)	0.53464	0.53464	0.50428	0.50428	4.62950	4.6297		
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.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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:

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

$$\text{RRF} = (A_s)(C_s) / (A_s)(C_s)$$

Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 A_s = Area of compound
 C_s = Concentration of compound

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	FCA-8262	11/25/07	S (1st internal standard)	0.29152	0.28699	1.55455	1.5344	
			CC (2nd internal standard)	0.97869	1.07247	9.58158	9.5819	
			MMM (3rd internal standard)	2.48536	2.77949	11.8345	11.8391	
2	FCA-8261	11/25/07	NW/W (1st internal standard)	0.00164	0.00138	15.60088	15.592	
			AAA (2nd internal standard)	0.52212	0.55233	5.78651	5.7867	
			OOO (3rd internal standard)	1.34097	1.37020	2.17980	2.1796	
3	FCA-8464	11/29/07	S (1st internal standard)	0.29152	0.28738	14.1945	14.1925	
			CC (2nd internal standard)	0.97869	1.08694	11.0007	11.0603	
			MMM (3rd internal standard)	2.48536	2.50015	0.59576	0.59505	
4	FCA-8465	11/29/07	NW/W (1st internal standard)	0.00164	0.00145	11.81560	11.8049	
			AAA (2nd internal standard)	0.52212	0.56952	9.07869	9.07856	
			OOO (3rd internal standard)	1.34097	1.43815	6.50132	6.5010	

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 #: 18/0021
 SDG #: SA COVEN

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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 = $100 \times (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$ Where: ave. RRF = initial calibration average RRF
 RRF = $(A_x) / (C_x) / (A_s) / (C_s)$ RRF = continuing calibration RRF
 A_x = Area of compound, A_s = Area of associated internal standard
 C_x = Concentration of compound, C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	FEA-8500	11/30/07	S (1st internal standard)	0.2952	0.30095	2.9350	2.92525	
			CC (2nd internal standard)	0.97869	1.11983	4.42058	4.4209	
			MMM (3rd internal standard)	2.48536	2.72319	9.5936	9.5935	
2	FEA-8501	11/30/07	WINW (1st internal standard)	0.00164	0.00164	0.30839	0.29268	
			BBB (2nd internal standard)	0.52212	0.49863	4.4985	4.4989	
			DDD (3rd internal standard)	1.34097	1.28956	3.83370	3.834	
3	FEA-8505	11/30/07	S (1st internal standard)	0.48260	0.46777	3.07342	3.0731	
			CC (2nd internal standard)	1.43348	1.35090	5.76065	5.7607	
			MMM (3rd internal standard)	0.50428	0.58382	15.77310	15.7735	
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 #: 1810021
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Toluene-d8	50	45.0576	90	90	0
Bromofluorobenzene	↓	42.8873	86	86	
1,2-Dichloroethane-d4		41.3154	83	83	
Dibromofluoromethane	↓	43.7186	87	87	↓

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					

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

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

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

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

MS/MSD sample: 25/26

Compound	Spiky Added (45)		Sample Concentration (48)		Spiked Sample Concentration (48)		Matrix-Spike Percent Recovery		Matrix-Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	MS	MSD	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	51.3	50.8	ND		40.8	45.1	80	80	89	89	99	10
Trichloroethene					35.0	38.8	68	68	76	76	10	10
Benzene					40.3	43.5	78	78	86	86	76	7.6
Toluene			0.78		40.7	43.5	78	78	84	84	6.6	6.6
Chlorobenzene			ND		39.5	41.6	77	77	82	82	5.1	5.2

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.

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

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

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

% Recovery = $100 \cdot \frac{SSC}{SA}$ Where: SSC = Spiked sample concentration
 SA = Spike added

RPD = $\frac{|LCS - LCSD|}{LCS + LCSD} \cdot 2$

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

LCS ID: 133403405

Compound	Spike Added		Spiked Sample Concentration		LCS		LCSD		Percent Recovery		Percent Recovery		RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalc
1,1-Dichloroethene	50	50	51.8	49.4	104	104	99	99	4.8	4.7				
Trichloroethene			47.7	46.6	95	95	93	93	2.4	2.3				
Benzene			50.9	50.2	102	102	100	100	1.5	1.4				
Toluene			55.6	52.0	111	111	104	104	6.6	6.7				
Chlorobenzene			53.1	51.5	106	106	103	103	3.1	3.1				

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 #: 1810021
 SDG #: 32001

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

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

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?

$$\text{Concentration} = \frac{(A_s)(I_s)(DF)}{(A_{is})(RRF)(V_s)(\%S)}$$

- A_s = 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_s = 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. 2, CC

$$\text{Conc.} = \frac{25546(1.50)(1.5)(1.1)}{24428(0.9789)(5.0)(0.941)} = 0.567 \text{ ng/kg}$$

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

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 16, 2007
LDC Report Date: February 11, 2008
Matrix: Soil/Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

TSB-FJ-08-0'	TB5-11-16-07
TSB-FJ-08-10'	TSB-FJ-01-0'MS
TSB-FR-05-0'	TSB-FJ-01-0'MSD
TSB-FR-05-10'	TSB-FJ-01-0'REMS
TSB-FR-04-0'	TSB-FJ-01-0'REMSD
TSB-FR-04-0'-FD	
TSB-FR-04-10'	
TSB-FJ-01-0'	
TSB-FJ-01-0'RE	
TSB-FJ-01-10'	
TSB-GR-01-0'	
TSB-GR-01-5'	
TSB-GJ-06-0'	
TSB-GJ-06-5'	
TSB-GJ-01-0'	
TSB-GJ-01-5'	
TB3-11-16-07	
TB1-11-16-07	
TB4-11-16-07	
RINSATE-4	

Introduction

This data review covers 20 soil samples and 5 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
*11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>*Iodomethane</u> Ethanol	0.04881 (≥ 0.05) 0.03735 (≥ 0.05) 0.03359 (≥ 0.05) 0.00331 (≥ 0.05)	All water samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects)	A
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥ 0.05) 0.04730 (≥ 0.05)	All soil samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥ 0.05)	All soil samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects)	A

*Corrected compound from Nonanal to Iodomethane in above finding for water samples.

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
11/20/07 (LCAL6902)	Bromomethane Iodomethane Methyl ethyl ketone	64.95744 85.21601 188	All water samples in SDG TRNC-D-6	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/29/07 (FCAL8464)	Dichloromethane Acetone Acetonitrile	27.78400 28.94367 33.03338	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'MS TSB-FJ-01-0'MSD 7333508MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/30/07 (FCAL8500)	Dichloromethane Acetonitrile Nonanal	32.20394 52.78688 28.28801	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' *TSB-FJ-01-10' TSB-FJ-01-0'REMS TSB-FJ-01-0'REMSD 7335121MB	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
11/16/07 (LICV6847)	Nonanal	32.75684	All water samples in SDG TRNC-D-6	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
11/20/07 (LCAL6902)	Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.04492 (≥ 0.05) 0.04910 (≥ 0.05) 0.03949 (≥ 0.05)	All water samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects)	A
11/20/07 (LCAL6901)	Ethanol	0.00354 (≥ 0.05)	All water samples in SDG TRNC-D-6	J (all detects) UJ (all non-detects)	A
11/29/07 (FCAL8464)	Acetonitrile Methyl ethyl ketone	0.01239 (≥ 0.05) 0.04487 (≥ 0.05)	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'MS TSB-FJ-01-0'MSD 7333508MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/29/07 (FCAL8465)	Ethanol	0.00145 (≥ 0.05)	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'MS TSB-FJ-01-0'MSD 7333508MB	J (all detects) UJ (all non-detects)	A
*11/30/07 (FCAL8500)	Acetonitrile	0.01423 (≥ 0.05)	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' TSB-FJ-01-10' TSB-FJ-01-0'REMS TSB-FJ-01-0'REMSD 7335121MB	J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/30/07 (FCAL8501)	Ethanol	0.00164 (≥ 0.05)	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' TSB-FJ-01-10' TSB-FJ-01-0'REMS TSB-FJ-01-0'REMSD 7335121MB	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
7333508MB	11/29/07	Dichloromethane Acetone Toluene	5.6 ug/Kg 5.6 ug/Kg 0.85 ug/Kg	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0'

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-FR-05-0'	Dichloromethane Acetone	7.3 ug/Kg 14 ug/Kg	7.3U ug/Kg 21U ug/Kg
TSB-FR-04-0'	Dichloromethane	6.4 ug/Kg	6.4U ug/Kg
TSB-FR-05-10'	Dichloromethane Acetone	7.0 ug/Kg 16 ug/Kg	7.0U ug/Kg 22U ug/Kg
TSB-FR-04-0'-FD	Dichloromethane Acetone	7.4 ug/Kg 13 ug/Kg	7.4U ug/Kg 22U ug/Kg

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
TSB-FR-04-10'	Dichloromethane Acetone	8.5 ug/Kg 8.8 ug/Kg	8.5U ug/Kg 22U ug/Kg
TSB-FJ-01-0'	Dichloromethane Acetone	8.7 ug/Kg 40 ug/Kg	8.7U ug/Kg 40U ug/Kg

Samples TB3-11-16-07, TB1-11-16-07, TB4-11-16-07, and TB5-11-16-07 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
TB3-11-16-07	11/16/07	Dichloromethane	0.99 ug/L	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10'
TB1-11-16-07	11/16/07	Dichloromethane	0.93 ug/L	TSB-FJ-01-0' TSB-FJ-01-0'RE TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5'
TB4-11-16-07	11/16/07	Dichloromethane	0.92 ug/L	TSB-GJ-01-0' TSB-GJ-01-5'
TB5-11-16-07	11/16/07	Dichloromethane	0.86 ug/L	RINSATE-4

Sample "RINSATE-4" was identified as a rinsate. No volatile contaminants were found in this blank.

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

Sample	Compound	Reported Concentration	Modified Final Concentration
TSB-FR-05-0'	Dichloromethane	7.3 ug/Kg	7.3U ug/Kg

Sample	Compound	Reported Concentration	Modified Final Concentration
TSB-FR-05-10'	Dichloromethane	7.0 ug/Kg	7.0U ug/Kg
TSB-FR-04-0'	Dichloromethane	6.4 ug/Kg	6.4U ug/Kg
TSB-FR-04-0'-FD	Dichloromethane	7.4 ug/Kg	7.4U ug/Kg
TSB-FR-04-10'	Dichloromethane	8.5 ug/Kg	8.5U ug/Kg
TSB-FJ-01-0'	Dichloromethane	8.7 ug/Kg	8.7U 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.

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) were not within QC limits for several compounds, the MS/MSD or LCS percent recoveries (%R) were within QC limits and no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7329018LCS/D (All water samples in SDG TRNC-D-6)	Bromomethane Vinyl acetate	195 (38-140) 152 (23-140)	177 (38-140) 152 (23-140)	- -	J+ (all detects) J+ (all detects)	P
7329018LCS/D (All water samples in SDG TRNC-D-6)	Iodomethane	232 (33-140)	180 (33-140)	25 (≤ 20)	J (all detects) UJ (all non-detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FJ-01-0'	Fluorobenzene Chlorobenzene-d5 1,4-Dichlorobenzene-d4	1974291 (2227127-8908506) 1302200 (1361549-5446196) 647186 (664527-2658106)	All TCL compounds	J (all detects) UJ (all non-detects)	A

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

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

XVI. Field Duplicates

Samples TSB-FR-04-0' and TSB-FR-04-0'-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-FR-04-0'	TSB-FR-04-0'-FD				
Acetone	67	13	-	54 ug/Kg (≤ 21)	J (all detects)	A
Dichloromethane	6.4	7.4	-	1 ug/Kg (≤ 5.2)	-	-
1,2,4-Trimethylbenzene	0.47	5.4U	-	4.93 ug/Kg (≤ 5.4)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Methyl ethyl ketone	4.5	22U	-	17.5 ug/Kg (≤ 22)	-	-

***BRC Tronox Parcel C/D/F/G**
Volatiles - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound	Flag	A or P	Reason
*TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>*Iodomethane</u> Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'RE TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Bromomethane Iodomethane Methyl ethyl ketone	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-6	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0'	Dichloromethane Acetone Acetonitrile	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' TSB-FJ-01-10'	Dichloromethane Acetonitrile Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Nonanal	J+ (all detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-6	TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FJ-01-0'RE TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5' TSB-FJ-01-10'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Bromomethane Vinyl acetate	J+ (all detects) J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-6	TB3-11-16-07 TB1-11-16-07 TB4-11-16-07 RINSATE-4 TB5-11-16-07	Iodomethane	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)(RPD)
TRNC-D-6	TSB-FJ-01-0'	All TCL compounds	J (all detects) UJ (all non-detects)	A	Internal standards (area)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Acetone	J (all detects)	A	Field duplicates (Difference)

*Corrected compound in above Initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G

Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-05-0'	Dichloromethane Acetone	7.3U ug/Kg 21U ug/Kg	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-04-0'	Dichloromethane	6.4U ug/Kg	A
TRNC-D-6	TSB-FR-05-10'	Dichloromethane Acetone	7.0U ug/Kg 22U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Dichloromethane Acetone	7.4U ug/Kg 22U ug/Kg	A
TRNC-D-6	TSB-FR-04-10'	Dichloromethane Acetone	8.5U ug/Kg 22U ug/Kg	A
TRNC-D-6	TSB-FJ-01-0'	Dichloromethane Acetone	8.7U ug/Kg 40U ug/Kg	A

BRC Tronox Parcel C/D/F/G

Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-05-0'	Dichloromethane	7.3U ug/Kg	A
TRNC-D-6	TSB-FR-05-10'	Dichloromethane	7.0U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'	Dichloromethane	6.4U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Dichloromethane	7.4U ug/Kg	A
TRNC-D-6	TSB-FR-04-10'	Dichloromethane	8.5U ug/Kg	A
TRNC-D-6	TSB-FJ-01-0'	Dichloromethane	8.7U ug/Kg	A

LDC #: 18100F1 **VALIDATION COMPLETENESS WORKSHEET**
 SDG #: TRNC-D-6 Level III
 Laboratory: Test America

Date: 11/16/08
 Page: 6 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/16/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD . Y ²
IV.	Continuing calibration/ICV	SW	ICV 5.70
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	CCS 7
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 5 + 6
XVII.	Field blanks	SW	TB = 17, 18, 19, 21. E = 20 *

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

*ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

1	TSB-FJ-08-0'	5	11	TSB-GR-01-0'	35	21	TB5-11-16-07	SW	31	7329018MB W
2	TSB-FJ-08-10'	1	12	TSB-GR-01-5'	3	22	TSB-FJ-01-0'MS	S	32	7333508MB
3	TSB-FR-05-0'	1	13	TSB-GJ-06-0'	3	23	TSB-FJ-01-0'MSD	V	33	733521MB
4	TSB-FR-05-10'	1	14	TSB-GJ-06-5'	3	24	REMS		34	
5	TSB-FR-04-0'	1	15	TSB-GJ-01-0'	4	25	REMSD		35	
6	TSB-FR-07-0'-FD	1	16	TSB-GJ-01-5'	4	26			36	
7	TSB-FR-04-10'	1	17	TB3-11-16-07	1 W	27			37	
8	TSB-FJ-01-0'	2	18	TB1-11-16-07	2/3	28			38	
9	TSB-FJ-01-0'RE	2	19	TB4-11-16-07	4	29			39	
10	TSB-FJ-01-10'	2	20	RINSATE-4	5	30			40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethane	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethane**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethane	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethane	KKKK. Propionitrile
J. 1,2-Dichloroethane, 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-trifluoroethane	NNNN. <i>1,4-dioxane</i>
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. <i>2-nitropropane</i>
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethyvinyl 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. Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	GGG. p-isopropyltoluene	AAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBB. tert-Amyl methyl ether	VVVV.

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

LDC #: 2007/1
 SDG #: SARCELLO

VALIDATION FINDINGS WORKSHEET

Initial Calibration

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

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 Reviewer: [Signature]
 2nd Reviewer: [Signature]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 Did the laboratory perform a 5 point calibration prior to sample analysis? N/A
 Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's? N/A
 Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? N/A
 Did the initial calibration meet the acceptance criteria? N/A
 Were all %RSDs and RRFs within the validation criteria of ≤ 30 %RSD and ≥ 0.05 RRF? N/A

#	Date	Standard ID	Compound	Finding %RSD (Limit: $\leq 30.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/16/07	197C	PP NM		0.04881	MH=1, 7332018UB	✓ N/A
			PP NNNN		0.03735		
	11/16/07	197C	MWW		0.00331		✓
	11/13/07	197C	EE N/A		0.00932	M=15, 733508UB	✓ N/A
			EE N/A		0.04730	7335121UB	
	11/16/07	197C	MWW		0.00164		✓

LDC #: 18200F/1
 SDG #: 20201201

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260)
 Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
 Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 Were all %D and RRFs within the validation criteria of $\leq 25\%$ %D and ≥ 20.05 RRF?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/16/07	LCAL8827 (LCV)	Nonanal	39.75882		WAH20-1329018H13	IT 20/15 / A
	11/30/07	LCAL6902	B	64.95744			IT 20/15 / A
			NNNN	86.21807			
			AN	188			
			FP		0.14492		IT 20/15 / A
			FR		0.04910		IT 20/15 / A
			NU		0.03949		IT 20/15 / A
	11/30/07	LCAL6901	WWV		0.00354		IT 20/15 / A
	11/30/07	FAK28464	Dichloromethane	27.78400		3-8-22-23	IT 20/15 / A
			F	28.94367		7333528MB	IT 20/15 / A
			EEEC	33.03338			IT 20/15 / A
			EEEE		0.01239		IT 20/15 / A
			NI		0.04487		IT 20/15 / A
	11/30/07	FAK28465	WWV		0.00145		IT 20/15 / A
	11/30/07	FAK28500	Dichloromethane	32.20394		1-2-9-16-24-25	IT 20/15 / A
			EEEE	58.78688		7335721MB	IT 20/15 / A
			Abnormal	20.28801			IT 20/15 / A
			EEEE		0.01423		IT 20/15 / A
	11/30/07	FAK28501	WWV		0.00154		IT 20/15 / A

LDC #: 18122967
 SDG #: See below

VALIDATION FINDINGS WORKSHEET
 Blanks

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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: 11/29/07
 Conc. units: ug/l

Associated Samples: 3-8

Compound	Blank ID	Sample Identification								
		3	4	5	6	7	8			
PERKINELINE	33808MB									
Acetone	5.6	7.3/U	7.0/U	6.4/U	7.4/U	8.5/U	8.7/U			
cc	0.85	14/21U	16/22U	(ET)	13/22U	13/22U	14/20U			
CROL										

Blank analysis date: _____
 Conc. units: _____

Associated Samples: _____

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
CROL										

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 TIOs 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 #: 120071
 SDG #: See below

VALIDATION FINDINGS WORKSHEET
 Field Blanks

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

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Were field blanks identified in this SDG? N/A
 Were target compounds detected in the field blanks?
 Blank units: None Associated sample units: None
 Sampling date: 11/16/07
 Field blank type: (circle one) Field Blank / Rinseate / Trip Blank / Other: Field Blank

Associated Samples: 1-7

Compound	Blank ID	Sample Identification						
		3	4	5	6	7		
Methylene chloride	17							
Acetone								
Chloroform								
Dichloromethane	0.99	7.3/N	7.9/N	6.4/N	7.4/N	8.5/N		
CRCL								

Blank units: None Associated sample units: None
 Sampling date: 11/16/07
 Field blank type: (circle one) Field Blank / Rinseate / Trip Blank / Other: Field Blank

Associated Samples: 8-14

Compound	Blank ID	Sample Identification						
		3	4	5	6	7		
Methylene chloride	18							
Acetone								
Chloroform								
Dichloromethane	0.93	8.7/N						
CRCL								

CIRCLD RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLD 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 #: 18100F1
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
 Field Blanks

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

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

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: 10 Associated sample units: 10
 Sampling date: 11/16/07 Associated sample units: 10

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank
 Associated Samples: 15-16

Compound	Blank ID	Sample Identification									
Methylene chloride	19										
Acetone											
Chloroform											
Dichloromethane	0.92										
CRQL											

Blank units: 10 Associated sample units: 10
 Sampling date: 11/16/07
 Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank

Associated Samples: 22

Compound	Blank ID	Sample Identification									
Methylene chloride	21										
Acetone											
Chloroform											
Dichloromethane	0.86										
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 #: 18100FL
 SDG #: See below

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD, Soil / Water.
 N N/A Was a MS/MSD analyzed every 20 samples of each matrix?
 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
	22/33		N	54 (59-134)	()	()	8	No Qual
			RR	49 (56-133)	()	()		
			ZZZ	160 (49-150)	()	()		(see m)
				()	()	()		
				()	()	()		
				()	()	()		
	24/35		F	362 (33-150)	274 (33-150)	()	9	No Qual
			F	200 (46-150)	776 (46-150)	()		
			Y	218 (45-150)	224 (45-150)	()		
			N	257 (35-150)	249 (35-150)	()		
			N	174 (28-150)	169 (28-150)	()		
			0000	195 (20-150)	190 (20-150)	()		
			ZZZ	352 (49-150)	343 (49-150)	()		
			HH	217 (10-150)	206 (10-150)	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
		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	60-139%	≤ 21%	75-130%	≤ 13%		

LDC #: 18100F1
SDG #: see calen

VALIDATION FINDINGS WORKSHEET
Internal Standards

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Reviewer: [Signature]
2nd Reviewer: [Signature]

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".
Were all internal standard area counts within -50 to +100% of the associated calibration standard?
Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		8	FBZ	197429 (3227127-8908506)		✓ (N/A) (all)
			CBZ	1303200 (1361549-5448196)		✓
			ADCB	647186 (664537-2658106)		✓
		22 (US)	FBZ	1304629		No Qual
			CBZ	837626		✓
			ADCB	471131		✓

- (BCM) = Bromochloromethane
(DFB) = 1,4-Difluorobenzene
(CBZ) = Chlorobenzene-d5
(PFB) = Pentafluorobenzene
(ADCB) = 1,4-Dichlorobenzene-d4
(2DCB) = 1,2-Dichlorobenzene-d4

(FBZ) = Fluorobenzene

LDC #: 18100F1
 SDG #: SAC061

VALIDATION FINDINGS WORKSHEET
 Field Duplicates

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

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

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

Compound	Concentration ($\mu\text{g/g}$)		RPD
	5	6	
F	67	13	($\leq 5^2$)
Dichloromethane	6.4	7.4	
DD₂	0.47		
NN	4.5		

Compound	Concentration ($\mu\text{g/g}$)		⊕ RPD
	5	6	
F	67	13	54 (≤ 21) ✓ <i>detected</i>
Dichloromethane	6.4	7.4	1 ($\leq 5^2$) <i>Normal</i>
DD ₂	0.47	5.4	4.93 (≤ 5.4)
NN	4.5	22	17.5 (≤ 22) ✓

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 19, 2007
LDC Report Date: February 11, 2008
Matrix: Soil/Water
Parameters: Volatiles
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

TSB-GR-02-0'	TSB-GJ-04-0'MSD
TSB-GR-02-0'-FD	TSB-GJ-07-5'MS
TSB-GR-02-5'	TSB-GJ-07-5'MSD
TSB-GJ-04-0'	RINSATE-5MS
TSB-GJ-04-5'	RINSATE-5MSD
TSB-GJ-02-0'	
TSB-GJ-02-0'-FD	
TSB-GJ-02-5'	
TSB-GJ-07-0'	
TSB-GJ-07-5'	
TSB-GJ-05-0'	
TSB-GJ-05-5'	
TSB-GJ-03-0'	
TSB-GJ-03-5'	
RINSATE-5	
TB1-11-19-07	
TB2-11-19-07	
TB3-11-19-07	
TB4-11-19-07	
TSB-GJ-04-0'MS	

Introduction

This data review covers 18 soil samples and 7 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
RINSATE-5	All aromatic compounds	10	7	J- (all detects) UJ (all non-detects)	P

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

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

*III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 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
*11/16/07	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>*Iodomethane</u> Ethanol	0.04881 (≥ 0.05) 0.03735 (≥ 0.05) 0.03359 (≥ 0.05) 0.00331 (≥ 0.05)	All water samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects)	A

*Indicates change as the result of report review.
SDG TRNC-D-7

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/13/07	Acetonitrile Methyl ethyl ketone	0.00932 (≥ 0.05) 0.04730 (≥ 0.05)	All soil samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/17/07	Ethanol	0.00164 (≥ 0.05)	All soil samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects)	A

*Changed compound Nonanal to Iodomethane in above table

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
11/30/07 (FCAL8500)	Dichloromethane Acetonitrile Nonanal	32.20394 52.78688 28.28801	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-04-0'MS TSB-GJ-04-0'MSD 7335121MB	J+ (all detects) J+ (all detects) J+ (all detects)	A
11/29/07 (LCAL7103)	Bromomethane	173	All water samples in SDG TRNC-D-7	J+ (all detects)	A
12/3/07 (FCAL8567)	Acetonitrile	39.05814	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5' TSB-GJ-07-5'MS TSB-GJ-07-5'MSD 7338138MB	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.

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
11/30/07 (FCAL8500)	Acetonitrile	0.01423 (≥ 0.05)	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-04-0'MS TSB-GJ-04-0'MSD 7335121MB	J (all detects) UJ (all non-detects)	A
11/30/07 (FCAL8501)	Ethanol	0.00164 (≥ 0.05)	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-04-0'MS TSB-GJ-04-0'MSD 7335121MB	J (all detects) UJ (all non-detects)	A
11/29/07 (LCAL7103)	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane	0.04008 (≥ 0.05) 0.04763 (≥ 0.05) 0.04435 (≥ 0.05) 0.03242 (≥ 0.05)	All water samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects)	A
11/29/07 (LCAL7104)	Ethanol	0.00322 (≥ 0.05)	All water samples in SDG TRNC-D-7	J (all detects) UJ (all non-detects)	A
12/3/07 (FCAL8567)	Acetonitrile Methyl ethyl ketone	0.01296 (≥ 0.05) 0.04819 (≥ 0.05)	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5' TSB-GJ-07-5'MS TSB-GJ-07-5'MSD 7338138MB	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
12/3/07 (FCAL8566)	Ethanol	0.00134 (≥ 0.05)	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5' TSB-GJ-07-5'MS TSB-GJ-07-5'MSD 7338138MB	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
7334157MB	11/29/07	Dichloromethane	0.60 ug/L	All water samples in SDG TRNC-D-7

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
TB1-11-19-07	Dichloromethane	0.96 ug/L	1.0U ug/L
TB2-11-19-07	Dichloromethane	0.83 ug/L	1.0U ug/L
TB3-11-19-07	Dichloromethane	1.0 ug/L	1.0U ug/L
TB4-11-19-07	Dichloromethane	0.93 ug/L	1.0U ug/L

Samples TB1-11-19-07, TB2-11-19-07, TB3-11-19-07, and TB4-11-19-07 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
TB1-11-19-07	11/19/07	Dichloromethane Trichloroethene	0.96 ug/L 0.45 ug/L	TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'
TB2-11-19-07	11/19/07	Dichloromethane Trichloroethene	0.83 ug/L 0.27 ug/L	TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'
TB3-11-19-07	11/19/07	Dichloromethane Trichloroethene	1.0 ug/L 0.24 ug/L	All soil samples in SDG TRNC-D-7
TB4-11-19-07	11/19/07	Dichloromethane	0.93 ug/L	RINSATE-5

Sample "RINSATE-5" was identified as a rinsate. No volatile contaminants were found in this blank with the following exceptions:

Rinsate ID	Sampling Date	Compound	Concentration	Associated Samples
RINSATE-5	11/19/07	Trichloroethene	0.17 ug/L	All soil samples in SDG TRNC-D-7

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-GJ-03-0'	Dichloromethane	3.1 ug/Kg	5.0U 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
TB4-11-19-07	Bromofluorobenzene	116 (71-115)	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. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
RINSATE-5MS/MSD (RINSATE-5)	Bromomethane	297 (25-150)	332 (25-150)	-	J+ (all detects)	A

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 with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
7341571LCS/D (All water samples in SDG TRNC-D-7)	Bromomethane	270 (38-140)	312 (38-140)	-	J+ (all detects)	P

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-GJ-03-0'	Fluorobenzene	669276 (692014-2768056)	Chloroethane Chloroform Chloromethane Dibromomethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene cis-1,2-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloroethene, total 1,2-Dichloropropane 2,2-Dichloropropane 1,1-Dichloropropene cis-1,3-Dichloropropene Ethanol Trichlorofluoromethane Acetone Acetonitrile Benzene Chlorobromomethane Bromodichloromethane Bromomethane Carbon disulfide Carbon tetrachloride Iodomethane Dichloromethane 1,1,1-Trichloroethane Vinyl acetate Vinyl chloride Methyl-tert-butyl ether Methyl ethyl ketone Dichlorodifluoromethane 2,4-Dimethylpentane 2-Methylhexane 3-Methylhexane 3-Ethylpentane 2,2-Dimethylpentane 2,3-Dimethylpentane 3,3-Dimethylpentane 2,2,3-Trimethylbutane Trichloroethene	J (all detects) UJ (all non-detects)	P

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

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

XVI. Field Duplicates

Samples TSB-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-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-GR-02-0'	TSB-GR-02-0'-FD				
Acetone	8.1	6.4	-	1.7 (≤ 21)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'***	TSB-FJ-02-0'-FD**				
Acetone	21U	14	-	7 (≤ 21)	-	-
1,2,4-Trimethylbenzene	5.2U	0.45	-	4.75 (≤ 5.2)	-	-

***BRC Tronox Parcel C/D/F/G**
Volatiles - Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	RINSATE-5	Benzene Toluene Chlorobenzene Ethylbenzene Styrene Isopropylbenzene n-Propylbenzene 2-Chlorotoluene 1,3,5-Trimethylbenzene 4-Chlorotoluene tert-Butylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene 1,3-Dichlorobenzene p-Isopropyltoluene 1,4-Dichlorobenzene n-Butylbenzene 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene 1,3,5-Trichlorobenzene m,p-Xylenes o-Xylene *Bromobenzene *Xylenes, total	J- (all detects) UJ (all non-detects)	P	Technical holding times
*TRNC-D-7	RINSATE-5 TB1-11-19-07 TB2-11-19-07 TB3-11-19-07 TB4-11-19-07	Bromochloromethane 1,2-Dibromo-3-chloropropane <u>*Iodomethane</u> Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0'	Dichloromethane Acetonitrile Nonanal	J+ (all detects) J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-7	RINSATE-5 TB1-11-19-07 TB2-11-19-07 TB3-11-19-07 TB4-11-19-07	Bromomethane	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-7	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Acetonitrile	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0'	Acetonitrile Ethanol	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-7	RINSATE-5 TB1-11-19-07 TB2-11-19-07 TB3-11-19-07 TB4-11-19-07	Iodomethane Bromochloromethane Dibromomethane 1,2-Dibromo-3-chloropropane Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-7	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Acetonitrile Methyl ethyl ketone Ethanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-7	TB4-11-19-07	Nonanal	J+ (all detects)	A	Surrogate spikes (%R)
TRNC-D-7	RINSATE-5	Bromomethane	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	RINSATE-5 TB1-11-19-07 TB2-11-19-07 TB3-11-19-07 TB4-11-19-07	Bromomethane	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-7	TSB-GJ-03-0'	Chloroethane Chloroform Chloromethane Dibromomethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethene cis-1,2-Dichloroethene trans-1,2-Dichloroethene 1,2-Dichloroethene, total 1,2-Dichloropropane 2,2-Dichloropropane 1,1-Dichloropropene cis-1,3-Dichloropropene Ethanol Trichlorofluoromethane Acetone Acetonitrile Benzene Chlorobromomethane Bromodichloromethane Bromomethane Carbon disulfide Carbon tetrachloride Iodomethane Dichloromethane 1,1,1-Trichloroethane Vinyl acetate Vinyl chloride Methyl-tert-butyl ether Methyl ethyl ketone Dichlorodifluoromethane 2,4-Dimethylpentane 2-Methylhexane 3-Methylhexane 3-Ethylpentane 2,2-Dimethylpentane 2,3-Dimethylpentane 3,3-Dimethylpentane 2,2,3-Trimethylbutane Trichloroethene	J (all detects) UJ (all non-detects)	P	Internal standards (area)

*Corrected compound in above initial calibration (RRF) finding for water samples in this SDG.

BRC Tronox Parcel C/D/F/G

Volatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-7	TB1-11-19-07	Dichloromethane	1.0U ug/L	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
TRNC-D-7	TB2-11-19-07	Dichloromethane	1.0U ug/L	A
TRNC-D-7	TB3-11-19-07	Dichloromethane	1.0U ug/L	A
TRNC-D-7	TB4-11-19-07	Dichloromethane	1.0U ug/L	A

BRC Tronox Parcel C/D/F/G

Volatiles - Field Blank Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Compound	Modified Final Concentration	A or P
TRNC-D-7	TSB-GJ-03-0'	Dichloromethane	5.0U ug/Kg	A

LDC #: 18100G1
 SDG #: TRNC-D-7
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 11/19/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/19/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD. 1.2
IV.	Continuing calibration/ICV	SW	11/19/07
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	11/19/07
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D=1+2. 6+7
XVII.	Field blanks	SW	R=15. TB=16.17.18.19

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

Validated Samples:

1	3	TSB-GR-02-0'	5	11	2	TSB-GJ-05-0'	29	21	TSB-GJ-04-0'MSD	5	31	T334 15TB W
2	3	TSB-GR-02-0'-FD	1	12	2	TSB-GJ-05-5'	21	22	TSB-GJ-07-5'MS	32		T337 20TB W
3	3	TSB-GR-02-5'	1	13	2	TSB-GJ-03-0'	2	23	TSB-GJ-07-5'MSD	33		T338 13TB S
4	3	TSB-GJ-04-0'	1	14	2	TSB-GJ-03-5'	2	24	RINSATE-5MS	W	34	T335 12TB S
5	3	TSB-GJ-04-5'	1	15	1	RINSATE-5	x	25	RINSATE-5MSD	35		
6	3	TSB-GJ-02-0'	2	16		TB1-11-19-07	2	26			36	
7	3	TSB-GJ-02-0'-FD	2	17		TB2-11-19-07	2	27			37	
8	3	TSB-GJ-02-5'	2	18		TB3-11-19-07	1	28			38	
9	3	TSB-GJ-07-0'	2	19		TB4-11-19-07	2	29			39	
10	3	TSB-GJ-07-5'	2	20	3	TSB-GJ-04-0'MS	5	30			40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropane	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. Tetrachloroethane	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethane**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethane	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethane	KKKK. Propionitrile
J. 1,2-Dichloroethane, 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. 1,4-dimethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. 2,2-Dimethylpentane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. 2,4'-Dimethylpentane
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Diisopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	GGG. p-isopropyltoluene	AAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBB. tert-Amyl methyl ether	VVVV.

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

Aromatics

LDC #: 1810051
 SDG #: SEC COLBY

VALIDATION FINDINGS WORKSHEET

Technical Holding Times

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

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

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)							
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	<u>Analysis date</u>	Total # of Days	Qualifier
15	W	N	11-19-07	NA	11-29-07	10	5/14/P *

TECHNICAL HOLDING TIME CRITERIA

- Water unpreserved: *
 - Water preserved: *
 - Soil: *
- * Aromatic within 7 days, non-aromatic within 14 days of sample collection.
 Both within 14 days of sample collection.

LDC #: 18007
 SDG #: See column

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
 Reviewer: R
 2nd Reviewer: C

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
 N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?
 Y N/A Did the initial calibration meet the acceptance criteria?
 Y 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: $\leq 30.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	1/16/07	10A	PP		0.04881	MH01s	N/A
		(C)	NY		0.03735	7334157MB	N/A
	1/16/07	10A	PP WNW		0.03359		↓
		(C)			0.00331		
	1/17/07	10A	SEE		0.00932	M5016, T338138MB	N/A
		(F)	NN		0.04730	T335131MB	↓
	1/17/07	10A	WNW		0.00164	T338138MB	↓

LDC #: 1810051
 SDG #: 202016V

VALIDATION FINDINGS WORKSHEET
 Continuing Calibration

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

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A
 N N/A
 Y N/A
 Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 Were all %D and RRFs within the validation criteria of ≤ 25 %D and ≥ 0.05 RRF?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
11/30/01	FCAL8500	Dichloromethane	EEEE	32.20394		1-9-20-21	Y+Delete/A
		Nonanal	EEEE	52.78688		T335/31MB	Y
		Nonanal	EEEE	28.28801			Y
11/30/01	FCAL8501	WINN	WINN		0.01423 0.00162		Y/M/A
11/29/01	LOAL7103	B	NNNN	173		11/15/03 T334/157MB	Y+Delete/A Y/M/A
		NNNN	NNNN		0.04008 0.04763		Y
		PP	PP		0.04435		Y
		MM	MM		0.03242		Y
11/29/01	LOAL7104	WINN	WINN		0.00322		Y
12/3/01	FCAL8567	EEEE	EEEE	39.05814		10-14-22-23	Y+Delete/A
		EEEE	EEEE		0.01296 0.04819	T338/38MB	Y/M/A
12/3/01	FCAL8566	NN	NN				Y
		WINN	WINN		0.00134		Y

LDC #: 1810041
SDG #: See cover

VALIDATION FINDINGS WORKSHEET Blanks

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

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
Y N N/A
Y N N/A

Was a method blank associated with every sample in this SDG? Yes No N/A

Was a method blank analyzed at least once every 12 hours for each matrix and concentration? Yes No N/A

Was there contamination in the method blanks? If yes, please see the qualifications below.
Blank analysis date: 1/29/07

Conc. units: ug/L
Associated Samples: 16 17 18 19
[Signature]

Compound	Blank ID	Sample Identification
Methylene chloride	13, 15, 16	16 17 18 19
Acetone	0.60	0.96/1.00 83/0.10/0.093/0.014
Dichloromethane		
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 #: BMSF/
SDG #: Se. cover

VALIDATION FINDINGS WORKSHEET Field Blanks

Page: 1 of 1
Reviewer: _____
2nd Reviewer: _____

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

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: MS/L Associated sample units: US/KS
Sampling date: 11/19/07
Field blank type: (circle one) Field Blank Rinsate Trip Blank / Other: _____ Associated Samples: All soils

Compound	Blank ID	Sample Identification
Methylene chloride	<u>15</u>	
Acetone		
Chloroform		
<u>S</u>	<u>0.17</u>	
CRQL		

Blank units: MS/L Associated sample units: US/KS
Sampling date: 11/19/07
Field blank type: (circle one) Field Blank / Rinsate Trip Blank / Other: _____ Associated Samples: 6-14

Compound	Blank ID	Sample Identification
Methylene chloride	<u>16</u>	
Acetone		
Chloroform		
<u>Dichloromethane</u>	<u>0.96</u>	<u>31/5.01</u>
<u>S</u>	<u>0.45</u>	<u>0.7</u>
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 #: B1021
SDG #: 200101

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: g
2nd Reviewer: g

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

Y N/A Were field blanks identified in this SDG?
 N/A Were target compounds detected in the field blanks?
Blank units: ug/L Associated sample units: ug/L
Sampling date: 11/19/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank

Associated Samples: All soils

Compound	Blank ID	Sample Identification
Methylene chloride	<u>18</u>	
Acetone		
Chloroform		
<u>Dichloromethane</u>	<u>1.0</u>	<u>31/5.0</u>
<u>S</u>	<u>0.24</u>	
CRQL		

Blank units: ug/L Associated sample units: ug/L
Sampling date: 11/19/07
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Field Blank

Associated Samples: 15

Compound	Blank ID	Sample Identification
Methylene chloride	<u>19</u>	
Acetone		
Chloroform		
<u>Dichloromethane</u>	<u>0.93</u>	
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 #: 121005-1
SDG #: See cover

VALIDATION FINDINGS WORKSHEET

Surrogate Spikes

Page: 101
Reviewer: [Signature]
2nd Reviewer: [Signature]

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? [Signature]
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
		<u>19</u>	<u>BFB</u>	<u>116</u> (71-115)	<u>1+ delets / A (No manual)</u>

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

LDC #: 1812052
SDG #: See below

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

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

N / A Was a LCS required?
 Y / N 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
		7334157 LCS	B	76 (38-140)	312 (38-140)	()	MH=DS	- 1+ sheets P
		7334157 LCS	NNNN	()	213 (33-140)	60 (≤20)	7334157 HB	No Gen al (see in)
			HH	()	141 (23-140)	44 (√)		↓
		7335214 LCS	HH	157 (56-115)	()	()	1-9.7335214 HB	No Gen al
				()	()	()		1+ sheets
				()	()	()		(MS/MSD in)
		7338138 <CS	HH	72 (56-115)	()	()	10-14.7338138 HB	No Gen al
				()	()	()		(MS/MSD in)
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
				()	()	()		
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LDC #: 1810061
 SDG #: Becken

VALIDATION FINDINGS WORKSHEET
Internal Standards

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

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 internal standard area counts within -50 to +100% of the associated calibration standard?
 Y N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		13	FBZ	66976 (693014-2768256)		Y/N/A

(BCM) = Bromochloromethane
 (DFB) = 1,4-Difluorobenzene
 (CBZ) = Chlorobenzene-d5
 (PFB) = Pentafluorobenzene
 (4DCB) = 1,4-Dichlorobenzene-d4
 (2DCB) = 1,2-Dichlorobenzene-d4
 (FBZ) = Fluorobenzene

INTST.1SB

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: TRNC/D-7 Work Order #....: KDAJ31AA Matrix.....: WATER
 MB Lot-Sample #: F7K300000-157 Prep Date.....: 11/29/07 Analysis Time...: 13:02
 Analysis Date...: 11/29/07 Prep Batch #....: 7334157
 Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
[REDACTED]	ND	2.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	2.0	ug/L	SW846 8260B
2-Chlorotoluene	ND	1.0	ug/L	SW846 8260B
4-Chlorotoluene	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
1,2-Dichlorobenzene	ND	1.0	ug/L	SW846 8260B
1,3-Dichlorobenzene	ND	1.0	ug/L	SW846 8260B
1,4-Dichlorobenzene	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	2.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
1,3-Dichloropropane	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	250	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
n-Heptane	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	2.0	ug/L	SW846 8260B
[REDACTED]	ND	10	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
Bromobenzene	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
Bromoform	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	2.0	ug/L	SW846 8260B
n-Butylbenzene	ND	1.0	ug/L	SW846 8260B
sec-Butylbenzene	ND	1.0	ug/L	SW846 8260B
tert-Butylbenzene	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
Chlorobenzene	ND	1.0	ug/L	SW846 8260B
Chlorodibromomethane	ND	1.0	ug/L	SW846 8260B

(Continued on next page)

[REDACTED] FB2

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: TRNC/D-7

Work Order #...: KDAJ31AA

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
2-Hexanone	ND	5.0	ug/L	SW846 8260B
[REDACTED]	ND	2.0	ug/L	SW846 8260B
Isopropylbenzene	ND	1.0	ug/L	SW846 8260B
p-Isopropyltoluene	ND	1.0	ug/L	SW846 8260B
[REDACTED]	0.60 J	1.0	ug/L	SW846 8260B
4-Methyl-2-pentanone	ND	5.0	ug/L	SW846 8260B
2-Nitropropane	ND	10	ug/L	SW846 8260B
n-Propylbenzene	ND	1.0	ug/L	SW846 8260B
Styrene	ND	1.0	ug/L	SW846 8260B
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260B
Tetrachloroethene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
1,2,3-Trichlorobenzene	ND	1.0	ug/L	SW846 8260B
1,2,4-Trichlorobenzene	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846 8260B
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	1.0	ug/L	SW846 8260B
1,2,4-Trimethylbenzene	ND	1.0	ug/L	SW846 8260B
1,3,5-Trimethylbenzene	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	2.0	ug/L	SW846 8260B
[REDACTED]	ND	2.0	ug/L	SW846 8260B
o-Xylene	ND	1.0	ug/L	SW846 8260B
Xylenes (total)	ND	3.0	ug/L	SW846 8260B
[REDACTED]	ND	2.0	ug/L	SW846 8260B
m-Xylene & p-Xylene	ND	2.0	ug/L	SW846 8260B
1,3,5-Trichlorobenzene	ND	5.0	ug/L	SW846 8260B
1,2-Dibromo-3-chloropropane (DBCP)	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	5.0	ug/L	SW846 8260B
[REDACTED]	ND	2.0	ug/L	SW846 8260B
(Freon 12)	ND	5.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	10	ug/L	SW846 8260B
[REDACTED]	ND	10	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B
[REDACTED]	ND	1.0	ug/L	SW846 8260B

(Continued on next page)

LDC #: 1810061
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: G
 2nd reviewer: W

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 (<u>µg/gst</u>)		D RPD
	1	2	
F	8.1	6.4	1.T (≤=1) <i>No Equal</i>

Compound	Concentration (<u>µg/gst</u>)		D RPD
	6	7	
F	0.11	14	7 (≤=1) <i>No Equal</i>
DD	5.211	0.45	4.5 (≤=5) ✓

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

**BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100**

Semivolatiles

LDC

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 9, 2007
LDC Report Date: January 23, 2008
Matrix: Soil/Water
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
RINSATE 1MS
RINSATE 1MSD

Introduction

This data review covers 13 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 8270C for Semivolatiles.

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

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
TSB-CJ-03-0'	All TCL compounds	17	14	J- (all detects) UJ (all non-detects)	A

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).

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
11/20/07 (ICAL1990)	Benzoic acid	28.03619	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CR-07-0'MS TSB-CR-07-0'MSD 7318065MB	J+ (all detects)	A
11/20/07 (ICAL1992)	N-(Hydroxymethyl)phthalimide	28.48742	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CR-07-0'MS TSB-CR-07-0'MSD 7318065MB	J+ (all detects)	A
11/21/07 (ICAL2035)	N-(Hydroxymethyl)phthalimide	29.40416	TSB-CJ-03-10'	J+ (all detects)	A
11/20/07 (ICAL2011)	N-(Hydroxymethyl)phthalimide	40.96823	RINSATE 1 RINSATE 1MS RINSATE 1MSD 7318085MB	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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/07 (ICAL1887)	Hexachlorocyclopentadiene	29.20492	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-10' RINSATE 1 TSB-CR-07-0'MS TSB-CR-07-0'MSD RINSATE 1MS RINSATE 1MSD 7318065MB 7318085MB	J- (all detects) UJ (all non-detects)	A
11/12/07 (ICAL1887)	Chrysene	29.99656	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-10' RINSATE 1 TSB-CR-07-0'MS TSB-CR-07-0'MSD RINSATE 1MS RINSATE 1MSD 7318065MB 7318085MB	J+ (all detects)	A

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.

Sample RINSATE-1 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. Although the MSD percent recovery (%R) and relative percent difference (RPD) was not within QC limits for some compounds, the MS or LCS percent recoveries (%R) and relative percent differences (RPD) 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 recoveries (%R) were not within QC limits for some compounds, the MS or 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 are summarized at the end of the report if data has been qualified.

XVI. Field Duplicates

Samples TSB-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD			
Hexachlorobenzene	35	340U	305 (≤340)	-	-

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CJ-03-0'	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' RINSATE 1	Benzoic acid N-(Hydroxymethyl)phthalimide	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-03-10'	N-(Hydroxymethyl)phthalimide	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-10' RINSATE 1	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-10' RINSATE 1	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)

BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-1

No Sample Data Qualified in this SDG

LDC #: 18100A2
 SDG #: TRNC-D-1
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11/9/08
 Page: 6 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/9/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD = 12
IV.	Continuing calibration/ICV	SW	ICV = 2570
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS = 1
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	X = 3 + 4
XVII.	Field blanks	ND	R = 12

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

Validated Samples:

1	TSB-CR-07-0'	S	11	3	TSB-CJ-03-10'	S	21	1	7318065MB	31	S
2	TSB-CR-07-10'		12	2	RINSATE 1	W	22	2	7318085MB	32	
3	TSB-CJ-08-0'		13	1	TSB-CR-07-0'MS	S	23	1	7330071MB	33	S
4	TSB-CJ-08-0'-FD		14	1	TSB-CR-07-0'MSD	✓	24			34	
5	TSB-CJ-08-10'		15	2	RINSATE 1MS	W	25			35	
6	TSB-CJ-04-0'		16	2	RINSATE 1MSD	✓	26			36	
7	TSB-CJ-04-10'		17				27			37	
8	TSB-CJ-07-0'		18				28			38	
9	TSB-CJ-07-10'		19				29			39	
10	TSB-CJ-03-0'	✓	20				30			40	

VALIDATION FINDINGS WORKSHEET

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

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

VALIDATION FINDINGS WORKSHEET

Technical Holding Times

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

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
10	S	X	11-9-07	11-26-07	12-1-07	17	JM/A

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

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

LDC #: 18100A-2
 SDG #: See COV
 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".
 Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
 Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 Were all %D and RRFs within the validation criteria of $\leq 25\%$ %D and ≥ 0.05 RRF?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/12/07	1CAL1887 (1 EV)	X DDA	29.20492 29.99656		1-9.11-16 7318085MB 7318085MB	N/A / D N/A / D
	11/20/07	1CAL1990 1CAL1992	PPF UUV	28.03619 28.48742		1-9.13-14 7318085MB	N/A / D N/A / D
	11/20/07	1CAL2035	UUV	29.40416		13.15-16 7318085MB-11	N/A / A
	11/20/07	1CAL2011	UUV	40.96823		13.15-16 7318085MB	N/A / D

LDC #: 18100A
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Surrogate Recovery

Page: 6 of 1
Reviewer: G
2nd Reviewer: R

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
Were percent recoveries (%R) for surrogates within QC limits?
N/A
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
N/A
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?
N/A

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		<u>18100SMB</u>	<u>FBP</u>	<u>48</u> (<u>50-100</u>)	<u>No Qual</u>
		<u>12</u>	<u>TBP</u>	<u>47</u> (<u>49-96</u>)	<u>✓</u>
				()	
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* QC limits are advisory
S1 (NBZ) = Nitrobenzene-d5 23-120
S2 (FBP) = 2-Fluorobiphenyl 30-115
S3 (TPH) = Terphenyl-d14 18-137
S4 (PHL) = Phenol-d5 24-113
S5 (2FP) = 2-Fluorophenol 25-121
S6 (TBP) = 2,4,6-Tribromophenol 19-122
S7 (2CP) = 2-Chlorophenol-d4 20-130*
S8 (DCB) = 1,2-Dichlorobenzene-d4 20-130*
QC Limits (Water)
21-100
10-123
33-110*
16-110*

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

LDC #: B110A
 SDG #: See CDKN

Page: 1 of 9
 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".

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

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

N 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
		<u>13/14</u>	<u>RPD out for General exp</u>	()	()	()	()	<u>No Qual</u>
			<u>HH</u>	()	<u>60 (40-100)</u>	()	()	<u>(To R in)</u>
				()	()	()	()	<u>No Qual (CCS in)</u>
				()	()	()	()	
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	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%					

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7318065 LCS	DDD	101 (46-97)	() ()	() ()	1-9-11-7318065 NB	No Anal (MS/MSD in)
		7318085 LCS	K	28 (30-77)	() ()	() ()	all 4 = 0/s	No Anal
			U	29 (30-86)	() ()	() ()	7318085 NB	
			X	27 (35-104)	() ()	() ()		
			DDD	97 (43-95)	() ()	() ()		
								(MS/MSD in)

LDC #: 18100A-2
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

Y N N/A
 Y N N/A

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

Compound	Concentration (<u>µg/g</u>)		RPD
	3	4	
SS	35	3404	305 (≤ 340) <i>Not equal</i>

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 12, 2007
LDC Report Date: January 23, 2008
Matrix: Soil
Parameters: Semivolatiles
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

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

This review follows 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

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

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

Average relative response factors (RRF) for all 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).

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
11/20/07 (ICAL2011)	N-(Hydroxymethyl)phthalimide	40.96823	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-01-0'MSD TSB-CR-01-0'MSD 7319097MB	J+ (all detects)	A
11/21/07 (ICAL2035)	N-(Hydroxymethyl)phthalimide	29.40416	TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/07 (ICAL1887)	Hexachlorocyclopentadiene	29.20492	All samples in SDG TRNC-D-2	J- (all detects) UJ (all non-detects)	A
11/12/07 (ICAL1887)	Chrysene	29.99656	All samples in SDG TRNC-D-2	J+ (all detects)	A

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.

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 recoveries (%R) were not within QC limits for some compounds, the MS or 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

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)

Tentatively identified compounds were not reported by the laboratory.

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-CJ-06-0' and TSB-CJ-06-0'-FD and samples TSB-CJ-01-0'** and TSB-CJ-01-0'-FD** were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD			
Octachlorostyrene	340U	39	301 (≤ 340)	-	-
Hexachlorobenzene	340U	330	10 (≤ 340)	-	-

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	N-(Hydroxymethyl)phthalimide	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-2	TSB-CJ-02-0'** TSB-CJ-02-10'** TSB-CJ-01-0'** TSB-CJ-01-10'** TSB-CJ-01-0'-FD** TSB-CR-02-0'** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-2**

No Sample Data Qualified in this SDG

LDC #: 18100B2
 SDG #: TRNC-D-2
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 11/2/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/12/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD < 1%
IV.	Continuing calibration/ICV	M	ICV < 25%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	M	CCS
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)	N	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	M	D = 3 + 5*. 14 + 15
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

1	TSB-CJ-02-0***	17	TSB-CR-03-10'	21	7319097MB	31	
2	TSB-CJ-02-10***	12	TSB-CJ-05-0'	22		32	
3	TSB-CJ-01-0***	13	TSB-CJ-05-10'	23		33	
4	TSB-CJ-01-10***	14	TSB-CJ-06-0'	24		34	
5	TSB-CJ-01-0'-FD**	15	TSB-CJ-06-0'-FD	25		35	
6	TSB-CR-02-0***	16	TSB-CJ-06-10'	26		36	
7	TSB-CR-02-10'	17	TSB-CR-01-0'MS	27		37	
8	TSB-CR-01-0'	18	TSB-CR-01-0'MSD	28		38	
9	TSB-CR-01-10'	19		29		39	
10	TSB-CR-03-0'	20		30		40	

VALIDATION FINDINGS CHECKLIST

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) $\leq 30\%$ 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) $\leq 25\%$ 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?	/			

VALIDATION FINDINGS CHECKLIST

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

VALIDATION FINDINGS WORKSHEET

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

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

XXX. Phenyl sulfide
 AAAA. N-(Hydroxymethyl)phthalimide
 ZZZ. 4-chlorophenyl sulfone
 COMPNDL-2S

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

LDC #: 18/02 B2
SDG #: SOCCOKA

Page: 6 of 9
Reviewer: [Signature]
2nd Reviewer: [Signature]

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

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

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

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

Y(N) N/A Were all %D and RRFs within the validation criteria of $\leq 25\%$ %D and ≥ 0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	<u>11/20/07</u>	<u>1CAL1887 (1CV)</u>	<u>X</u>	<u>29.20492</u>		<u>MT BK</u>	<u>N/A</u>
			<u>DDD</u>	<u>29.99656</u>			<u>N/A</u>
	<u>11/20/07</u>	<u>1CAL2011</u>	<u>AAA</u>	<u>40.96823</u>		<u>1-9.17-18 BK</u>	<u>N/A</u>
	<u>11/21/07</u>	<u>1CAL2035</u>	<u>AAA</u>	<u>29.40416</u>		<u>10-16</u>	<u>N/A</u>

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N/A Was a LCS required?
 Y (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)	LCS %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7319097LCS	DDD	110	46-97	()	M + BK	No Qual (MS/MSD IN)
				()	()	()		
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LDC #: B/00 B2
 SDG #: So cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: CR
 2nd reviewer: ✓

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

Y N N/A
Y N N/A

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

Compound	Concentration (<u>µg/kg</u>)		D RPD
	14	15	
<u>Detach/Nostyrene</u>	<u>3404</u>	<u>39</u>	<u>301 (≤340) No Anal</u>
<u>SS</u>	<u>↓</u>	<u>330</u>	<u>10 ↓</u>

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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

$RRF = (A_x)(C_s)/(A_s)(C_x)$
 average RRF = sum of the RRFs/number of standards
 $\%RSD = 100 * (S/X)$

A_x = Area of compound, A_s = Area of associated internal standard
 C_x = Concentration of compound, C_s = Concentration of internal standard
 S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (50 std)	RRF (50 std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	1eA	11/17/07	Phenol (1st internal standard)	1.96340	1.96340	1.88172	1.88172	3.87433	3.8742
			Naphthalene (2nd internal standard)	1.10806	1.10806	1.07477	1.07477	4.5600	4.5600
			Fluorene (3rd internal standard)	1.43536	1.43536	1.37592	1.37592	4.8429	4.8230
			Pentachlorophenol (4th internal standard) UUY	1.30164	1.30164	1.28737	1.28737	3.37315	3.39315
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.89601	0.89600	0.87134	0.87134	3.96949	3.9694
			Benzo(a)pyrene (6th internal standard)	1.23661	1.23666	1.19442	1.19442	3.34875	3.3486
2	1eA	11/19/07	Phenol (1st internal standard) TTT	0.41806	0.41806	0.47070	0.47070	1.61662	1.6163
			Naphthalene (2nd internal standard) UUY	0.49114	0.49114	0.47988	0.47988	2.70619	2.7061
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3	1eA	11/19/07	Phenol (1st internal standard) VVV	2.28635	2.28635	2.2555	2.2555	1.99529	1.9953
			Naphthalene (2nd internal standard) WNW	0.99032	0.99032	0.89089	0.89089	3.75902	3.3571
			Fluorene (3rd internal standard) XXX	1.37927	1.37927	1.34098	1.34098	2.13517	2.1352
			Pentachlorophenol (4th internal standard) YYY	0.60062	0.60062	0.56980	0.56980	6.5166	6.5788
			Bis(2-ethylhexyl)phthalate (5th internal standard) ZZZ	0.67224	0.67224	0.66380	0.66380	1.55063	1.55063
			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.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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

% Difference = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$ Where: ave. RRF = initial calibration average RRF
 RRF = $(A_x)(C_b) / (A_b)(C_x)$ RRF = continuing calibration RRF
 A_x = Area of compound, A_b = Area of associated internal standard
 C_x = Concentration of compound, C_b = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	1CA12010	11/20/07	Phenol (1st internal standard)	1.88172	1.98522	5.50052	1.98522	5.5004
			Naphthalene (2nd internal standard)	1.07477	1.10713	3.01138	1.10713	3.01097
			Fluorene (3rd internal standard)	1.31592	1.45499	5.74686	1.45499	5.7592
			Pentachlorophenol (4th internal standard)	1.28137	1.29725	0.76705	1.29725	0.76711
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.87134	0.87666	0.61101	0.87666	0.61088
			Benzo(a)pyrene (6th internal standard)	1.18442	1.22706	3.73259	1.22706	2.7329
2	1CA1201	11/20/07	Phenol (1st internal standard)	0.47070	0.48253	2.51243	0.48253	2.5124
			Naphthalene (2nd internal standard)	0.47988	0.48824	1.74197	0.48824	1.74266
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3	1CA12012	11/20/07	Phenol (1st internal standard)	2.22555	2.2487	1.03995	2.2487	1.04007
			Naphthalene (2nd internal standard)	0.09089	0.09220	1.43511	0.09220	1.43866
			Fluorene (3rd internal standard)	1.34098	1.39238	3.83251	1.39238	3.8327
			Pentachlorophenol (4th internal standard)	0.56980	0.60042	5.37353	0.60042	5.3737
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.66380	0.68125	2.62958	0.68125	2.6290
			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 #: 18100B-2
 SDG #: Seconley

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
 Reviewer: 9
 2nd reviewer: W

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

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

% Recovery: $SF/SS * 100$

Where: SF = Surrogate Found
 SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	50	34.0646	68		
2-Fluorobiphenyl	↓	35.7341	63		
Terphenyl-d14	↓	45.9166	89		
Phenol-d5	75	53.5335	68		
2-Fluorophenol	↓	50.8159	62		
2,4,6-Tribromophenol	↓	48.2973	71		
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	50	30.0275	60	60	0
2-Fluorobiphenyl	↓	31.7528	63	63	↓
Terphenyl-d14	↓	44.7055	89	89	↓
Phenol-d5	75	50.7812	68	68	↓
2-Fluorophenol	↓	46.7916	62	62	↓
2,4,6-Tribromophenol	↓	53.3847	71	71	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

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

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

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

% Recovery = $100 * (SSC - SC) / SA$ Where: SSC = Spiked sample concentration SC = Sample concentration
 RPD = $|MS - MSD| * 2 / (MS + MSD)$ MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 17/18

Compound	Spike Added (MS/MSD)		Sample Concentration (MS/MSD)	Spiked Sample Concentration (MS/MSD)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
Phenol	3380	3380	ND	2310	2220	68	68	66	66	3.8	4.0
N-Nitroso-di-n-propylamine				2570	2490	76	76	74	74	3.3	3.2
4-Chloro-3-methylphenol				2530	2530	75	75	75	75	0.04	0
Acenaphthene				2580	2530	76	76	75	75	1.8	2.0
Pentachlorophenol				2080	2200	62	62	65	65	5.5	5.6
Pyrene				2790	2910	83	83	86	86	4.1	4.2

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.

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

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

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

Where: SSC = Spike concentration
SA = Spike added

RPD = $100 * \frac{|LCS - LCSD|}{LCS + LCSD}$

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7319097

Compound	Spike Added (<u>10/15</u>)		Spike Concentration (<u>10/15</u>)		LCS		LCSD		Percent Recovery		Percent Recovery		RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	3330	NA	2270	NA	68	68								
N-Nitroso-di-n-propylamine			2550		77	77								
4-Chloro-3-methylphenol			2430		73	73								
Acenaphthene			2460		74	74								
Pentachlorophenol			2400		72	72								
Pyrene			2790		84	84								

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 #: 18100B2
 SDG #: SACOLV

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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

- 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?

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

- A_x = Area of the characteristic ion (EICP) for the compound to be measured
- A_s = 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_c = 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. 1-6, ND:

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

=

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

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 13, 2007
LDC Report Date: February 5, 2008
Matrix: Soil/Water
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'	RINSATE-2MS
TSB-DR-06-10'	RINSATE-2MSD
TSB-DR-05-0'	
TSB-DR-05-0'-FD	
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	
RINSATE-2	
TSB-DR-03-0'MS	
TSB-DR-03-0'MSD	

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 8270C for Semivolatiles.

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

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

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

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

Average relative response factors (RRF) for all 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).

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
11/20/07 (ICAL2011)	N-(Hydroxymethyl)phthalimide	40.96823	7319097MB	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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/07 (ICAL1887)	Hexachlorocyclopentadiene	29.20492	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' 7319097MB 7320067MB	J- (all detects) UJ (all non-detects)	A
11/12/07 (ICAL1887)	Chrysene	29.99656	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' 7319097MB 7320067MB	J+ (all detects)	A
11/27/07 (ICAL2111)	Hexachlorocyclopentadiene	27.65129	TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10' RINSATE-2 RINSATE-2MS RINSATE-2MSD 7323118MB	J- (all detects) UJ (all non-detects)	A

Date	Compound	%D	Associated Samples	Flag	A or P
11/27/07 (ICAL2111)	Chrysene	31.22409	TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10' RINSATE-2 RINSATE-2MS RINSATE-2MSD 7323118MB	J+ (all detects)	A

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.

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 recoveries (%R) were not within QC limits for some compounds, the MS or 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 are summarized at the end of the report if data has been qualified.

XVI. Field Duplicates

Samples TSB-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-3**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10' RINSATE-2	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10' RINSATE-2	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

LDC #: 18100C2
 SDG #: TRNC-D-3
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/11/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/13/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD: Y =
IV.	Continuing calibration/ICV	SW	ICV = 25%
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	SW	CC9
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 = 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:

1	TSB-DR-06-0'	5	11	TSB-DR-04-10'	S	21	RINSTATE-2MS	W	31	T31909TMB	S
2	TSB-DR-06-10'	10	12	TSB-CR-04-0'	1	22	RINSTATE-2MSD	V	32	T320067MB	V
3	TSB-DR-05-0'	1	13	TSB-CR-04-10'	1	23			33	T323118MB	
4	TSB-DR-05-0'-FD	1	14	TSB-CR-05-0'	X	24			34		
5	TSB-DR-05-10'	1	15	TSB-CR-05-10'	1	25			35		
6	TSB-DR-03-0'	1	16	TSB-CR-06-0'	1	26			36		
7	TSB-DR-03-10'	1	17	TSB-CR-06-10'	1	27			37		
8	TSB-DJ-01-0'	1	18	RINSTATE-2	W	28			38		
9	TSB-DJ-01-10'	1	19	TSB-DR-03-0'MS	S	29			39		
10	TSB-DR-04-0'	1	20	TSB-DR-03-0'MSD	V	30			40		

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis(2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. <i>N-CH₃hexylmethylphthalimide</i>
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.

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

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

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

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

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/2/07	1CAL1887 (1CV)	X DDD	29.20492 29.99656		1-14. 7319097MB 7320067MB	N/A / A N/A / A
	11/27/07	1CAL2111 (1CV)	X DDD	27.65129 31.222419		15-18. 21-22 7323118MB	N/A / A N/A / A
	11/20/07	1CAL2011	TTT	40.96823		1-14. 7320067MB 7319097MB	N/A / A

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Was a LCS required?
 Y 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)	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		T319097LCS	DDD	110 (46-97)	()	()	()	1-5-T319097MB	No Qual (MS/MSD in)
				()	()	()	()		
				()	()	()	()		
		T32006T-C-S	DDD	107 (46-97)	()	()	()	6-17-T32006TMB	No Qual (MS/MSD in)
				()	()	()	()		
				()	()	()	()		
				()	()	()	()		
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 14, 2007
LDC Report Date: January 23, 2008
Matrix: Soil
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW-DITCH01-0'
JB-NW-DITCH01-10'

Introduction

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

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

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

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

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

Average relative response factors (RRF) for all 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).

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
11/28/07 (ICAL2152)	Bis(2-chloroisopropyl)ether	25.06818	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J- (all detects) UJ (all non-detects)	A
11/28/07 (ICAL2152)	2,4-Dinitrophenol	29.26967	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J+ (all detects)	A
11/28/07 (ICAL 2154)	N-(Hydroxymethyl)phthalimide Phthalic acid	33.87537 25.37305	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A

The percent difference (%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
11/12/07 (ICAL1887)	Hexachlorocyclopentadiene	29.20492	7320067MB	J- (all detects) UJ (all non-detects)	A
11/12/07 (ICAL1887)	Chrysene	29.99656	7320067MB	J+ (all detects)	A

Date	Compound	%D	Associated Samples	Flag	A or P
11/27/07 (ICAL2111)	Hexachlorocyclopentadiene	27.65129	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J- (all detects) UJ (all non-detects)	A
11/27/07 (ICAL2111)	Chrysene	31.22409	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J+ (all detects)	A

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.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

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

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
7324092LCS	3,3'-Dichlorobenzidine	65 (18-58)	TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10' 7324092MB	J+ (all detects)	P

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

XVI. Field Duplicates

Samples TSB-FJ-06-0' and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD			
N-(Hydroxymethyl)phthalimide	120	340U	220 (≤ 340)	-	-
Phenol	440	340U	100 (≤ 340)	-	-
Benzyl alcohol	340	340U	0 (≤ 340)	-	-
Acetophenone	62	340U	270 (≤ 340)	-	-
Di-n-butylphthalate	4700	47	4653 (≤ 340)	J (all detects)	A
Fluoranthene	41	340U	299 (≤ 340)	-	-
Chrysene	43	340U	297 (≤ 340)	-	-
Bis(2-ethylhexyl)phthalate	94	340U	246 (≤ 340)	-	-
Di-n-octylphthalate	280	210	70 (≤ 340)	-	-
Benzoic acid	230	1600U	1370 (≤ 1600)	-	-

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Bis(2-chloroisopropyl)ether N-(Hydroxymethyl)phthalimide Phthalic acid	J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
TRNC-D-4	TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	2,4-Dinitrophenol	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	3,3'-Dichlorobenzidine	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	Di-n-butylphthalate	J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G

Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G

Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

LDC #: 18100D2
 SDG #: TRNC-D-4
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/21/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/14/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD. Y ²
IV.	Continuing calibration/ICV	TW	ICV ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	TW	No sp. ass'd - No equal
VIII.	Laboratory control samples	TW	LCs
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	TW	D = 5 + 6 · 12 + 14 *
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:

MS 3/1/2

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21	7320067 MB	31
2	TSB-FR-01-10'	12	TSB-DR-02-0'	22	7324092 MB	32
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD	24		34
5	TSB-FJ-06-0'	15	JB-NW-DITCH01-0'	25		35
6	TSB-FJ-06-0'-FD	16	JB-NW-DITCH01-10'	26		36
7	TSB-FJ-06-10'	17		27		37
8	TSB-FJ-05-0'	18		28		38
9	TSB-FJ-05-10'	19		29		39
10	TSB-DR-01-0'	20		30		40

VALIDATION FINDINGS WORKSHEET

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

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

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
 N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
 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: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	<u>11/13/07</u>	<u>1CA21887</u> <u>(1CV)</u>	<u>X</u> <u>DDA</u>	<u>29.20492</u> <u>29.99656</u>		<u>T32067MB</u>	<u>J-UN/A</u> <u>+dets/A</u>
	<u>11/27/07</u>	<u>1CA2111</u> <u>(1CV)</u>	<u>X</u> <u>DDA</u>	<u>27.65129</u> <u>31.22409</u>		<u>MW.T32409MB</u>	<u>J-UN/A</u> <u>+dets/A</u>
	<u>11/28/07</u>	<u>1CA2152</u>	<u>MMM</u> <u>HH</u>	<u>25.06818</u> <u>29.26967</u>		<u>T-16.T32409MB</u>	<u>J-UN/A</u> <u>+dets/A</u>
	<u>11/28/07</u>	<u>1CA2154</u>	<u>VUU</u> <u>TIT</u>	<u>25.37305</u> <u>33.87537</u>			<u>J-UN/A</u> <u>+dets/A</u>

LDC #: 18/0002
SDG #: See above

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Page: 4 of 7
Reviewer: [Signature]
2nd Reviewer: [Signature]

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

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

N/N/A Was a LCS required?

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
		T320067 LCS	DDD	107 (46-97)	()	()	1-7. T320067MS	No Qual (MS/MSD in)
		T324092 LCS	BBB	65 (18-58)	()	()	8-16. T324092MS	† detects No Qual (MS/MSD in)
			DDD	111 (46-97)	()	()		
				()	()	()		
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LDC #: 18/00 D2
 SDG #: Se cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

Y N N/A
 X N N/A

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

qual parent

Compound	Concentration (<i>µg/kg</i>)		RPD
	5	6	
TTT	120	340 U	220 (≤340) No Qual
A	440	↓	100 ↓
AAA	340	↓	0 ↓
Acetophenone	62	↓	270 ↓
XX	4700	47	4653 (≤340) det/A
YY	41	340 U	299 No Qual
Compound	Concentration ()		RPD
DDD	43	↓	297 ↓
ZZZ	94	↓	246 ↓
FFF	280	210	70 (≤340) No Qual
PPP	230	1600 U	1370 (≤1600) ↓

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 15, 2007
LDC Report Date: January 23, 2008
Matrix: Soil/Water
Parameters: Semivolatiles
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-03-10'**
TSB-FJ-10-0'**
TSB-FJ-10-10'**
TSB-FJ-04-0'**
TSB-FJ-04-10'**
TSB-FJ-02-0'**
TSB-FJ-02-0'-FD**
TSB-FJ-02-10'**
TSB-FR-02-0'**
TSB-FR-02-10'**
TSB-FJ-09-0'**
TSB-FJ-09-10'**
TSB-FR-03-0'**
TSB-FR-03-10'**
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 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.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

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

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

Average relative response factors (RRF) for all 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).

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
11/28/07 (ICAL2152)	Bis(2-chloroisopropyl)ether	25.06818	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FR-02-0'*** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J- (all detects) UJ (all non-detects)	A
11/28/07 (ICAL2152)	2,4-Dinitrophenol	29.26967	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FR-02-0'*** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J+ (all detects)	A
11/28/07 (ICAL2154)	Phthalic acid N-(Hydroxymethyl)phthalimide	25.37307 33.87537	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FR-02-0'*** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A

The percent difference (%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
11/27/07 (ICAL2111)	Hexachlorocyclopentadiene	27.65129	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FR-02-0'*** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J- (all detects) UJ (all non-detects)	A
11/27/07 (ICAL2111)	Chrysene	31.22409	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FR-02-0'*** TSB-FR-02-0'MS TSB-FR-02-0'MSD 7324092MB	J+ (all detects)	A

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.

Sample RINSATE-3 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. 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. Although the LCS percent recoveries (%R) were not within QC limits for some compounds, the MS or 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 with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FR-02-0***	Perylene-d12	236275 (360694-1442774)	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FJ-10-0**	1,4-Dichlorobenzene-d4 Acenaphthene-d10	331563 (79986-319942) 637504 (156643-626570)	1,4-Dioxane 3-Methylphenol 4-Methylphenol Pyridine Phenol Aniline Bis(2-chloroethyl)ether 2-Chlorophenol Benzyl alcohol 2-Methylphenol Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine Hexachloroethane N-(Hydroxymethyl)phthalimide Phenyl sulfide Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran Pentachlorobenzene 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenyl-phenyl ether 4-Nitroaniline Benzenethiol	J (all detects) J (all detects)	P

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FJ-10-10'***	1,4-Dichlorobenzene-d4 Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10	343703 (79986-319942) 1300481 (316072-1264286) 660472 (156643-626570) 976657 (242634-970534)	1,4-Dioxane	J (all detects)	P
			3-Methylphenol	J (all detects)	
			4-Methylphenol	J (all detects)	
			Pyridine	J (all detects)	
			Phenol	J (all detects)	
			Aniline	J (all detects)	
			Bis(2-chloroethyl)ether	J (all detects)	
			2-Chlorophenol	J (all detects)	
			Benzyl alcohol	J (all detects)	
			2-Methylphenol	J (all detects)	
			Bis(2-chloroisopropyl)ether	J (all detects)	
			N-Nitroso-di-n-propylamine	J (all detects)	
			Hexachloroethane	J (all detects)	
			Phthalic acid	J (all detects)	
			4-Chlorobenzenethiol	J (all detects)	
			4-Chlorophenyl methyl sulfide	J (all detects)	
			Acetophenone	J (all detects)	
			2-Methylnaphthalene	J (all detects)	
			Nitrobenzene	J (all detects)	
			Isophorone	J (all detects)	
			2-Nitrophenol	J (all detects)	
			2,4-Dimethylphenol	J (all detects)	
			Bis(2-chloroethoxy)methane	J (all detects)	
			Benzoic acid	J (all detects)	
			Naphthalene	J (all detects)	
			4-Chloroaniline	J (all detects)	
			Hexachlorobutadiene	J (all detects)	
			4-Chloro-3-methylphenol	J (all detects)	
			1,2,4,5-Tetrachlorobenzene	J (all detects)	
			N-(Hydroxymethyl)phthalimide	J (all detects)	
			Phenyl sulfide	J (all detects)	
			Hexachlorocyclopentadiene	J (all detects)	
			2,4,6-Trichlorophenol	J (all detects)	
			2,4,5-Trichlorophenol	J (all detects)	
			2-Chloronaphthalene	J (all detects)	
			2-Nitroaniline	J (all detects)	
			Dimethylphthalate	J (all detects)	
			Acenaphthylene	J (all detects)	
			2,6-Dinitrotoluene	J (all detects)	
			3-Nitroaniline	J (all detects)	
			Acenaphthene	J (all detects)	
			2,4-Dinitrophenol	J (all detects)	
			4-Nitrophenol	J (all detects)	
			Dibenzofuran	J (all detects)	
			Pentachlorobenzene	J (all detects)	
			2,4-Dinitrotoluene	J (all detects)	
			Diethylphthalate	J (all detects)	
			Fluorene	J (all detects)	
			4-Chlorophenyl-phenyl ether	J (all detects)	
			4-Nitroaniline	J (all detects)	
			1,2-Diphenylhydrazine (as Azobenzene)	J (all detects)	
			Phenyl disulfide	J (all detects)	
			Phenyl sulfone	J (all detects)	
			Benzenethiol	J (all detects)	
			Di-n-butylphthalate	J (all detects)	

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
TSB-FJ-04-0***	1,4-Dichlorobenzene-d4 Acenaphthene-d10	340853 (79986-319942) 639235 (156643-626570)	1,4-Dioxane 3-Methylphenol 4-Methylphenol Pyridine Phenol Aniline Bis(2-chloroethyl)ether 2-Chlorophenol Benzyl alcohol 2-Methylphenol Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine Hexachloroethane N-(Hydroxymethyl)phthalimide Phenyl sulfide Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran Pentachlorobenzene 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenyl-phenyl ether 4-Nitroaniline Benzenethiol	J (all detects) J (all detects)	P

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)

Tentatively identified compounds were not reported by the laboratory.

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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'** and TSB-FJ-02-0'-FD** were identified as field duplicates. No semivolatiles were detected in any of the samples.

BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FR-02-0'***	Bis(2-chloroisopropyl)ether Phthalic acid N-(Hydroxymethyl)phthalimide	J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FR-02-0'***	2,4-Dinitrophenol	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FR-02-0'***	Hexachlorocyclopentadiene	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FR-02-0'***	Chrysene	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-5	TSB-FR-02-0'***	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A	Internal standards (area)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-10-0** TSB-FJ-04-0**	1,4-Dioxane 3-Methylphenol 4-Methylphenol Pyridine Phenol Aniline Bis(2-chloroethyl)ether 2-Chlorophenol Benzyl alcohol 2-Methylphenol Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine Hexachloroethane N-(Hydroxymethyl)phthalimide Phenyl sulfide Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran Pentachlorobenzene 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenyl-phenyl ether 4-Nitroaniline Benzenethiol	J (all detects) J (all detects)	P	Internal standards (area)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-10-10**	1,4-Dioxane	J (all detects)	P	Internal standards (area)
		3-Methylphenol	J (all detects)		
		4-Methylphenol	J (all detects)		
		Pyridine	J (all detects)		
		Phenol	J (all detects)		
		Aniline	J (all detects)		
		Bis(2-chloroethyl)ether	J (all detects)		
		2-Chlorophenol	J (all detects)		
		Benzyl alcohol	J (all detects)		
		2-Methylphenol	J (all detects)		
		Bis(2-chloroisopropyl)ether	J (all detects)		
		N-Nitroso-di-n-propylamine	J (all detects)		
		Hexachloroethane	J (all detects)		
		Phthalic acid	J (all detects)		
		4-Chlorobenzenethiol	J (all detects)		
		4-Chlorophenyl methyl sulfide	J (all detects)		
		Acetophenone	J (all detects)		
		2-Methylnaphthalene	J (all detects)		
		Nitrobenzene	J (all detects)		
		Isophorone	J (all detects)		
		2-Nitrophenol	J (all detects)		
		2,4-Dimethylphenol	J (all detects)		
		Bis(2-chloroethoxy)methane	J (all detects)		
		Benzoic acid	J (all detects)		
		Naphthalene	J (all detects)		
		4-Chloroaniline	J (all detects)		
		Hexachlorobutadiene	J (all detects)		
		4-Chloro-3-methylphenol	J (all detects)		
		1,2,4,5-Tetrachlorobenzene	J (all detects)		
		N-(Hydroxymethyl)phthalimide	J (all detects)		
		Phenyl sulfide	J (all detects)		
		Hexachlorocyclopentadiene	J (all detects)		
		2,4,6-Trichlorophenol	J (all detects)		
		2,4,5-Trichlorophenol	J (all detects)		
		2-Chloronaphthalene	J (all detects)		
		2-Nitroaniline	J (all detects)		
		Dimethylphthalate	J (all detects)		
		Acenaphthylene	J (all detects)		
		2,6-Dinitrotoluene	J (all detects)		
		3-Nitroaniline	J (all detects)		
		Acenaphthene	J (all detects)		
		2,4-Dinitrophenol	J (all detects)		
		4-Nitrophenol	J (all detects)		
		Dibenzofuran	J (all detects)		
		Pentachlorobenzene	J (all detects)		
		2,4-Dinitrotoluene	J (all detects)		
		Diethylphthalate	J (all detects)		
		Fluorene	J (all detects)		
		4-Chlorophenyl-phenyl ether	J (all detects)		
		4-Nitroaniline	J (all detects)		
		1,2-Diphenylhydrazine (as	J (all detects)		
		Azobenzene)	J (all detects)		
		Phenyl disulfide	J (all detects)		
		Phenyl sulfone	J (all detects)		
		Benzenethiol	J (all detects)		
		Di-n-butylphthalate	J (all detects)		

BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

LDC #: 18100E2
 SDG #: TRNC-D-5
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 11/2/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/15/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD .12
IV.	Continuing calibration/ICV	SW	ICV ≤ 25% 0
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
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)	N	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	ND	D = 1 + 2, 8 + 9
XVII.	Field blanks	ND	R = 17

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 X	TSB-FJ-03-0**	S	11 X	TSB-FR-02-0**	S	21	7323118MB	31
2 X	TSB-FJ-03-0'-FD**		12	TSB-FR-02-10**		22 X	7324092MB	32
3 X	TSB-FJ-03-10**		13	TSB-FJ-09-0**		23!	7325172MB	33
4 /	TSB-FJ-10-0**		14	TSB-FJ-09-10**		24		34
5 /	TSB-FJ-10-10**		15	TSB-FR-03-0**		25		35
6 /	TSB-FJ-04-0**		16	TSB-FR-03-10**		26		36
7 /	TSB-FJ-04-10**		17	RINSATE-3	W	27		37
8 /	TSB-FJ-02-0**		18 X	TSB-FR-02-0'MS	S	28		38
9 /	TSB-FJ-02-0'-FD**		19 X	TSB-FR-02-0'MSD	↓	29		39
10 /	TSB-FJ-02-10**		20			30		40

VALIDATION FINDINGS CHECKLIST

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) $\leq 30\%$ 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) $\leq 25\%$ 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 #: 1810022
 SDG #: see cover

VALIDATION FINDINGS CHECKLIST

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

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

VALIDATION FINDINGS WORKSHEET

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

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

XXX. Phenyl sulfide
 AAAA. N-(Hydroxymethyl)phthalimide
 COMPNDL2S
 YYY. Phenyl disulfide
 ZZZ. 4-chlorophenyl sulfone

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

- N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
- 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: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/27/07	1CAL2111 (11CV)	X DDD	27.65729 31.22409		1-3.11.18-19 T324092MB T32512MB	N UN/A S+det/A
	11/28/07	1CAL2152	MUM HH	25.06818 29.26967		1-3.11.18-19 T324092MB	N UN/A S+det/A
	11/28/07	1CAL215A	MUM AAA	25.37307 33.87537			N UN/A S

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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

Were percent recoveries (%R) for surrogates within QC limits?
 If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
 If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		<u>TBP</u>	<u>✓</u>	()	
		<u>T323118MB</u>	<u>TBP</u>	<u>45</u>	<u>No Qual</u>
			<u>TBP</u>	<u>18</u>	<u>(55-103)</u>
				()	
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* QC limits are advisory

QC Limits (Soil)	QC Limits (Water)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5 23-120	35-114	21-100
S2 (FBP) = 2-Fluorobiphenyl 30-115	43-116	10-123
S3 (TPH) = Terphenyl-d14 18-137	33-141	33-110*
S4 (PHL) = Phenol-d5 24-113	10-94	16-110*
S5 (2FP) = 2-Fluorophenol	25-121	
S6 (TBP) = 2,4,6-Tribromophenol	19-122	
S7 (2CP) = 2-Chlorophenol-d4	20-130*	
S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

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

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

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
		18/19	T	10 (14-72)	6.9 (14-72)	37 (≤30)	11	No Qual
			BB	15 (37-103)	14 (37-103)	()		
			FF	17 (27-87)	15 (27-87)	()		
			KK	128 (26-120)	()	()		
			DD	121 (22-120)	()	()		
			FF	136 (34-110)	116 (34-110)	()		(See in)
				()	()	()		
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Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A. Phenol	26-90%	≤ 35%	12-110%	≤ 42%	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C. 2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E. 1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J. N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R. 1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V. 4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%					

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

LDC #: 170022
 SDG #: 322021

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 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCS %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		<u>7324092LCS</u>	<u>BBB</u>	<u>65</u>	<u>(18-58)</u>	()	<u>1-11-7324092MB</u>	<u>No Gen a r</u>
			<u>DDD</u>	<u>111</u>	<u>46-97</u>	()		<u>(MS/MSD in)</u>
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VALIDATION FINDINGS WORKSHEET
Internal Standards

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".
 Were all internal standard area counts within -50 to +100 of the associated calibration standard?
 Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		11	PRY	236275 (360694 - 1442774)		✓ M / A
						(FFF → LLL)
		732517MB	DCB ANT	325869 (79986 - 319942) 626682 (156643 - 626570)		✓ M / P
		A	DCB ANT	331563 637504		
		5	DCB NPT ANT PHN	343703 (79986 - 319942) 1300481 (316072 - 1264286) 660472 (156643 - 626570) 976657 (242634 - 970534)		
		6	DCB ANT	340853 639235		

* GC limits are advisory
 IS1 (DCB) = 1,4-Dichlorobenzene-d4
 IS2 (NPT) = Naphthalene-d8
 IS3 (ANT) = Acenaphthene-d10
 IS4 (PHN) = Phenanthrene-d10
 IS5 (CRY) = Chrysene-d12
 IS6 (PRY) = Perylene-d12

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: TRNC/D-5

Work Order #...: KCLDV1AA

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Hexachlorobutadiene	ND	10	ug/L	SW846 8270C
4-Chloro-3-methylphenol	ND	10	ug/L	SW846 8270C
1,2,4,5-Tetrachloro-benzene	ND	10	ug/L	SW846 8270C
Hexachlorocyclopenta-diene	ND	10	ug/L	SW846 8270C
2,4,6-Trichloro-phenol	ND	10	ug/L	SW846 8270C
2,4,5-Trichloro-phenol	ND	10	ug/L	SW846 8270C
2-Chloronaphthalene	ND	10	ug/L	SW846 8270C
2-Nitroaniline	ND	10	ug/L	SW846 8270C
Dimethyl phthalate	ND	10	ug/L	SW846 8270C
Acenaphthylene	ND	10	ug/L	SW846 8270C
2,6-Dinitrotoluene	ND	10	ug/L	SW846 8270C
3-Nitroaniline	ND	10	ug/L	SW846 8270C
Acenaphthene	ND	10	ug/L	SW846 8270C
2,4-Dinitrophenol	ND	50	ug/L	SW846 8270C
4-Nitrophenol	ND	25	ug/L	SW846 8270C
Dibenzofuran	ND	10	ug/L	SW846 8270C
Pentachlorobenzene	ND	10	ug/L	SW846 8270C
2,4-Dinitrotoluene	ND	10	ug/L	SW846 8270C
Diethyl phthalate	ND	10	ug/L	SW846 8270C
Fluorene	ND	10	ug/L	SW846 8270C
4-Chlorophenyl phenyl ether	ND	10	ug/L	SW846 8270C
4-Nitroaniline	ND	10	ug/L	SW846 8270C
N-Nitrosodiphenylamine	ND	10	ug/L	SW846 8270C
Azobenzene	ND	10	ug/L	SW846 8270C
4-Bromophenyl phenyl ether	ND	10	ug/L	SW846 8270C
Hexachlorobenzene	ND	10	ug/L	SW846 8270C
Pentachlorophenol	ND	50	ug/L	SW846 8270C
Phenanthrene	ND	10	ug/L	SW846 8270C
Anthracene	ND	10	ug/L	SW846 8270C
Carbazole	ND	10	ug/L	SW846 8270C
Fluoranthene	ND	10	ug/L	SW846 8270C
Pyrene	ND	10	ug/L	SW846 8270C
Butyl benzyl phthalate	ND	10	ug/L	SW846 8270C
Benzo(a)anthracene	ND	10	ug/L	SW846 8270C
3,3'-Dichlorobenzidine	ND	50	ug/L	SW846 8270C
Chrysene	ND	10	ug/L	SW846 8270C
bis(2-Ethylhexyl) phthalate	ND	10	ug/L	SW846 8270C
Di-n-butyl phthalate	ND	10	ug/L	SW846 8270C

FREE
GG
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PHN XX

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METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: TRNC/D-5

Work Order #...: KCLDV1AA

Matrix.....: WATER

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	METHOD
Di-n-octyl phthalate	ND	10	ug/L	SW846 8270C
Benzo(b) fluoranthene	ND	10	ug/L	SW846 8270C
Benzo(k) fluoranthene	ND	10	ug/L	SW846 8270C
Benzo(a) pyrene	ND	10	ug/L	SW846 8270C
Indeno(1,2,3-cd) pyrene	ND	10	ug/L	SW846 8270C
Benzo(ghi) perylene	ND	10	ug/L	SW846 8270C
Dibenzo(a,h) anthracene	ND	10	ug/L	SW846 8270C

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
2-Fluorophenol	30	(26 - 67)
Phenol-d5	20	(19 - 45)
Nitrobenzene-d5	49	(45 - 96)
2-Fluorobiphenyl	45 *	(50 - 100)
2,4,6-Tribromophenol	48 *	(55 - 103)
Terphenyl-d14	55	(40 - 106)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

* Surrogate recovery is outside stated control limits.

VALIDATION FINDINGS WORKSHEET
 Initial Calibration Calculation Verification

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

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

$RRF = (A_x)(C_{int}) / (A_{int})(C_x)$
 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_{int} = Area of associated internal standard
 C_{int} = Concentration of internal standard
 S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported		Recalculated		Reported		Recalculated	
				RRF (50 std)	(50 std)	RRF (50 std)	(50 std)	Average RRF (Initial)	%RSD	Average RRF (Initial)	%RSD
1	1CAL	11/27/07	Phenol (1st internal standard)	2.07280	2.07380	1.96736	1.96736	9.48172	9.48172	9.48172	9.48172
			Naphthalene (2nd internal standard)	1.13487	1.13487	1.08830	1.08830	8.38443	8.38443	8.38443	8.38443
			Fluorene (3rd internal standard)	1.43505	1.43505	1.35666	1.35666	5.99566	5.99566	5.99566	5.99566
			Benzochlorophenol (4th internal standard)	1.28039	1.28039	1.24406	1.24406	3.23497	3.23497	3.23497	3.23497
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.91037	0.91037	0.87240	0.87240	6.78812	6.78812	6.78812	6.78812
			Benzo(a)pyrene (6th internal standard)	1.33156	1.33156	1.17928	1.17928	8.11457	8.11457	8.11457	8.11457
2	1CAL	11/27/07	Phenol (1st internal standard)	0.57820	0.57820	0.48862	0.48862	9.35847	9.35847	9.35847	9.35847
			Naphthalene (2nd internal standard)	0.46293	0.46293	0.46108	0.46108	6.35259	6.35259	6.35259	6.35259
			Fluorene (3rd internal standard)								
			Pentachlorophenol (4th internal standard)								
			Bis(2-ethylhexyl)phthalate (5th internal standard)								
			Benzo(a)pyrene (6th internal standard)								
3	1CAL	11/27/07	Phenol (1st internal standard)	2.30581	2.30581	2.17013	2.17013	6.53712	6.53712	6.53712	6.53712
			Naphthalene (2nd internal standard)	0.12903	0.12903	0.12792	0.12792	9.17513	9.17513	9.17513	9.17513
			Fluorene (3rd internal standard)	1.37285	1.37285	1.30000	1.30000	4.78194	4.78194	4.78194	4.78194
			Pentachlorophenol (4th internal standard)	0.58495	0.58495	0.53076	0.53076	16.61464	16.61464	16.61464	16.61464
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.73244	0.73244	0.69775	0.69775	4.18848	4.18848	4.18848	4.18848
			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.

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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		Recalculated		Reported		Recalculated	
				RRF (SD std)	RRF (SD std)	RRF	(SD std)	Average RRF (Initial)	%RSD	Average RRF (Initial)	%RSD
1	1CAL	11/29/07	Phenol (1st internal standard)	1.90543	1.90543	1.86211	1.86211	15.07264	15.0726		
			Naphthalene (2nd internal standard)	1.05271	1.05271	1.04379	1.04379	16.46177	16.4622		
			Fluorene (3rd internal standard)	1.29796	1.29796	1.31323	1.31323	14.51116	14.5111		
			Pentachlorophenol (4th internal standard) UUV	1.25095	1.25095	1.24174	1.24174	13.58738	13.5873		
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.92542	0.92542	0.86485	0.86485	8.78944	8.7896		
			Benzo(a)pyrene (6th internal standard)	1.17974	1.17974	1.18333	1.18333	5.13549	5.1355		
2	1CAL	11/30/07	Phenol (1st internal standard) TTT	0.45894	0.45894	0.45720	0.45720	19.72310	19.7233		
			Naphthalene (2nd internal standard) UUV	0.47536	0.47536	0.47347	0.47347	7.07575	7.0760		
			Fluorene (3rd internal standard)								
			Pentachlorophenol (4th internal standard)								
			Bis(2-ethylhexyl)phthalate (5th internal standard)								
			Benzo(a)pyrene (6th internal standard)								
3	1CAL		Phenol (1st internal standard) VVV	2.23699	2.23699	2.17154	2.17154	14.2410	14.2139		
			Naphthalene (2nd internal standard) WNW	0.12756	0.12756	0.12600	0.12600	5.62069	5.6190		
			Fluorene (3rd internal standard) XXX	1.27406	1.27406	1.24533	1.24533	14.01629	14.0162		
			Pentachlorophenol (4th internal standard) YYY	0.51028	0.51028	0.51107	0.51107	10.06503	10.0658		
			Bis(2-ethylhexyl)phthalate (5th internal standard) ZZZ	0.68457	0.68457	0.66797	0.66797	11.49026	11.4898		
			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.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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

% Difference = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$ Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 $\text{RRF} = (A_x)(C_s) / (A_s)(C_x)$ RRF = continuing calibration RRF
 A_x = Area of compound, A_s = Area of associated internal standard
 C_x = Concentration of compound, C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	10K2152	11/28/07	Phenol (1st internal standard)	1.96736	1.88514	4.17922	1.88514	4.1793
			Naphthalene (2nd internal standard)	1.08830	1.11062	2.05092	1.11062	2.0507
			Fluorene (3rd internal standard)	1.35666	1.41157	4.49026	1.41157	4.490
			Pentachlorophenol (4th internal standard) UY	1.24406	1.26991	2.07798	1.26991	2.0779
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.84240	0.80891	3.97459	0.80891	3.9752
			Benzo(a)pyrene (6th internal standard)	1.17928	1.22762	4.09838	1.22762	4.0987
2	10K2153	11/28/07	Phenol (1st internal standard) TTT	0.48862	0.49604	1.51702	0.49604	1.5177
			Naphthalene (2nd internal standard) UUY	0.46108	0.50971	10.54877	0.50971	10.5480
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3	10K2154	11/28/07	Phenol (1st internal standard) VVV	2.17013	2.22247	24.1163	2.22247	24.122
			Naphthalene (2nd internal standard) WWV	0.12792	0.09546	25.37305	0.09546	25.375
			Fluorene (3rd internal standard) X X X	1.32200	1.38319	6.39862	1.38319	6.3989
			Pentachlorophenol (4th internal standard) YYY	0.53076	0.60758	14.47369	0.60758	14.4739
			Bis(2-ethylhexyl)phthalate (5th internal standard) ZZZ	0.69775	0.67304	3.54165	0.67304	3.5412
			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.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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

% Difference = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$ Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 $\text{RRF} = (A_s)(C_s) / (A_{is})(C_{is})$ A_s = Area of associated internal standard
 A_{is} = Area of compound, C_s = Concentration of internal standard
 C_{is} = Concentration of compound.

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	1CAL222	11/30/07	Phenol (1st internal standard)	1.86211	1.90982	2.56226	1.90982	2.56226
			Naphthalene (2nd internal standard)	1.04379	1.05853	1.41191	1.05853	1.41191
			Fluorene (3rd internal standard)	1.31323	1.30018	0.99350	1.30018	0.99350
			Pentachlorophenol (4th internal standard)	1.24174	1.24234	0.04778	1.24234	0.04778
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.86485	0.92365	6.79795	0.92365	6.79795
			Benzo(a)pyrene (6th internal standard)	1.11833	1.17264	4.85619	1.17264	4.85619
2	1CAL228	11/30/07	Phenol (1st internal standard)	0.45720	0.45674	0.10013	0.45674	0.10122
			Naphthalene (2nd internal standard)	0.47347	0.49009	3.51110	0.49009	3.5106
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3	1CAL229	11/30/07	Phenol (1st internal standard)	2.17154	2.24705	3.47759	2.24705	3.4775
			Naphthalene (2nd internal standard)	0.12600	0.12015	4.64208	0.12015	4.6448
			Fluorene (3rd internal standard)	1.24533	1.27345	2.25788	1.27345	2.2579
			Pentachlorophenol (4th internal standard)	0.51107	0.57632	12.76732	0.57632	12.7668
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.66797	0.68968	3.25066	0.68968	3.250
			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 #: 18/0022
 SDG #: See CDV1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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

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

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
 SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	50	33.0839	66	66	0
2-Fluorobiphenyl	↓	37.2628	75	75	
Terphenyl-d14	↓	46.9939	94	94	
Phenol-d5	75	52.9072	71	71	
2-Fluorophenol	↓	50.6072	67	67	
2,4,6-Tribromophenol	↓	63.3824	85	85	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

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

Sample ID: _____

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

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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

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 = $1 MS - MSD / 2 * (MS + MSD)$ MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 18/19

Compound	Spike Added (MS/MSD)		Sample Concentration (MS/MSD)	Spiked Sample Concentration (MS/MSD)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	3390	3370	ND	2280	2150	67	67	64	64	6.0	5.9
N-Nitroso-di-n-propylamine				2440	2280	72	72	67	68	6.8	6.8
4-Chloro-3-methylphenol				2600	2460	77	77	73	73	5.6	5.5
Acenaphthene				2580	2480	76	76	74	74	4.0	4.0
Pentachlorophenol				3020	2910	89	89	86	86	3.5	3.7
Pyrene			1900	4630	3850	82	81	59	58	1.8	1.8

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

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

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 = $|LCS - LCSD| * 2 / (LCS + LCSD)$

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

LCS/LCSD samples: 732492

Compound	Spike Added (µg/L)		Spike Concentration (µg/L)		LCS		LCSD		Percent Recovery		Percent Recovery		RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalc	Reported	Recalc
Phenol	3330	NA	2220	NA	67	67								
N-Nitroso-di-n-propylamine			2350		70	70								
4-Chloro-3-methylphenol			2350		71	71								
Acenaphthene			2500		75	75								
Pentachlorophenol			2460		74	74								
Pyrene			2590		78	80								
			2680											

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 #: B10062
 SDG #: SEA COVEN

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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

- 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?

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

- A_x = Area of the characteristic ion (EICP) for the compound to be measured
- A_s = 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. 11, S:

$$\text{Conc.} = \frac{(26092)(40)(1000)(1)(1)}{(79387)(1.08830)(30.7)(1)(0.976)}$$

= 40.3 $\mu\text{g}/\text{kg}$

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

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 16, 2007
LDC Report Date: January 23, 2008
Matrix: Soil/Water
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-10'
TSB-FJ-01-0'
TSB-FJ-01-10'
TSB-GR-01-0'
TSB-GR-01-5'
TSB-GJ-06-0'
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD
RINSATE-4MS
RINSATE-4MSD

Introduction

This data review covers 17 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 8270C for Semivolatiles.

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

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals with the following exceptions:

Sample	Compound	Total Time From DFTPP Tuning Until Analysis	Required Analysis Time (in Hours) From DFTPP Tuning Until Analysis	Flag	A or P
TSB-GJ-01-5'	All TCL compounds	12 hours 1 min.	12 hours	None	P

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).

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
12/11/07 (JCAL2820)	N-(Hydroxymethyl)phthalimide	25.66437	All water samples in SDG TRNC-D-6	J- (all detects) UJ (all non-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.

Sample RINSATE-4 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. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
7325172MB	1,4-Dichlorobenzene-d4 Acenaphthene-d10	325869 (79986-319942) 626682 (156643-626570)	1,4-Dioxane 3-Methylphenol 4-Methylphenol Pyridine Phenol Aniline Bis(2-chloroethyl)ether 2-Chlorophenol Benzyl alcohol 2-Methylphenol Bis(2-chloroisopropyl)ether N-Nitroso-di-n-propylamine Hexachloroethane N-(Hydroxymethyl)phthalimide Phenyl sulfide Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol Dibenzofuran Pentachlorobenzene 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenyl-phenyl ether 4-Nitroaniline Benzenethiol	J (all detects) J (all detects)	P
TSB-FR-04-0'-FD	Perylene-d12 Chrysene-d12	97084 (266169-1064676) 141596 (249202-996806)	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene Octachlorostyrene Bis(p-chlorophenyl)disulfide 4-Chlorophenyl sulfone Pyrene Butylbenzylphthalate Benzo(a)anthracene 3,3'-Dichlorobenzidine Chrysene Bis(2-ethylhexyl)phthalate	J (all detects) UJ (all non-detects)	P

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

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

XVI. Field Duplicates

Samples TSB-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD			
Pyrene	40	300	260 (≤ 340)	-	-
Phenanthrene	95	960	865 (≤ 340)	J (all detects)	A
Fluoranthene	47	97	50 (≤ 340)	-	-
Chrysene	93	510	417 (≤ 340)	J (all detects)	A
Di-n-butylphthalate	340U	140	200 (≤ 340)	-	-
Benzo(a)anthracene	340U	96	244 (≤ 340)	-	-

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-6**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-GJ-01-5'	All TCL compounds	None	P	GC/MS instrument performance check
TRNC-D-6	RINSATE-4	N-(Hydroxymethyl)phthalimide	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-6	TSB-FR-04-0'-FD	Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene Octachlorostyrene Bis(p-chlorophenyl)disulfide 4-Chlorophenyl sulfone Pyrene Butylbenzylphthalate Benzo(a)anthracene 3,3'-Dichlorobenzidine Chrysene Bis(2-ethylhexyl)phthalate	J (all detects) UJ (all non-detects)	P	Internal standards (area)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Phenanthrene Chrysene	J (all detects) J (all detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

LDC #: 18100F2
 SDG #: TRNC-D-6
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/21/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1/16/07
II.	GC/MS Instrument performance check	SW	
III.	Initial calibration	A	RSD .12
IV.	Continuing calibration/ICV	SW	ICV = 2570
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LES
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D = 5 + 6
XVII.	Field blanks	ND	R = 16

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

Validated Samples:

1	2	TSB-FJ-08-0'	11	2	TSB-GR-01-5'	21	7325214MB	31	W
2	2	TSB-FJ-08-10'	12	2	TSB-GJ-06-0'	22	7325172MB	32	
3	2	TSB-FR-05-0'	13	2	TSB-GJ-06-5'	23	7325172MB	33	
4	2	TSB-FR-05-10'	14	2	TSB-GJ-01-0'	24		34	
5	2	TSB-FR-04-0'	15	2	TSB-GJ-01-5'	25		35	
6	2	TSB-FR-07-0'-FD	16		RINSATE-4	26		36	
7	2	TSB-FR-04-10'	17	1	TSB-FJ-01-0'MS	27		37	
8	1	TSB-FJ-01-0'	18	1	TSB-FJ-01-0'MSD	28		38	
9	2	TSB-FJ-01-10'	19		RINSATE-4MS	29		39	
10	2	TSB-GR-01-0'	20		RINSATE-4MSD	30		40	

VALIDATION FINDINGS WORKSHEET

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

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

VALIDATION FINDINGS WORKSHEET
GC/MS Performance Check

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were the DFTPP performance results reviewed and found to be within the EPA Functional Guideline criteria?
 Y N/A Were all samples analyzed within the 12 hour clock criteria?

#	Laboratory ID	12 Hour Clock (Time/date)	Finding	Associated Samples Client ID	Qualifications
	15	055 / 12/2/07	Analyzed @ 0555 (1 min out of 12 hr clock)	15	None

m/z	ION ABUNDANCE CRITERIA	m/z	ION ABUNDANCE CRITERIA
51	30.0 - 60.0% of m/z 198	199	5.0 - 9.0% of m/z 198
68	Less than 2.0% of m/z 69	275	10.0 - 30.0% of m/z 198
69	Present	365	Greater than 1.0% of m/z 198
70	Less than 2.0% of 69	441	Present, but less than m/z 443
127	40.0 - 60.0% of m/z 198	442	Greater than 40.0% of m/z 198
197	Less than 1.0% of m/z 198	443	17.0 - 23.0% of m/z 442
198	Base peak, 100% relative abundance		

VALIDATION FINDINGS WORKSHEET

Continuing Calibration

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

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

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

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

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

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	11/27/07	10AL					
	11/29/07	10AL 2227					
	12/11/07	10AL 2820	TTT	25.66437		M+20s, T321AMB	N+20s/18

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
 Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
 Were percent recoveries (%R) for surrogates within QC limits?
 Y N N/A
 if 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
 Y N N/A
 if any %R was less than 10 percent, was a reanalysis performed to confirm %R?
 Y N N/A

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		730521AMB	TBP	46 (49-96)	No Qual
		5	TBP	20 (37-105)	
		6	TPH	117 (34-105)	
		7	TPH	117 ()	
		9	TPH	110 ()	
		10	TPH	111 ()	
		11	TPH	107 ()	
		12	TPH	115 ()	
		13	TPH	111 ()	
		14	TPH	111 ()	
		15	TPH	107 ()	

* QC limits are advisory

S1 (NBZ) = Nitrobenzene-d5	QC Limits (Soil)	23-120	QC Limits (Water)	35-114	QC Limits (Water)	21-100
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116	S5 (2FP) = 2-Fluorophenol	25-121	10-123	
S3 (TPH) = Terphenyl-d14	18-137	33-141	S6 (TBP) = 2,4,6-Tribromophenol	19-122	33-110*	
S4 (PHL) = Phenol-d5	24-113	10-94	S7 (2CP) = 2-Chlorophenol-d4	20-130*	16-110*	
			S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*		

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

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

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

Y (N) N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		732572MB	DCB	325869(79986-319942)		X N/A ✓
			ANT	626682(156643-626570)		X N/A ✓
		6	PHN	97084(266669-1064676)		X N/A ✓
			CRY	141596(249202-996806)		(SEE BELOW)

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

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

LDC #: 18/00F2
 SDG #: Sa. cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

Y / N / N/A
Y / N / N/A

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

Compound	Concentration (<u>µg/g</u>)		RPD
	5	6	
ZZ	40	300	260 (≠340) No Anal
UU	95	960	865 ↓ dots / A
YY	47	97	50 No Anal
DDD	93	510	417 ↓ dots / A
XX	340 U	140	200 No Anal
ccc	340 U	5 96	244 ↓ ↓
Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 19, 2007
LDC Report Date: January 23, 2008
Matrix: Soil/Water
Parameters: Semivolatiles
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD

Introduction

This data review covers 16 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.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/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).

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
12/11/07 (JCAL2842)	N-(Hydroxymethyl)phthalimide	40.70733	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	J- (all detects) UJ (all non-detects)	A

The percent difference (%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
12/11/07 (JCAL2820)	N-(Hydroxymethyl)phthalimide	25.66437	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' RINSATE-5 TSB-GJ-04-0'MS TSB-GJ-04-0'MSD 7325214MB	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
12/11/07 (JCAL2842)	N-(Hydroxymethyl)phthalimide	0.03547 (≥ 0.05)	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	J (all detects) UJ (all non-detects)	A

V. Blanks

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

Sample RINSATE-5 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 with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-GJ-03-0'	2-Fluorophenol Phenol-d5 Nitrobenzene-d5 2-Fluorobiphenyl 2,4,6-Tribromophenol Terphenyl-d14	11 (41-87) 12 (40-94) 12 (41-91) 12 (44-96) 11 (37-105) 11 (34-105)	All TCL compounds	J- (all detects) UJ (all non-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. 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 are summarized at the end of the report if data has been qualified.

XVI. Field Duplicates

Samples TSB-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No semivolatiles were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Data Qualification Summary - SDG TRNC-D-7**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	N-(Hydroxymethyl)phthalimide	J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' RINSATE-5	N-(Hydroxymethyl)phthalimide	J+ (all detects)	A	Continuing calibration (ICV %D)
TRNC-D-7	TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	N-(Hydroxymethyl)phthalimide	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)
TRNC-D-7	TSB-GJ-03-0'	All TCL compounds	J- (all detects) UJ (all non-detects)	P	Surrogate spikes (%R)

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Semivolatiles - Field Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

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: 11/19/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD - Y ²
IV.	Continuing calibration/ICV	W	ICV ≤ 25%
V.	Blanks	A	
VI.	Surrogate spikes	W	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	ICS
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 = 1 + 2 · 6 + 7
XVII.	Field blanks	ND	R = 15

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

Validated Samples:

1 /	TSB-GR-02-0'	S	11	TSB-GJ-05-0'	S	21	732524 MB W	31
2 /	TSB-GR-02-0'-FD		12	TSB-GJ-05-5'		22	7330071 MB S	32
3 /	TSB-GR-02-5'		13	TSB-GJ-03-0'		23		33
4 /	TSB-GJ-04-0'		14	TSB-GJ-03-5'		24		34
5 /	TSB-GJ-04-5'		15	RINSATE-5	W	25		35
6 /	TSB-GJ-02-0'		16	TSB-GJ-04-0'MS	S	26		36
7 /	TSB-GJ-02-0'-FD		17	TSB-GJ-04-0'MSD	W	27		37
8 /	TSB-GJ-02-5'		18			28		38
9 /	TSB-GJ-07-0'		19			29		39
10	TSB-GJ-07-5'		20			30		40

VALIDATION FINDINGS WORKSHEET

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

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	GGG. 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**	<i>N-ethylhexylphthalimide</i>
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenyl ether	GGG. Benzo(b)fluoranthene	UUU.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	<i>3,3'-Dimethylbenzidine</i>
				VVV.
				WWW.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

LDC #: 1810042
SDG #: See down
METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
N Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
N Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
N Were all %D and RRFs within the validation criteria of ≤ 25 %D and ≥ 0.05 RRF?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 25.0\%$)	Finding RRF (Limit: ≥ 0.05)	Associated Samples	Qualifications
	12/16/07	JCA 2820	TTT	25.6637		1-9. 15-17 T352 KMB	1+ lots / A
	12/11/07	JCA 2842	TTT TTT	40.70733	0.03547	10-14	17/24 / A 18/24 / B

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

LDC #: 1810092
SDG #: See below
METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A
Y N N/A
Y N N/A

Page: 6 of 8
Reviewer: [Signature]
2nd Reviewer: A

Were percent recoveries (%R) for surrogates within QC limits?
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		7385214MB	TBP	76 (49-96)	N dual
				()	
				()	
		13	ZFP	11 (41-87)	2/11/12 P (all)
			PHL	12 (40-94)	
			NBZ	12 (41-91)	
			FBP	12 (44-96)	
			TBP	11 (37-105)	
			TPH	11 (34-105)	
				()	
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				()	
				()	
				()	
				()	

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

**BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100**

Pesticides

LDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 9, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Chlorinated Pesticides
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'	TSB-CR-07-10'MSD
TSB-CR-07-0'DL	RINSATE 1MS
TSB-CR-07-10'	RINSATE 1MSD
TSB-CJ-08-0'	
TSB-CJ-08-0'DL	
TSB-CJ-08-0'-FD	
TSB-CJ-08-0'-FDDL	
TSB-CJ-08-10'	
TSB-CJ-04-0'	
TSB-CJ-04-0'DL	
TSB-CJ-04-10'	
TSB-CJ-07-0'	
TSB-CJ-07-0'DL	
TSB-CJ-07-10'	
TSB-CJ-03-0'	
TSB-CJ-03-0'DL	
TSB-CJ-03-10'	
TSB-CJ-03-10'DL	
RINSATE 1	
TSB-CR-07-10'MS	

Introduction

This data review covers 20 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 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
All soil samples in SDG TRNC-D-1	All TCL compounds	21	14	J- (all detects) UJ (all non-detects)	P

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

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

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

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

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

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
11/21/07	KCAL998	STX-CLP1	Heptachlor	31.3	All water samples in SDG TRNC-D-1	J+ (all detects)	P
			4,4'-DDE	15.3		J+ (all detects)	
			Dieldrin	17.0		J+ (all detects)	
			Endrin	23.4		J+ (all detects)	
			4,4'-DDD	17.8		J+ (all detects)	
			Endosulfan II	21.0		J+ (all detects)	
			4,4'-DDT	29.0		J+ (all detects)	
			methoxychlor	30.6		J+ (all detects)	
			Endosulfan sulfate	19.5		J+ (all detects)	
			Endrin ketone	16.2		J+ (all detects)	

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
12/3/07	KCAL554	STX-CLP1	Endrin ketone	16.6	TSB-CR-07-10'MS TSB-CR-07-10'MSD 7334483MB	J+ (all detects)	A
12/3/07	KCAL554	STX-CLP2	delta-BHC gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Methoxychlor Endrin ketone	15.6 16.0 17.5 16.3 19.7 19.1 21.2 22.6 18.9 21.2 21.1 19.4 17.5 24.0	TSB-CR-07-10'MS TSB-CR-07-10'MSD 7334483MB	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P
12/3/07	KCAL568	STX-CLP1	Endrin ketone	16.5	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'	J+ (all detects)	A
12/3/07	KCAL568	STX-CLP2	delta-BHC Heptachlor Heptachlor epoxide gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Methoxychlor Endrin ketone	17.1 16.2 15.4 17.5 18.7 18.2 21.4 20.5 22.5 22.9 19.7 26.5 21.5 19.9 17.2 24.5	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P
12/3/07	KCAL584	STX-CLP1	Endosulfan sulfate Endrin ketone	25.0 18.0	TSB-CJ-03-0' TSB-CJ-03-10'	J+ (all detects) J+ (all detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
12/3/07	KCAL584	STX-CLP2	gamma-BHC delta-BHC Heptachlor Aldrin Heptachlor epoxide gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Methoxychlor Endrin ketone	15.8 18.4 15.3 15.8 15.7 18.2 19.2 19.2 21.5 21.0 22.0 21.4 18.4 25.0 21.2 19.9 18.2 28.3	TSB-CJ-03-0' TSB-CJ-03-10'	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P
12/11/07	KCAL015	STX-CLP2	4,4'-DDD	15.9	TSB-CR-07-10'	J+ (all detects)	A

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

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

V. Blanks

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

Sample "RINSATE 1" 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-CR-07-0'	STX-CLP1	Decachlorobiphenyl	980 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-08-10'	STX-CLP1	Decachlorobiphenyl	201 (57-144)	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 (%R) were not within QC limits for one compound, the LCS percent recovery (%R) was 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. Pesticide Cleanup Checks

a. Florisil Cartridge Check

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

b. GPC Calibration

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

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-CR-07-0'	beta-BHC 4,4'-DDE 2,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	A
TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-04-0' TSB-CJ-07-0' TSB-CJ-03-0' TSB-CJ-03-10'	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

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

Sample	Compound	%D	Flag	A or P
TSB-CR-07-0'	gamma-Chlordane	119.4	J (all detects)	A
	Endrin aldehyde	131.7	J (all detects)	

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-CJ-08-0' and TSB-CJ-08-0'-FD and samples TSB-CJ-08-0'DL and TSB-CJ-08-0'-FDDL 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-CJ-08-0'	TSB-CJ-08-0'-FD				
alpha-BHC	4.0	2.1	-	1.9 (≤ 1.8)	J (all detects)	A
beta-BHC	60	130	74 (≤ 50)	-	J (all detects)	A
4,4'-DDE	6.8	3.1	-	3.7 (≤ 1.8)	J (all detects)	A
4,4'-DDT	2.7	4.1	-	1.4 (≤ 1.8)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'DL	TSB-CJ-08-0'-FDDL				
beta-BHC	63	140	-	77 (≤ 18)	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-0'DL TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'DL TSB-CJ-08-0'-FD TSB-CJ-08-0'-FDDL TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-0'DL TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-0'DL TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-0'DL TSB-CJ-03-10' TSB-CJ-03-10'DL	All TCL compounds	J- (all detects) UJ (all non-detects)	P	Technical holding times
TRNC-D-1	RINSATE 1	Heptachlor 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT methoxychlor Endosulfan sulfate Endrin ketone	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'	Endrin ketone	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'	delta-BHC Heptachlor Heptachlor epoxide gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Methoxychlor Endrin ketone	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) 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)	P	Continuing calibration (%D)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CJ-03-0' TSB-CJ-03-10'	Endosulfan sulfate Endrin ketone	J+ (all detects) J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CJ-03-0' TSB-CJ-03-10'	gamma-BHC delta-BHC Heptachlor Aldrin Heptachlor epoxide gamma-Chlordane alpha-Chlordane Endosulfan I 4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Endosulfan sulfate Methoxychlor Endrin ketone	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P	Continuing calibration (%D)
TRNC-D-1	TSB-CR-07-10'	4,4'-DDD	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-1	TSB-CR-07-0'	All TCL compounds	J+ (all detects)	A	Surrogate spikes (%R)
TRNC-D-1	TSB-CJ-08-10'	All TCL compounds	J+ (all detects)	P	Surrogate spikes (%R)
TRNC-D-1	TSB-CR-07-0'	beta-BHC 4,4'-DDE 2,4'-DDE	J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-04-0' TSB-CJ-07-0' TSB-CJ-03-0' TSB-CJ-03-10'	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-1	TSB-CR-07-0'	gamma-Chlordane Endrin aldehyde	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (RPD)
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	alpha-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Field duplicates (Difference)
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	beta-BHC	J (all detects)	A	Field duplicates (RPD)
TRNC-D-1	TSB-CJ-08-0'DL TSB-CJ-08-0'-FDDL	beta-BHC	J (all detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

LDC #: 18100A3a

VALIDATION COMPLETENESS WORKSHEET

Date: 1/21/08

SDG #: TRNC/D-1

Level III

Page: 1 of 1

Laboratory: Test America

Reviewer: JVL

2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/09/07
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LC-S
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	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D ₁ = 4, 6 D ₂ = 5, 7
XV.	Field blanks	ND	R = 19

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-CR-07-0'	S	11	TSB-CJ-04-10'	S	21	TSB-CR-07-10'MSD	S	31	7334483 MB
2	TSB-CR-07-0'DL		12	TSB-CJ-07-0'		22	RINSATE 1MS	W	32	7318100 MB
3	TSB-CR-07-10'		13	TSB-CJ-07-0'DL		23	RINSATE 1MSD	↓	33	
4	TSB-CJ-08-0' D ₁		14	TSB-CJ-07-10'		24			34	
5	TSB-CJ-08-0'DL D ₂		15	TSB-CJ-03-0'		25			35	
6	TSB-CJ-08-0'-FD D ₁		16	TSB-CJ-03-0'DL		26			36	
7	TSB-CJ-08-0'-FDDL D ₂		17	TSB-CJ-03-10'		27			37	
8	TSB-CJ-08-10'		18	TSB-CJ-03-10'DL	↓	28			38	
9	TSB-CJ-04-0'		19	RINSATE 1	W	29			39	
10	TSB-CJ-04-0'DL	↓	20	TSB-CR-07-10'MS	S	30			40	

LDC #: 18100 A3a
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

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

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

METHOD : GC Pesticides/PCBs (EPA SW 846 Method 8081)							
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All soils	S	N	11/09/07	11/30/07	12/03-12/07	21	J-43/P

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

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. 2,4'-DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

What type or calibration verification calculation was performed? ✓ %D or RPD

Were Evaluation mix standards run before initial calibration and before samples?

Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

Was at least one standard run daily to verify the working curve?

Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Y N N/A
Y N N/A
Y N N/A
Y N N/A
Y N N/A
 Level I/II Only
 Y N N/A

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	11/21/07	KCAL 998	STX-CUP1	E (+)	31.3	()	19, 22, 23, 7318100 MB	J + det B / P
				J (+)	15.3	()		
				I (+)	17.0	()		
				K (+)	23.4	()		
				M (+)	17.8	()		
				L (+)	21.0	()		
				O (+)	29.0	()		
				P (+)	30.6	()		
				N (+)	19.5	()		
				Q (+)	16.2	()		
	12/03/07	KCAL 554	STX-CUP1	Q (+)	16.6	()	7334483 MB, 20, 21	J + det B / A
				C (+)	15.6	()		J + det B / P
				T	16.0	()		
				S	17.5	()		
				H	16.3	()		
				J	19.7	()		
				I	19.1	()		
				K	21.2	()		
				M	22.6	()		
				L	18.9	()		
				O	21.2	()		

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

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

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

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

What type or calibration verification calculation was performed? ✓ %D or RPD

Were Evaluation mix standards run before initial calibration and before samples?

Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

Was at least one standard run daily to verify the working curve?

Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level W/D Only

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	12/6/07	KCAL 557	STX-LRP2	R (4)	21.1	()	7 3 3 4 4 3 MB, 20, 21	J+ dets / P
				N	19.4	()		
				P	17.5	()		
				Q	24.0	()		
						()		
						()		
	12/6/07	KCAL 568	STX-CIP1	Q (8)	16.5	()	6, 8, 9, 11, 12	J+ dets / A
			STX-LRP2	C	17.1	()		J+ dets / P
				E	16.2	()		
				G	15.4	()		
				T	17.5	()		
				S	18.7	()		
				H	18.2	()		
				J	21.4	()		
				I	20.5	()		
				K	22.5	()		
				M	22.9	()		
				L	19.7	()		
				O	26.5	()		
				R	21.5	()		
				N	19.9	()		
				P	17.2	()		
				Q	24.5	()		

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

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

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

- N N/A What type or calibration verification calculation was performed? %D or RPD
- N N/A Were Evaluation mix standards run before initial calibration and before samples?
- N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?
- Y N N/A Was at least one standard run daily to verify the working curve?
- Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level I/II Only

Y N (N/A) Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	12/6/07	KCAL 584	STX-CP1	N (+)	25.0	()	15 17	J + det's / A
				B	18.0	()		↓
			STX-CP2	D	15.8	()		J + det's / P
				C	18.4	()		
				E	15.3	()		
				F	15.8	()		
				G	15.7	()		
				T	18.2	()		
				S	19.2	()		
				H	19.2	()		
				J	21.5	()		
				I	21.0	()		
				K	22.0	()		
				M	21.4	()		
				L	18.4	()		
				O	25.0	()		
				R	21.2	()		
				N	19.9	()		
				P	18.2	()		
				Q	28.3	()		↓
	12/6/07	KCAL 015	STX-CP1	M (+)	15.9	()	3	J + det's / A

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

VALIDATION FINDINGS WORKSHEET
 Surrogate Spikes

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

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were surrogates spiked into all samples, standards and blanks?
 N N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		1	STX-CAP1	P	180 (57-144)	J + dets / A
		2 (10x)		A	DD (73-116)	No qual
				B	(57-144)	
		4 (10x)		A	()	
				B	()	
		6 (10x)		A	()	
				B	()	
		8		B	201 ()	J + dets / P
		10 (10x)		A	DD ()	No qual
				B	()	
		13 (10x)		A	()	
				B	()	
		16 (10x)		A	()	
			✓	B	()	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			
B	Decachlorobiphenyl			

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

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

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were surrogates spiked into all samples, standards and blanks?
 Y N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		18 (105)	SIX-CLP1	A	DO (73-116)	No qual
				B	↓ (57-144)	↓
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 1800A3A
 SDG #: See Cond

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

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

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

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

#	Compound Name	Finding	Associated Samples	Qualifications
	B, J, EE	7 cal range	1	J det's / A
	B		4, 6, 9, 12, 15, 17	

Comments: See sample calculation verification worksheet for recalculations

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

METHOD: GC HPLC

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

Level I/II Only

Y N N/A
 Y N N/A
 Y N N/A

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

Did the percent difference of detected compounds between two columns/detectors \leq 40%?

If no, please see findings below.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (\leq 40%)	Qualifications
T		1	119.4	JACS/A
R		↓	131.7	

Comments:

LDC #: 18100A 3A
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A
 Y N N/A

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

Compound	Concentration ($\mu\text{g}/\text{kg}$)		RPD (Parent only)
	4	6	
A	4.0	2.1	1.9 (≤ 1.8 Diff) J det's/A
B	60	130	74 (≤ 50.2 RPD)
J	6.8	3.1	3.7 (≤ 1.8 Diff) ↓
O	2.7	4.1	1.4 ↓ -

Compound	Concentration ($\mu\text{g}/\text{kg}$)		RPD
	5	7	
B	63	140	77 (≤ 18 Diff) J det's/A

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 12, 2007
LDC Report Date: January 28, 2008
Matrix: Soil
Parameters: Chlorinated Pesticides
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**	TSB-CJ-06-10'
TSB-CJ-02-0'DL**	TSB-CR-01-0'MS
TSB-CJ-02-10'**	TSB-CR-01-0'MSD
TSB-CJ-01-0'**	
TSB-CJ-01-10'**	
TSB-CJ-01-0'-FD**	
TSB-CJ-01-0'-FDDL**	
TSB-CR-02-0'**	
TSB-CR-02-10'	
TSB-CR-01-0'	
TSB-CR-01-0'DL	
TSB-CR-01-10'	
TSB-CR-03-0'	
TSB-CR-03-10'	
TSB-CJ-05-0'	
TSB-CJ-05-0'DL	
TSB-CJ-05-10'	
TSB-CJ-06-0'	
TSB-CJ-06-0'-FD	
TSB-CJ-06-0'-FDDL	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 23 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.

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

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

A Indicates the finding is based upon technical validation criteria.

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

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

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of 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.

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	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-CJ-01-0 ^{***}	Decachlorobiphenyl	197 (57-144)	All TCL compounds	J+ (all detects)	P
TSB-CJ-05-0 [']	Decachlorobiphenyl	581 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-06-0 ['] -FD	Decachlorobiphenyl	455 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-06-10 [']	Tetrachloro-m-xylene Decachlorobiphenyl	154 (73-116) 155 (57-144)	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 and MSD percent recoveries (%R) were not within QC limits for one compound, the LCS percent recovery (%R) was 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. 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 with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-CJ-02-0'*** TSB-CJ-01-0'-FD** TSB-CR-01-0'	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
TSB-CJ-05-0'	alpha-BHC beta-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
TSB-CJ-06-0'-FD	beta-BHC 4,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A

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

Sample	Compound	%D	Flag	A or P
TSB-CJ-01-0'***	2,4'-DDE	69.8	J (all detects)	A
TSB-CJ-01-0'-FDDL**	beta-BHC	46.2	J (all detects)	A
TSB-CR-01-0'DL	beta-BHC	46.3	J (all detects)	A
TSB-CJ-05-0'	Methoxychlor 2,4'-DDD	169.4 99.6	J (all detects) J (all detects)	A
TSB-CJ-05-0'DL	alpha-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	47.7 93.0 87.9 60.4	J (all detects) J (all detects) J (all detects) J (all detects)	A
TSB-CJ-02-0'DL**	beta-BHC	47.0	J (all detects)	A

Introduction

This data review covers 23 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.

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Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

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The following are definitions of the data qualifiers:

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- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of 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.

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-CJ-01-0'**	STX-CLP1	Decachlorobiphenyl	197 (57-144)	All TCL compounds	J+ (all detects)	P
TSB-CJ-05-0'	STX-CLP1	Decachlorobiphenyl	581 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-06-0'-FD	STX-CLP1	Decachlorobiphenyl	455 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CJ-06-10'	STX-CLP1	Tetrachloro-m-xylene Decachlorobiphenyl	154 (73-116) 155 (57-144)	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 and MSD percent recoveries (%R) were not within QC limits for one compound, the LCS percent recovery (%R) was 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. 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 with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-CJ-02-0'** TSB-CJ-01-0'-FD** TSB-CR-01-0'	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
TSB-CJ-05-0'	alpha-BHC beta-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A
TSB-CJ-06-0'-FD	beta-BHC 4,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A

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

Sample	Compound	%D	Flag	A or P
TSB-CJ-01-0'**	2,4'-DDE	69.8	J (all detects)	A
TSB-CJ-01-0'-FDDL**	beta-BHC	46.2	J (all detects)	A
TSB-CR-01-0'DL	beta-BHC	46.3	J (all detects)	A
TSB-CJ-05-0'	Methoxychlor 2,4'-DDD	169.4 99.6	J (all detects) J (all detects)	A
TSB-CJ-05-0'DL	alpha-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	47.7 93.0 87.9 60.4	J (all detects) J (all detects) J (all detects) J (all detects)	A
TSB-CJ-02-0'DL**	beta-BHC	47.0	J (all detects)	A

Sample	Compound	%D	Flag	A or P
TSB-CJ-06-0'-FD	Methoxychlor 2,4'-DDD	65.0 51.6	J (all detects) J (all detects)	A
TSB-CJ-06-0'-FDDL	beta-BHC 4,4'-DDE	42.4 84.0	J (all detects) J (all detects)	A

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-CJ-01-0'*** and TSB-CJ-01-0'-FD**, samples TSB-CJ-01-0'*** and TSB-CJ-01-0'-FDDL**, samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD, and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FDDL 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-CJ-01-0'***	TSB-CJ-01-0'-FD**				
beta-BHC	19	80	123 (≤50)	-	J (all detects)	A
4,4'-DDE	18	1.8U	-	16.2 (≤1.8)	J (all detects) UU (all non-detects)	A
4,4'-DDT	1.8	2.5	-	0.7 (≤1.8)	-	-
2,4'-DDE	2.5	1.8U	-	0.7 (≤1.8)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'***	TSB-CJ-01-0'-FDDL**				
beta-BHC	19	90	130 (≤50)	-	J (all detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
beta-BHC	3.0	65	-	62 (≤1.7)	J (all detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
4,4'-DDE	1.9	82	-	80.1 (≤ 1.7)	J (all detects)	A
Methoxychlor	7.8	3.0	-	4.8 (≤ 3.4)	J (all detects)	A
alpha-BHC	1.7U	5.7	-	4.0 (≤ 1.7)	J (all detects) UJ (all non-detects)	A
4,4'-DDT	1.7U	37	-	35.3 (≤ 1.7)	J (all detects) UJ (all non-detects)	A
2,4'-DDD	1.7U	1.8	-	0.1 (≤ 1.7)	-	-
2,4'-DDE	1.7U	30	-	28.3 (≤ 1.7)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FDDL				
beta-BHC	3.0	75	-	72 (≤ 17)	J (all detects)	A
4,4'-DDE	1.9	96	-	94.1 (≤ 17)	J (all detects)	A

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-2**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-01-0'*** TSB-CJ-06-10'	All TCL compounds	J+ (all detects)	P	Surrogate recovery (%R)
TRNC-D-2	TSB-CJ-05-0' TSB-CJ-06-0'-FD	All TCL compounds	J+ (all detects)	A	Surrogate recovery (%R)
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-01-0'-FD** TSB-CR-01-0'	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-05-0'	alpha-BHC beta-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-06-0'-FD	beta-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-01-0'***	2,4'-DDE	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-01-0'-FDDL** TSB-CR-01-0'DL TSB-CJ-02-0'DL**	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-05-0' TSB-CJ-06-0'-FD	Methoxychlor 2,4'-DDD	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-05-0'DL	alpha-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	J (all detects) J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-06-0'-FDDL	beta-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-2	TSB-CJ-01-0'*** TSB-CJ-01-0'-FD** TSB-CJ-01-0'-FDDL**	beta-BHC	J (all detects)	A	Field duplicates (RPD)
TRNC-D-2	TSB-CJ-01-0'*** TSB-CJ-01-0'-FD**	4,4'-DDE	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	beta-BHC 4,4'-DDE Methoxychlor	J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	alpha-BHC 4,4'-DDT 2,4'-DDE	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FDDL	beta-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-2**

No Sample Data Qualified in this SDG

LDC #: 18100B3a
 SDG #: TRNC-D-2
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 1/21/08
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/12/07
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation and reported CRQLs	SW	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D ₁ = 4, 6 D ₂ = 4, 7 D ₃ = 18, 19 D ₄ = 18, 20
XV.	Field blanks	N	

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

Validated Samples: ** Indicates sample underwent Level IV validation

Soil

1	TSB-CJ-02-0**	11	TSB-CR-01-0'DL	21	TSB-CJ-06-10'	31	7319099 MB
2	TSB-CJ-02-0'DL**	12	TSB-CR-01-10'	22	TSB-CR-01-0'MS	32	
3	TSB-CJ-02-10**	13	TSB-CR-03-0'	23	TSB-CR-01-0'MSD	33	
4	TSB-CJ-01-0** D ₁ D ₂	14	TSB-CR-03-10'	24		34	
5	TSB-CJ-01-10**	15	TSB-CJ-05-0'	25		35	
6	TSB-CJ-01-0'-FD** D	16	TSB-CJ-05-0'DL	26		36	
7	TSB-CJ-01-0'-FDDL** D ₁	17	TSB-CJ-05-10'	27		37	
8	TSB-CR-02-0**	18	TSB-CJ-06-0' D ₃ D ₄	28		38	
9	TSB-CR-02-10'	19	TSB-CJ-06-0'-FD D ₃	29		39	
10	TSB-CR-01-0'	20	TSB-CJ-06-0'-FDDL D ₄	30		40	

LDC #: 18100 B3a
 SDG #: See Corel

VALIDATION FINDINGS CHECKLIST

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

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) \leq 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the required standard concentrations analyzed in the initial calibration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? <u> </u> %D or <u> </u> %R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were endrin and 4,4'-DDT breakdowns \leq 15%.0 for individual breakdown in the Evaluation mix standards?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) \leq 15%.0 or percent recoveries 85-115%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were extract cleanup blanks analyzed with every batch requiring clean-up?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 18100 pna
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: JVZ
 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. 2,4'-DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. 2,4'-DDD	NN.

Notes:

VALIDATION FINDINGS WORKSHEET Surrogate Spikes

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

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were surrogates spiked into all samples, standards and blanks?
 Y N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		2, 7, 11, 16, 20	SPK-CLP1	A	DO (73-116) ↓ (57-144)	No qual ↓
	4			B	()	
				B	197	J + dirts / P
	15			B	581	J + dirts / A
	19			B	455	↓
	21		↓	A	154	J + dirts / P
			↓	B	155	↓
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			
B	Decachlorobiphenyl			

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

METHOD: GC HPLC

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

Level IV/D Only

- Y, N, N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
- Y, N, N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
- Y, N, N/A Did the percent difference of detected compounds between two columns/detectors $\leq 40\%$?
 If no, please see findings below.

#	Compound Name	Sample ID	%RPD/D Between Two Columns/Detectors Limit ($\leq 40\%$)	Qualifications
	EE	4	69.8	J acts A
	B	7	46.2	
	B	11	46.3	
	P	15	169.4	
	FF	↓	99.6	
	A	16	47.7	
	B		—	
	J		93.0	
	O		87.9	
	EE	↓	60.4	
	b	2	47.0	✓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100 β3a
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 2
 Reviewer: JVG
 2nd reviewer: ✓

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A
Y N N/A

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

Compound	Concentration (ug/kg)		RPD (Parent only)
	4	6	
B	19	80	123 (≤ 50% RPD) J det ^s /A
J	18	1.8 u	16.2 ≤ 1.8 Diff J/US/A
O	1.8	2.5	0.7 ↓
EE	2.5	1.8 u	0.7 ↓

Compound	Concentration (ug/kg)		RPD (Parent only)
	4	7	
B	19	90	130 (≤ 50% RPD) J det ^s /A
J	18	NR	NC ↓
O	1.8		↓
EE	2.5		↓

Compound	Concentration (ug/kg)		RPD (Parent only)
	18	19	
B	3.0	65	62 (≤ 1.7 Diff) J det ^s /A
J	1.9	82	80.1 ↓
P	7.8	3.0	4.8 (≥ 3.4 Diff) ↓
A	1.7 u	5.7	4.0 ≤ 1.7 Diff J/US/A
O		37	35.3 ↓
FF		1.8	0.1 ↓

Compound	Concentration ()		RPD
EE	✓	30	28.3 ↓ J/US/A

LDC #: 18100 B3a
 SDG #: See Anal

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 2 of 2
 Reviewer: JVG
 2nd reviewer: W

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A
Y N N/A

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

Compound	Concentration ($\mu\text{g/L}$)		RPD (Parent only)
	18	20	
B	3.0	75	72 (≤ 17 Diff) J drts/A
J	1.9	96	94.1 ↓ ↓
P	7.8	NR	NC

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 18100 D3a
 SDG #: See above

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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		Recalculated		Reported		Recalculated	
				CF (0.100 std)	CF (0.100std)	Average CF (Initial)	Average CF (Initial)	%RSD	%RSD		
1	ICAV	11/21/07	H (SIX-CLP1)	474162270	474162270	506321046	506321046	4.443	4.443	4.443	4.443
			P	188364990	188364990	19468954	19468954	4.142	4.142	4.142	4.142
			H (CLP2)	263177150	263177150	283388782	283388782	4.470	4.470	4.470	4.470
2			P	55406290	55406290	55622434	55622434	3.292	3.292	3.292	3.292
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 #: 18100 D3a
 SDG #: See Copy

VALIDATION FINDINGS WORKSHEET

Continuing Calibration Results Verification

Page: 1 of 1
 Reviewer: JVG
 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 = $100 \cdot (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ 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		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	KCAL112	11/23/07	H C-STR-CLP1 P H P	0.0250	0.0256	2.6	0.256	2.6
					0.0248	0.7	0.0248	0.7
					0.0257	0.8	0.0257	0.8
2					0.0248	0.9	0.0248	0.8
3	KCAL215	11/26/07	B STX-CLP1 P	0.0250	0.0246	1.7	0.0246	1.7
					0.0250	0	0.0250	0
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 #: 18100 D3a
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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: #

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene	STX-CUP1	0.0200	0.01618	81	81	0
Decachlorobiphenyl	↓	↓	0.01833	92	92	↓
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: _____

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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 = $|MS - MSD| * 2 / (MS + MSD)$

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

MS/MSD samples: 22/23

Compound	Spike Added (ug/Lg)		Sample Concentration (ug/Lg)	Spiked Sample Concentration (ug/Lg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC	17.0	16.7	0	15.6	15.9	97	97	15	15	1.9	1.9
4,4'-DDT	↓	↓	↓	18.1	18.3	107	106	110	110	1.1	1.1

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 #: 1810073a
 SDG #: See cover

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

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

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 = $100 * |LCS - LCSD| * 2 / (LCS + LCSD)$

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7319099 LCS

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	16.7	NA	13.5	NA	81	81				
4,4'-DDT	↓	↓	153	↓	92	92				

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 #: 18100 B36

SDG #: See Cover

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: 1 of 1

Reviewer: JVC

2nd reviewer: 

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

Y N N/A
Y N N/A

Were all reported results recalculated and verified for all level IV samples?

Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Example:

ent. B

Sample I.D. # 2 b-BHC

$$\text{Conc.} = \frac{(2671079) (10 \text{ ml}) (1000) (\mu\text{g})}{(282164257) (30.20 \text{ g}) (0.946)}$$

$$= \frac{188428162}{188428162}$$

$$= 49.6 \text{ ug/kg}$$

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

Note: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 13, 2007
LDC Report Date: February 5, 2008
Matrix: Soil/Water
Parameters: Chlorinated Pesticides
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'	RINSATE-2
TSB-DR-06-10'	TSB-DR-03-0'MS
TSB-DR-05-0'	TSB-DR-03-0'MSD
TSB-DR-05-0'DL	RINSATE-2MS
TSB-DR-05-0'-FD	RINSATE-2MSD
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-0'DL	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-0'DL	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	

Introduction

This data review covers 22 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 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

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

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

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

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 were not within QC limits. Since the samples were all non-detected, no data were qualified.

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-DR-04-0'	STX-CLP1	Decachlorobiphenyl	420 (57-144)	All TCL compounds	J+ (all detects)	A
TSB-CR-04-0'	STX-CLP1	Decachlorobiphenyl	162 (57-144)	All TCL compounds	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 and MSD percent recoveries (%R) were not within QC limits for one compound, the LCS percent recovery (%R) was 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. Pesticide Cleanup Checks

a. Florisil Cartridge Check

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

b. GPC Calibration

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

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-DR-05-0' TSB-CR-04-0'	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-DR-04-0'	beta-BHC 4,4'-DDE 2,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	A

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

Sample	Compound	%D	Flag	A or P
TSB-DR-05-0'DL	beta-BHC	47.1	J (all detects)	A
TSB-DR-04-0'DL	beta-BHC 4,4'-DDE	44.7 87.7	J (all detects) J (all detects)	A
TSB-CR-04-0'DL	beta-BHC	44.3	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-DR-05-0' and TSB-DR-05-0'-FD and samples TSB-DR-05-0'DL and TSB-DR-05-0'-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-DR-05-0'	TSB-DR-05-0'-FD				
beta-BHC	41	1.7U	-	39.3 (≤ 1.7)	J (all detects) UJ (all non-detects)	A
4,4'-DDE	1.8	1.7U	-	0.1 (≤ 1.7)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'DL	TSB-DR-05-0'-FD				
beta-BHC	45	1.7U	-	43.3 (≤ 17)	J (all detects) UJ (all non-detects)	A

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-3**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-04-0' TSB-CR-04-0'	All TCL compounds	J+ (all detects)	A	Surrogate recovery (%R)
TRNC-D-3	TSB-DR-05-0' TSB-CR-04-0'	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-3	TSB-DR-04-0'	beta-BHC 4,4'-DDE 2,4'-DDE	J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-3	TSB-DR-05-0'DL TSB-CR-04-0'DL	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-3	TSB-DR-04-0'DL	beta-BHC 4,4'-DDE	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-0'DL	beta-BHC	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

LDC #: 18100C3a
 SDG #: TRNC-D-3
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/21/08
 Page: 1 of 1
 Reviewer: JV6
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/13/07
II.	GC/ECD Instrument Performance Check	SW	see cal worksheet
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	F7 k130262-008 (TRNC-D-2)
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	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D ₁ = 3, 5 D ₂ = 4, 5
XV.	Field blanks	ND	R = 21

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

Validated Samples:

Soil + Water

1	TSB-DR-06-0'	S	11	TSB-DR-04-0'	S	21	RINSTATE-2	W	31	7319099 MB
2	TSB-DR-06-10'		12	TSB-DR-04-0'DL		22	TSB-DR-03-0'MS	S	32	7320107 MB
3	TSB-DR-05-0' D ₁		13	TSB-DR-04-10'		23	TSB-DR-03-0'MSD		33	732444 MB
4	TSB-DR-05-0'DL D ₂		14	TSB-CR-04-0'		24	RINSTATE-2MS	W	34	
5	TSB-DR-05-0'-FD D ₁ D ₂		15	TSB-CR-04-0'DE DL		25	RINSTATE-2MSD		35	
6	TSB-DR-05-10'		16	TSB-CR-04-10'		26			36	
7	TSB-DR-03-0'		17	TSB-CR-05-0'		27			37	
8	TSB-DR-03-10'		18	TSB-CR-05-10'		28			38	
9	TSB-DJ-01-0'		19	TSB-CR-06-0'		29			39	
10	TSB-DJ-01-10'		20	TSB-CR-06-10'		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. 2,4'-DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. 2,4'-DDD	NN.

Notes:

VALIDATION FINDINGS WORKSHEET
 Surrogate Spikes

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

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
 Y N/A Were surrogates spiked into all samples, standards and blanks?
 Y N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		4 (10x)	SIX-CAP 1	A	DD (73-116)	No qual
				B	↓ (57-114)	↓
		11		B	420 ()	J + dets / A
		12 (10x)		A	DD ()	No qual
				B	↓ ()	↓
		14		B	162 ()	J + dets / A
		15 (10x)		A	DD ()	No qual
				B	()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	
					()	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			
B	Decachlorobiphenyl			

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
 Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
 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
		F7K130262-008	B	0 (62-109)	0 (62-109)	()	NONE	No qual
		(from TRNG-D-2)		()	()	()		
				()	()	()		
		22/23	B	197 (62-109)	213 (62-109)	()	7	Normal (CS in)
				()	()	()		
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VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

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

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

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

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

#	Compound Name	Finding	Associated Samples	Qualifications
	B	> cal range	3, 14	J det's / A
	B, J, EE		11	

Comments: See sample calculation verification worksheet for recalculations

(#14 not marked E on the Form 1)

LDC #: 18100C 3a
 SDG #: Sr. Curved

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
 Reviewer: N/G
 2nd Reviewer: [Signature]

METHOD: GC HPLC

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

Y N / N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
 Y N / N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
 Y N / N/A Did the percent difference of detected compounds between two columns/detectors $\leq 40\%$?
 If no, please see findings below.

#	Compound Name	Sample ID	%RPD/%D Between Two Columns/Detectors Limit ($\leq 40\%$)	Qualifications
	<u>B</u>	<u>4</u>	<u>47.1</u>	<u>J acts / A</u>
	<u>B</u>	<u>12</u>	<u>44.7</u>	
	<u>J</u>	<u>↓</u>	<u>87.7</u>	
	<u>B</u>	<u>15</u>	<u>44.3</u>	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18/00C3a
 SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N/A
 Y N/A

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

Compound	Concentration ($\mu\text{g}/\text{kg}$)		RPD (Parent only)
	3	5	
B	41	1.74	39.3 (≤ 1.7 Diff) J/UJ/A
J	1.8	↓	0.1 ($\leq \downarrow$) -

Compound	Concentration ($\mu\text{g}/\text{kg}$)		RPD (Parent only)
	4	5	
B	45	1.74	43.3 (≤ 1.7 Diff) J/UJ/A

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 14, 2007
LDC Report Date: January 28, 2008
Matrix: Soil
Parameters: Chlorinated Pesticides
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-0'DL
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-0'-FDDL
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW-DITCH01-0'
JB-NW-DITCH01-0'DL
JB-NW-DITCH01-10'

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 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

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

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

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

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
11/27/07	KCAL294	STX-CLP2	Endrin	16.8	JB-NW-DITCH01-10'	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 were not within QC limits. Since the samples were all non-detected, no data were qualified.

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	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-DR-02-0'-FD	Decachlorobiphenyl	170 (57-144)	All TCL compounds	J+ (all detects)	P
JB-NW-DITCH01-0'	Decachlorobiphenyl	237 (57-144)	All TCL compounds	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. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

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

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

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

b. GPC Calibration

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

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-FJ-07-0' TSB-FJ-06-0'-FD	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
JB-NW-DITCH01-0'	4,4'-DDE	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

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

Sample	Compound	%D	Flag	A or P
TSB-FJ-06-0'	4,4'-DDE Endrin aldehyde	93.8 188.3	J (all detects) J (all detects)	A
TSB-FJ-06-10'	4,4'-DDT	69.2	J (all detects)	A
JB-NW-DITCH01-0'	alpha-BHC	46.2	J (all detects)	A
TSB-FJ-06-0'-FDDL	beta-BHC	49.9	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-FJ-06-0' and TSB-FJ-06-0'-FD, samples TSB-FJ-06-0' and TSB-FJ-06-0'-FDDL, and samples TSB-DR-02-0' and TSB-DR-02-0'-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-FJ-06-0'	TSB-FJ-06-0'-FD				
beta-BHC	120	46	89 (≤50)	-	J (all detects)	A
4,4'-DDE	66	1.7U	-	64.3 ug/Kg (≤18)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Endrin aldehyde	20	1.7U	-	18.3 ug/Kg (≤ 18)	J (all detects) UJ (all non-detects)	A
alpha-BHC	18U	2.1	-	15.9 ug/Kg (≤ 18)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FDDL				
beta-BHC	120	52	-	68 ug/Kg (≤ 18)	J (all detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
beta-BHC	1.7U	28	-	26.3 ug/Kg (≤ 1.7)	J (all detects) UJ (all non-detects)	A
4,4'-DDE	1.7U	31	-	29.3 ug/Kg (≤ 1.7)	J (all detects) UJ (all non-detects)	A
4,4'-DDT	1.7U	19	-	17.3 ug/Kg (≤ 1.7)	J (all detects) UJ (all non-detects)	A
2,4'-DDE	1.7U	8.8	-	7.1 ug/Kg (≤ 1.7)	J (all detects) UJ (all non-detects)	A

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-4**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	JB-NW-DITCH01-10'	Endrin	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-4	TSB-DR-02-0'-FD	All TCL compounds	J+ (all detects)	P	Surrogate recovery (%R)
TRNC-D-4	JB-NW-DITCH01-0'	All TCL compounds	J+ (all detects)	A	Surrogate recovery (%R)
TRNC-D-4	TSB-FJ-07-0' TSB-FJ-06-0'-FD	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-4	JB-NW-DITCH01-0'	4,4'-DDE	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-4	TSB-FJ-06-0'	4,4'-DDE Endrin aldehyde	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-4	TSB-FJ-06-10'	4,4'-DDT	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-4	JB-NW-DITCH01-0'	alpha-BHC	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-4	TSB-FJ-06-0'-FDDL	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	beta-BHC	J (all detects)	A	Field duplicates (RPD)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	4,4'-DDE Endrin aldehyde	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FDDL	beta-BHC	J (all detects)	A	Field duplicates (Difference)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-DR-02-0' TSB-DR-02-0'-FD	beta-BHC 4,4'-DDE 4,4'-DDT 2,4'-DDE	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G

Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G

Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-4

No Sample Data Qualified in this SDG

LDC #: 18100D3a

VALIDATION COMPLETENESS WORKSHEET

Date: 1/21/08

SDG #: TRNC-D-4

Level III

Page: 1 of 1

Laboratory: Test America

Reviewer: JTG

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: 11/14/07
II.	GC/ECD Instrument Performance Check	SW	See CW worksheet
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	F7K140171-006 (TRNC-D-3)
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	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D ₁ = 6, 7 D ₂ = 6, 8 D ₃ = 14, 16
XV.	Field blanks	N	

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

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Soil

1	TSB-FR-01-0'	11	TSB-FJ-05-10'	21	7320107 MB	31	
2	TSB-FR-01-10'	12	TSB-DR-01-0'	22	7324198 MB	32	
3	TSB-FJ-07-0'	13	TSB-DR-01-10'	23		33	
4	TSB-FJ-07-0'DL	14	TSB-DR-02-0' D ₃	24		34	
5	TSB-FJ-07-10'	15	TSB-DR-02-10'	25		35	
6	TSB-FJ-06-0' D ₁ D ₂	16	TSB-DR-02-0'-FD D ₃	26		36	
7	TSB-FJ-06-0'-FD D ₁	17	JB-NW-DITCH01-0'	27		37	
8	TSB-FJ-06-0'-FDDL D ₂	18	JB-NW-DITCH01-0'DL	28		38	
9	TSB-FJ-06-10'	19	JB-NW-DITCH01-10'	29		39	
10	TSB-FJ-05-0'	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. 2,4'-DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. 2,4'-DDD	NN.

Notes:

LDC #: 18100 D3a
SDG #: See Contd

VALIDATION FINDINGS WORKSHEET

Surrogate Spikes

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

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

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
Y () N () N/A ()
Were surrogates spiked into all samples, standards and blanks? ()
Did all surrogate percent recoveries (%R) meet the QC limits? ()

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		4 (10x)	SIX-CLP 1	A	DD (72-116)	No qual
		6		B	(57-144)	↓
		8			()	
		18			()	
		16		B	170	J+ dets / p
		17	✓	B	237	J+ dets / A
					()	
					()	
					()	
					()	
					()	
					()	
					()	
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					()	
					()	
					()	
					()	
					()	
					()	
					()	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
 X N N/A Was a 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 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
		F7 K140171-006	B	197 (62-109)	213 (62-109)	() ()	None	No qual

VALIDATION FINDINGS WORKSHEET

Compound Quantitation and Reported CRQLs

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

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

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

#	Compound Name	Finding	Associated Samples	Qualifications
	B	> cal range	3, 7	J det's / A
	J		17	

Comments: See sample calculation verification worksheet for recalculations

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Level I/II Only
 N N/A
 Y N/A
 N N/A
 Y N/A
 Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
 Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
 Did the percent difference of detected compounds between two columns/detectors \leq 40%?
 If no, please see findings below.

#	Compound Name	Sample ID	%RPD(%) ^a Between Two Columns/Detectors Limit (\leq 40%)	Qualifications
	J	6	93.8	Jets / A
	R	↓	188.3	
	0	9	69.2	
	A	17	46.2	
	B	8	49.9	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100 D3a
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

Y N N/A
 Y N N/A

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

Compound	Concentration (ug/kg)		RPD (Parent only)
	6	7	
B	120	46	89 (≤50% RPD) J det/A
J	66	1.7u	64.3 (≤18 Diff) J/uJ/A
R	20	↓	18.3 ↓
A	18u	2.1	15.9 ↓

Compound	Concentration (ug/kg)		RPD
	6	8	
B	120	52	68 (≤18 Diff) J det/A
J	66	NR	NC
R	20	↓	↓

Compound	Concentration (ug/kg)		RPD
	14	16	
B	1.7 u	28	26.3 (≤1.7 Diff) J/uJ/A
J	↓	31	29.3 ↓
O	↓	19	17.3 ↓
EE	↓	8.8	7.1 ↓

Compound	Concentration ()		RPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 15, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Chlorinated Pesticides
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**	TSB-FR-03-10'**
TSB-FJ-03-0'-FD**	TSB-FR-03-10'RE**
TSB-FJ-03-10'**	RINSATE-3
TSB-FJ-10-0'**	TSB-FJ-09-10'REMS
TSB-FJ-10-10'**	TSB-FJ-09-10'REMSD
TSB-FJ-04-0'**	
TSB-FJ-04-10'**	
TSB-FJ-02-0'**	
TSB-FJ-02-0'-FD**	
TSB-FJ-02-10'**	
TSB-FR-02-0'**	
TSB-FR-02-10'**	
TSB-FR-02-10'RE**	
TSB-FJ-09-0'**	
TSB-FJ-09-0'RE**	
TSB-FJ-09-10'**	
TSB-FJ-09-10'RE**	
TSB-FR-03-0'**	
TSB-FR-03-0'RE**	
TSB-FR-03-0'REDL**	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 24 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.

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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
TSB-FR-02-10'RE** TSB-FJ-09-0'RE** TSB-FR-03-0'RE** TSB-FR-03-0'REDL** TSB-FR-03-10'RE**	All TCL compounds	20	14	J- (all detects) UJ (all non-detects)	A
TSB-FJ-09-10'RE** TSB-FJ-09-10'REMS TSB-FJ-09-10'REMSD	All TCL compounds	26	14	J- (all detects) UJ (all non-detects)	A

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
11/27/07	KCAL294	STX-CLP2	Endrin	16.8	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'** TSB-FJ-10-0'** TSB-FJ-10-10'** TSB-FJ-04-0'** TSB-FJ-04-10'** TSB-FJ-02-0'** TSB-FJ-02-0'-FD**	J+ (all detects)	A
11/28/07	KCAL308	STX-CLP2	Endrin	18.7	TSB-FJ-02-10'**	J+ (all detects)	A
12/12/07	KCAL073	STX-CLP1	4,4'-DDD	24.1	TSB-FJ-09-10'RE** TSB-FJ-09-10'REMS TSB-FJ-09-10'REMSD 7345204MB	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.

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.

The individual 4,4'-DDT and Endrin breakdowns were not within QC limits. Since the samples were all non-detected, no data were qualified.

V. Blanks

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

Sample "RINSATE-3" was identified as a rinsate. No chlorinated pesticide contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for samples TSB-FR-02-0'** and TSB-FR-03-0'REDL**. Since these samples were diluted out, no data were qualified.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS percent recoveries (%R) were not within QC limits for all TCL compounds, 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. 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 with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-FR-03-0'RE**	beta-BHC	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

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

Sample	Compound	%D	Flag	A or P
TSB-FR-02-0**	4,4'-DDE 4,4'-DDT	58.1 50.5	J (all detects) J (all detects)	A
TSB-FR-03-0**	2,4'-DDE	55.5	J (all detects)	A

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-FJ-03-0'*** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'*** and TSB-FJ-02-0'-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-FJ-03-0'***	TSB-FJ-03-0'-FD**				
4,4'-DDE	1.8U	1.9	-	0.1 ug/Kg (≤ 1.8)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0'***	TSB-FJ-02-0'-FD**				
beta-BHC	1.8U	22	-	20.2 ug/Kg (≤ 1.8)	J (all detects) UJ (all non-detects)	A

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-5**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FR-02-10'RE** TSB-FJ-09-0'RE** TSB-FR-03-0'RE** TSB-FR-03-0'REDL** TSB-FR-03-10'RE** TSB-FJ-09-10'RE**	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'***	Endrin	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FJ-09-10'RE**	4,4'-DDD	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-5	TSB-FR-03-0'RE**	beta-BHC	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-5	TSB-FR-02-0'***	4,4'-DDE 4,4'-DDT	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-5	TSB-FR-03-0'***	2,4'-DDE	J (all detects)	A	Compound quantitation and CRQLs (%D)
TRNC-D-5	TSB-FJ-02-0'*** TSB-FJ-02-0'-FD**	beta-BHC	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-5

No Sample Data Qualified in this SDG

LDC #: 18100E3a

VALIDATION COMPLETENESS WORKSHEET

Date: 1/24/08

SDG #: TRNC/D-5

Level III/IV

Page: 1 of 1

Laboratory: Test America

Reviewer: JVL

2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/15/07
II.	GC/ECD Instrument Performance Check	SW	See CCV worksheet
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	F7K140171-021 (TRNC/D-3) F7K140148-008 (TRNC/D-6) F7K140148-001 (TRNC/D-6)
VIII.	Laboratory control samples	SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisol cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	A	Not reviewed for Level III validation.
XII.	Compound quantitation and reported CRQLs	SW	Not reviewed for Level III validation.
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D ₁ = 1, 2 D ₂ = 8, 9
XV.	Field blanks	ND	R = 23

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-FJ-03-0**	D ₁ S	11	TSB-FR-02-0**	S	21	TSB-FR-03-10**	S	31	7324198 MB	11/20
2	TSB-FJ-03-0-FD**	D ₁	12	TSB-FR-02-10**		22	TSB-FR-03-10'RE**	↓	32	7325371 MB	11/20
3	TSB-FJ-03-10**		13	TSB-FR-02-10'RE**		23	RINSATE-3	W	33	7339072 MB	12/05
4	TSB-FJ-10-0**		14	TSB-FJ-09-0**		24	TSB-FJ-09-10'MS	S	34	7345204 MB	12/11
5	TSB-FJ-10-10**		15	TSB-FJ-09-0'RE**		25	TSB-FJ-09-10'MSD	↓	35	7324442 MB	11/20
6	TSB-FJ-04-0**		16	TSB-FJ-09-10**	-	26			36		
7	TSB-FJ-04-10**		17	TSB-FJ-09-10'RE**		27			37		
8	TSB-FJ-02-0**	D ₂	18	TSB-FR-03-0**		28			38		
9	TSB-FJ-02-0-FD**	D ₂	19	TSB-FR-03-0'RE**		29			39		
10	TSB-FJ-02-10**		20	TSB-FR-03-0'REDL**		30			40		

LDC #: 18100 E 3a
 SDG #: CPE Core

VALIDATION FINDINGS CHECKLIST

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

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/ECD instrument performance check				
Was the instrument performance found to be acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) \leq 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the required standard concentrations analyzed in the initial calibration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? <u> </u> %D or <u> </u> %R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were endrin and 4,4'-DDT breakdowns \leq 15%.0 for individual breakdown in the Evaluation mix standards?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) \leq 15%.0 or percent recoveries 85-115%?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were extract cleanup blanks analyzed with every batch requiring clean-up?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 18100 E3a
 SDG #: see cover

VALIDATION FINDINGS CHECKLIST

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

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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. 2,4'-DDE	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:

LDC #: 18100 E3a
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

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

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

METHOD : GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)							
Sample ID	Matrix	Preserved	Sampling Date	<u>Extraction date</u>	Analysis date	Total # of Days	Qualifier
13, 15, 19, 20, 22	S	N	11/15/07	12/05/07	12/07/07	20	S/W/A
	↓	↓	↓				↓
17, 24, 25				12/11/07	12/12/07	26	↓

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
 Soil: Extracted within 14 days, analyzed within 40 days.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

LDC #: 18100 E3a
SDG #: See Cover

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

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

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

- Y N N/A What type or calibration verification calculation was performed? %D or RPD
- Y N N/A Were Evaluation mix standards run before initial calibration and before samples?
- Y N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?
- Y N N/A Was at least one standard run daily to verify the working curve?
- Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level IV/D Only

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
					% BD ≤ 15.0	()		
	11/26/07	KPEM 214	STX-C18	K	19.40	()	23	No qual (ND)
	11/28/07	KPEM 313	STX-C18	K	15.89	()	16	
	11/28/07	KPEM 342	STX-C18	K	17.85	()	11	
	11/27/07	KCAL 294 (CON)	STX-C18	K (F)	16.8	()	1-9	J+ det's / A
	11/28/07	KCAL 308 (CON)	STX-C18	K (F)	18.7	()	10	
	12/10/07	KCAL 073 (CON)	STX-C18	M (F)	24.1	()	17, 24, 25, 7345204 MB	

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

LDC #: 18100 E3a
 SDG #: See below

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

VALIDATION FINDINGS WORKSHEET

Surrogate Spikes

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

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were surrogates spiked into all samples, standards and blanks?
 Y (N) N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		11 (10x)	MSX-GUP	A	DD (73-116)	No qual ↓
		20 (10x)	↓	B	(57-144)	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
 N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
 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
		F7K190 148-001	E	()	175 (63-146)	58 (20)	None ↓	No qual ↓
			B	()	114 (62-109)	()	↓	
				()	()	()		
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LDC #: 18100 E 34

SDG #: see cover

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

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 a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

VALIDATION FINDINGS WORKSHEET
 Laboratory Control Samples

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7325371 LCS	All TCL	← control limits	()	()	12, 14, 16, 18, 21, 7325371 MB	No Qual (MS MSD in)
				()	()	()		
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VALIDATION FINDINGS WORKSHEET

Compound Quantitation and Reported CRQLs

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

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

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	B	> cal range	19	J Acts/A

Comments: See sample calculation verification worksheet for recalculations

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

LDC #: 118100E3a

SDG #: See Copy

METHOD: GC HPLC

Page: 1 of 1

Reviewer: JVZ

2nd Reviewer: [Signature]

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

- N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
- N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
- N N/A Did the percent difference of detected compounds between two columns/detectors ≤40%?
 If no, please see findings below.

#	Compound Name	Sample ID	%RPD/ ΔD Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	J	11	58.1	J det A
	D	↓	50.5	
	EE	18	55.5	

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100 E3a
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Field Duplicates

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

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

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

Compound	Concentration ($\mu\text{g}/\text{kg}$)		RPD	Parent only
	1	2		
J	1.8 u	1.9	0.1 ($\leq 1.8 \text{ Diff}$)	-

Compound	Concentration ($\mu\text{g}/\text{kg}$)		RPD	Parent only
	8	9		
B	1.8 u	22	20.2 ($\leq 1.8 \text{ Diff}$)	J/UJ/A

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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 = $100 \cdot (S/X)$
- 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		Recalculated		Reported		Recalculated	
				CF (A, std)	CF (O, std)	Average CF (Initial)	Average CF (Initial)	%RSD	%RSD		
1	ICAL	11/21/07	H	474162270	474162270	506321046	506321046	4.443	4.443		
			P	188264990	188364990	194628954	194628954	4.142	4.142		
	GCK		H	263177950	263177950	283388782	283388782	4.470	4.470		
2			P	55406290	55406290	55632434	55632434	3.242	3.242		
3	ICAL	12/04/07	H	49776900	49776900	529584384	529584384	3.682	3.682		
	GCK		P	214458330	214458330	246999058	246999058	8.028	8.028		
			H	278077240	278077240	306992176	306992176	5.576	5.576		
4			P	59458080	59458080	70208852	70208852	9.442	9.442		

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

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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:

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

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

#	Standard ID	Calibration Date	Compound	Reported		Recalculated		Reported		Recalculated	
				CF (s.d.)	CF (s.d.)	Average CF (initial)	%RSD	Average CF (initial)	%RSD	Average CF (initial)	%RSD
1	1CAL	12/03/07	H STX-CAP 1	224298420	224298420	244321004	6.586	244321004	6.586	244321004	6.586
			P	87244750	87244750	96310314	9.260	96310314	9.260	96310314	9.260
	GCP		H	288180890	288180890	309100006	5.614	309100006	5.614	309100006	5.614
2			P	66263200	66263200	6977808	7.816	6977808	7.816	6977808	7.816
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.

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

LDC #: 1810 E3a
SDG #: Sec Cont

Page: 1 of 4
Reviewer: JNZ
2nd Reviewer: [Signature]

METHOD: GC MS _____ 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 = $100 \cdot (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ 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(cal)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	KCAL 280	11/27/08	H	0.0250	0.0255	7.2	0.0255	7.2
			P		0.0276	10.3	0.0276	10.3
			H		0.0260	4.2	0.0260	4.2
			P		0.0277	10.8	0.0277	10.8
3	KCA 244	11/27/08	H		0.0254	1.5	0.0254	1.5
			P		0.0274	9.4	0.0274	9.4
			A		0.0260	4.0	0.0260	4.0
			P		0.0269	7.7	0.0269	7.7
4	(1-9)							

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 #: 18100 E96
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 7 of 4
 Reviewer: JVL
 2nd Reviewer: [Signature]

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 = $100 * (\text{ave. CF} - \text{CF}) / \text{ave. CF}$

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(1cal)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	KCAL 308 (10)	11/28/07	H SIX-CUP 1 P H P	0.0263	5.1	0.0263	5.1	
				0.0286	14.3	0.0286	14.3	
				0.0270	8.1	0.0270	8.1	
2				0.0280	12.1	0.0280	12.1	
3	KCAL 343 (11)	11/28/07	H P H P	0.0260	3.9	0.0260	3.9	
				0.0235	5.9	0.0235	5.9	
				0.0254	1.6	0.0254	1.6	
4				0.0270	7.9	0.0270	7.9	

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 #: 18100 E 31
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 3 of 4
 Reviewer: JVL
 2nd Reviewer: J

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 = $100 * (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ 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(lcal)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	KCAL 814 (15,14,22)	12/07/07	H (97X-CUP1)	0.0257	3.0	0.0257	3.0	
			P	0.0240	4.0	0.0240	4.0	
			H	0.0259	3.8	0.0259	3.8	
			P	0.0238	4.8	0.0238	4.8	
3	KCAL 800 (12) (ND) (103)	12/07/07	H	0.0268	7.3	0.0268	7.3	
			P	0.0264	5.8	0.0264	5.6	
			H	N/A				
			P	↓				
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 #: 18100 E 34
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 4 of 4
 Reviewer: JN
 2nd Reviewer: [Signature]

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 = $100 * (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ 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		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	KCAL 073	12/11/07	H (STX-CMP1)	0.0250	0.0281	12.4	0.0281	12.4
			P		0.0241	3.4	0.0241	3.4
	(17,24,25) MB4		H		NR			
2			P					
3	KCAL 528	12/10/07	B (SIX-CMP1)		0.0259	0.9	0.0259	3.5
	(20)				0.0252	0.9	0.0252	0.9
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.

(MB2 analyzed after 1CAL)

LDC #: 18 100 E 3a
 SDG #: See Copy

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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: # 1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene	<u>STX-C1P1</u>	<u>0.0200</u>	<u>0.01950</u>	<u>98</u>	<u>98</u>	<u>0</u>
Decachlorobiphenyl	<u>↓</u>	<u>↓</u>	<u>0.02071</u>	<u>104</u>	<u>104</u>	<u>↓</u>
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 #: 18110 Epa

SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

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 = $1 MS - MSD \mid * 2 / (MS + MSD)$

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 24 / 25

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC	17.9	18.0	0	17.1	17.4	46	96	97	97	1.6	1.7
4,4'-DDT											

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 #: 18/00 E34
 SDG #: See Cover

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

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

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 = $100 \times \frac{SSC - SC}{SA}$
 Where: SSC = Spiked sample concentration
 SA = Spike added

SC = Concentration

RPD = $100 \times \frac{LCS - LCSD}{LCS + LCSD}$

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7324148 LCS

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	16.7	NA	14.2	NA	85	85				
4,4'-DDT	↓	↓	16.7	↓	100	100				

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 #: 18100 E3a
 SDG #: Lee Cooper

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

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

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

Y N N/A
Y N N/A

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

Example:

Sample I.D. # 2 4,4'-DDE

$$\text{Conc.} = \frac{(289\ 0806) (10\ \text{ml}) (1000)}{(546\ 493\ 914) (20.2\ \text{g}) (0.941)}$$

$$= 1.255$$

\approx 1.9 ug/kg

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

Note: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 16, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Chlorinated Pesticides
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'	TSB-GR-01-5'
TSB-FJ-08-0'RE	TSB-GR-01-5'RE
TSB-FJ-08-10'	TSB-GR-01-5'REDL
TSB-FJ-08-10'RE	TSB-GJ-06-0'
TSB-FR-05-0'	TSB-GJ-06-0'RE
TSB-FR-05-0'RE	TSB-GJ-06-5'
TSB-FR-05-10'	TSB-GJ-06-5'RE
TSB-FR-05-10'RE	TSB-GJ-01-0'
TSB-FR-04-0'	TSB-GJ-01-0'RE
TSB-FR-04-0'RE	TSB-GJ-01-5'
TSB-FR-04-0'-FD	TSB-GJ-01-5'RE
TSB-FR-04-0'FDRE	RINSATE-4
TSB-FR-04-10'	TSB-FJ-08-0'REMS
TSB-FR-04-10'RE	TSB-FJ-08-0'REMSD
TSB-FJ-01-0'	TSB-FJ-01-0'MS
TSB-FJ-01-0'RE	TSB-FJ-01-0'MSD
TSB-FJ-01-10'	
TSB-FJ-01-10'RE	
TSB-GR-01-0'	
TSB-GR-01-0'RE	

Introduction

This data review covers 35 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
TSB-FJ-08-0'RE TSB-FJ-08-10'RE TSB-FR-05-0'RE TSB-FR-05-10'RE TSB-FR-04-10'RE TSB-FJ-01-0'RE TSB-FJ-01-10'RE TSB-GR-01-0'RE TSB-GR-01-5'RE TSB-GR-01-5'REDL TSB-GJ-06-0'RE TSB-GJ-06-5'RE TSB-GJ-01-0'RE TSB-GJ-01-5'RE TSB-FR-04-0'RE TSB-FR-04-0'FDRE TSB-FJ-08-0'REMS TSB-FJ-08-0'REMSD	All TCL compounds	19	14	J- (all detects) UJ (all non-detects)	A

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

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

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

IV. Continuing Calibration

Continuing calibration was performed at required frequencies with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GJ-06-5'	All TCL compounds	Performance Evaluation Mixtures were not analyzed at the proper frequency. The PEM was analyzed at 15:37 on 12/3/07 and the sample analysis was started at 05:19 on 12/4/07.	Performance Evaluation Mixtures must be analyzed for each column at the proper frequency within 12 hours of each sample analysis.	None	P

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
12/4/07	PCAL077	STX-CLP1	4,4'-DDE	21.4	TSB-FR-04-0'	J+ (all detects)	P
			Dieldrin	16.9	TSB-FR-04-0'-FD	J+ (all detects)	
			Endrin	17.8		J+ (all detects)	
			4,4'-DDD	26.5		J+ (all detects)	
			Endosulfan II	21.6		J+ (all detects)	
			4,4'-DDT	23.7		J+ (all detects)	
			Endrin aldehyde	22.2		J+ (all detects)	
			Methoxychlor	27.8		J+ (all detects)	
			Endosulfan sulfate	24.8		J+ (all detects)	
			Endrin ketone	22.8		J+ (all detects)	

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 were not within QC limits. Since the samples were all non-detected, no data were qualified.

V. Blanks

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

Sample "RINSATE-4" was identified as a rinsate. No chlorinated pesticide contaminants were found in this blank.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for samples TSB-FR-04-0' and TSB-FR-04-0'-FD. Since these samples were diluted out, no data were qualified.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Although the MSD percent recoveries (%R) were not within QC limits for 2 compounds, the MS percent recoveries (%R) were within QC limits and no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS percent recoveries (%R) were not within QC limits for all TCL compounds, 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. Pesticide Cleanup Checks

a. Florisil Cartridge Check

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

b. GPC Calibration

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

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-GR-01-5'RE	4,4'-DDE 4,4'-DDT	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-FR-04-0' and TSB-FR-04-0'-FD and samples TSB-FR-04-0'RE and TSB-FR-04-0'FDRE were identified as field duplicates. No chlorinated pesticides were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-6**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-FJ-08-0'RE TSB-FJ-08-10'RE TSB-FR-05-0'RE TSB-FR-05-10'RE TSB-FR-04-10'RE TSB-FJ-01-0'RE TSB-FJ-01-10'RE TSB-GR-01-0'RE TSB-GR-01-5'RE TSB-GR-01-5'REDL TSB-GJ-06-0'RE TSB-GJ-06-5'RE TSB-GJ-01-0'RE TSB-GJ-01-5'RE TSB-FR-04-0'RE TSB-FR-04-0'FDRE	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	4,4'-DDE Dieldrin Endrin 4,4'-DDD Endosulfan II 4,4'-DDT Endrin aldehyde Methoxychlor Endosulfan sulfate Endrin ketone	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	P	Continuing calibration (%D)
TRNC-D-6	TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GJ-06-5'	All TCL compounds	None	P	Continuing calibration (PEM)
TRNC-D-6	TSB-GR-01-5'RE	4,4'-DDE 4,4'-DDT	J (all detects) J (all detects)	A	Compound quantitation and CRQLs

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

LDC #: 18100F3a
 SDG #: TRNC/D-6
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/23/08
 Page: 1 of 1
 Reviewer: JVB
 2nd Reviewer: [Signature]

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

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

Validation Area		Comments	
I.	Technical holding times	SW	Sampling dates: 11/16/07
II.	GC/ECD Instrument Performance Check	SW	See CV worksheet
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	F7K140171-021 (TRNC/D-3)
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	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	ND	D ₁ = 9, 11 D ₂ = 10, 12
XV.	Field blanks	ND	R = 32

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

Validated Samples:

Soil + Water

1	TSB-FJ-08-0'	S	11	TSB-FR-07-0'-FD RE D ₁	S	21	TSB-GR-01-5'	S	31	TSB-GJ-01-5'RE	S
2	TSB-FJ-08-0'DLRE		12	TSB-FR-07-0'-FDR RE D ₂		22	TSB-GR-01-5'RE		32	RINSATE-4	W
3	TSB-FJ-08-10'		13	TSB-FR-04-10'		23	TSB-GR-01-5'REDL		33	TSB-FJ-08-0'MS ^{RE}	S
4	TSB-FJ-08-10'RE		14	TSB-FR-04-10'RE		24	TSB-GJ-06-0'		34	TSB-FJ-08-0'MSD ^{RE}	
5	TSB-FR-05-0'		15	TSB-FJ-01-0'		25	TSB-GJ-06-0'RE		35	TSB-FJ-01-0'MS	
6	TSB-FR-05-0'RE		16	TSB-FJ-01-0'RE		26	TSB-GJ-06-5'		36	TSB-FJ-01-0'MSD	
7	TSB-FR-05-10'		17	TSB-FJ-01-10'		27	TSB-GJ-06-5'RE		37	7325371 MB	
8	TSB-FR-05-10'RE		18	TSB-FJ-01-10'RE		28	TSB-GJ-01-0'		38	7339072 MB	
9	TSB-FR-04-0' RE D ₁		19	TSB-GR-01-0'		29	TSB-GJ-01-0'RE		39	7324442 MB	
10	TSB-FR-04-0' RE D ₂		20	TSB-GR-01-0'RE		30	TSB-GJ-01-5'		40		

LDC #: 18100 F3a
SDG #: See Copy

VALIDATION FINDINGS WORKSHEET

Technical Holding Times

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

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

METHOD : GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)							
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All RE's	S	N	11/6/07	12/05/07	12/07-11/07	19	J-V/A

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

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

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

What type or calibration verification calculation was performed? %D or RPD

Were Evaluation mix standards run before initial calibration and before samples?

Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

Was at least one standard run daily to verify the working curve?

Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level IV/D Only

Y N (N/A)

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
				Samples were analyzed after the for PEM had expired		12 hr or (dock)	13, 15, 17, 26	None / P
				(PEM 028 analyzed 12/20/07 at 15:37)				
				(sample analysis started at 12/24/07 at 5:19)				
12/6/07		PCA L077 (SEN)	SPX-CUR1	J (4)	21.4		9, 11	J + 0.15 / P
				I	16.9			
				K	17.8			
				M	26.5			
				L	21.6			
				O	23.7			
				R	22.2			
				P	27.8			
				N	24.8			
				Q	22.8			
					(2, 3, 4, 5, 6, 7)			
11/20/07		k PEM 214	SPX-CUR2	k	19.40		32	No qual (ND)

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

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
 Were surrogates spiked into all samples, standards and blanks?
 Did all surrogate percent recoveries (%R) meet the QC limits?

N N/A
N N/A

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		9 (50x)	Not specified	A	100 (73-116)	N = good
				B	(57-144)	
		11 (50x)		A	()	
				B	()	
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Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

LDC #: 18100 F34

SDG #: Spec Copy

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

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

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

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

N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
 N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
 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
		35/36	E	()	175 (62-146)	58 (70)	2	No qual (MSD) ↓
			B	()	114 (62-109)	()	↓	
				()	()	()		
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LDC #: 18100 F34
 SDG #: See Control

VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples

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

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

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 I/II Only

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		<u>7325371 LCS</u>	<u>All ← control (limits)</u>	()	()	()	<u>1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 24, 26, 28, 30, 7325371 MB</u>	<u>No qual</u> <u>(MS/MSD in)</u>
				()	()	()		
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LDC #: 18100.F3a
SDG #: See below

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

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CROs

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

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

Level IV/D Only

Y N N/A
Y N N/A

Were CROs adjusted for sample dilutions, dry weight factors, etc.?

Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	J, D	> cal range	22	J detts / A

Comments: See sample calculation verification worksheet for recalculations

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 19, 2007
LDC Report Date: January 28, 2008
Matrix: Soil
Parameters: Chlorinated Pesticides
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-0'-FDDL
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-0'DL
TSB-GJ-04-5'
TSB-GJ-04-5'RE
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
TSB-GJ-04-5'MS
TSB-GJ-04-5'MSD

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 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (In Days) From Sample Collection Until Extraction	Flag	A or P
TSB-GJ-04-5'RE TSB-GJ-04-5'MS TSB-GJ-04-5'MSD	All TCL compounds	21	14	J- (all detects) UJ (all non-detects)	A

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

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

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

IV. Continuing Calibration

Continuing calibration was performed at required frequencies with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	All TCL compounds	Performance Evaluation Mixtures were not analyzed at the proper frequency. The PEM was analyzed at 14:47 on 12/4/07 and the sample analysis was started at 04:22 on 12/5/07.	Performance Evaluation Mixtures must be analyzed for each column at the proper frequency within 12 hours of each sample analysis.	None	P

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
12/11/07	KCAL015	STX-CLPII	4,4'-DDD	15.9	TSB-GJ-04-5'RE TSB-GJ-04-5'MS TSB-GJ-04-5'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%.

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-GJ-04-5'	Not specified	Tetrachloro-m-xylene Decachlorobiphenyl	40 (73-116) 44 (57-144)	All TCL compounds	J- (all detects) UJ (all non-detects)	A
7330197MB	Not specified	Tetrachloro-m-xylene	61 (73-116)	All TCL compounds	J- (all detects) UJ (all non-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) 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

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

Sample	Compound	Finding	Criteria	Flag	A or P
TSB-GR-02-0'-FD	4,4'-DDT	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A
TSB-GJ-04-0'	4,4'-DDE 4,4'-DDT	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

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

XIV. Field Duplicates

Samples TSB-GR-02-0' and TSB-GR-02-0'-FD, samples TSB-GR-02-0' and TSB-GR-02-0'-FDDL, and samples TSB-GJ-02-0' and TSB-GJ-02-0'-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-GR-02-0'	TSB-GR-02-0'-FD				
beta-BHC	5.1	18	-	12.9 (≤ 1.8)	J (all detects)	A

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
4,4'-DDE	2.3	25	-	22.7 (≤ 1.8)	J (all detects)	A
4,4'-DDT	3.4	64	-	60.6 (≤ 1.8)	J (all detects)	A
2,4'-DDE	1.7U	1.8	-	0.1 (≤ 1.8)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FDDL				
4,4'-DDT	3.4	69	-	65.6 (≤ 1.7)	J (all detects)	A

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Data Qualification Summary - SDG TRNC-D-7**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GJ-04-5'RE	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-7	TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	All TCL compounds	None	P	Continuing calibration (PEM frequency)
TRNC-D-7	TSB-GJ-04-5'RE	4,4'-DDD	J+ (all detects)	A	Continuing calibration (%D)
TRNC-D-7	TSB-GJ-04-5'	All TCL compounds	J- (all detects) UJ (all non-detects)	A	Surrogate spikes (%R)
TRNC-D-7	TSB-GR-02-0'-FD	4,4'-DDT	J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-7	TSB-GJ-04-0'	4,4'-DDE 4,4'-DDT	J (all detects) J (all detects)	A	Compound quantitation and CRQLs
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD	beta-BHC 4,4'-DDE 4,4'-DDT	J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)
TRNC-D-7	TSB-GR-02-0'-FDDL	4,4'-DDT	J (all detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Chlorinated Pesticides - Field Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

LDC #: 18100G3a
 SDG #: TRNC/D-7
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/23/08
 Page: 1 of 1
 Reviewer: SVL
 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	SW	Sampling dates: 11/19/07
II.	GC/ECD Instrument Performance Check	SW	See CCV worksheet
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	SW	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	SW	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	SW	D ₁ = 1, 2 D ₂ = 1, 3 D ₃ = 9, 10
XV.	Field blanks	N	

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

* ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

Soil +

1	1	TSB-GR-02-0'	D ₁ D ₂	11	11	TSB-GJ-02-5'	21	7330197 MB	31	
2	1	TSB-GR-02-0'-FD	D ₁	12	12	TSB-GJ-07-0'	22	7344227 MB	32	
3	1	TSB-GR-02-0'-FDDL	D ₁	13	13	TSB-GJ-07-5'	23		33	
4	1	TSB-GR-02-5'		14	14	TSB-GJ-05-0'	24		34	
5	1	TSB-GJ-04-0'		15	15	TSB-GJ-05-5'	25		35	
6	1	TSB-GJ-04-0'DL		16	16	TSB-GJ-03-0'	26		36	
7	1	TSB-GJ-04-5'		17	17	TSB-GJ-03-5'	27		37	
8	1	TSB-GJ-04-5'RE		18	18	TSB-GJ-04-5'MS	28		38	
9	1	TSB-GJ-02-0'	D ₃	19	19	TSB-GJ-04-5'MSD	29		39	
10	1	TSB-GJ-02-0'-FD	D ₃	20	20		30		40	

LDC #: 18/00G 3a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET

Technical Holding Times

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

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

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

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
8, 18, 19	S	N	11/19/07	12/10/07	12/12/07	21	J/WJ/A

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

VALIDATION FINDINGS WORKSHEET Continuing Calibration

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

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

What type or calibration verification calculation was performed? %D or RPD

Were Evaluation mix standards run before initial calibration and before samples? Y / N / N/A

Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard ($\leq 15.0\%$ for individual breakdowns)? Y / N / N/A

Was at least one standard run daily to verify the working curve? Y / N / N/A

Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of $\leq 15.0\%$? Y / N / N/A

Level I/VD Only

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

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
				Samples were analyzed after the 12 hr clock for PEM had expired (KPEMG22 analyzed at 12/04/07 14:47, sample analysis started at 12/05/07 at 4:22)	()	()	9-17	None / p
	12/11/07	KCAL015	STX-DUPII	M (+)	15.9	()	8, 18, 19, 7354227 MB	Jacks / A
					()	()		
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- A. alpha-BHC
- B. beta-BHC
- C. delta-BHC
- D. gamma-BHC
- E. Heptachlor
- F. Aldrin
- G. Heptachlor epoxide
- H. Endosulfan I
- I. Dieldrin
- J. 4,4'-DDE
- K. Endrin
- L. Endosulfan II
- M. 4,4'-DDD
- N. Endosulfan sulfate
- O. 4,4'-DDT
- P. Methoxychlor
- Q. Endrin ketone
- R. Endrin aldehyde
- S. alpha-Chlordane
- T. gamma-Chlordane
- U. Toxaphene
- V. Arochlor-1016
- W. Arochlor-1221
- X. Arochlor-1232
- Y. Arochlor-1242
- Z. Arochlor-1248
- AA. Arochlor-1254
- BB. Arochlor-1260
- CC. DB 608
- DD. DB 1701
- EE. _____
- FF. _____
- GG. _____
- HH. _____
- II. _____
- JJ. _____

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

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

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

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

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		3 (10x)	Not Specified	A	60 (73-116)	No qual
		5 (10x)		B	57 (57-114)	
		6 (100x)			()	
		16 (80x)			()	
					()	
					()	
					()	
					()	
		7		A	40	J- / UJ / A
				B	44	
					()	
					()	
		7330197 MB		A	61	J- / UJ / P
					()	
					()	
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					()	
					()	
					()	

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachloro-m-xylene			
B	Decachlorobiphenyl			

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples

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

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 1/4 Only

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		734427 LCS	E	150 (74-128)	()	()	()	8, 7344227MB	No qual (MS MSD in)

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

LDC #: 18100 G 3a Page: 1 of 1
 SDG #: See Conv Reviewer: JYL
 2nd Reviewer: [Signature]

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

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

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

#	Compound Name	Finding	Associated Samples	Qualifications
	D	> cal range	2	J det ₅ /A
	J, 6	↓	5	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18100 G 24
 SDG #: Sox Canal

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

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

Compound	Concentration ($\mu\text{g}/\text{kg}$)		RPD	Parent only
	1	2		
B	5.1	18	12.9 (≤ 1.8 Diff)	J det/A
J	2.3	25	22.7	
O	3.4	64	60.6	
EE	1.7 u	1.8	0.1	

Compound	Concentration ($\mu\text{g}/\text{kg}$)		RPD	Parent only
	1	3		
O	3.4	69	65.6 ≤ 1.7 Diff	J det/A

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

**BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100**

PCBs

IDC

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 15, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Polychlorinated Biphenyls
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-10-0'**
TSB-FJ-04-0'
TSB-FJ-02-0'
TSB-FJ-02-0'-FD
TSB-FR-02-0'
TSB-FJ-09-0'
TSB-FR-03-0'
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD
RINSATE-3MS
RINSATE-3MSD

**Indicates sample underwent EPA Level IV review

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 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of multicomponent compounds was performed for the primary (quantitation) column as required by the method.

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

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.

Sample RINSATE-3 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
TSB-FR-02-0'	Not specified	Decachlorobiphenyl	189 (51-145)	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 (%R) 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. 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-FJ-03-0'*** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0' and TSB-FJ-02-0'-FD were identified as field duplicates. No polychlorinated biphenyls were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'***	TSB-FJ-03-0'-FD**				
Aroclor-1248	35U	74	-	39 (≤ 35)	J (all detects) UJ (all non-detects)	A

**BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Data Qualification Summary - SDG TRNC-D-5**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FR-02-0'	All TCL compounds	J+ (all detects)	P	Surrogate spikes (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD**	Aroclor-1248	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

LDC #: 18100E3b
 SDG #: TRNC/D-5
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 1/24/08
 Page: 1 of 1
 Reviewer: N6
 2nd Reviewer: N

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: 11/15/07
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS to
IX.	Regional quality assurance and quality control	N	
Xa.	Florisol 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 ₁ = 1, 2 * D ₂ = 5, 6
XV.	Field blanks	ND	R = 10

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

Validated Samples: ** Indicates sample underwent Level IV validation

Soil + water

1	TSB-FJ-03-0**	D ₁ S	11	TSB-FR-02-0'MS	S	21	7324735 MB	11/20/31
2	TSB-FJ-03-0'-FD**	D ₁	12	TSB-FR-02-0'MSD	↓	22	7324347 MB	11/20/32
3	TSB-FJ-10-0**		13	RINSATE-3MS	W	23		33
4	TSB-FJ-04-0'		14	RINSATE-3MSD	↓	24		34
5	TSB-FJ-02-0'	D ₂	15			25		35
6	TSB-FJ-02-0'-FD	D ₂	16			26		36
7	TSB-FR-02-0'		17			27		37
8	TSB-FJ-09-0'		18			28		38
9	TSB-FR-03-0'		19			29		39
10	RINSATE-3	W	20			30		40

LDC #: 18100 E3b
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

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

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
III. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) \leq 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the required standard concentrations analyzed in the initial calibration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? <u> </u> %D or <u> </u> %R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were Evaluation mix standards analyzed prior to the initial calibration and sample analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were endrin and 4,4'-DDT breakdowns \leq 15%.0 for individual breakdown in the Evaluation mix standards?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) \leq 15%.0 or percent recoveries 85-115%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were extract cleanup blanks analyzed with every batch requiring clean-up?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks or clean-up blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

LDC #: 18100 E3b
 SDG #: see cover

VALIDATION FINDINGS CHECKLIST

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

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.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET

Surrogate Spikes

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

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".
 Y/N/N/A Were surrogates spiked into all samples, standards and blanks?
 Y/N/N/A Did all surrogate percent recoveries (%R) meet the QC limits?

#	Date	Sample ID	Column	Surrogate Compound	%R (Limits)	Qualifications
		17		B	189 (51-145)	J + dots / P

Letter Designation	Surrogate Compound	Recovery QC Limits (Soil)	Recovery QC Limits (Water)	Comments
A	Tetrachoro-m-xylene			
B	Decachlorobiphenyl			

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

SDG #: See Cover

Reviewer: JVG

2nd Reviewer: [Signature]

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
 N N/A Was a MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
 Y 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
		<u>11/12</u>	<u>N</u>	<u>161 (50-140)</u>	<u>150 (50-140)</u>	() ()	<u>7</u>	<u>No qual (MS)</u>
			<u>PB</u>	<u>271 (57-134)</u>	<u>240 (57-134)</u>	() ()	<u>↓</u>	<u>↓</u>
				()	()	() ()		
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LDC #: 18100 E36
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

METHOD: GC Pesticides/PCBs (EPA SW846 Method 8081/8082)

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

Compound	Concentration (<u>ug/kg</u>)		RPD <i>Parent only</i>
	1	✓	
Arolor 1248	35 u	74	39 (± 35 diff) J/US/A

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

LDC #: 18100 E 3b
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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

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 = $100 \cdot (S/X)$
- 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		Recalculated		Reported		Recalculated	
				CF (100% std)	CF (100% std)	Average CF (Initial)	Average CF (Initial)	%RSD	%RSD		
1	1 CAL	9/26/07	1260-1 (CP17) 12	1147 1054 10743	11471 10743	11502 11104	11502 11104	9.589 8.799	9.589 8.802		
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 #: 18100 E36
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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 = $100 \times \frac{\text{ave. CF} - \text{CF}}{\text{ave. CF}}$
 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		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	MCAL859	11/20/07	1260 (CIP1) ↓	1000	993.2276	7	993.2142	7
					1022-9651	2.3	1022-8	2.3
2	MCAL870	11/20/07	(CIP1) ↓	✓	996.1075	0.4	996.0898	0.4
					1043.8424	6.4	1043.7755	4.4
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 #: 18100 E7b
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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: # 1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl	<u>CUP 1</u>	<u>20</u>	<u>23.1752</u>	<u>116</u>	<u>116</u>	<u>0</u>
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: _____

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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:

$\% \text{ Recovery} = 100 \cdot (\text{SSC} - \text{SC}) / \text{SA}$ Where: SSC = Spiked sample concentration SC = Concentration
 SA = Spike added
 $\text{RPD} = | \text{MS} - \text{MSD} | \cdot 2 / (\text{MS} + \text{MSD})$ MS = Matrix spike percent recovery MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 11/17

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	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
gamma-BHC											
4,4'-DDT											
1260	166	169	0	450	271	271	240	240	10	10	

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 #: 1610 E2b
 SDG #: See Core

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

Page: of
 Reviewer: JV
 2nd Reviewer:

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 = $100 \times (\text{SSC}-\text{SC})/\text{SA}$

Where: SSC = Spiked sample concentration
 SA = Spike added

SC = Concentration

RPD = $100 \times (\text{LCS} - \text{LCSD}) / ((\text{LCS} + \text{LCSD}) / 2)$

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7324735 LCS

Compound	Spike Added ($\mu\text{g}/\text{kg}$)		Spiked Sample Concentration ($\mu\text{g}/\text{kg}$)		LCS		LCSD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.
gamma-BHC								
4,4'-DDT								
1260	167	NA	187	NA	112	112		

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 #: 1810 E3b
 SDG #: See Core

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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

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

Y N N/A
Y N N/A

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

Example:

Sample I.D. # 2 1248
1248-1

$$\text{Conc.} = \frac{(430984) (10 \text{ ml})}{(5460) (30.4 \text{ g})}$$

$$= 25.97$$

$$1248 \text{ Total} = \frac{25.97 + 76.77 + 77.98 + 9824}{4}$$

$$= 69.74$$

$$\text{find conc.} = \frac{69.74 (2)}{(2) (0.941)}$$

$$= 74 \text{ ug/kg}$$

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

Note: _____

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 16, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Polychlorinated Biphenyls
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FR-05-0'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FJ-01-0'
RINSATE-4

Introduction

This data review covers 5 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8082 for Polychlorinated Biphenyls.

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

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of multicomponent compounds was performed for the primary (quantitation) column as required by the method.

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

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

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

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

V. Blanks

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

Sample RINSATE-4 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.

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No polychlorinated biphenyls were detected in any of the samples.

LDC #: 18100F3b
 SDG #: TRNC/D-6
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/23/08
 Page: 1 of 1
 Reviewer: JTG
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/16/07
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	F7K160235-020 (TRNC/D-5)
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	ND	R = 6

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-FJ-08-0'	S	17	7324 735 MB	21	31
2	TSB-FR-05-0'		12	7324 347 MB	22	32
3	TSB-FR-04-0'		13		23	33
4	TSB-FR-04-0'-FD		14		24	34
5	TSB-FJ-01-0'		15		25	35
6	RINSATE-4	W	16		26	36
7			17		27	37
8			18		28	38
9			19		29	39
10			20		30	40

**BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG
TRNC-D-6**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Polychlorinated Biphenyls - Field Blank Data Qualification Summary - SDG
TRNC-D-6**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100**

Metals

LDC

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 9, 2007
LDC Report Date: January 17, 2008
Matrix: Soil/Water
Parameters: Metals
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
RINSATE 1MS
RINSATE 1MSD

Introduction

This data review covers 13 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 a 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.
- 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
11/20/07	CCV (2341)	Niobium	111.1 (85-115)	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' RINSATE 1 TSB-CR-07-0'MS TSB-CR-07-0'MSD RINSATE 1MS RINSATE 1MSD PB	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)	Tin	0.43 ug/L	All water samples in SDG TRNC-D-1
ICB/CCB	Niobium Tungsten Lithium	5.8 ug/L 0.47 ug/L 13.7 ug/L	All water samples in SDG TRNC-D-1

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Arsenic Barium Boron Chromium Iron Niobium Phosphorus Potassium Sodium Thallium Titanium Tungsten Zinc	0.12 mg/Kg 0.069 mg/Kg 5.4 mg/Kg 0.42 mg/Kg 2.5 mg/Kg 2.3 mg/Kg 2.7 mg/Kg 1.6 mg/Kg 5.2 mg/Kg 0.23 mg/Kg 0.12 mg/Kg 0.29 mg/Kg 0.87 mg/Kg	All soil samples in SDG TRNC-D-1
ICB/CCB	Niobium Titanium Tungsten Vanadium Mercury	5.8 ug/L 0.3 ug/L 0.7 ug/L 0.8 ug/L 0.1 ug/L	All soil samples in SDG TRNC-D-1

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
RINSATE 1	Niobium Tin Tungsten	11.2 ug/L 0.62 ug/L 1.4 ug/L	25.0U ug/L 2.0U ug/L 5.0U ug/L
TSB-CR-07-0'	Boron Niobium Thallium Tungsten	7.9 mg/Kg 3.1 mg/Kg 0.36 mg/Kg 0.95 mg/Kg	20.1U mg/Kg 5.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-CR-07-10'	Boron Niobium Thallium Tungsten Mercury	7.6 mg/Kg 1.8 mg/Kg 0.28 mg/Kg 0.52 mg/Kg 7.5 ug/Kg	22.0U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.7U ug/Kg
TSB-CJ-08-0'	Boron Thallium Tungsten	6.0 mg/Kg 0.17 mg/Kg 0.34 mg/Kg	20.9U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-CJ-08-0'-FD	Boron Tungsten Mercury	5.6 mg/Kg 0.26 mg/Kg 10.6 ug/Kg	20.9U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-CJ-08-10'	Boron Tungsten	7.2 mg/Kg 0.32 mg/Kg	21.8U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-CJ-04-0'	Boron Tungsten Mercury	6.4 mg/Kg 0.31 mg/Kg 7.7 ug/Kg	21.1U mg/Kg 1.1U mg/Kg 35.2U ug/Kg
TSB-CJ-04-10'	Boron Tungsten	7.8 mg/Kg 0.33 mg/Kg	21.7U mg/Kg 1.1U mg/Kg
TSB-CJ-07-10'	Boron Tungsten Mercury	6.7 mg/Kg 0.29 mg/Kg 9.1 ug/Kg	20.9U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-CJ-07-10'	Boron Tungsten	7.3 mg/Kg 0.31 mg/Kg	22.5U mg/Kg 1.1U mg/Kg
TSB-CJ-03-0'	Boron Tungsten Mercury	6.9 mg/Kg 0.26 mg/Kg 10.9 ug/Kg	21.1U mg/Kg 1.1U mg/Kg 35.2U ug/Kg
TSB-CJ-03-10'	Boron Tungsten	6.3 mg/Kg 0.29 mg/Kg	21.5U mg/Kg 1.1U mg/Kg

Sample "RINSATE 1" 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 1	11/9/07	Boron Cadmium Calcium Magnesium Molybdenum Niobium Sodium Strontium Thallium Tin Titanium Tungsten	14.9 ug/L 0.045 ug/L 70.0 ug/L 5.4 ug/L 0.27 ug/L 11.2 ug/L 65.1 ug/L 0.42 ug/L 0.72 ug/L 0.62 ug/L 0.47 ug/L 1.4 ug/L	All soil samples in SDG TRNC-D-1

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-CR-07-0'	Boron Molybdenum Niobium Thallium Tin Tungsten	7.9 mg/Kg 0.86 mg/Kg 3.1 mg/Kg 0.36 mg/Kg 0.32 mg/Kg 0.95 mg/Kg	20.1U mg/Kg 1.0U mg/Kg 5.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-CR-07-10'	Boron Cadmium Molybdenum Niobium Thallium Tin Tungsten	7.6 mg/Kg 0.060 mg/Kg 0.53 mg/Kg 1.8 mg/Kg 0.28 mg/Kg 0.34 mg/Kg 0.52 mg/Kg	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-CJ-08-0'	Boron Cadmium Molybdenum Thallium Tin Tungsten	6.0 mg/Kg 0.097 mg/Kg 0.55 mg/Kg 0.17 mg/Kg 0.19 mg/Kg 0.34 mg/Kg	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-CJ-08-0'-FD	Boron Cadmium Molybdenum Tin Tungsten	5.6 mg/Kg 0.062 mg/Kg 0.53 mg/Kg 0.24 mg/Kg 0.26 mg/Kg	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-CJ-08-10'	Boron Cadmium Molybdenum Tin Tungsten	7.2 mg/Kg 0.054 mg/Kg 0.58 mg/Kg 0.25 mg/Kg 0.32 mg/Kg	21.8U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-CJ-04-0'	Boron Cadmium Molybdenum Tin Tungsten	6.4 mg/Kg 0.081 mg/Kg 0.48 mg/Kg 0.21 mg/Kg 0.31 mg/Kg	21.1U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg
TSB-CJ-04-10'	Boron Cadmium Molybdenum Tin Tungsten	7.8 mg/Kg 0.11 mg/Kg 0.77 mg/Kg 0.29 mg/Kg 0.33 mg/Kg	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-CJ-07-10'	Boron Cadmium Molybdenum Tin Tungsten	6.7 mg/Kg 0.086 mg/Kg 0.60 mg/Kg 0.16 mg/Kg 0.29 mg/Kg	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-CJ-07-10'	Boron Cadmium Molybdenum Tin Tungsten	7.3 mg/Kg 0.088 mg/Kg 0.64 mg/Kg 0.22 mg/Kg 0.31 mg/Kg	22.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.45U mg/Kg 1.1U mg/Kg
TSB-CJ-03-0'	Boron Cadmium Molybdenum Tin Tungsten	6.9 mg/Kg 0.086 mg/Kg 0.55 mg/Kg 0.20 mg/Kg 0.26 mg/Kg	21.1U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg
TSB-CJ-03-10'	Boron Molybdenum Tin Tungsten	6.3 mg/Kg 0.57 mg/Kg 0.30 mg/Kg 0.29 mg/Kg	21.5U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U 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-CR-07-0'MS/MSD (All soil samples in SDG TRNC-D-1)	Antimony Tungsten Zinc	56.3 (75-125) 74.8 (75-125) -	59.3 (75-125) - 56.9 (75-125)	- - - -	J- (all detects) UJ (all non-detects)	A
TSB-CR-07-0'MS/MSD (All soil samples in SDG TRNC-D-1)	Niobium	198.2 (75-125)	212.7 (75-125)	-	J+ (all detects)	A
TSB-CR-07-0'MS/MSD (All soil samples in SDG TRNC-D-1)	Phosphorus	63.0 (75-125)	29.1 (75-125)	-	J- (all detects) R (all non-detects)	A

VI. Duplicate Sample Analysis

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

VII. Laboratory Control Samples (LCS)

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

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not performed 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-CR-07-0'L	Magnesium Phosphorus Potassium Vanadium	10.9 (≤ 10) 16.8 (≤ 10) 10.8 (≤ 10) 13.6 (≤ 10)	All soil samples in SDG TRNC-D-1	J (all detects) J (all detects) 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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
Aluminum	7100	5530	25 (≤ 50)	-	-	-
Antimony	0.16	0.11U	-	0.05 (≤ 1.0)	-	-
Arsenic	2.5	3.1	-	0.6 (≤ 2.1)	-	-
Barium	172	124	32 (≤ 50)	-	-	-
Beryllium	0.40	0.34	-	0.06 (≤ 2.1)	-	-
Boron	6.0	5.6	-	0.4 (≤ 20.9)	-	-
Cadmium	0.097	0.062	-	0.035 (≤ 0.10)	-	-
Calcium	17900	28200	45 (≤ 50)	-	-	-
Chromium	7.3	5.4	-	1.9 (≤ 2.1)	-	-
Cobalt	6.2	3.6	53 (≤ 50)	-	J (all detects)	A
Copper	14.6	11.1	27 (≤ 50)	-	-	-
Iron	11700	8060	37 (≤ 50)	-	-	-
Lead	10.6	4.9	74 (≤ 50)	-	J (all detects)	A
Magnesium	7840	5760	31 (≤ 50)	-	-	-
Manganese	400	163	84 (≤ 50)	-	J (all detects)	A
Molybdenum	0.55	0.53	-	0.02 (≤ 1.0)	-	-
Nickel	13.7	8.4	48 (≤ 50)	-	-	-
Palladium	0.36	0.46	-	0.1 (≤ 0.21)	-	-
Phosphorus	1230	869	34 (≤ 50)	-	-	-
Potassium	2870	2270	23 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
Silicon	159	220	32 (≤ 50)	-	-	-
Silver	0.095	0.087	-	0.008 (≤ 0.42)	-	-
Sodium	549	496	10 (≤ 50)	-	-	-
Strontium	162	197	19 (≤ 50)	-	-	-
Thallium	0.17	0.15U	-	0.02 (≤ 0.42)	-	-
Tin	0.19	0.24	-	0.05 (≤ 0.42)	-	-
Titanium	450	398	12 (≤ 50)	-	-	-
Tungsten	0.34	0.26	-	0.08 (≤ 1.0)	-	-
Uranium	0.73	0.86	-	0.13 (≤ 0.21)	-	-
Vanadium	28.7	22.5	24 (≤ 50)	-	-	-
Zinc	28.2	19.4	37 (≤ 50)	-	-	-
Zirconium	19.8	19.4	-	0.4 (≤ 4.2)	-	-
Lithium	10.2	12.9	-	2.7 (≤ 10.4)	-	-
Sulfur	550	946	-	396 (≤ 1040)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
Mercury	7.0U	10.6	-	3.6 (≤ 34.8)	-	-

**BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-1**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' RINSATE 1	Niobium	J+ (all detects)	P	Calibration (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Antimony Tungsten Zinc	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Niobium	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Phosphorus	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Magnesium Phosphorus Potassium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects)	A	ICP serial dilution (%D)
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	Cobalt Lead Manganese	J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-1	RINSATE 1	Niobium Tin Tungsten	25.0U ug/L 2.0U ug/L 5.0U ug/L	A
TRNC-D-1	TSB-CR-07-0'	Boron Niobium Thallium Tungsten	20.1U mg/Kg 5.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CR-07-10'	Boron Niobium Thallium Tungsten Mercury	22.0U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.7U ug/Kg	A
TRNC-D-1	TSB-CJ-08-0'	Boron Thallium Tungsten	20.9U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CJ-08-0'-FD	Boron Tungsten Mercury	20.9U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-1	TSB-CJ-08-10'	Boron Tungsten	21.8U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-04-0'	Boron Tungsten Mercury	21.1U mg/Kg 1.1U mg/Kg 35.2U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-1	TSB-CJ-04-10'	Boron Tungsten	21.7U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Boron Tungsten Mercury	20.9U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Boron Tungsten	22.5U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-03-0'	Boron Tungsten Mercury	21.1U mg/Kg 1.1U mg/Kg 35.2U ug/Kg	A
TRNC-D-1	TSB-CJ-03-10'	Boron Tungsten	21.5U mg/Kg 1.1U mg/Kg	A

BRC Tronox Parcel C/D/F/G

Metals - Field Blank Data Qualification Summary - SDG TRNC-D-1

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-1	TSB-CR-07-0'	Boron Molybdenum Niobium Thallium Tin Tungsten	20.1U mg/Kg 1.0U mg/Kg 5.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CR-07-10'	Boron Cadmium Molybdenum Niobium Thallium Tin Tungsten	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-08-0'	Boron Cadmium Molybdenum Thallium Tin Tungsten	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CJ-08-0'-FD	Boron Cadmium Molybdenum Tin Tungsten	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-1	TSB-CJ-08-10'	Boron Cadmium Molybdenum Tin Tungsten	21.8U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-04-0'	Boron Cadmium Molybdenum Tin Tungsten	21.1U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-04-10'	Boron Cadmium Molybdenum Tin Tungsten	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Boron Cadmium Molybdenum Tin Tungsten	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-1	TSB-CJ-07-10'	Boron Cadmium Molybdenum Tin Tungsten	22.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.45U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-03-0'	Boron Cadmium Molybdenum Tin Tungsten	21.1U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-1	TSB-CJ-03-10'	Boron Molybdenum Tin Tungsten	21.5U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A

LDC #: 18100A4
 SDG #: TRNC-D-1
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/15/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>11/09/07</u>
II.	Calibration	SW	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	<u>> hrs/mis p</u>
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	<u>LCS</u>
VIII.	Internal Standard (ICP-MS)	N	<u>Not reviewed</u>
IX.	Furnace Atomic Absorption QC	N	<u>Not performed</u>
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	<u>(3,4)</u>
XIV.	Field Blanks	SW	<u>R=12</u>

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

Validated Samples: All soil except # 12, 15, 16 A2

1	TSB-CR-07-0'	11	TSB-CJ-03-10'	21		31
2	TSB-CR-07-10'	12	RINSATE 1 <u>A2</u>	22		32
3	TSB-CJ-08-0'	13	TSB-CR-07-0'MS	23		33
4	TSB-CJ-08-0'-FD	14	TSB-CR-07-0'MSD	24		34
5	TSB-CJ-08-10'	15	RINSATE 1MS <u>A2</u>	25		35
6	TSB-CJ-04-0'	16	RINSATE 1MSD <u>↓</u>	26		36
7	TSB-CJ-04-10'	17	<u>PB</u>	27		37
8	TSB-CJ-07-0'	18		28		38
9	TSB-CJ-07-10'	19		29		39
10	TSB-CJ-03-0'	20		30		40

Notes: _____

DC #: 18100AY
 SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
 Reviewer: MN
 2nd reviewer: J

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-12	Soil/Az	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, V, Zn, Mo, B, Si,
13, 14	Soil	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si
15, 16	Az	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, V, Zn, Mo, B, Si,
1-12	Soil/Az	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
13, 14	Soil	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
15, 16	Az	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,

Analysis Method

ICP	Li, S
ICP-MS	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, K, Se, Ag, Na, Ti, 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, Ti, 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 #: 18100A4
 SDG #: TRAC-V-

VALIDATION FINDINGS WORKSHEET
Calibration

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

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

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

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%)?
Y N N/A Were all initial and continuing calibration recalculation worksheets for recalculations?

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	11/20/07	66V(2341)	Nb	111.1	A1, A2 +1-7, 13, 14, +PB	J+dt/P

Comments: _____

Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	12								
Nb			5.8		11.2 / 25.0								
Sn		0.43			0.62 / 2.0								
W			0.47		1.4 / 5.0								
Li			13.7										

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.

Analyte	Maximum PB* (mg/Kg)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification														
				1	2	3	4	5	6	7	8	9	10	11				
As	0.12																	
Ba	0.069																	
B	5.4			7.9 / 20.1	7.6 / 22.0	6.0 / 20.9	5.6 / 20.9	7.2 / 21.8	6.4 / 21.1	7.8 / 21.7	6.7 / 20.9	7.3 / 22.5	6.9 / 21.1	6.3 / 21.5				
Cr	0.42																	
Fe	2.5																	
Nb	2.3	5.8		3.1 / 5.0	1.8 / 5.5													
P	2.7																	
K	1.6																	
Na	5.2																	
Tl	0.23		2.3	0.36 / 0.40	0.28 / 0.44	0.17 / 0.42												
Ti	0.12	0.3																
W	0.29	0.7		0.95 / 1.0	0.52 / 1.1	0.34 / 1.0	0.26 / 1.0	0.32 / 1.1	0.31 / 1.1	0.33 / 1.1	0.29 / 1.0	0.31 / 1.1	0.26 / 1.1	0.29 / 1.1				
V		0.8																
Zn	0.87																	
Hg (ug/Kg)		0.1			7.5 / 36.7		10.6 / 34.8		7.7 / 35.2		9.1 / 34.8		10.9 / 35.2					

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.

VALIDATION FINDINGS WORKSHEET
Field Blanks

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

LDC #: 18100A4
SDG #: TRNC-D-1

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: 11/09/07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification																		
		1	2	3	4	5	6	7	8	9	10	11								
	12																			
B	14.9	7.9 / 20.1	7.6 / 22.0	6.0 / 20.9	5.6 / 20.9	7.2 / 21.8	6.4 / 21.1	7.8 / 21.7	6.7 / 20.9	7.3 / 22.5	6.9 / 21.1	6.3 / 21.5								
Cd	0.045		0.060 / 0.11	0.097 / 0.10	0.062 / 0.10	0.054 / 0.11	0.081 / 0.11	0.11 / 0.11	0.086 / 0.10	0.088 / 0.11	0.086 / 0.11									
Ca	70.0																			
Mg	5.4																			
Mo	0.27	0.86 / 1.0	0.53 / 1.1	0.55 / 1.0	0.53 / 1.0	0.58 / 1.1	0.48 / 1.1	0.77 / 1.1	0.60 / 1.0	0.64 / 1.1	0.55 / 1.1	0.57 / 1.1								
Nb	11.2	3.1 / 5.0	1.8 / 5.5																	
Na	65.1																			
Sr	0.42																			
Tl	0.72	0.36 / 0.40	0.28 / 0.44	0.17 / 0.42																
Sn	0.62	0.32 / 0.40	0.34 / 0.44	0.19 / 0.42	0.24 / 0.42	0.25 / 0.44	0.21 / 0.42	0.29 / 0.43	0.16 / 0.42	0.22 / 0.45	0.20 / 0.42	0.30 / 0.43								
Ti	0.47																			
W	1.4	0.95 / 1.0	0.52 / 1.1	0.34 / 1.0	0.26 / 1.0	0.32 / 1.1	0.31 / 1.1	0.33 / 1.1	0.29 / 1.0	0.31 / 1.1	0.26 / 1.1	0.29 / 1.1								

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 #: 8100 AY
 SDG #: TKNC-9-1

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

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

Y N N/A
Y N N/A

Was a matrix spike analyzed for each matrix in this SDG?

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

Y N/A
 LEVEL IV ONLY:
Y N N/A

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

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	5/16	AB	Fe			29.1 (≤ 20)	AB	No find (LCS, MS/MSD)
2	13/14	Soil	Sb	56.3	59.3		AB Soil	I-MS/A
			Nb	198.2	212.7			J+J/A
			P	63.0	29.1			J-R/A
			W	74.8				J-MS/A
			Zn		56.9			J
			Si			25.6 (≤ 20)		No find (LCS, MS/MSD)

Comments:

LDC #: 1810 AD
 SDG #: TX-16-11-1

VALIDATION FINDINGS WORKSHEET ICP Serial Dilution

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

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

10x dilution for 200/MS, 6x for 100 for 200p

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 IDL, was an ICP 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.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1		Soil	Mg	10.9	A1 Soil	T ↓ F/A
			P	16.8		
			K	10.8		
				13.6		

Comments: 6010/7000

LDC#: 18100A4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

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

Compound	Concentration (mg/kg)		(≤ 50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	3	4	RPD	Difference	Limits	
Aluminum	7100	5530	25			
Antimony	0.16	0.11U		0.05	(≤ 1.0)	
Arsenic	2.5	3.1		0.6	(≤ 2.1)	
Barium	172	124	32			
Beryllium	0.40	0.34		0.06	(≤ 0.21)	
Boron	6.0	5.6		0.4	(≤ 20.9)	
Cadmium	0.097	0.062		0.035	(≤ 0.10)	
Calcium	17900	28200	45			
Chromium	7.3	5.4		1.9	(≤ 2.1)	
Cobalt	6.2	3.6	53			J det / A
Copper	14.6	11.1	27			
Iron	11700	8060	37			
Lead	10.6	4.9	74			J det / A
Magnesium	7840	5760	31			
Manganese	400	163	84			J det / A
Molybdenum	0.55	0.53		0.02	(≤ 1.0)	
Nickel	13.7	8.4	48			
Palladium	0.36	0.46		0.1	(≤ 0.21)	
Phosphorus	1230	869	34			

LDC#: 18100A4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

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

Compound	Concentration (mg/kg)		(≤ 50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	3	4	RPD	Difference	Limits	
Potassium	2870	2270	23			
Silicon	159	220	32			
Silver	0.095	0.087		0.008	(≤ 0.42)	
Sodium	549	496	10			
Strontium	162	197	19			
Thallium	0.17	0.15U		0.02	(≤ 0.42)	
Tin	0.19	0.24		0.05	(≤ 0.42)	
Titanium	450	398	12			
Tungsten	0.34	0.26		0.08	(≤ 1.0)	
Uranium	0.73	0.86		0.13	(≤ 0.21)	
Vanadium	28.7	22.5	24			
Zinc	28.2	19.4	37			
Zirconium	19.8	19.4		0.4	(≤ 4.2)	
Lithium	10.2	12.9		2.7	(≤ 10.4)	
Sulfur	550	946		396	(≤ 1040)	
Mercury (ug/Kg)	7.0U	10.6		3.6	(≤ 34.8)	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 12, 2007
LDC Report Date: January 22, 2008
Matrix: Soil
Parameters: Metals
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 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 a 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

III. Blanks

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

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium Chromium Copper Iron Nickel Phosphorus Potassium Sodium Tin Titanium Zinc Mercury	15.7 mg/Kg 0.27 mg/Kg 0.25 mg/Kg 3.2 mg/Kg 0.36 mg/Kg 1.6 mg/Kg 2.6 mg/Kg 5.1 mg/Kg 0.089 mg/Kg 0.13 mg/Kg 1.4 mg/Kg 7.8 ug/Kg	All samples in SDG TRNC-D-2
ICB/CCB	Niobium Tin Titanium Tungsten Vanadium Lithium	5.8 ug/L 0.2 ug/L 0.3 ug/L 0.7 ug/L 0.8 ug/L 12.5 ug/L	All samples in SDG TRNC-D-2

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-CJ-02-0***	Niobium Tungsten	5.3 mg/Kg 0.53 mg/Kg	5.3U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-CJ-02-10'***	Niobium Tungsten Mercury	1.8 mg/Kg 0.31 mg/Kg 7.2 ug/Kg	5.2U mg/Kg 1.1U mg/Kg 34.9U ug/Kg
TSB-CJ-01-0'***	Tin Tungsten Mercury	0.39 mg/Kg 0.23 mg/Kg 32.7 ug/Kg	0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-CJ-01-10'***	Niobium Tungsten	1.9 mg/Kg 0.45 mg/Kg	5.3U mg/Kg 1.1U mg/Kg
TSB-CJ-01-0'-FD**	Tin Tungsten Mercury	0.39 mg/Kg 0.28 mg/Kg 9.9 ug/Kg	0.42U mg/Kg 1.0U mg/Kg 34.6U ug/Kg
TSB-CR-02-0'***	Tungsten Mercury	0.22 mg/Kg 17.8 ug/Kg	1.0U mg/Kg 34.3U ug/Kg
TSB-CR-02-10'	Tungsten	0.23 mg/Kg	1.1U mg/Kg
TSB-CR-01-0'	Tin Tungsten Lithium Mercury	0.41 mg/Kg 0.46 mg/Kg 10.0 mg/Kg 9.4 ug/Kg	0.41U mg/Kg 1.0U mg/Kg 10.2U mg/Kg 34.0U ug/Kg
TSB-CR-01-10'	Tungsten Mercury	0.58 mg/Kg 7.5 ug/Kg	1.0U mg/Kg 34.7U ug/Kg
TSB-CR-03-0'	Tungsten Mercury	0.28 mg/Kg 10.5 ug/Kg	1.0U mg/Kg 33.8U ug/Kg
TSB-CR-03-10'	Tungsten Mercury	0.35 mg/Kg 8.4 ug/Kg	1.1U mg/Kg 34.9U ug/Kg
TSB-CJ-05-0'	Tungsten Mercury	0.35 mg/Kg 7.8 ug/Kg	1.0U mg/Kg 34.6U ug/Kg
TSB-CJ-05-10'	Tungsten	0.32 mg/Kg	1.1U mg/Kg
TSB-CJ-06-0'	Tin Mercury	0.39 mg/Kg 9.8 ug/Kg	0.41U mg/Kg 33.9U ug/Kg
TSB-CJ-06-0'-FD	Tungsten Mercury	0.33 mg/Kg 14.5 ug/Kg	1.0U mg/Kg 34.1U ug/Kg
TSB-CJ-06-10'	Tin	0.43 mg/Kg	0.46U 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-CR-01-0'MS/MSD (All samples in SDG TRNC-D-2)	Antimony	58.7 (75-125)	61.7 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-CR-01-0'MS/MSD (All samples in SDG TRNC-D-2)	Barium	176.4 (75-125)	148.7 (75-125)	-	J+ (all detects)	A
	Niobium	233.3 (75-125)	254.4 (75-125)	-	J+ (all detects)	
	Silicon	395.4 (75-125)	504.7 (75-125)	-	J+ (all detects)	
	Strontium	264.8 (75-125)	147.5 (75-125)	-	J+ (all detects)	
	Titanium	162.0 (75-125)	195.5 (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.

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which a EPA 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 with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TSB-CR-01-0'L	Phosphorus	11.3 (≤ 10)	All samples in SDG TRNC-D-2	J (all detects)	A

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-CJ-01-0'*** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'***	TSB-CJ-01-0'-FD**				
Aluminum	5770 mg/Kg	6440 mg/Kg	11 (≤ 50)	-	-	-
Antimony	0.11 mg/Kg	0.13 mg/Kg	-	0.02 mg/Kg (≤ 1.0)	-	-
Arsenic	2.8 mg/Kg	3.4 mg/Kg	-	0.6 mg/Kg (≤ 2.1)	-	-
Barium	123 mg/Kg	118 mg/Kg	4 (≤ 50)	-	-	-
Beryllium	0.37 mg/Kg	0.45 mg/Kg	-	0.08 mg/Kg (≤ 0.21)	-	-
Boron	7.5 mg/Kg	5.7 mg/Kg	-	1.8 mg/Kg (≤ 20.9)	-	-
Cadmium	0.075 mg/Kg	0.074 mg/Kg	-	0.001 mg/Kg (≤ 0.10)	-	-
Calcium	27700 mg/Kg	27400 mg/Kg	1 (≤ 50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0**	TSB-CJ-01-0'-FD**				
Chromium	5.6 mg/Kg	4.8 mg/Kg	-	0.8 mg/Kg (≤ 2.1)	-	-
Cobalt	3.9 mg/Kg	5.0 mg/Kg	25 (≤ 50)	-	-	-
Copper	10.4 mg/Kg	11.6 mg/Kg	11 (≤ 50)	-	-	-
Iron	7730 mg/Kg	8810 mg/Kg	13 (≤ 50)	-	-	-
Lead	6.0 mg/Kg	6.1 mg/Kg	2 (≤ 50)	-	-	-
Magnesium	5960 mg/Kg	6780 mg/Kg	13 (≤ 50)	-	-	-
Manganese	200 mg/Kg	242 mg/Kg	19 (≤ 50)	-	-	-
Molybdenum	0.46 mg/Kg	0.44 mg/Kg	-	0.02 mg/Kg (≤ 1.0)	-	-
Nickel	8.7 mg/Kg	10.6 mg/Kg	20 (≤ 50)	-	-	-
Palladium	0.44 mg/Kg	0.47 mg/Kg	-	0.03 mg/Kg (≤ 0.21)	-	-
Phosphorus	954 mg/Kg	1230 mg/Kg	25 (≤ 50)	-	-	-
Potassium	2660 mg/Kg	2690 mg/Kg	1 (≤ 50)	-	-	-
Silicon	268 mg/Kg	248 mg/Kg	8 (≤ 50)	-	-	-
Silver	0.090 mg/Kg	0.087 mg/Kg	-	0.003 mg/Kg (≤ 0.42)	-	-
Sodium	794 mg/Kg	444 mg/Kg	57 (≤ 50)	-	J (all detects)	A
Strontium	183 mg/Kg	202 mg/Kg	10 (≤ 50)	-	-	-
Tin	0.39 mg/Kg	0.39 mg/Kg	-	0 mg/Kg (≤ 0.42)	-	-
Titanium	372 mg/Kg	334 mg/Kg	11 (≤ 50)	-	-	-
Tungsten	0.23 mg/Kg	0.28 mg/Kg	-	0.05 mg/Kg (≤ 1.0)	-	-
Uranium	0.87 mg/Kg	0.93 mg/Kg	-	0.06 mg/Kg (≤ 0.21)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0***	TSB-CJ-01-0'-FD**				
Vanadium	20.8 mg/Kg	22.0 mg/Kg	6 (≤ 50)	-	-	-
Zinc	20.3 mg/Kg	20.9 mg/Kg	3 (≤ 50)	-	-	-
Zirconium	19.1 mg/Kg	19.5 mg/Kg	-	0.4 mg/Kg (≤ 20.9)	-	-
Lithium	10.9 mg/Kg	14.9 mg/Kg	-	4 mg/Kg (≤ 10.4)	-	-
Sulfur	1200 mg/Kg	421U mg/Kg	-	779 mg/Kg (≤ 1040)	-	-
Mercury	37.2 ug/Kg	9.9 ug/Kg	-	27.3 ug/Kg (≤ 34.8)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Aluminum	5770 mg/Kg	5930 mg/Kg	3 (≤ 50)	-	-	-
Antimony	0.14 mg/Kg	0.13 mg/Kg	-	0.01 mg/Kg (≤ 1.0)	-	-
Arsenic	4.5 mg/Kg	2.2 mg/Kg	-	2.3 mg/Kg (≤ 2.1)	J (all detects)	A
Barium	117 mg/Kg	163 mg/Kg	33 (≤ 50)	-	-	-
Beryllium	0.44 mg/Kg	0.38 mg/Kg	-	0.06 mg/Kg (≤ 4.1)	-	-
Boron	3.6 mg/Kg	3.2 mg/Kg	-	0.4 mg/Kg (≤ 20.5)	-	-
Cadmium	0.058 mg/Kg	0.094 mg/Kg	-	0.036 mg/Kg (≤ 0.10)	-	-
Calcium	22800 mg/Kg	16000 mg/Kg	35 (≤ 50)	-	-	-
Chromium	6.9 mg/Kg	7.1 mg/Kg	-	0.2 mg/Kg (≤ 0.21)	-	-
Cobalt	5.6 mg/Kg	5.6 mg/Kg	0 (≤ 50)	-	-	-
Copper	10.4 mg/Kg	12.7 mg/Kg	20 (≤ 50)	-	-	-
Iron	9170 mg/Kg	10900 mg/Kg	17 (≤ 50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Lead	6.5 mg/Kg	13.0 mg/Kg	67 (≤ 50)	-	J (all detects)	A
Magnesium	8300 mg/Kg	6740 mg/Kg	21 (≤ 50)	-	-	-
Manganese	231 mg/Kg	366 mg/Kg	45 (≤ 50)	-	-	-
Molybdenum	0.38 mg/Kg	0.53 mg/Kg	-	0.15 mg/Kg (≤ 1.0)	-	-
Nickel	11.1 mg/Kg	12.8 mg/Kg	14 (≤ 50)	-	-	-
Palladium	0.36 mg/Kg	0.30 mg/Kg	-	0.06 mg/Kg (≤ 0.21)	-	-
Phosphorus	712 mg/Kg	938 mg/Kg	27 (≤ 50)	-	-	-
Potassium	2110 mg/Kg	2200 mg/Kg	4 (≤ 50)	-	-	-
Silicon	219 mg/Kg	159 mg/Kg	32 (≤ 50)	-	-	-
Silver	0.10 mg/Kg	0.089 mg/Kg	-	0.011 mg/Kg (≤ 0.41)	-	-
Sodium	484 mg/Kg	253 mg/Kg	63 (≤ 50)	-	J (all detects)	A
Strontium	165 mg/Kg	142 mg/Kg	15 (≤ 50)	-	-	-
Tin	0.39 mg/Kg	0.48 mg/Kg	-	0.09 mg/Kg (≤ 0.41)	-	-
Titanium	368 mg/Kg	485 mg/Kg	27 mg/Kg	-	-	-
Tungsten	0.20U mg/Kg	0.33 mg/Kg	-	0.13 mg/Kg (≤ 1.0)	-	-
Uranium	0.84 mg/Kg	0.77 mg/Kg	-	0.07 mg/Kg (≤ 0.21)	-	-
Vanadium	23.3 mg/Kg	28.8 mg/Kg	21 mg/Kg	-	-	-
Zinc	21.4 mg/Kg	31.7 mg/Kg	39 (≤ 50)	-	-	-
Zirconium	18.2 mg/Kg	20.5 mg/Kg	-	2.3 mg/Kg (≤ 20.5)	-	-
Lithium	10.2 mg/Kg	11.4 mg/Kg	-	1.2 mg/Kg (≤ 10.2)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Mercury	9.8 ug/Kg	14.5 ug/Kg	-	4.7 ug/Kg (≤ 34.1)	-	-

**BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-2**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Antimony	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Barium Niobium Silicon Strontium Titanium	J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Phosphorus	J (all detects)	A	ICP serial dilution (%D)
TRNC-D-2	TSB-CJ-01-0'*** TSB-CJ-01-0'-FD**	Sodium	J (all detects)	A	Field duplicates (RPD)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	Arsenic	J (all detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	Lead Sodium	J (all detects) J (all detects)	A	Field duplicates (RPD)

BRC Tronox Parcel C/D/F/G

Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-2	TSB-CJ-02-0'***	Niobium Tungsten	5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-2	TSB-CJ-02-10'***	Niobium Tungsten Mercury	5.2U mg/Kg 1.1U mg/Kg 34.9U ug/Kg	A
TRNC-D-2	TSB-CJ-01-0'***	Tin Tungsten Mercury	0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-2	TSB-CJ-01-10'***	Niobium Tungsten	5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-2	TSB-CJ-01-0'-FD**	Tin Tungsten Mercury	0.42U mg/Kg 1.0U mg/Kg 34.6U ug/Kg	A
TRNC-D-2	TSB-CR-02-0'***	Tungsten Mercury	1.0U mg/Kg 34.3U ug/Kg	A
TRNC-D-2	TSB-CR-02-10'	Tungsten	1.1U mg/Kg	A
TRNC-D-2	TSB-CR-01-0'	Tin Tungsten Lithium Mercury	0.41U mg/Kg 1.0U mg/Kg 10.2U mg/Kg 34.0U ug/Kg	A
TRNC-D-2	TSB-CR-01-10'	Tungsten Mercury	1.0U mg/Kg 34.7U ug/Kg	A
TRNC-D-2	TSB-CR-03-0'	Tungsten Mercury	1.0U mg/Kg 33.8U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-2	TSB-CR-03-10'	Tungsten Mercury	1.1U mg/Kg 34.9U ug/Kg	A
TRNC-D-2	TSB-CJ-05-0'	Tungsten Mercury	1.0U mg/Kg 34.6U ug/Kg	A
TRNC-D-2	TSB-CJ-05-10'	Tungsten	1.1U mg/Kg	A
TRNC-D-2	TSB-CJ-06-0'	Tin Mercury	0.41U mg/Kg 33.9U ug/Kg	A
TRNC-D-2	TSB-CJ-06-0'-FD	Tungsten Mercury	1.0U mg/Kg 34.1U ug/Kg	A
TRNC-D-2	TSB-CJ-06-10'	Tin	0.46U mg/Kg	A

BRC Tronox Parcel C/D/F/G

Metals - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B4
 SDG #: TRNC-D-2
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III/IV

Date: 1/15/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/12/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	MS/MSD
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	A	not reviewed for level 3
IX.	Furnace Atomic Absorption QC	N	not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(3.5) (3.5) (14, 15)
XIV.	Field Blanks	N	

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

Validated Samples: ** Indicates sample underwent Level IV validation

1	TSB-CJ-02-0**	11	TSB-CR-03-10'	21		31	
2	TSB-CJ-02-10**	12	TSB-CJ-05-0'	22		32	
3	TSB-CJ-01-0**	13	TSB-CJ-05-10'	23		33	
4	TSB-CJ-01-10**	14	TSB-CJ-06-0'	24		34	
5	TSB-CJ-01-0'-FD**	15	TSB-CJ-06-0'-FD	25		35	
6	TSB-CR-02-0**	16	TSB-CJ-06-10'	26		36	
7	TSB-CR-02-10'	17	TSB-CR-01-0'MS	27		37	
8	TSB-CR-01-0'	18	TSB-CR-01-0'MSD	28		38	
9	TSB-CR-01-10'	19	PK	29		39	
10	TSB-CR-03-0'	20		30		40	

Notes: _____

LDC #: 18100B4
 SDG #: TRN-2

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: mu
 2nd Reviewer: g

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 analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	/			
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients > 0.995?			/	
Do all applicable analyses have duplicate injections? (Level IV only)			/	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			/	
Were analytical spike recoveries within the 85-115% QC limits?			/	

LDC #: 18100B4
 SDG #: TRAC-D-2

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: mm
 2nd Reviewer: js

Validation Area	Yes	No	NA	Findings/Comments
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			7100/1400 for rep. (s)
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 8020)				
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.			✓	

DC #: 18100BY
 SDG #: TRNC-D-2

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

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

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-16	Soil	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, V, Zn, Mo, B, Si
17, 18	Soil	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, V, Zn, Mo, B, Si
1-16	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
17, 18	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, Ti, V, Zn, Mo, B, Si
ICP-MS	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Zr
IGFAA	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	Sample Identification																
				1	2	3	4	5	6	7	8	9	10	11						
Ca	15.7																			
Cr	0.27																			
Cu	0.25																			
Fe	3.2																			
Ni	0.36																			
Nb				5.3 / 5.3	1.8 / 5.2		1.9 / 5.3													
P	1.6																			
K	2.6																			
Na	5.1																			
Sn	0.089					0.39 / 0.42		0.39 / 0.42					0.41 / 0.41							
Ti	0.13																			
W				0.53 / 1.1	0.31 / 1.1	0.23 / 1.0	0.45 / 1.1	0.28 / 1.0	0.22 / 1.0	0.23 / 1.1	0.23 / 1.1	0.46 / 1.0	0.58 / 1.0	0.28 / 1.0	0.35 / 1.1					
V																				
Zn	1.4																			
Li																				
Hg (ug/Kg)	7.8			7.2 / 34.9	32.7 / 34.8		9.9 / 34.6	17.8 / 34.3		10.0 / 10.2		9.4 / 34.0	7.5 / 34.7	10.5 / 33.8	8.4 / 34.9					

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.

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

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

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	Sample Identification																
				12	13	14	15	16												
Ca	15.7																			
Cr	0.27																			
Cu	0.25																			
Fe	3.2																			
Ni	0.36																			
Nb		5.8																		
P	1.6																			
K	2.6																			
Na	5.1																			
Sn	0.089	0.2			0.39 / 0.41															
Ti	0.13	0.3																		
W		0.7		0.35 / 1.0	0.32 / 1.1				0.33 / 1.0											
V		0.8																		
Zn	1.4																			
Li		12.5																		
Hg (ug/Kg)	7.8			7.8 / 34.6		9.8 / 33.9			14.5 / 34.1											

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.

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

N N/A

Was a matrix spike analyzed for each matrix in this SDG?

Y N/A

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

Y N/A

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

Y N/A

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	17/18	Soil	Sb	58.7	61.7		All	J-MJ/A
			Ba	176.4	148.7			Jt Jt/A
			Nb	233.3	254.4			
			Si	395.4	504.7			
			Sr	264.8	147.5	29.1 (600)		(No good for RPD)
			Ti	162.0	195.5			(MSD)

Comments:

VALIDATION FINDINGS WORKSHEET
 ICP Serial Dilution

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".
 If analyte concentrations were > 50X the IDL, was an ICP 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.

7.0ix ml for 100mL

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	8	Soil	P	11.3	A1	ILT/A

Comments: _____

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 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	3	5	RPD	Difference	Limits	
Aluminum	5770	6440	11			
Antimony	0.11	0.13		0.02	(≤1.0)	
Arsenic	2.8	3.4		0.6	(≤2.1)	
Barium	123	118	4			
Beryllium	0.37	0.45		0.08	(≤0.21)	
Boron	7.5	5.7		1.8	(≤20.9)	
Cadmium	0.075	0.074		0.001	(≤0.10)	
Calcium	27700	27400	1			
Chromium	5.6	4.8		0.8	(≤2.1)	
Cobalt	3.9	5.0	25			
Copper	10.4	11.6	11			
Iron	7730	8810	13			
Lead	6.0	6.1	2			
Magnesium	5960	6780	13			
Manganese	200	242	19			
Molybdenum	0.46	0.44		0.02	(≤1.0)	
Nickel	8.7	10.6	20			
Palladium	0.44	0.47		0.03	(≤0.21)	
Phosphorus	954	1230	25			

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 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 2 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

Y N NA
Y N NA

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

Compound	Concentration (mg/kg)		(≤ 50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	3	5				
Potassium	2660	2690	1			
Silicon	268	248	8			
Silver	0.090	0.087		0.003	(≤ 0.42)	
Sodium	794	444	57			J det / A
Strontium	183	202	10			
Tin	0.39	0.39		0	(≤ 0.42)	
Titanium	372	334	11			
Tungsten	0.23	0.28		0.05	(≤ 1.0)	
Uranium	0.87	0.93		0.06	(≤ 0.21)	
Vanadium	20.8	22.0	6			
Zinc	20.3	20.9	3			
Zirconium	19.1	19.5		0.4	(≤ 20.9)	
Lithium	10.9	14.9		4	(≤ 10.4)	
Sulfur	1200	421U		779	(≤ 1040)	
Mercury (ug/Kg)	37.2	9.9		27.3	(≤ 34.8)	

Compound	Concentration (mg/kg)		(≤ 50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	14	15				
Aluminum	5770	5930	3			
Antimony	0.14	0.13		0.01	(≤ 1.0)	

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VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

Compound	Concentration (mg/kg)		(≤ 50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	14	15	RPD	Difference	Limits	
Arsenic	4.5	2.2		2.3	(≤ 2.1)	J det / A
Barium	117	163	33			
Beryllium	0.44	0.38		0.06	(≤ 4.1)	
Boron	3.6	3.2		0.4	(≤ 20.5)	
Cadmium	0.058	0.094		0.036	(≤ 0.10)	
Calcium	22800	16000	35			
Chromium	6.9	7.1		0.2	(≤ 0.21)	
Cobalt	5.6	5.6	0			
Copper	10.4	12.7	20			
Iron	9170	10900	17			
Lead	6.5	13.0	67			J det / A
Magnesium	8300	6740	21			
Manganese	231	366	45			
Molybdenum	0.38	0.53		0.15	(≤ 1.0)	
Nickel	11.1	12.8	14			
Palladium	0.36	0.30		0.06	(≤ 0.21)	
Phosphorus	712	938	27			
Potassium	2110	2200	4			
Silicon	219	159	32			

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 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 4 of 4
 Reviewer: [Signature]
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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)
	14	15				
Silver	0.10	0.089		0.011	(≤0.41)	
Sodium	484	253	63			J det / A
Strontium	165	142	15			
Tin	0.39	0.48		0.09	(≤0.41)	
Titanium	368	485	27			
Tungsten	0.20U	0.33		0.13	(≤1.0)	
Uranium	0.84	0.77		0.07	(≤0.21)	
Vanadium	23.3	28.8	21			
Zinc	21.4	31.7	39			
Zirconium	18.2	20.5		2.3	(≤20.5)	
Lithium	10.2	11.4		1.2	(≤10.2)	
Mercury (ug/Kg)	9.8	14.5		4.7	(≤34.1)	

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

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

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

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

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

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated		Reported		Acceptable (Y/N)
					%R	%R	%R	%R	
ICV	ICP (Initial calibration)	S	422/0	4000	105.5	105.5			Y
	GFAA (Initial calibration)								
ICV	CVAA (Initial calibration)	Hg	2.46	2.5	98.4	98.4			Y
CCV	ICP (Continuing calibration)	Li	4088.3	4000	102.2	102.2			Y
	GFAA (Continuing calibration)								
CCV	CVAA (Continuing calibration)	Hg	4.8	5.0	96.0	96.0			Y
ICV	ICP/MS (Initial calibration)	Mo	205.42	200	102.7	102.7			Y
CCV	ICP/MS (Continuing calibration)	Se	192.6	200	96.3	96.3			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 #: 1810034
 SDG #: TRNL-9-2

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VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

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		Reported		Acceptable (Y/N)
					%R / RPD / %D	%R / RPD / %D			
TSAB	ICP interference check	Cd	97.47	1.0	97.5	97.5	97.5	97.5	Y
LC5	Laboratory control sample	B	80.36	97.4	82.5	82.5	82.5	82.5	Y
17	Matrix spike	Pb	(SSR-SR) 24.0	25.495	94.1	94.1	94.1	94.1	Y
17/18	Duplicate	Zn	110.5	105.5	4.7	4.7	4.7	4.7	Y
8	ICP serial dilution	Ni	30.258	28.548	6.6	6.6	6.6	6.6	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 #: 18100B4
 SDG #: TR NC D-2

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

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 Reviewer: mu
 2nd reviewer: [Signature]

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

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

- 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 _____ were recalculated and verified using the following equation:

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

Recalculation:

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

$$NA = \frac{1357.69 \mu g / L \times 0.1 L \times 2}{0.9457 \times 0.5 g} = 574.3 \text{ mg/kg}$$

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
1	Li	140	140	Y
	S	1450	1450	
	Al	6570	6570	
	Sb	0.13	0.13	
	As	3.1	3.1	
	Ba	134	134	
	Be	0.45	0.45	
	B	9.7	9.7	
	Cd	0.095	0.095	
	Ca	30600	30600	
	Cr	6.1	6.1	
	Co	4.5	4.5	
	Cu	10.5	10.5	
	Fe	9100	9100	
	Pb	7.3	7.2	
	Mg	6810	6810	
	Mn	210	210	
	Mo	0.52	0.52	
	Ni	9.7	9.7	
	Mb	5.3	5.3	
	Pd	0.46	0.46	
	P	743	743	Y

LDC #: 1810134
SDG #: TRK-11-V

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

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Reviewer: [Signature]
2nd reviewer: [Signature]

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

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

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

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

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

Recalculation:

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

Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
*	K	2820	2820	Y
	Si	285	285	Y
	Ag	0.10	0.10	Y
	Na	594	594	Y
	Sr	211	211	Y
	Sn	0.54	0.54	Y
	Ti	394	394	Y
	W	0.53	0.53	Y
	Y	1.0	1.0	Y
	V	23.1	23.1	Y
	Zn	22.8	22.8	Y
	Zv	21.8	21.8	Y

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 13, 2007
LDC Report Date: February 8, 2008
Matrix: Soil/Water
Parameters: Metals
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'	RINSATE-2MS
TSB-DR-06-10'	RINSATE-2MSD
TSB-DR-05-0'	
TSB-DR-05-0'-FD	
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	
RINSATE-2	
TSB-DR-03-0'MS	
TSB-DR-03-0'MSD	

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 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 a 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

*III. Blanks

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

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Cadmium Niobium Tungsten	0.0275 ug/L 9.0 ug/L 0.8 ug/L	All water samples in SDG TRNC-D-3
PB (prep blank)	Barium Boron Niobium Phosphorus Potassium Sodium Thallium Tin Titanium Tungsten Zinc	0.059 mg/Kg 3.5 mg/Kg 1.1 mg/Kg 1.5 mg/Kg 3.3 mg/Kg 6.8 mg/Kg 0.096 mg/Kg 0.092 mg/Kg 0.067 mg/Kg 0.14 mg/Kg 0.91 mg/Kg	All soil samples in SDG TRNC-D-3
ICB/CCB	Arsenic Cadmium Niobium Potassium Thallium Tin Titanium Tungsten Vanadium	0.6 ug/L 0.0275 ug/L 9.0 ug/L 6.7 ug/L 0.5 ug/Kg 0.2 ug/Kg 0.4 ug/Kg 0.8 ug/Kg 0.9 ug/Kg	All soil samples in SDG TRNC-D-3

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 Tungsten	0.044 ug/L 16.1 ug/L 1.9 ug/L	0.50U ug/L 2.5U ug/L 5.0U ug/L
TSB-DR-06-0'	Boron Thallium Tungsten	11.5 mg/Kg 0.20 mg/Kg 0.79 mg/Kg	20.2U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-DR-06-10'	Boron Cadmium Niobium Tungsten	7.7 mg/Kg 0.072 mg/Kg 2.0 mg/Kg 0.42 mg/Kg	21.3U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 1.1U mg/Kg
TSB-DR-05-0'	Niobium Thallium Tungsten	1.7 mg/Kg 0.22 mg/Kg 0.43 mg/Kg	5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-05-0'-FD	Boron Thallium Tungsten	12.9 mg/Kg 0.21 mg/Kg 0.44 mg/Kg	20.2U mg/Kg 0.40U mg/Kg 1.0U ug/Kg
TSB-DR-05-10'	Boron Cadmium Tungsten	14.1 mg/Kg 0.066 mg/Kg 0.42 mg/Kg	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg
TSB-DR-03-0'	Boron Thallium Tungsten	4.5 mg/Kg 0.16 mg/Kg 0.35 mg/Kg	20.2U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-03-10'	Boron Cadmium Niobium Thallium Tungsten	17.0 mg/Kg 0.10 mg/Kg 1.9 mg/Kg 0.32 mg/Kg 0.63 mg/Kg	21.4U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
*TSB-DJ-01-0'	Boron Cadmium Thallium Tungsten	4.5 mg/Kg 0.076 mg/Kg 0.23 mg/Kg 0.43 mg/Kg	20.8U mg/Kg <u>*0.10U mg/Kg</u> 0.42U mg/Kg 1.0U mg/Kg
TSB-DJ-01-10'	Boron Cadmium Niobium Thallium Tungsten	15.8 mg/Kg 0.091 mg/Kg 1.8 mg/Kg 0.20 mg/Kg 0.50 mg/Kg	21.4U mg/Kg 0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-DR-04-0'	Boron Thallium Tungsten	5.3 mg/Kg 0.30 mg/Kg 1.0 mg/Kg	20.3U mg/Kg 0.41U mg/Kg 1.0U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-DR-04-10'	Boron Cadmium Tungsten	6.4 mg/Kg 0.083 mg/Kg 0.88 mg/Kg	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg
TSB-CR-04-0'	Boron Thallium Tungsten	9.7 mg/Kg 0.15 mg/Kg 0.37 mg/Kg	20.1U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-CR-04-10'	Boron Cadmium Tungsten	15.3 mg/Kg 0.067 mg/Kg 0.34 mg/Kg	22.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg
TSB-CR-05-0'	Boron Tungsten	6.1 mg/Kg 0.32 mg/Kg	21.1U mg/Kg 1.1U mg/Kg
TSB-CR-05-10'	Boron Cadmium Tungsten	8.5 mg/Kg 0.073 mg/Kg 0.35 mg/Kg	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg
TSB-CR-06-0'	Boron Thallium Tungsten	4.9 mg/Kg 0.19 mg/Kg 0.40 mg/Kg	20.6U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-CR-06-10'	Boron Cadmium Tungsten	8.1 mg/Kg 0.064 mg/Kg 0.32 mg/Kg	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg

*Corrected modified concentration for Cadmium in sample TSB-DJ-01-0'.

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	11/12/07	Boron Cadmium Calcium Iron Magnesium Manganese Molybdenum Niobium Potassium Silicon Sodium Strontium Thallium Tin Titanium Tungsten Zinc	18.7 ug/L 0.044 ug/L 269 ug/L 91.0 ug/L 19.8 ug/L 0.84 ug/L 0.59 ug/L 16.1 ug/L 14.9 ug/L 87.7 ug/L 86.1 ug/L 1.3 ug/L 0.74 ug/L 0.40 ug/L 0.42 ug/L 1.9 ug/L 6.2 ug/L	All soil samples in SDG TRNC-D-3

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-DR-06-0'	Boron Molybdenum Thallium Tungsten	11.5 mg/Kg 0.67 mg/Kg 0.20 mg/Kg 0.79 mg/Kg	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-DR-06-10'	Boron Cadmium Molybdenum Niobium Tungsten	7.7 mg/Kg 0.072 mg/Kg 0.64 mg/Kg 2.0 mg/Kg 0.42 mg/Kg	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 1.1U mg/Kg
TSB-DR-05-0'	Molybdenum Niobium Thallium Tungsten	0.79 mg/Kg 1.7 mg/Kg 0.22 mg/Kg 0.43 mg/Kg	1.0U mg/Kg 5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-05-0'-FD	Boron Molybdenum Thallium Tungsten	12.9 mg/Kg 0.54 mg/Kg 0.21 mg/Kg 0.44 mg/Kg	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U ug/Kg
TSB-DR-05-10'	Boron Cadmium Molybdenum Tungsten	14.1 mg/Kg 0.066 mg/Kg 0.56 mg/Kg 0.42 mg/Kg	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-DR-03-0'	Boron Molybdenum Thallium Tungsten	4.5 mg/Kg 0.50 mg/Kg 0.16 mg/Kg 0.35 mg/Kg	20.2U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-03-10'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	17.0 mg/Kg 0.10 mg/Kg 1.0 mg/Kg 1.9 mg/Kg 0.32 mg/Kg 0.63 mg/Kg	21.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
*TSB-DJ-01-0'	Boron Cadmium Molybdenum Thallium Tungsten	4.5 mg/Kg 0.076 mg/Kg 0.44 mg/Kg 0.23 mg/Kg 0.43 mg/Kg	20.8U mg/Kg <u>*0.10U mg/Kg</u> 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-DJ-01-10'	Boron Cadmium Niobium Thallium Tungsten	15.8 mg/Kg 0.091 mg/Kg 1.8 mg/Kg 0.20 mg/Kg 0.50 mg/Kg	21.4U mg/Kg 0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-DR-04-0'	Boron Molybdenum Thallium Tungsten	5.3 mg/Kg 0.77 mg/Kg 0.30 mg/Kg 1.0 mg/Kg	20.3U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-DR-04-10'	Boron Cadmium Molybdenum Tungsten	6.4 mg/Kg 0.083 mg/Kg 0.61 mg/Kg 0.88 mg/Kg	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-CR-04-0'	Boron Molybdenum Thallium Tungsten	9.7 mg/Kg 0.75 mg/Kg 0.15 mg/Kg 0.37 mg/Kg	20.1U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-CR-04-10'	Boron Cadmium Molybdenum Tungsten	15.3 mg/Kg 0.067 mg/Kg 0.65 mg/Kg 0.34 mg/Kg	22.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-CR-05-0'	Boron Molybdenum Tungsten	6.1 mg/Kg 0.54 mg/Kg 0.32 mg/Kg	21.1U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-CR-05-10'	Boron Cadmium Molybdenum Tungsten	8.5 mg/Kg 0.073 mg/Kg 0.50 mg/Kg 0.35 mg/Kg	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg
TSB-CR-06-0'	Boron Molybdenum Thallium Tungsten	4.9 mg/Kg 0.59 mg/Kg 0.19 mg/Kg 0.40 mg/Kg	20.6U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-CR-06-10'	Boron Cadmium Molybdenum Tungsten	8.1 mg/Kg 0.064 mg/Kg 0.58 mg/Kg 0.32 mg/Kg	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg

*Corrected modified concentration for Cadmium in sample TSB-DJ-01-0'.

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-DR-03-0'MSMS/MSD (All soil samples in SDG TRNC-D-3)	Antimony	55.0 (75-125)	54.8 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-DR-03-0'MSMS/MSD (All soil samples in SDG TRNC-D-3)	Niobium Silicon Sulfur	190.8 (75-125) 185.5 (75-125) -	195.7 (75-125) 168.3 (75-125) 128.6 (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	Niobium	119.6 (85-115)	All water samples in SDG TRNC-D-3	J+ (all detects)	P

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in 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-CR-06-0'L	Aluminum	11.2 (≤ 10)	All soil samples in SDG TRNC-D-3	J (all detects)	A
	Calcium	10.9 (≤ 10)		J (all detects)	
	Magnesium	11.1 (≤ 10)		J (all detects)	
	Manganese	10.2 (≤ 10)		J (all detects)	
	Phosphorus	13.5 (≤ 10)		J (all detects)	
	Potassium	10.1 (≤ 10)		J (all detects)	
	Strontium	17.1 (≤ 10)		J (all detects)	
	Titanium	10.9 (≤ 10)		J (all detects)	
	Vanadium	15.2 (≤ 10)		J (all detects)	

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-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Aluminum	7700	7650	1 (≤ 50)	-	-	-
Antimony	0.20	0.19	-	0.01 (≤ 1.0)	-	-
Arsenic	2.8	2.8	-	0 (≤ 2.0)	-	-
Barium	174	151	14 (≤ 50)	-	-	-
Beryllium	0.51	0.50	-	0.01 (≤ 0.20)	-	-
Boron	22.6	12.9	-	9.7 (≤ 20.3)	-	-
Cadmium	0.11	0.11	-	0 (≤ 0.10)	-	-
Calcium	21100	21100	0 (≤ 50)	-	-	-
Chromium	11.6	11.3	3 (≤ 50)	-	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Cobalt	6.3	7.0	11 (≤ 50)	-	-	-
Copper	13.3	12.6	5 (≤ 50)	-	-	-
Iron	13200	12600	5 (≤ 50)	-	-	-
Lead	10.9	9.5	14 (≤ 50)	-	-	-
Magnesium	8550	9040	6 (≤ 50)	-	-	-
Manganese	387	393	2 (≤ 50)	-	-	-
Molybdenum	0.79	0.54	-	0.25 (≤ 1.0)	-	-
Nickel	13.9	13.8	1 (≤ 50)	-	-	-
Niobium	1.7	1.5U	-	0.2 (≤ 5.1)	-	-
Palladium	0.28	0.27	-	0.01 (≤ 0.20)	-	-
Phosphorus	845	823	3 (≤ 50)	-	-	-
Potassium	4170	4480	7 (≤ 50)	-	-	-
Silicon	384	330	15 (≤ 50)	-	-	-
Silver	0.11	0.091	-	0.019 (≤ 0.41)	-	-
Sodium	428	374	13 (≤ 50)	-	-	-
Strontium	150	141	6 (≤ 50)	-	-	-
Thallium	0.22	0.21	-	0.01 (≤ 0.41)	-	-
Tin	0.57	0.52	-	0.05 (≤ 0.41)	-	-
Titanium	626	542	14 (≤ 50)	-	-	-
Tungsten	0.43	0.44	-	0.01 (≤ 1.0)	-	-

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Uranium	0.85	0.75	-	0.1 (≤ 0.20)	-	-
Vanadium	37.1	34.5	7 (≤ 50)	-	-	-
Zinc	30.8	29.8	3 (≤ 50)	-	-	-
Zirconium	19.9	15.6	-	4.3 (≤ 20.3)	-	-
Lithium	11.5	12.6	-	1.1 (≤ 10.1)	-	-
Sulfur	964	426U	-	538 (≤ 1010)	-	-

Compound	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Mercury	10.8	12.5	-	1.7 (≤ 33.8)	-	-

BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Antimony	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Niobium Silicon Sulfur	J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
	RINSATE-2	Niobium	J+ (all detects)	P	Laboratory control samples (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Aluminum Calcium Magnesium Manganese Phosphorus Potassium Strontium Titanium Vanadium	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	ICP serial dilution (%D)

***BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	RINSATE-2	Cadmium Niobium Tungsten	0.50U ug/L 2.5U ug/L 5.0U ug/L	A
TRNC-D-3	TSB-DR-06-0'	Boron Thallium Tungsten	20.2U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-06-10'	Boron Cadmium Niobium Tungsten	21.3U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-05-0'	Niobium Thallium Tungsten	5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-05-0'-FD	Boron Thallium Tungsten	20.2U mg/Kg 0.40U mg/Kg 1.0U ug/Kg	A
TRNC-D-3	TSB-DR-05-10'	Boron Cadmium Tungsten	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-03-0'	Boron Thallium Tungsten	20.2U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-03-10'	Boron Cadmium Niobium Thallium Tungsten	21.4U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
*TRNC-D-3	TSB-DJ-01-0'	Boron Cadmium Thallium Tungsten	20.8U mg/Kg <u>*0.10U mg/Kg</u> 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DJ-01-10'	Boron Cadmium Niobium Thallium Tungsten	21.4U mg/Kg 0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-04-0'	Boron Thallium Tungsten	20.3U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-04-10'	Boron Cadmium Tungsten	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-04-0'	Boron Thallium Tungsten	20.1U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-CR-04-10'	Boron Cadmium Tungsten	22.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-05-0'	Boron Tungsten	21.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-05-10'	Boron Cadmium Tungsten	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-06-0'	Boron Thallium Tungsten	20.6U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-CR-06-10'	Boron Cadmium Tungsten	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg	A

*Corrected modified concentration for Cadmium in sample TSB-DJ-01-0'.

***BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-3**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-06-0'	Boron Molybdenum Thallium Tungsten	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-06-10'	Boron Cadmium Molybdenum Niobium Tungsten	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-05-0'	Molybdenum Niobium Thallium Tungsten	1.0U mg/Kg 5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-05-0'-FD	Boron Molybdenum Thallium Tungsten	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U ug/Kg	A
TRNC-D-3	TSB-DR-05-10'	Boron Cadmium Molybdenum Tungsten	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-03-0'	Boron Molybdenum Thallium Tungsten	20.2U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-03-10'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
*TRNC-D-3	TSB-DJ-01-0'	Boron Cadmium Molybdenum Thallium Tungsten	20.8U mg/Kg <u>*0.10U mg/Kg</u> 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DJ-01-10'	Boron Cadmium Niobium Thallium Tungsten	21.4U mg/Kg 0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-DR-04-0'	Boron Molybdenum Thallium Tungsten	20.3U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-DR-04-10'	Boron Cadmium Molybdenum Tungsten	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-04-0'	Boron Molybdenum Thallium Tungsten	20.1U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-CR-04-10'	Boron Cadmium Molybdenum Tungsten	22.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-05-0'	Boron Molybdenum Tungsten	21.1U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-05-10'	Boron Cadmium Molybdenum Tungsten	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A
TRNC-D-3	TSB-CR-06-0'	Boron Molybdenum Thallium Tungsten	20.6U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-3	TSB-CR-06-10'	Boron Cadmium Molybdenum Tungsten	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 1.1U mg/Kg	A

*Corrected modified concentration for Cadmium in sample TSB-DJ-01-0'.

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: 11/13/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	3 ms / ms
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	SW	Les
VIII.	Internal Standard (ICP-MS)	N	n.t. reviewed
IX.	Furnace Atomic Absorption QC	N	n.t. 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=18

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

Validated Samples: *All soil event # 18, 21, 22, 23*

1	TSB-DR-06-0'	11	TSB-DR-04-10'	21	RINSTATE-2MS <i>Az</i>	31	
2	TSB-DR-06-10'	12	TSB-CR-04-0'	22	RINSTATE-2MSD <i>↓</i>	32	
3	TSB-DR-05-0'	13	TSB-CR-04-10'	23	<i>PB</i>	33	
4	TSB-DR-05-0'-FD	14	TSB-CR-05-0'	24		34	
5	TSB-DR-05-10'	15	TSB-CR-05-10'	25		35	
6	TSB-DR-03-0'	16	TSB-CR-06-0'	26		36	
7	TSB-DR-03-10'	17	TSB-CR-06-10'	27		37	
8	TSB-DJ-01-0'	18	RINSTATE-2 <i>Az</i>	28		38	
9	TSB-DJ-01-10'	19	TSB-DR-03-0'MS	29		39	
10	TSB-DR-04-0'	20	TSB-DR-03-0'MSD	30		40	

Notes: _____

DC# 181004
 SDG# TRNC-D-3

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page: 1 of 1
 Reviewer: MM
 2nd reviewer: J

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-18	Soil/As	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, V, Zn, Mo, B, Si,
~ 19.20	Sr	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si,
JM-W	As	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, V, Zn, Mo, B, Si,
1-18	Soil/As	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
~ 19.20	Sr	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
JM-W	As	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr,
		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, Ti, 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, Ti, 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

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied:
 Associated Samples: All AQ

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

Analyte	Maximum PB ^a (mg/kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	18	Sample Identification																			
Cd			0.0275		0.044 / 0.50																				
Nb			9.0		16.1 / 25.0																				
W			0.8		1.9 / 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.

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

LDC #: 18100C4
 SDG #: TRNC-D-3
 METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
 Sample Concentration units, unless otherwise noted: mg/Kg

Analyte	Maximum PB* (mg/Kg)	Maximum IC/CCB* (ug/L)	Blank Action Limit	1	2	3	4	5	6	7	8	9	10
As		0.6											
Ba	0.059			11.5 / 20.2	7.7 / 21.3		12.9 / 20.2	14.1 / 22.0	4.5 / 20.2	17.0 / 21.4	4.5 / 20.8	15.8 / 21.4	5.3 / 20.3
B	3.5				0.072 / 0.11			0.066 / 0.11		0.10 / 0.11	0.076 / 0.10	0.091 / 0.11	
Cd		0.0275								1.9 / 5.3		1.8 / 5.4	
Nb	1.1	9.0			2.0 / 5.3	1.7 / 5.1							
P	1.5												
K	3.3	6.7											
Na	6.8												
TI	0.096	0.5		0.20 / 0.40		0.22 / 0.41	0.21 / 0.40		0.16 / 0.41	0.32 / 0.43	0.23 / 0.42	0.20 / 0.43	0.30 / 0.41
Sn	0.092	0.2											
Ti	0.067	0.4											
W	0.14	0.8		0.79 / 1.0	0.42 / 1.1	0.43 / 1.0	0.44 / 1.0	0.42 / 1.1	0.35 / 1.0	0.63 / 1.1	0.43 / 1.0	0.50 / 1.1	1.0 / 1.0
V		0.9											
Zn	0.91												

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 #: 18100C4

SDG #: IRNC-D-3

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

Sample Concentration units, unless otherwise noted: mg/Kg

VALIDATION FINDINGS WORKSHEET

PB/ICB/CB QUALIFIED SAMPLES

Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X

Associated Samples: All Soil

Page: 2 of 3

Reviewer: [Signature]

2nd Reviewer: [Signature]

Analyte	Maximum PB* (mg/Kg)	Maximum ICB/CB* (ug/L)	Blank Action Limit	Sample Identification														
				11	12	13	14	15	16	17								
As		0.6																
Ba	0.059																	
B	3.5			6.4 / 21.2	9.7 / 20.1	15.3 / 22.4	6.1 / 21.1	8.5 / 21.6	4.9 / 20.6	8.1 / 21.9								
Cd		0.0275		0.083 / 0.11		0.067 / 0.11		0.073 / 0.11		0.064 / 0.11								
Nb	1.1	9.0																
P	1.5																	
K	3.3	6.7																
Na	6.8																	
Tl	0.096	0.5			0.15 / 0.40					0.19 / 0.41								
Sn	0.092	0.2																
Ti	0.067	0.4																
W	0.14	0.8		0.88 / 1.1	0.37 / 1.0	0.34 / 1.1	0.32 / 1.1	0.35 / 1.1	0.40 / 1.0	0.32 / 1.1								
V		0.9																
Zn	0.91																	

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.

**VALIDATION FINDINGS WORKSHEET
Field Blanks**

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

LDC #: 18100C4
SDG #: TRNC-D-3

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: 11/12/07 Soil factor applied: 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification										
		1	2	3	4	5	6	7	8	9	10	
B	18.7	11.5 / 20.2	7.7 / 21.3		12.9 / 20.2	14.1 / 22.0	4.5 / 20.2	17.0 / 21.4	4.5 / 20.8	15.8 / 21.4		5.3 / 20.3
Cd	0.044		0.072 / 0.11			0.066 / 0.11		0.10 / 0.11	0.076 / 0.11	0.091 / 0.11		
Ca	269											
Fe	91.0											
Mg	19.8											
Mn	0.84											
Mo	0.59	0.67 / 1.0	0.64 / 1.1	0.79 / 1.0	0.54 / 1.0	0.56 / 1.1	0.50 / 1.0	1.0 / 1.1	0.44 / 1.0		0.77 / 1.0	
Nb	16.1		2.0 / 5.3	1.7 / 5.1				1.9 / 5.3		1.8 / 5.4		
K	14.9											
Si	87.7											
Na	86.1											
Sr	1.3											
Tl	0.74	0.20 / 0.40		0.22 / 0.41	0.21 / 0.40		0.16 / 0.41	0.32 / 0.43	0.23 / 0.42	0.20 / 0.43	0.30 / 0.41	
Sn	0.40											
Ti	0.42											
W	1.9	0.79 / 1.0	0.42 / 1.1	0.43 / 1.0	0.44 / 1.0	0.42 / 1.1	0.35 / 1.0	0.63 / 1.1	0.43 / 1.0	0.50 / 1.1	1.0 / 1.0	
Zn	6.2											

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".

VALIDATION FINDINGS WORKSHEET
Field Blanks

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: 11/12/07 **Soil factor applied:** 200X

Field blank type: (circle one) Field Blank / Rinsate / Other: R **Associated Samples:** All Soil

Analyte	Blank ID	Sample Identification														
		Action Level	11	12	13	14	15	16	17	18	19	20	21	22	23	24
B	18.7		6.4 / 21.2	9.7 / 20.1	15.3 / 22.4	6.1 / 21.1	8.5 / 21.6	4.9 / 20.6	8.1 / 21.9							
Cd	0.044		0.083 / 0.11		0.067 / 0.11		0.073 / 0.11		0.064 / 0.11							
Ca	269	538														
Fe	91.0	182														
Mg	19.8															
Mn	0.84															
Mo	0.59		0.61 / 1.1	0.75 / 1.0	0.65 / 1.1	0.54 / 1.1	0.50 / 1.1	0.59 / 1.0	0.58 / 1.1							
Nb	16.1															
K	14.9															
Si	87.7															
Na	86.1	172.2														
Sr	1.3															
Tl	0.74			0.15 / 0.40				0.19 / 0.41								
Sn	0.40															
Ti	0.42															
W	1.9		0.88 / 1.1	0.37 / 1.0	0.34 / 1.1	0.32 / 1.1	0.35 / 1.1	0.40 / 1.0	0.32 / 1.1							
Zn	6.2															

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 #: 81024
 SDG #: TRV-7-3

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 Reviewer: BM
 2nd Reviewer: R

VALIDATION FINDINGS WORKSHEET
 Matrix Spike/Matrix Spike Duplicates

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

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

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

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

LEVEL IV ONLY:
 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	21/22	AD	Li S			25.7 (50) 24.6	AD A ↓	N ₂ found (MS/MSD cases N) ↓
2	19/20	soil	Sb Nb Si S	55.0 190.8 185.5	54.8 195.7 168.3		All Soil ↓	I=MS/A I+MS/A ↓

Comments:

LDC #: 18120c4
 SDG #: TRAC-23

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

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

#	LCS ID	Matrix	Analyte	%R (limits)	Associated Samples	Qualifications
1	LCS	AC	Nb	119.6 (85-115)	A-1 Ac	JR LF / P

Comments: _____

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

LDC #: 1810024
 SDG #: TRAC-0-3

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

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 (X) N N/A If analyte concentrations were > 50X the IDL, was an ICP serial dilution analyzed? > 100X here for 204 mg
 Y (X) N/A Were ICP serial dilution percent differences (%D) ≤ 10%?
 Y (X) 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.

#	Diluted Sample ID	Matrix	Analyte	%D	Associated Samples	Qualifications
1	6	Soil	As	11.2	M soil	✓ Soil - Jkt/A
			Ca	10.9		
			Mg	11.1		
			Mn	10.2		
			P	13.5		
			K	10.1		
			Sr	17.1		
			Ti	10.9		
			V	15.2		

Comments: As, Cu, Ni, Zn 100X min

LDC#: 18100C4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 2
 Reviewer:
 2nd Reviewer:

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

Y N A
 Y N A

Were field duplicate pairs identified in this SDG?

Were target analytes detected in the field duplicate pairs?

Compound	Concentration (mg/kg)		(≤ 50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	3	4				
Aluminum	7700	7650	1			
Antimony	0.20	0.19		0.01	(≤ 1.0)	
Arsenic	2.8	2.8		0	(≤ 2.0)	
Barium	174	151	14			
Beryllium	0.51	0.50		0.01	(≤ 0.20)	
Boron	22.6	12.9		9.7	(≤ 20.3)	
Cadmium	0.11	0.11		0	(≤ 0.10)	
Calcium	21100	21100	0			
Chromium	11.6	11.3	3			
Cobalt	6.3	7.0	11			
Copper	13.3	12.6	5			
Iron	13200	12600	5			
Lead	10.9	9.5	14			
Magnesium	8550	9040	6			
Manganese	387	393	2			
Molybdenum	0.79	0.54		0.25	(≤ 1.0)	
Nickel	13.9	13.8	1			
Niobium	1.7	1.5U		0.2	(≤ 5.1)	
Palladium	0.28	0.27		0.01	(≤ 0.20)	

LDC#: 18100C4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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)
	3	4				
Phosphorus	845	823	3			
Potassium	4170	4480	7			
Silicon	384	330	15			
Silver	0.11	0.091		0.019	(≤ 0.41)	
Sodium	428	374	13			
Strontium	150	141	6			
Thallium	0.22	0.21		0.01	(≤ 0.41)	
Tin	0.57	0.52		0.05	(≤ 0.41)	
Titanium	626	542	14			
Tungsten	0.43	0.44		0.01	(≤ 1.0)	
Uranium	0.85	0.75		0.1	(≤ 0.20)	
Vanadium	37.1	34.5	7			
Zinc	30.8	29.8	3			
Zirconium	19.9	15.6		4.3	(≤ 20.3)	
Lithium	11.5	12.6		1.1	(≤ 10.1)	
Sulfur	964	426U		538	(≤ 1010)	
Mercury (ug/Kg)	10.8	12.5		1.7	(≤ 33.8)	

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 14, 2007
LDC Report Date: January 22, 2008
Matrix: Soil
Parameters: Metals
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW DITCH01-0'
JB-NW DITCH01-10'
TSB-FR-01-0'MS
TSB-FR-01-0'MSD

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 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 a 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

III. Blanks

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

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Copper Manganese Phosphorus Potassium Sodium Tin Titanium Zinc Zirconium	0.11 mg/Kg 0.16 mg/Kg 0.99 mg/Kg 2.2 mg/Kg 4.0 mg/Kg 0.042 mg/Kg 0.11 mg/Kg 1.3 mg/Kg 0.30 mg/Kg	All samples in SDG TRNC-D-4
ICB/CCB	Arsenic Cadmium Niobium Phosphorus Potassium Thallium Tin Titanium Tungsten Vanadium	0.6 ug/L 0.0275 ug/L 9.0 ug/L 4.0 ug/L 7.3 ug/L 0.5 ug/L 0.2 ug/L 0.4 ug/L 0.8 ug/L 1.1 ug/L	All samples in SDG TRNC-D-4

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FR-01-0'	Thallium	0.27 mg/Kg	0.42U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FR-01-10'	Cadmium Niobium Thallium Tungsten Zirconium	0.082 mg/Kg 2.5 mg/Kg 0.36 mg/Kg 0.72 mg/Kg 20.6 mg/Kg	0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg
TSB-FJ-07-0'	Thallium Tungsten	0.21 mg/Kg 0.59 mg/Kg	0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-07-10'	Cadmium Tungsten	0.092 mg/Kg 0.36 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FJ-06-0'	Thallium Tungsten	0.17 mg/Kg 0.67 mg/Kg	0.41U mg/Kg 1.0U mg/Kg
TSB-FJ-06-0'-FD	Niobium Thallium Tungsten	1.7 mg/Kg 0.22 mg/Kg 0.60 mg/Kg	5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-FJ-06-10'	Cadmium Tungsten	0.073 mg/Kg 0.35 mg/Kg	0.10U mg/Kg 1.0U mg/Kg
TSB-FJ-05-0'	Tungsten Zirconium	0.37 mg/Kg 21.0 mg/Kg	1.1U mg/Kg 21.6U mg/Kg
TSB-FJ-05-10'	Cadmium Tungsten	0.084 mg/Kg 0.41 mg/Kg	0.10U mg/Kg 1.0U mg/Kg
TSB-DR-01-0'	Tungsten Zirconium	0.29 mg/Kg 19.4 mg/Kg	1.0U mg/Kg 20.4U mg/Kg
TSB-DR-01-10'	Cadmium Tin Tungsten Zirconium	0.071 mg/Kg 0.41 mg/Kg 0.33 mg/Kg 18.9 mg/Kg	0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 21.0U mg/Kg
TSB-DR-02-0'	Thallium Tungsten	0.14 mg/Kg 0.31 mg/Kg	0.40U mg/Kg 1.0U mg/Kg
TSB-DR-02-10'	Cadmium Tungsten	0.080 mg/Kg 0.40 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-DR-02-0'-FD	Tungsten	0.28 mg/Kg	1.0U mg/Kg
JB-NW DITCH01-10'	Cadmium Tungsten Zirconium	0.041 mg/Kg 0.44 mg/Kg 18.7 mg/Kg	0.11U mg/Kg 1.1U mg/Kg 22.1U 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-FR-01-0'MS/MSD (All samples in SDG TRNC-D-4)	Sulfur	130.8 (75-125)	-	-	J+ (all detects)	A
	Niobium	134.7 (75-125)	-	-	J+ (all detects)	
TSB-FR-01-0'MS/MSD (All samples in SDG TRNC-D-4)	Antimony	49.0 (75-125)	42.78 (75-125)	-	J- (all detects)	A
	Cobalt	68.7 (75-125)	66.7 (75-125)	-	UJ (all non-detects)	
	Nickel	47.0 (75-125)	45.6 (75-125)	-		
	Potassium	38.1 (75-125)	44.8 (75-125)	-		
	Sodium	35.1 (75-125)	64.4 (75-125)	-		
	Zirconium	71.0 (75-125)	62.3 (75-125)	-		
	Tungsten	-	68.9 (75-125)	-		
TSB-FR-01-0'MS/MSD (All samples in SDG TRNC-D-4)	Barium	-31.5 (75-125)	-31.3 (75-125)	-	J- (all detects)	A
	Chromium	20.8 (75-125)	29.9 (75-125)	-	R (all non-detects)	
	Copper	-0.6 (75-125)	-5.6 (75-125)	-		
	Phosphorus	-46.6 (75-125)	-66.2 (75-125)	-		
	Vanadium	-12.6 (75-125)	-19.7 (75-125)	-		
	Zinc	16.3 (75-125)	9.6 (75-125)	-		
	Silicon	-	-10.5 (75-125)	-		

VI. Duplicate Sample Analysis

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

VII. Laboratory Control Samples (LCS)

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

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in 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-FR-01-0'L	Barium Vanadium	11.9 (≤ 10) 10.5 (≤ 10)	All samples in SDG TRNC-D-4	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-FJ-06-0' and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Aluminum	6380 mg/Kg	8580 mg/Kg	29 (≤ 50)	-	-	-
Antimony	0.29 mg/Kg	0.32 mg/Kg	-	0.03 mg/Kg (≤ 1.0)	-	-
Arsenic	5.0 mg/Kg	6.9 mg/Kg	-	1.9 mg/Kg (≤ 2.1)	-	-
Barium	859 mg/Kg	629 mg/Kg	31 (≤ 50)	-	-	-
Beryllium	0.49 mg/Kg	0.58 mg/Kg	-	0.09 mg/Kg (≤ 0.21)	-	-
Boron	12.4 mg/Kg	13.4 mg/Kg	-	1 mg/Kg (≤ 20.6)	-	-
Cadmium	0.23 mg/Kg	0.25 mg/Kg	-	0.02 mg/Kg (≤ 0.10)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Calcium	66200 mg/Kg	30900 mg/Kg	73 (≤ 50)	-	J (all detects)	A
Chromium	15.4 mg/Kg	17.2 mg/Kg	11 (≤ 50)	-	-	-
Cobalt	10.2 mg/Kg	8.6 mg/Kg	17 (≤ 50)	-	-	-
Copper	19.2 mg/Kg	25.1 mg/Kg	27 (≤ 50)	-	-	-
Iron	12900 mg/Kg	15000 mg/Kg	15 (≤ 50)	-	-	-
Lead	38.5 mg/Kg	39.8 mg/Kg	3 (≤ 50)	-	-	-
Magnesium	10300 mg/Kg	12600 mg/Kg	20 (≤ 50)	-	-	-
Manganese	775 mg/Kg	671 mg/Kg	14 (≤ 50)	-	-	-
Molybdenum	1.1 mg/Kg	0.92 mg/Kg	-	0.18 mg/Kg (≤ 1.0)	-	-
Nickel	16.5 mg/Kg	16.5 mg/Kg	0 (≤ 50)	-	-	-
Niobium	1.6U mg/Kg	1.7 mg/Kg	-	0.1 mg/Kg (≤ 5.2)	-	-
Palladium	0.29 mg/Kg	0.30 mg/Kg	-	0.01 mg/Kg (≤ 0.21)	-	-
Phosphorus	934 mg/Kg	951 mg/Kg	2 (≤ 50)	-	-	-
Platinum	0.15 mg/Kg	0.021 mg/Kg	-	0.129 mg/Kg (≤ 0.21)	-	-
Potassium	1680 mg/Kg	2270 mg/Kg	30 (≤ 50)	-	-	-
Silicon	149 mg/Kg	426 mg/Kg	-	277 mg/Kg (≤ 51.6)	J (all detects)	A
Silver	0.13 mg/Kg	0.15 mg/Kg	-	0.02 mg/Kg (≤ 0.41)	-	-
Sodium	845 mg/Kg	1730 mg/Kg	69 (≤ 50)	-	J (all detects)	A
Strontium	150 mg/Kg	167 mg/Kg	11 (≤ 50)	-	-	-
Thallium	0.17 mg/Kg	0.22 mg/Kg	-	0.05 mg/Kg (≤ 0.41)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Tin	1.1 mg/Kg	1.1 mg/Kg	-	0 mg/Kg (≤ 0.41)	-	-
Titanium	576 mg/Kg	701 mg/Kg	20 (≤ 50)	-	-	-
Tungsten	0.67 mg/Kg	0.60 mg/Kg	-	0.07 mg/Kg (≤ 1.0)	-	-
Uranium	1.0 mg/Kg	1.2 mg/Kg	-	0.2 mg/Kg (≤ 0.21)	-	-
Vanadium	41.8 mg/Kg	47.6 mg/Kg	13 (≤ 50)	-	-	-
Zinc	61.8 mg/Kg	67.1 mg/Kg	8 (≤ 50)	-	-	-
Zirconium	21.6 mg/Kg	25.9 mg/Kg	-	4.3 mg/Kg (≤ 20.6)	-	-
Lithium	11.2 mg/Kg	12.0 mg/Kg	-	0.8 mg/Kg (≤ 10.3)	-	-
Sulfur	919 mg/Kg	893 mg/Kg	-	26 mg/Kg (≤ 1030)	-	-
Mercury	10.5 ug/Kg	41.3 ug/Kg	-	30.8 ug/Kg (≤ 34.4)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Aluminum	7760 mg/Kg	8170 mg/Kg	5 (≤ 50)	-	-	-
Antimony	0.15 mg/Kg	0.18 mg/Kg	-	0.03 mg/Kg (≤ 1.0)	-	-
Arsenic	2.9 mg/Kg	3.1 mg/Kg	-	0.2 mg/Kg (≤ 2.0)	-	-
Barium	168 mg/Kg	171 mg/Kg	2 (≤ 50)	-	-	-
Beryllium	0.49 mg/Kg	0.55 mg/Kg	-	0.06 mg/Kg (≤ 0.20)	-	-
Boron	5.0 mg/Kg	5.8 mg/Kg	-	0.8 mg/Kg (≤ 20.3)	-	-
Cadmium	0.11 mg/Kg	0.11 mg/Kg	-	0 mg/Kg (≤ 0.10)	-	-
Calcium	22400 mg/Kg	20900 mg/Kg	7 (≤ 50)	-	-	-
Chromium	10.8 mg/Kg	10.8 mg/Kg	0 (≤ 50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Cobalt	5.9 mg/Kg	6.6 mg/Kg	11 (≤ 50)	-	-	-
Copper	12.1 mg/Kg	13.9 mg/Kg	14 (≤ 50)	-	-	-
Iron	11800 mg/Kg	12800 mg/Kg	8 (≤ 50)	-	-	-
Lead	13.9 mg/Kg	10.9 mg/Kg	24 (≤ 50)	-	-	-
Magnesium	8140 mg/Kg	8120 mg/Kg	0 (≤ 50)	-	-	-
Manganese	390 mg/Kg	348 mg/Kg	11 (≤ 50)	-	-	-
Molybdenum	0.55 mg/Kg	0.49 mg/Kg	-	0.06 mg/Kg (≤ 1.0)	-	-
Nickel	13.6 mg/Kg	15.5 mg/Kg	13 (≤ 50)	-	-	-
Palladium	0.26 mg/Kg	0.26 mg/Kg	-	0 mg/Kg (≤ 0.20)	-	-
Phosphorus	757 mg/Kg	1030 mg/Kg	31 (≤ 50)	-	-	-
Potassium	3130 mg/Kg	2920 mg/Kg	7 (≤ 50)	-	-	-
Silicon	256 mg/Kg	259 mg/Kg	1 (≤ 50)	-	-	-
Silver	0.094 mg/Kg	0.11 mg/Kg	-	0.016 mg/Kg (≤ 0.41)	-	-
Sodium	247 mg/Kg	533 mg/Kg	73 (≤ 50)	-	J (all detects)	A
Strontium	149 mg/Kg	147 mg/Kg	1 (≤ 50)	-	-	-
Thallium	0.14 mg/Kg	0.14U mg/Kg	-	0 mg/Kg (≤ 0.41)	-	-
Tin	0.55 mg/Kg	0.58 mg/Kg	-	0.03 mg/Kg (≤ 0.41)	-	-
Titanium	600 mg/Kg	614 mg/Kg	2 (≤ 50)	-	-	-
Tungsten	0.31 mg/Kg	0.28 mg/Kg	-	0.03 mg/Kg (≤ 1.0)	-	-
Uranium	0.75 mg/Kg	0.91 mg/Kg	-	0.16 mg/Kg (≤ 0.20)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Vanadium	33.2 mg/Kg	35.9 mg/Kg	8 (≤ 50)	-	-	-
Zinc	29.8 mg/Kg	32.7 mg/Kg	9 (≤ 50)	-	-	-
Zirconium	21.3 mg/Kg	22.6 mg/Kg	-	1.3 mg/Kg (≤ 20.3)	-	-
Lithium	13.2 mg/Kg	12.0 mg/Kg	-	1.2 mg/Kg (≤ 10.2)	-	-
Sulfur	425U mg/Kg	470 mg/Kg	-	45 mg/Kg (≤ 1020)	-	-
Mercury	15.3 ug/Kg	17.5 ug/Kg	-	2.2 ug/Kg (≤ 33.9)	-	-

**BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-4**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Sulfur Niobium	J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Antimony Cobalt Nickel Potassium Sodium Zirconium Tungsten	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Barium Chromium Copper Phosphorus Vanadium Zinc Silicon	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Barium Vanadium	J (all detects) J (all detects)	A	ICP serial dilution (%D)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	Calcium Sodium	J (all detects) J (all detects)	A	Field duplicates (RPD)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	Silicon	J (all detects)	A	Field duplicates (Difference)
TRNC-D-4	TSB-DR-02-0' TSB-DR-02-0'-FD	Sodium	J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-4	TSB-FR-01-0'	Thallium	0.42U mg/Kg	A
TRNC-D-4	TSB-FR-01-10'	Cadmium Niobium Thallium Tungsten Zirconium	0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg	A
TRNC-D-4	TSB-FJ-07-0'	Thallium Tungsten	0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-4	TSB-FJ-07-10'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-4	TSB-FJ-06-0'	Thallium Tungsten	0.41U mg/Kg 1.0U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-4	TSB-FJ-06-0'-FD	Niobium Thallium Tungsten	5.1U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-4	TSB-FJ-06-10'	Cadmium Tungsten	0.10U mg/Kg 1.0U mg/Kg	A
TRNC-D-4	TSB-FJ-05-0'	Tungsten Zirconium	1.1U mg/Kg 21.6U mg/Kg	A
TRNC-D-4	TSB-FJ-05-10'	Cadmium Tungsten	0.10U mg/Kg 1.0U mg/Kg	A
TRNC-D-4	TSB-DR-01-0'	Tungsten Zirconium	1.0U mg/Kg 20.4U mg/Kg	A
TRNC-D-4	TSB-DR-01-10'	Cadmium Tin Tungsten Zirconium	0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 21.0U mg/Kg	A
TRNC-D-4	TSB-DR-02-0'	Thallium Tungsten	0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-4	TSB-DR-02-10'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-4	TSB-DR-02-0'-FD	Tungsten	1.0U mg/Kg	A
TRNC-D-4	JB-NW DITCH01-1 0'	Cadmium Tungsten Zirconium	0.11U mg/Kg 1.1U mg/Kg 22.1U mg/Kg	A

**BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-4**

No Sample Data Qualified in this SDG

LDC #: 18100D4

VALIDATION COMPLETENESS WORKSHEET

Date: 1/17/08

SDG #: TRNC-D-4

Level III

Page: 1 of 1

Laboratory: Test America

Reviewer:
 2nd Reviewer:

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: 11/14/07
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)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	NIT reviewed
IX.	Furnace Atomic Absorption QC	N	NIT Utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(5,6) (12,14)
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:

2011

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21		31	
2	TSB-FR-01-10'	12	TSB-DR-02-0'	22		32	
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33	
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD	24		34	
5	TSB-FJ-06-0'	15	JB-NW DITCH01-0'	25		35	
6	TSB-FJ-06-0'-FD	16	JB-NW DITCH01-10'	26		36	
7	TSB-FJ-06-10'	17	TSB-FR-01-0'MS	27		37	
8	TSB-FJ-05-0'	18	TSB-FR-01-0'MSD	28		38	
9	TSB-FJ-05-10'	19	PB	29		39	
10	TSB-DR-01-0'	20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-16	Soil	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, V, Zn, Mo, B, Si
17, 18	Soil	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, V, Zn, Mo, B, Si
1-16	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
17, 18	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
		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, Ti, V, Zn, Mo, B, Si
ICP-MS		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Zr
GEAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	Sample Identification																
				1	2	3	4	5	6	7	8	9	10							
As		0.6																		
Cd		0.0275		0.082 / 0.11		0.092 / 0.11						0.073 / 0.10				0.084 / 0.10				
Cu	0.11																			
Mn	0.16																			
Nb		9.0		2.5 / 5.3								1.7 / 5.1								
P	0.99	4.0																		
K	2.2	7.3																		
Na	4.0																			
Tl		0.5		0.27 / 0.42	0.36 / 0.43	0.21 / 0.43		0.17 / 0.41		0.22 / 0.41										
Sn	0.042	0.2																		
Ti	0.11	0.4																		
W		0.8		0.72 / 1.1	0.59 / 1.1	0.36 / 1.1	0.67 / 1.0	0.35 / 1.0	0.37 / 1.1	0.41 / 1.0	0.29 / 1.0									
V		1.1																		
Zn	1.3																			
Zr	0.30			20.6 / 21.3								21.0 / 21.6								

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.

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/l)	Blank Action Limit	Sample Identification																
				11	12	13	14	16												
As		0.6																		
Cd		0.0275		0.071 / 0.11		0.080 / 0.11								0.041 / 0.11						
Cu	0.11																			
Mn	0.16																			
Nb		9.0																		
P	0.99	4.0																		
K	2.2	7.3																		
Na	4.0																			
Tl		0.5			0.14 / 0.40															
Sn	0.042	0.2		0.41 / 0.42																
Ti	0.11	0.4																		
W		0.8		0.33 / 1.1	0.31 / 1.0	0.40 / 1.1	0.28 / 1.0	0.44 / 1.1												
V		1.1																		
Zn	1.3																			
Zr	0.30			18.9 / 21.0				18.7 / 22.1												

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.

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

- Y N N/A Was a matrix spike analyzed for each matrix in this SDG?
- Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.
- Y N N/A Were all duplicate sample relative percent differences (RPD) \leq 20% for water samples and \leq 35% for soil samples?
- Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	19/18	Soil	S	130.8			A11	J+ ↓ + / A
			Sb	49.0	42.7			J- / NT / A
			Ba	-31.5	-31.3			J- / R / A
			Cr	20.8	29.9			J- / NT / A
			Ca	68.7	66.7			J- / R / A
			Cu	-0.6	-5.6			J- / NT / A
			Ni	49.0	45.6			J+ ↓ + / A
			Nb	134.7				J- / R / A
			P	-46.6	-66.2			J- / NT / A
			K	38.1	44.8			J- / R / A
			Na	65.1	64.4			J- / NT / A
			V	-12.6	-19.7			J- / R / A
			Zn	16.3	9.6			J- / NT / A
			Zr	71.0	62.3			J- / R / A
			Si		-10.5			J- / R / A
			W		68.9			J- / NT / A
			Mn			29.2 (520)		M. 600 L-55 in
			Si			29.7		[Signature]

Comments: _____

LDC#: 18100D4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 4
 Reviewer: _____
 2nd Reviewer: _____

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

Y N NA
Y N NA

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

Compound	Concentration (mg/kg)		(≤ 50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	5	6	RPD	Difference	Limits	
Aluminum	6380	8580	29			
Antimony	0.29	0.32		0.03	(≤ 1.0)	
Arsenic	5.0	6.9		1.9	(≤ 2.1)	
Barium	859	629	31			
Beryllium	0.49	0.58		0.09	(≤ 0.21)	
Boron	12.4	13.4		1	(≤ 20.6)	
Cadmium	0.23	0.25		0.02	(≤ 0.10)	
Calcium	66200	30900	73			J det / A
Chromium	15.4	17.2	11			
Cobalt	10.2	8.6	17			
Copper	19.2	25.1	27			
Iron	12900	15000	15			
Lead	38.5	39.8	3			
Magnesium	10300	12600	20			
Manganese	775	671	14			
Molybdenum	1.1	0.92		0.18	(≤ 1.0)	
Nickel	16.5	16.5	0			
Niobium	1.6U	1.7		0.1	(≤ 5.2)	
Palladium	0.29	0.30		0.01	(≤ 0.21)	

LDC#: 18100D4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 2 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(≤ 50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	5	6	RPD	Difference	Limits	
Phosphorus	934	951	2			
Platinum	0.15	0.021		0.129	(≤ 0.21)	
Potassium	1680	2270	30			
Silicon	149	426		277	(≤ 51.6)	J det / A
Silver	0.13	0.15		0.02	(≤ 0.41)	
Sodium	845	1730	69			J det / A
Strontium	150	167	11			
Thallium	0.17	0.22		0.05	(≤ 0.41)	
Tin	1.1	1.1		0	(≤ 0.41)	
Titanium	576	701	20			
Tungsten	0.67	0.60		0.07	(≤ 1.0)	
Uranium	1.0	1.2		0.2	(≤ 0.21)	
Vanadium	41.8	47.6	13			
Zinc	61.8	67.1	8			
Zirconium	21.6	25.9		4.3	(≤ 20.6)	
Lithium	11.2	12.0		0.8	(≤ 10.3)	
Sulfur	919	893		26	(≤ 1030)	
Mercury (ug/Kg)	10.5	41.3		30.8	(≤ 34.4)	

LDC#: 18100D4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 3 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(≤ 50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	12	14	RPD	Difference	Limits	
Aluminum	7760	8170	5			
Antimony	0.15	0.18		0.03	(≤ 1.0)	
Arsenic	2.9	3.1		0.2	(≤ 2.0)	
Barium	168	171	2			
Beryllium	0.49	0.55		0.06	(≤ 0.20)	
Boron	5.0	5.8		0.8	(≤ 20.3)	
Cadmium	0.11	0.11		0	(≤ 0.10)	
Calcium	22400	20900	7			
Chromium	10.8	10.8	0			
Cobalt	5.9	6.6	11			
Copper	12.1	13.9	14			
Iron	11800	12800	8			
Lead	13.9	10.9	24			
Magnesium	8140	8120	0			
Manganese	390	348	11			
Molybdenum	0.55	0.49		0.06	(≤ 1.0)	
Nickel	13.6	15.5	13			
Palladium	0.26	0.26		0	(≤ 0.20)	
Phosphorus	757	1030	31			

LDC#: 18100D4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 4 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

Y N NA
Y N NA

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

Compound	Concentration (mg/kg)		(<=50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	12	14				
Potassium	3130	2920	7			
Silicon	256	259	1			
Silver	0.094	0.11		0.016	(<=0.41)	
Sodium	247	533	73			J det / A
Strontium	149	147	1			
Thallium	0.14	0.14U		0	(<=0.41)	
Tin	0.55	0.58		0.03	(<=0.41)	
Titanium	600	614	2			
Tungsten	0.31	0.28		0.03	(<=1.0)	
Uranium	0.75	0.91		0.16	(<=0.20)	
Vanadium	33.2	35.9	8			
Zinc	29.8	32.7	9			
Zirconium	21.3	22.6		1.3	(<=20.3)	
Lithium	13.2	12.0		1.2	(<=10.2)	
Sulfur	425U	470		45	(<=1020)	
Mercury (ug/Kg)	15.3	17.5		2.2	(<=33.9)	

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 15, 2007
LDC Report Date: January 21, 2008
Matrix: Soil/Water
Parameters: Metals
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'***
TSB-FJ-03-0'-FD**
TSB-FJ-03-10'***
TSB-FJ-10-0'***
TSB-FJ-10-10'***
TSB-FJ-04-0'***
TSB-FJ-04-10'***
TSB-FJ-02-0'***
TSB-FJ-02-0'-FD**
TSB-FJ-02-10'***
TSB-FR-02-0'***
TSB-FR-02-10'***
TSB-FJ-09-0'***
TSB-FJ-09-10'***
TSB-FR-03-0'***
TSB-FR-03-10'***
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 soil samples and one water sample 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

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

III. Blanks

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

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Cadmium Niobium Tungsten	0.0275 ug/L 9.0 ug/L 0.8 ug/L	All water samples in SDG TRNC-D-5
PB (prep blank)	Barium Boron Iron Molybdenum Phosphorus Sodium Tin Vanadium Zinc Zirconium	0.13 mg/Kg 1.5 mg/Kg 3.0 mg/Kg 0.058 mg/Kg 1.3 mg/Kg 4.3 mg/Kg 0.032 mg/Kg 0.27 mg/Kg 1.0 mg/Kg 0.31 mg/Kg	All soil samples in SDG TRNC-D-5
ICB/CCB	Boron Cadmium Nickel Niobium Thallium Tin Tungsten Vanadium Mercury	12.8 ug/L 0.045 ug/L 0.5 ug/L 9.2 ug/L 0.7 ug/L 0.2 ug/L 1.3 ug/L 1.9 ug/L 0.1 ug/L	All soil samples in SDG TRNC-D-5

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
RINSATE-3	Niobium Tungsten	19.7 ug/L 2.6 ug/L	25.0U ug/L 5.0U ug/L
TSB-FJ-03-0'***	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	10.0 mg/Kg 0.073 mg/Kg 0.47 mg/Kg 0.19 mg/Kg 0.81 mg/Kg 17.3 mg/Kg 15.7 ug/Kg	20.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 20.9U mg/Kg 34.9U ug/Kg
TSB-FJ-03-0'-FD**	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	8.1 mg/Kg 0.10 mg/Kg 0.37 mg/Kg 4.3 mg/Kg 0.21 mg/Kg 0.39 mg/Kg 17.0 mg/Kg 16.7 ug/Kg	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg 35.4U ug/Kg
TSB-FJ-03-10'***	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	5.5 mg/Kg 0.075 mg/Kg 0.62 mg/Kg 2.5 mg/Kg 0.16 mg/Kg 0.41 mg/Kg 19.1 mg/Kg 14.2 ug/Kg	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.6U mg/Kg 35.9U ug/Kg
TSB-FJ-10-0'***	Boron Cadmium Molybdenum Thallium Tungsten Mercury	9.7 mg/Kg 0.092 mg/Kg 0.97 mg/Kg 0.34 mg/Kg 0.53 mg/Kg 17.3 ug/Kg	21.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.6U ug/Kg
TSB-FJ-10-10'***	Boron Cadmium Molybdenum Thallium Tungsten Mercury	11.9 mg/Kg 0.071 mg/Kg 0.67 mg/Kg 0.16 mg/Kg 0.29 mg/Kg 11.5 ug/Kg	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-FJ-04-0'***	Boron Cadmium Molybdenum Thallium Tungsten Mercury	5.5 mg/Kg 0.080 mg/Kg 0.46 mg/Kg 0.21 mg/Kg 0.36 mg/Kg 13.8 ug/Kg	21.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.0U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FJ-04-10'***	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	7.8 mg/Kg 0.038 mg/Kg 0.37 mg/Kg 0.16 mg/Kg 0.22 mg/Kg 18.8 mg/Kg 9.8 ug/Kg	21.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.5U mg/Kg 35.8U ug/Kg
TSB-FJ-02-0'***	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	4.6 mg/Kg 0.10 mg/Kg 0.51 mg/Kg 0.20 mg/Kg 0.28 mg/Kg 18.6 mg/Kg 10.1 ug/Kg	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg 35.5U ug/Kg
TSB-FJ-02-0'-FD**	Cadmium Molybdenum Tin Tungsten Zirconium Mercury	0.055 mg/Kg 0.37 mg/Kg 0.35 mg/Kg 0.39 mg/Kg 12.1 mg/Kg 23.8 ug/Kg	0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 20.7U mg/Kg 34.4U ug/Kg
TSB-FJ-02-10'***	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	6.1 mg/Kg 0.072 mg/Kg 0.51 mg/Kg 1.7 mg/Kg 0.16 mg/Kg 0.29 mg/Kg 21.5 mg/Kg 10.0 ug/Kg	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 21.7U mg/Kg 36.2U ug/Kg
TSB-FR-02-0'***	Boron Cadmium Molybdenum Thallium Tungsten Zirconium	4.0 mg/Kg 0.081 mg/Kg 0.51 mg/Kg 0.18 mg/Kg 0.37 mg/Kg 20.3 mg/Kg	20.5U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 20.5U mg/Kg
TSB-FR-02-10'***	Boron Cadmium Molybdenum Niobium Thallium Tungsten Mercury	7.5 mg/Kg 0.099 mg/Kg 0.50 mg/Kg 1.9 mg/Kg 0.43 mg/Kg 0.66 mg/Kg 12.5 ug/Kg	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.7U ug/Kg
TSB-FJ-09-0'***	Boron Molybdenum Thallium Tungsten Mercury	9.3 mg/Kg 0.76 mg/Kg 0.27 mg/Kg 0.47 mg/Kg 8.3 ug/Kg	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FJ-09-10**	Boron Cadmium Molybdenum Thallium Tungsten Mercury	8.1 mg/Kg 0.073 mg/Kg 0.42 mg/Kg 0.22 mg/Kg 0.32 mg/Kg 9.6 ug/Kg	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.1U ug/Kg
TSB-FR-03-0**	Boron Cadmium Molybdenum Thallium Tin Tungsten Zirconium Mercury	9.7 mg/Kg 0.066 mg/Kg 0.37 mg/Kg 0.17 mg/Kg 0.36 mg/Kg 0.29 mg/Kg 16.0 mg/Kg 23.0 ug/Kg	20.2U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg 20.2U mg/Kg 33.6U ug/Kg
TSB-FR-03-10**	Boron Cadmium Molybdenum Thallium Tungsten	8.4 mg/Kg 0.068 mg/Kg 0.40 mg/Kg 0.17 mg/Kg 0.28 mg/Kg	21.8U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg

Sample RINSATE-3 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-3	11/15/07	Boron Calcium Iron Magnesium Molybdenum Niobium Sodium Strontium Thallium Tin Tungsten	25.0 ug/L 51.9 ug/L 12.8 ug/L 4.7 ug/L 0.43 ug/L 19.7 ug/L 98.9 ug/L 0.32 ug/L 1.5 ug/L 0.49 ug/L 0.26 ug/L	All soil samples in SDG TRNC-D-5

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-FJ-03-0**	Boron Molybdenum Thallium Tungsten	10.0 mg/Kg 0.47 mg/Kg 0.19 mg/Kg 0.81 mg/Kg	20.9U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FJ-03-0'-FD**	Boron Molybdenum Niobium Thallium Tungsten	8.1 mg/Kg 0.37 mg/Kg 4.3 mg/Kg 0.21 mg/Kg 0.39 mg/Kg	21.3U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-03-10**	Boron Molybdenum Niobium Thallium Tungsten	5.5 mg/Kg 0.62 mg/Kg 2.5 mg/Kg 0.16 mg/Kg 0.41 mg/Kg	21.6U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-10-0'***	Boron Molybdenum Thallium Tungsten	9.7 mg/Kg 0.97 mg/Kg 0.34 mg/Kg 0.53 mg/Kg	21.4U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-10-10**	Boron Molybdenum Thallium Tungsten	11.9 mg/Kg 0.67 mg/Kg 0.16 mg/Kg 0.29 mg/Kg	20.9U mg/Kg 1.00U mg/Kg 0.42U mg/Kg 1.0U mg/Kg
TSB-FJ-04-0'***	Boron Molybdenum Thallium Tungsten	5.5 mg/Kg 0.46 mg/Kg 0.21 mg/Kg 0.36 mg/Kg	21.0U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg
TSB-FJ-04-10**	Boron Molybdenum Thallium Tungsten	7.8 mg/Kg 0.37 mg/Kg 0.16 mg/Kg 0.22 mg/Kg	21.5U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-02-0'***	Boron Molybdenum Thallium Tungsten	4.6 mg/Kg 0.51 mg/Kg 0.20 mg/Kg 0.28 mg/Kg	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-02-0'-FD**	Molybdenum Tin Tungsten	0.37 mg/Kg 0.35 mg/Kg 0.39 mg/Kg	1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-FJ-02-10'***	Boron Molybdenum Niobium Thallium Tungsten	6.1 mg/Kg 0.51 mg/Kg 1.7 mg/Kg 0.16 mg/Kg 0.29 mg/Kg	21.7U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-FR-02-0'***	Boron Molybdenum Thallium Tungsten	4.0 mg/Kg 0.51 mg/Kg 0.18 mg/Kg 0.37 mg/Kg	20.5U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FR-02-10***	Boron Molybdenum Niobium Thallium Tungsten	7.5 mg/Kg 0.50 mg/Kg 1.9 mg/Kg 0.43 mg/Kg 0.66 mg/Kg	22.0U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-FJ-09-0***	Boron Molybdenum Thallium Tungsten	9.3 mg/Kg 0.76 mg/Kg 0.27 mg/Kg 0.47 mg/Kg	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FJ-09-10***	Boron Molybdenum Thallium Tungsten	8.1 mg/Kg 0.42 mg/Kg 0.22 mg/Kg 0.32 mg/Kg	21.7U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-FR-03-0***	Boron Molybdenum Thallium Tin Tungsten	9.7 mg/Kg 0.37 mg/Kg 0.17 mg/Kg 0.36 mg/Kg 0.29 mg/Kg	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-FR-03-10***	Boron Molybdenum Thallium Tungsten	8.4 mg/Kg 0.40 mg/Kg 0.17 mg/Kg 0.28 mg/Kg	21.8U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U 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-FR-02-0/MS/MSD (All soil samples in SDG TRNC-D-5)	Antimony	46.1 (75-125)	46.9 (75-125)	-	J- (all detects) UJ (all non-detects)	A
	Phosphorus	54.2 (75-125)	66.3 (75-125)	-		
	Tungsten	69.8 (75-125)	68.1 (75-125)	-		
	Zinc	74.2 (75-125)	71.5 (75-125)	-		
	Vanadium	-	51.9 (75-125)	-		
	Zirconium	-	72.2 (75-125)	-		

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-FR-02-0'MS/MSD (All soil samples in SDG TRNC-D-5)	Niobium	186.1 (75-125)	189.9 (75-125)	-	J+ (all detects)	A
	Silicon	349.2 (75-125)	126.6 (75-125)	-	J+ (all detects)	
	Strontium	264.9 (75-125)	140.7 (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	Niobium	119.6 (85-115)	All water samples in SDG TRNC-D-5	J+ (all detects)	P

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits for samples on which a EPA 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 with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
TSB-FR-02-0'L**	Aluminum	10.8 (≤ 10)	All soil samples in SDG TRNC-D-5	J (all detects)	A
	Cobalt	10.9 (≤ 10)		J (all detects)	
	Iron	15.6 (≤ 10)		J (all detects)	
	Magnesium	12.7 (≤ 10)		J (all detects)	
	Manganese	16.6 (≤ 10)		J (all detects)	
	Phosphorus	13.1 (≤ 10)		J (all detects)	
	Strontium	18.0 (≤ 10)		J (all detects)	
	Vanadium	14.3 (≤ 10)		J (all detects)	

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

XIII. Field Duplicates

Samples TSB-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'** and TSB-FJ-02-0'-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-FJ-03-0'**	TSB-FJ-03-0'-FD**				
Aluminum	6420	6130	5 (≤ 50)	-	-	-
Antimony	0.15	0.14	-	0.01 (≤ 1.1)	-	-
Arsenic	2.7	2.4	-	0.3 (≤ 2.1)	-	-
Barium	125	118	6 (≤ 50)	-	-	-
Beryllium	0.47	0.45	-	0.02 (≤ 0.21)	-	-
Boron	10.0	8.1	-	1.9 (≤ 21.3)	-	-
Cadmium	0.073	0.10	-	0.027 (≤ 0.11)	-	-
Calcium	16700	17100	2 (≤ 50)	-	-	-
Chromium	9.2	7.5	-	1.7 (≤ 2.1)	-	-
Cobalt	6.6	5.8	13 (≤ 50)	-	-	-
Copper	11.9	13.0	9 (≤ 50)	-	-	-
Iron	11000	9610	13 (≤ 50)	-	-	-
Lead	7.1	19.4	93 (≤ 50)	-	J (all detects)	A

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0***	TSB-FJ-03-0'-FD**				
Magnesium	8250	7300	12 (≤ 50)	-	-	-
Manganese	261	252	4 (≤ 50)	-	-	-
Molybdenum	0.47	0.37	-	0.1 (≤ 1.1)	-	-
Nickel	15.3	11.3	30 (≤ 50)	-	-	-
Niobium	9.0	4.3	-	4.7 (≤ 5.3)	-	-
Palladium	0.24	0.25	-	0.01 (≤ 0.21)	-	-
Phosphorus	1040	1270	20 (≤ 50)	-	-	-
Potassium	1330	1790	29 (≤ 50)	-	-	-
Silicon	190	240	23 (≤ 50)	-	-	-
Silver	0.065	0.10	-	0.035 (≤ 0.43)	-	-
Sodium	465	948	68 (≤ 50)	-	J (all detects)	A
Strontium	156	154	1 (≤ 50)	-	-	-
Thallium	0.19	0.21	-	0.02 (≤ 0.43)	-	-
Tin	0.56	0.50	-	0.06 (≤ 0.43)	-	-
Titanium	429	435	1 (≤ 50)	-	-	-
Tungsten	0.81	0.39	-	0.42 (≤ 1.1)	-	-
Uranium	1.1	0.84	27 (≤ 50)	-	-	-
Vanadium	34.8	35.7	3 (≤ 50)	-	-	-
Zinc	27.6	30.2	9	-	-	-
Zirconium	17.3	17.0	-	0.3 (≤ 21.3)	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0***	TSB-FJ-03-0'-FD**				
Lithium	11.7	10.6	-	1.1 (≤ 10.6)	-	-
Sulfur	441U	674	-	233 (≤ 1060)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0***	TSB-FJ-03-0'-FD**				
Mercury	15.7	16.7	-	1 (≤ 35.4)	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0***	TSB-FJ-02-0'-FD**				
Aluminum	8540	4650	59 (≤ 50)	-	J (all detects)	A
Antimony	0.29	0.14	-	0.15 (≤ 1.1)	-	-
Arsenic	11.3	3.5	-	7.8 (≤ 2.1)	J (all detects)	A
Barium	138	83.4	49 (≤ 50)	-	-	-
Beryllium	0.63	0.39	-	0.24 (≤ 0.21)	J (all detects)	A
Boron	4.6	2.9U	-	1.7 (≤ 21.3)	-	-
Cadmium	0.10	0.055	-	0.045 (≤ 0.11)	-	-
Calcium	12200	30000	84 (≤ 50)	-	J (all detects)	A
Chromium	10.3	5.2	-	5.1 (≤ 2.1)	J (all detects)	A
Cobalt	5.9	4.7	23 (≤ 50)	-	-	-
Copper	14.5	11.0	27 (≤ 50)	-	-	-
Iron	12400	8620	36 (≤ 50)	-	-	-
Lead	8.9	5.7	44 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0**	TSB-FJ-02-0'-FD**				
Magnesium	6920	5910	16 (≤ 50)	-	-	-
Manganese	330	259	24 (≤ 50)	-	-	-
Molybdenum	0.51	0.37	-	0.14 (≤ 1.1)	-	-
Nickel	12.7	8.1	44 (≤ 50)	-	-	-
Palladium	0.21	0.17	-	0.04 (≤ 0.21)	-	-
Phosphorus	680	751	10 (≤ 50)	-	-	-
Potassium	2900	1240	80 (≤ 50)	-	J (all detects)	A
Silicon	158	129	20 (≤ 50)	-	-	-
Silver	0.081	0.052	-	0.029 (≤ 0.43)	-	-
Sodium	2910	1100	90 (≤ 50)	-	J (all detects)	A
Strontium	140	117	18 (≤ 50)	-	-	-
Thallium	0.20	0.14U	-	0.06 (≤ 0.43)	-	-
Tin	0.51	0.35	-	0.16 (≤ 0.43)	-	-
Titanium	439	343	25 (≤ 50)	-	-	-
Tungsten	0.28	0.39	-	0.11 (≤ 1.1)	-	-
Uranium	0.84	0.58	37 (≤ 50)	-	-	-
Vanadium	36.0	28.6	23 (≤ 50)	-	-	-
Zinc	32.0	27.2	16 (≤ 50)	-	-	-
Zirconium	18.6	12.1	-	6.5 (≤ 21.3)	-	-
Lithium	8.6	5.7	-	2.9 (≤ 10.7)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0**	TSB-FJ-02-0'-FD**				
Mercury	10.1	23.8	-	13.7 (≤35.5)	-	-

**BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-5**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'** TSB-FJ-10-10'*** TSB-FJ-04-0'** TSB-FJ-04-10'*** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-0'** TSB-FR-02-10'*** TSB-FJ-09-0'** TSB-FJ-09-10'*** TSB-FR-03-0'** TSB-FR-03-10'***	Antimony Phosphorus Tungsten Zinc Vanadium Zirconium	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'** TSB-FJ-10-10'*** TSB-FJ-04-0'** TSB-FJ-04-10'*** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-0'** TSB-FR-02-10'*** TSB-FJ-09-0'** TSB-FJ-09-10'*** TSB-FR-03-0'** TSB-FR-03-10'***	Niobium Silicon Strontium	J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	RINSATE-3	Niobium	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'** TSB-FJ-10-10'*** TSB-FJ-04-0'** TSB-FJ-04-10'*** TSB-FJ-02-0'** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-0'** TSB-FR-02-10'*** TSB-FJ-09-0'** TSB-FJ-09-10'*** TSB-FR-03-0'** TSB-FR-03-10'***	Aluminum Cobalt Iron Magnesium Manganese Phosphorus Strontium Vanadium	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	ICP serial dilution (%D)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0'** TSB-FJ-03-0'-FD**	Lead Sodium	J (all detects) J (all detects)	A	Field duplicates (RPD)
TRNC-D-5	TSB-FJ-02-0'** TSB-FJ-02-0'-FD**	Arsenic Beryllium Chromium	J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)
TRNC-D-5	TSB-FJ-02-0'** TSB-FJ-02-0'-FD**	Aluminum Calcium Potassium Sodium	J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	RINSATE-3	Niobium Tungsten	25.0U ug/L 5.0U ug/L	A
TRNC-D-5	TSB-FJ-03-0'**	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	20.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 20.9U mg/Kg 34.9U ug/Kg	A
TRNC-D-5	TSB-FJ-03-0'-FD**	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg 35.4U ug/Kg	A
TRNC-D-5	TSB-FJ-03-10**	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	21.6U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.6U mg/Kg 35.9U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-10-0'***	Boron Cadmium Molybdenum Thallium Tungsten Mercury	21.4U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.6U ug/Kg	A
TRNC-D-5	TSB-FJ-10-10'***	Boron Cadmium Molybdenum Thallium Tungsten Mercury	20.9U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-5	TSB-FJ-04-0'***	Boron Cadmium Molybdenum Thallium Tungsten Mercury	21.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.0U ug/Kg	A
TRNC-D-5	TSB-FJ-04-10'***	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	21.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.5U mg/Kg 35.8U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'***	Boron Cadmium Molybdenum Thallium Tungsten Zirconium Mercury	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 21.3U mg/Kg 35.5U ug/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Cadmium Molybdenum Tin Tungsten Zirconium Mercury	0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 20.7U mg/Kg 34.4U ug/Kg	A
TRNC-D-5	TSB-FJ-02-10'***	Boron Cadmium Molybdenum Niobium Thallium Tungsten Zirconium Mercury	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 21.7U mg/Kg 36.2U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FR-02-0'***	Boron Cadmium Molybdenum Thallium Tungsten Zirconium	20.5U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 20.5U mg/Kg	A
TRNC-D-5	TSB-FR-02-10'***	Boron Cadmium Molybdenum Niobium Thallium Tungsten Mercury	22.0U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.7U ug/Kg	A
TRNC-D-5	TSB-FJ-09-0'***	Boron Molybdenum Thallium Tungsten Mercury	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg	A
TRNC-D-5	TSB-FJ-09-10'***	Boron Cadmium Molybdenum Thallium Tungsten Mercury	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.1U ug/Kg	A
TRNC-D-5	TSB-FR-03-0'***	Boron Cadmium Molybdenum Thallium Tin Tungsten Zirconium Mercury	20.2U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg 20.2U mg/Kg 33.6U ug/Kg	A
TRNC-D-5	TSB-FR-03-10'***	Boron Cadmium Molybdenum Thallium Tungsten	21.8U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A

**BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-5**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-03-0'***	Boron Molybdenum Thallium Tungsten	20.9U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-03-0'-FD**	Boron Molybdenum Niobium Thallium Tungsten	21.3U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-03-10'**	Boron Molybdenum Niobium Thallium Tungsten	21.6U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-10-0'**	Boron Molybdenum Thallium Tungsten	21.4U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-10-10'**	Boron Molybdenum Thallium Tungsten	20.9U mg/Kg 1.00U mg/Kg 0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-5	TSB-FJ-04-0'**	Boron Molybdenum Thallium Tungsten	21.0U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-04-10'**	Boron Molybdenum Thallium Tungsten	21.5U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-02-0'**	Boron Molybdenum Thallium Tungsten	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Molybdenum Tin Tungsten	1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-5	TSB-FJ-02-10'**	Boron Molybdenum Niobium Thallium Tungsten	21.7U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FR-02-0'**	Boron Molybdenum Thallium Tungsten	20.5U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FR-02-10'***	Boron Molybdenum Niobium Thallium Tungsten	22.0U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-09-0'***	Boron Molybdenum Thallium Tungsten	21.3U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-09-10'***	Boron Molybdenum Thallium Tungsten	21.7U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-5	TSB-FR-03-0'***	Boron Molybdenum Thallium Tin Tungsten	20.2U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-5	TSB-FR-03-10'***	Boron Molybdenum Thallium Tungsten	21.8U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A

LDC #: 18100E4
 SDG #: TRNC-D-5
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

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 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/15/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	gms/msd
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	SW	LCS
VIII.	Internal Standard (ICP-MS)	SW	n.f. reviewed for level 3
IX.	Furnace Atomic Absorption QC	N	not utilized
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	A	Not reviewed for Level III validation.
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	(1,2) (8,9)
XIV.	Field Blanks	SW	R = 17

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

Validated Samples: ** Indicates sample underwent Level IV validation

All Soil except # 17 for

1	TSB-FJ-03-0**	11	TSB-FR-02-0**	21		31	
2	TSB-FJ-03-0-FD**	12	TSB-FR-02-10**	22		32	
3	TSB-FJ-03-10**	13	TSB-FJ-09-0**	23		33	
4	TSB-FJ-10-0**	14	TSB-FJ-09-10**	24		34	
5	TSB-FJ-10-10**	15	TSB-FR-03-0**	25		35	
6	TSB-FJ-04-0**	16	TSB-FR-03-10**	26		36	
7	TSB-FJ-04-10**	17	RINSATE-3	27		37	
8	TSB-FJ-02-0**	18	TSB-FR-02-0'MS	28		38	
9	TSB-FJ-02-0-FD**	19	TSB-FR-02-0'MSD	29		39	
10	TSB-FJ-02-10**	20	RS	30		40	

Notes: _____

LDC #: 181024
 SDG #: TRAC-5

VALIDATION FINDINGS CHECKLIST

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 Reviewer: MH
 2nd Reviewer: [Signature]

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 analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?		✓		
VI. Furnace Atomic Absorption QC				
If MSA was performed, was the correlation coefficients > 0.995?			✓	
Do all applicable analyses have duplicate injections? (Level IV only)			✓	
For sample concentrations > RL, are applicable duplicate injection RSD values < 20%? (Level IV only)			✓	
Were analytical spike recoveries within the 85-115% QC limits?				

LDC #: 181024
 SDG #: TRNC-05

VALIDATION FINDINGS CHECKLIST

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 Reviewer: MM
 2nd Reviewer: J

Validation Area	Yes	No	NA	Findings/Comments
VII. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the IDL?	✓			760X used for 2000
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 8020)				
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.				

DC #: 1810024
 SDG #: TRNC-D-5

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

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All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-19	Soil/A	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
M18, 19	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
1-19	Soil/A	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
M18, 19	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
		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
GEAA	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

VALIDATION FINDINGS WORKSHEET

PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: ICP:100X, ICP/MS:200X, Hg:166.7X

Associated Samples: All

Analyte	Maximum PB* (mg/Kg)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification														
				1	2	3	4	5	6	7	8	9	10					
Ba	0.13																	
B	1.5	12.8		10.0 / 20.9	8.1 / 21.3	5.5 / 21.6	9.7 / 21.4	11.9 / 20.9	5.5 / 21.0	7.8 / 21.5	4.6 / 21.3							6.1 / 21.7
Cd		0.045		0.073 / 0.11	0.10 / 0.11	0.075 / 0.11	0.092 / 0.11	0.071 / 0.10	0.080 / 0.11	0.038 / 0.11	0.10 / 0.11							0.072 / 0.11
Fe	3.0																	
Mo	0.058			0.47 / 1.1	0.37 / 1.1	0.62 / 1.1	0.97 / 1.1	0.67 / 1.0	0.46 / 1.1	0.37 / 1.1	0.51 / 1.1							0.51 / 1.1
Ni		0.5																
Nb		9.2			4.3 / 5.3	2.5 / 5.4												1.7 / 5.4
P	1.3																	
Na	4.3																	
Tl		0.7		0.19 / 0.42	0.21 / 0.43	0.16 / 0.43	0.34 / 0.43	0.16 / 0.42	0.21 / 0.42	0.16 / 0.43	0.20 / 0.43							0.16 / 0.44
Sn	0.032	0.2																0.35 / 0.41
Ti		1.3																
W		1.9		0.81 / 1.1	0.39 / 1.1	0.41 / 1.1	0.53 / 1.1	0.29 / 1.0	0.36 / 1.1	0.22 / 1.1	0.28 / 1.1							0.29 / 1.1
V	0.27																	
Zn	1.0																	
Zr	0.31			17.3 / 20.9	17.0 / 21.3	19.1 / 21.6				18.8 / 21.5	18.6 / 21.3							21.5 / 21.7
Hg (ug/Kg)		0.1		15.7 / 34.9	16.7 / 35.4	14.2 / 35.9	17.3 / 35.6	11.5 / 34.8	13.8 / 35.0	9.8 / 35.8	10.1 / 35.5							10.0 / 36.2

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.

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	Sample Identification																
				11	12	13	14	15	16											
Ba	0.13																			
B	1.5	12.8		4.0 / 20.5	7.5 / 22.0	9.3 / 21.3	8.1 / 21.7	9.7 / 20.2	8.4 / 21.8											
Cd		0.045		0.081 / 0.10	0.099 / 0.11		0.073 / 0.11	0.066 / 0.10	0.068 / 0.11											
Fe	3.0																			
Mo	0.058			0.51 / 1.0	0.50 / 1.1	0.76 / 1.1	0.42 / 1.1	0.37 / 1.0	0.40 / 1.1											
Ni		0.5																		
Nb		9.2			1.9 / 5.5															
P	1.3																			
Na	4.3																			
Tl		0.7		0.18 / 0.41	0.43 / 0.44	0.27 / 0.43	0.22 / 0.43	0.17 / 0.40	0.17 / 0.44											
Sn	0.032	0.2							0.36 / 0.40											
Ti																				
W		1.3		0.37 / 1.0	0.66 / 1.1	0.47 / 1.1	0.32 / 1.1	0.29 / 1.0	0.28 / 1.1											
V	0.27	1.9																		
Zn	1.0																			
Zr	0.31			20.3 / 20.5					16.0 / 20.2											
Hg (ug/Kg)		0.1			12.5 / 36.7	8.3 / 35.5	9.6 / 36.1	23.0 / 33.6												

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.

VALIDATION FINDINGS WORKSHEET
Field Blanks

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)
 (Y) N N/A Were field blanks identified in this SDG?
 (X) N N/A Were target analytes detected in the field blanks?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11/15/07 **Soil factor applied:** 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R **Associated Samples:** All Soil

Analyte	Blank ID	Sample Identification																			
		1	2	3	4	5	6	7	8	9	10										
17	17																				
B	25.0	10.0 / 20.9	8.1 / 21.3	5.5 / 21.6	9.7 / 21.4	11.9 / 20.9	5.5 / 21.0	7.8 / 21.5	4.6 / 21.3												6.1 / 21.7
Ca	51.9																				
Fe	12.8																				
Mg	4.7																				
Mo	0.43	0.47 / 1.1	0.37 / 1.1	0.62 / 1.1	0.97 / 1.1	0.67 / 1.0	0.46 / 1.1	0.37 / 1.1	0.51 / 1.1	0.37 / 1.0	0.51 / 1.1	0.37 / 1.0	0.51 / 1.1	0.37 / 1.0	0.51 / 1.1	0.37 / 1.0	0.51 / 1.1	0.37 / 1.0	0.51 / 1.1	0.37 / 1.0	0.51 / 1.1
Nb	19.7		4.3 / 5.3	2.5 / 5.4																	1.7 / 5.4
Na	98.9																				
Sr	0.32																				
Tl	1.5	0.19 / 0.42	0.21 / 0.43	0.16 / 0.43	0.34 / 0.43	0.16 / 0.42	0.21 / 0.42	0.16 / 0.43	0.20 / 0.43												0.16 / 0.44
Sn	0.49																				0.35 / 0.41
W	0.26	0.81 / 1.1	0.39 / 1.1	0.41 / 1.1	0.53 / 1.1	0.29 / 1.0	0.36 / 1.1	0.22 / 1.1	0.28 / 1.1	0.39 / 1.0	0.36 / 1.1	0.22 / 1.1	0.28 / 1.1	0.39 / 1.0	0.29 / 1.1	0.39 / 1.0	0.29 / 1.1	0.39 / 1.0	0.29 / 1.1	0.39 / 1.0	0.29 / 1.1

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 #: 18100E4
 SDG #: TRNC-D-5

VALIDATION FINDINGS WORKSHEET

Field Blanks

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 2nd Reviewer: [Signature]

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)
 N **N/A** Were field blanks identified in this SDG?
 N **N/A** Were target analytes detected in the field blanks?
Blank units: ug/L **Associated sample units:** mg/Kg
Sampling date: 11/15/07 Soil factor applied 200X
Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Action Level	Sample Identification														
			11	12	13	14	15	16									
B	25.0		4.0 / 20.5	7.5 / 22.0	9.3 / 21.3	8.1 / 21.7	9.7 / 20.2	8.4 / 21.8									
Ca	51.9																
Fe	12.8																
Mg	4.7																
Mo	0.43		0.51 / 1.0	0.50 / 1.1	0.76 / 1.1	0.42 / 1.1	0.37 / 1.0	0.40 / 1.1									
Nb	19.7			1.9 / 5.5													
Na	98.9	197.8															
Sr	0.32																
Tl	1.5		0.18 / 0.41	0.43 / 0.44	0.27 / 0.43	0.22 / 0.43	0.17 / 0.40	0.17 / 0.44									
Sn	0.49							0.36 / 0.40									
W	0.26		0.37 / 1.0	0.66 / 1.1	0.47 / 1.1	0.32 / 1.1	0.29 / 1.0	0.28 / 1.1									

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 #: 181024
 SDG #: TRNLC-15

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 Reviewer: MH
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VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

- N N/A Was a matrix spike analyzed for each matrix in this SDG?
- Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.
- Y N N/A Were all duplicate sample relative percent differences (RPD) \leq 20% for water samples and \leq 35% for soil samples?
- Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
1	RINSATE-2	AA	Li S			25.9 (±20) 24.6 ↓	AA, AA	No Qual (MS/MSD) ↓
2	18119	Soil	Sb Nb P Si SY W Zn V Zr	Ab.1 186.1 54.2 349.2 264.9 69.8 74.2	46.9 189.9 66.3 126.6 140.7 68.1 71.5 51.9 72.3		AA, Soil J-103/A JH-103/A J-103/A JH-103/A J-103/A	
			Mn Si Zn			31.5 (±20) 56.9 ↓ 23.9 ↓		No Qual (MS/MSD) ↓

Comments:

LDC#: 18100E4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Y N NA
Y N NA

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

Compound	Concentration (mg/kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Aluminum	6420	6130	5			
Antimony	0.15	0.14		0.01	(≤1.1)	
Arsenic	2.7	2.4		0.3	(≤2.1)	
Barium	125	118	6			
Beryllium	0.47	0.45		0.02	(≤0.21)	
Boron	10.0	8.1		1.9	(≤21.3)	
Cadmium	0.073	0.10		0.027	(≤0.11)	
Calcium	16700	17100	2			
Chromium	9.2	7.5		1.7	(≤2.1)	
Cobalt	6.6	5.8	13			
Copper	11.9	13.0	9			
Iron	11000	9610	13			
Lead	7.1	19.4	93			J det / A
Magnesium	8250	7300	12			
Manganese	261	252	4			
Molybdenum	0.47	0.37		0.1	(≤1.1)	
Nickel	15.3	11.3	30			
Niobium	9.0	4.3		4.7	(≤5.3)	
Palladium	0.24	0.25		0.01	(≤0.21)	

LDC#: 18100E4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Phosphorus	1040	1270	20			
Potassium	1330	1790	29			
Silicon	190	240	23			
Silver	0.065	0.10		0.035	(≤0.43)	
Sodium	465	948	68			J det / A
Strontium	156	154	1			
Thallium	0.19	0.21		0.02	(≤0.43)	
Tin	0.56	0.50		0.06	(≤0.43)	
Titanium	429	435	1			
Tungsten	0.81	0.39		0.42	(≤1.1)	
Uranium	1.1	0.84	27			
Vanadium	34.8	35.7	3			
Zinc	27.6	30.2	9			
Zirconium	17.3	17.0		0.3	(≤21.3)	
Lithium	11.7	10.6		1.1	(≤10.6)	
Sulfur	441U	674		233	(≤1060)	
Mercury (ug/Kg)	15.7	16.7		1	(≤35.4)	

LDC#: 18100E4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	8	9	RPD	Difference	Limits	
Aluminum	8540	4650	59			J det / A
Antimony	0.29	0.14		0.15	(≤1.1)	
Arsenic	11.3	3.5		7.8	(≤2.1)	J det / A
Barium	138	83.4	49			
Beryllium	0.63	0.39		0.24	(≤0.21)	J det / A
Boron	4.6	2.9U		1.7	(≤21.3)	
Cadmium	0.10	0.055		0.045	(≤0.11)	
Calcium	12200	30000	84			J det / A
Chromium	10.3	5.2		5.1	(≤2.1)	J det / A
Cobalt	5.9	4.7	23			
Copper	14.5	11.0	27			
Iron	12400	8620	36			
Lead	8.9	5.7	44			
Magnesium	6920	5910	16			
Manganese	330	259	24			
Molybdenum	0.51	0.37		0.14	(≤1.1)	
Nickel	12.7	8.1	44			
Palladium	0.21	0.17		0.04	(≤0.21)	
Phosphorus	680	751	10			

LDC#: 18100E4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 4 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(<50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	8	9				
Potassium	2900	1240	80			J det / A
Silicon	158	129	20			
Silver	0.081	0.052		0.029	(≤0.43)	
Sodium	2910	1100	90			J det / A
Strontium	140	117	18			
Thallium	0.20	0.14U		0.06	(≤0.43)	
Tin	0.51	0.35		0.16	(≤0.43)	
Titanium	439	343	25			
Tungsten	0.28	0.39		0.11	(≤1.1)	
Uranium	0.84	0.58	37			
Vanadium	36.0	28.6	23			
Zinc	32.0	27.2	16			
Zirconium	18.6	12.1		6.5	(≤21.3)	
Lithium	8.6	5.7		2.9	(≤10.7)	
Mercury (ug/Kg)	10.1	23.8		13.7	(≤35.5)	

LDC #: 1810284
 SDG #: 101629-5

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

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

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

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

$\%R = \frac{\text{Found} \times 100}{\text{True}}$ Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
 True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated		Reported		Acceptable (Y/N)
					%R	%R	%R	%R	
TW	ICP (Initial calibration)	Li	4065.8	4000	101.6		101.6		Y
	GFAA (Initial calibration)								
TW	CVAA (Initial calibration)	Hg	2.44	2.5	97.6		97.6		Y
CW	ICP (Continuing calibration)	S	41610	40000	104.0		104.0		N
	GFAA (Continuing calibration)								
CW	CVAA (Continuing calibration)	Hg	4.90	5.0	98.0		98.0		Y
TW	ICP/MS (Initial calibration)	K	2017.4	2000	100.9		100.9		N
CW	ICP/MS (Continuing calibration)	Zn	20368	200	101.8		101.8		N

203-63

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 #: 18/0D24
 SDG #: FR-16-15

Page: 1 of 1
 Reviewer: MJ
 2nd Reviewer: R

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

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

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

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$

Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation,
 Found = SSR (spiked sample result) - SR (sample result).
 True = Concentration of each analyte in the source.

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

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

Where, S = Original sample concentration
 D = Duplicate sample concentration

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

$$\%D = \frac{|I-SDR|}{I} \times 100$$

Where, I = Initial Sample Result (mg/L)
 SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated		Reported		Acceptable (Y/N)
					%R / RPD / %D	%R / RPD / %D			
ICP AS	ICP interference check	Ni	95.465	100	95.5	95.5	95.5	95.5	Y
LC	Laboratory control sample	Se	66.0	64.2	102.9	102.9	102.9	102.9	
18	Matrix spike	Li (SSR-SR)	110.3	102.48	102.6	102.6	102.6	102.6	
18/9	Duplicate	cd	2.636	2.762	4.7	4.7	4.7	4.7	
118	ICP serial dilution	Pb	461	452.6	1.6	1.6	1.6	1.6	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 #: 1810064
 SDG #: TRWC-n-5

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 3
 Reviewer: MM
 2nd reviewer: g

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

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

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

Detected analyte results for 1, 11 were recalculated and verified using the following equation:

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

Recalculation:

R1

$$Be = \frac{1.1254 \times \frac{1}{2} \times 0.1 \times 2}{0.58 \times 0.9565} = 20.4706 \text{ } \mu\text{g}/\text{m}^3$$

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

Sample ID	Analyte	Reported Concentration ($\mu\text{g}/\text{m}^3$)	Calculated Concentration ($\mu\text{g}/\text{m}^3$)	Acceptable (Y/N)
	Li	11.7	11.6	✓
	Al	6420	6420	
	Sb	0.15	0.15	
	As	2.7	2.7	
	Ba	125	124	
	Be	0.47	0.47	
	B	100	100	
	Cd	0.073	0.073	
	Ca	16700	16700	
	Cr	9.2	9.2	
	Co	6.6	6.6	
	Cu	11.9	11.9	
	Fe	11000	11000	
	Pb	7.1	7.1	
	Mg	8250	8250	
	Mn	261	261	
	Mo	0.47	0.47	
	Ni	15.3	15.3	
	Nb	9.0	9.0	
	Pd	0.24	0.24	
	P	1040	1040	
	K	1330	1330	✓

LDC #: 1810024
 SDG #: TRN-1-1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 2 of 3
 Reviewer: MH
 2nd reviewer: [Signature]

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
~~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 1,1 were recalculated and verified using the following equation:

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

Recalculation:

1, Hg = $\frac{0.090 \mu g/L \times 100 mL}{0.6 g \times 0.9565} = 15.68 \mu g/kg$

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

Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
1	Si	190	190	Y
	Ag	0.065	0.065	Y
	Mn	465	46.4	
	Sr	156	156	
	TR	0.19	0.19	
	SN	0.56	0.56	
	Ti	429	429	
	W	0.81	0.81	
	U	1.1	1.1	
	V	34.8	34.8	
	Zn	27.6	27.6	
	Zr	17.3	17.3	
	Hg (ug/kg)	15.7	15.7	Y
	11	Li	10.0	10.0
Al		6900	6900	Y
Sb		0.22	0.22	
As		3.6	3.6	
Ba		186	186	
Be		0.55	0.55	
B		4.0	4.0	Y
Cd		0.081	0.081	Y

LDC #: 1810024
 SDG #: TRAC-D-5

VALIDATION FINDINGS WORKSHEET
 Sample Calculation Verification

Page: 4 of 3
 Reviewer: MH
 2nd reviewer: f

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 1,1 were recalculated and verified using the following equation:

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

Recalculation:

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

all

$$Mn = \frac{876,8939 \text{ ug/L} \times 0.1 \text{ L} \times 2}{0.58 \times 0.9958} = 343.06 \text{ ug/g}$$

Sample ID	Analyte	Reported Concentration (ug/g)	Calculated Concentration (ug/g)	Acceptable (Y/N)
11	Ca	21200	21200	Y
	Cr	10.0	10.0	
	Co	6.5	6.5	
	Cu	13.2	13.2	
	Fe	12700	12700	
	Pb	10.6	10.6	
	Mg	7620	7620	
	Mn	343	343	
	Mo	0.51	0.50	
	Ni	13.0	13.0	
	Pd	0.26	0.26	
	P	905	905	
	K	1880	1880	
	Si	157	157	
	Hg	0.074	0.074	
	Na	812	812	
	Sr	164	164	
	Tl	0.18	0.18	
	Sn	0.56	0.56	
	Ti	499	499	
	W	0.37	0.37	
	Y	0.88	0.88	

RECALC.4S2

V 43.9 43.9
 Zn 20.6 20.6
 Zr 20.3 20.3
 Hg (ug/g) 35.5 35.5



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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 16, 2007
LDC Report Date: January 22, 2008
Matrix: Soil/Water
Parameters: Metals
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-10'
TSB-FJ-01-0'
TSB-FJ-01-10'
TSB-GR-01-0'
TSB-GR-01-5'
TSB-GJ-06-0'
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD
RINSATE-4MS
RINSATE-4MSD

Introduction

This data review covers 17 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 a 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
11/27/07	CCV (2314)	Boron	112.1 (90-110)	TSB-FJ-08-0' TSB-FJ-08-10' RINSATE-4 RINSATE-4MS RINSATE-4MSD PBW PBS	J+ (all detects)	P
11/27/07	CCV (2314)	Niobium	119.7 (90-110)	All water samples in SDG TRNC-D-6	J+ (all detects)	P
11/28/07	CCV (0032)	Vanadium	111.9 (90-110)	RINSATE-4 RINSATE-4MS RINSATE-4MSD	J+ (all detects)	P
11/27/07	CCV (2156)	Boron Vanadium	111.5 (90-110) 113.1 (90-110)	PBW	J+ (all detects) J+ (all detects)	P
11/29/07	CCV (1900)	Niobium	118.2 (90-110)	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-0'MS 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)	Copper Manganese Nickel Tin	0.50 ug/L 0.62 ug/L 0.87 ug/L 0.35 ug/L	All water samples in SDG TRNC-D-6
ICB/CCB	Cadmium Copper Molybdenum Nickel Niobium Thallium Tungsten	0.045 ug/L 0.4 ug/L 0.2 ug/L 0.5 ug/L 14.9 ug/L 0.7 ug/L 1.3 ug/L	All water samples in SDG TRNC-D-6
PB (prep blank)	Aluminum Barium Boron Calcium Phosphorus Sodium Thallium Tin Titanium Tungsten Vanadium Zinc	2.0 mg/Kg 0.076 mg/Kg 3.6 mg/Kg 22.1 mg/Kg 1.2 mg/Kg 3.8 mg/Kg 0.17 mg/Kg 0.069 mg/Kg 0.029 mg/Kg 0.24 mg/Kg 0.19 mg/Kg 2.0 mg/Kg	All soil samples in SDG TRNC-D-6
ICB/CCB	Boron Cadmium Nickel Niobium Thallium Tin Tungsten Vanadium Lithium Mercury	12.8 ug/L 0.045 ug/L 0.5 ug/L 9.2 ug/L 0.7 ug/L 0.2 ug/L 1.3 ug/L 1.9 ug/L 15.0 ug/L 0.1 ug/L	All soil samples in SDG TRNC-D-6

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-4	Cadmium Copper Nickel Niobium Tin Tungsten	0.032 ug/L 0.63 ug/L 0.51 ug/L 8.8 ug/L 0.31 ug/L 0.66 ug/L	0.50U ug/L 1.0U ug/L 5.0U ug/L 25.0U ug/L 2.0U ug/L 5.0U ug/L
TSB-FJ-08-0'	Boron Niobium Thallium Mercury	8.6 mg/Kg 3.1 mg/Kg 0.28 mg/Kg 21.4 ug/Kg	21.2U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 35.4U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FJ-08-10'	Boron Cadmium Niobium Thallium Tungsten Mercury	8.4 mg/Kg 0.086 mg/Kg 1.8 mg/Kg 0.26 mg/Kg 0.69 mg/Kg 13.5 ug/Kg	22.2U mg/Kg 0.11U mg/Kg 5.6U mg/Kg 0.45U mg/Kg 1.1U mg/Kg 37.1U ug/Kg
TSB-FR-05-0'	Boron Cadmium Thallium Tungsten Mercury	5.2 mg/Kg 0.095 mg/Kg 0.25 mg/Kg 0.55 mg/Kg 28.6 ug/Kg	21.1U mg/Kg 0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.1U ug/Kg
TSB-FR-05-10'	Boron Cadmium Thallium Tungsten Mercury	9.0 mg/Kg 0.083 mg/Kg 0.21 mg/Kg 0.47 mg/Kg 10.7 ug/Kg	21.9U mg/Kg 0.11U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.4U ug/Kg
TSB-FR-04-0'	Boron Thallium Tin Tungsten Lithium Mercury	3.7 mg/Kg 0.18 mg/Kg 0.40 mg/Kg 0.33 mg/Kg 7.8 mg/Kg 16.6 ug/Kg	20.8U mg/Kg 0.42U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 10.4U mg/Kg 34.6U ug/Kg
TSB-FR-04-0'-FD	Boron Cadmium Thallium Tungsten Mercury	4.5 mg/Kg 0.075 mg/Kg 0.19 mg/Kg 0.36 mg/Kg 10.3 ug/Kg	21.6U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.0U ug/Kg
TSB-FR-04-10'	Boron Cadmium Thallium Tungsten Mercury	11.4 mg/Kg 0.083 mg/Kg 0.19 mg/Kg 0.40 mg/Kg 9.6 ug/Kg	21.7U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.2U ug/Kg
TSB-FJ-01-0'	Boron Cadmium Thallium Tungsten Mercury	6.0 mg/Kg 0.098 mg/Kg 0.16 mg/Kg 0.31 mg/Kg 11.7 ug/Kg	20.6U mg/Kg 0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.3U ug/Kg
TSB-FJ-01-10'	Boron Cadmium Niobium Thallium Tungsten Mercury	9.4 mg/Kg 0.088 mg/Kg 1.8 mg/Kg 0.40 mg/Kg 0.68 mg/Kg 11.4 ug/Kg	21.4U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.6U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GR-01-0'	Boron Thallium Tungsten Mercury	8.5 mg/Kg 0.23 mg/Kg 0.51 mg/Kg 9.9 ug/Kg	20.9U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg
TSB-GR-01-5'	Boron Thallium Tungsten Mercury	6.8 mg/Kg 0.20 mg/Kg 0.43 mg/Kg 14.6 ug/Kg	21.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.2U ug/Kg
TSB-GJ-06-0'	Boron Thallium Tungsten Mercury	7.9 mg/Kg 0.24 mg/Kg 0.53 mg/Kg 22.0 ug/Kg	21.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.7U ug/Kg
TSB-GJ-06-5'	Boron Cadmium Thallium Tungsten Mercury	8.1 mg/Kg 0.10 mg/Kg 0.17 mg/Kg 0.34 mg/Kg 8.6 ug/Kg	21.4U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.7U ug/Kg
TSB-GJ-01-0'	Boron Cadmium Thallium Tungsten Mercury	8.1 mg/Kg 0.10 mg/Kg 0.18 mg/Kg 0.36 mg/Kg 24.2 ug/Kg	21.1U mg/Kg 0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.1U ug/Kg
TSB-GJ-01-5'	Boron Cadmium Thallium Tungsten Mercury	7.5 mg/Kg 0.088 mg/Kg 0.17 mg/Kg 0.36 mg/Kg 13.1 ug/Kg	21.5U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.8U ug/Kg

Sample "RINSATE-4" 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-4	11/16/07	Cadmium Calcium Copper Iron Magnesium Nickel Niobium Silicon Sodium Strontium Tin Tungsten	0.032 ug/L 73.4 ug/L 0.63 ug/L 17.9 ug/L 5.7 ug/L 0.51 ug/L 8.8 ug/L 85.3 ug/L 75.9 ug/L 0.42 ug/L 0.31 ug/L 0.66 ug/L	All soil samples in SDG TRNC-D-6

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-FJ-08-0'	Niobium	3.1 mg/Kg	5.3U mg/Kg
TSB-FJ-08-10'	Cadmium Niobium Tungsten	0.086 mg/Kg 1.8 mg/Kg 0.69 mg/Kg	0.11U mg/Kg 5.6U mg/Kg 1.1U mg/Kg
TSB-FR-05-0'	Cadmium Tungsten	0.095 mg/Kg 0.55 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FR-05-10'	Cadmium Tungsten	0.083 mg/Kg 0.47 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FR-04-0'	Tin Tungsten	0.40 mg/Kg 0.33 mg/Kg	0.42U mg/Kg 1.0U mg/Kg
TSB-FR-04-0'-FD	Cadmium Tungsten	0.075 mg/Kg 0.36 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FR-04-10'	Cadmium Tungsten	0.083 mg/Kg 0.40 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-FJ-01-0'	Cadmium Tungsten	0.098 mg/Kg 0.31 mg/Kg	0.10U mg/Kg 1.0U mg/Kg
TSB-FJ-01-10'	Cadmium Niobium Tungsten	0.088 mg/Kg 1.8 mg/Kg 0.68 mg/Kg	0.11U mg/Kg 5.3U mg/Kg 1.1U mg/Kg
TSB-GR-01-0'	Tungsten	0.51 mg/Kg	1.0U mg/Kg
TSB-GR-01-5'	Tungsten	0.43 mg/Kg	1.1U mg/Kg
TSB-GJ-06-0'	Tungsten	0.53 mg/Kg	1.1U mg/Kg
TSB-GJ-06-5'	Cadmium Tungsten	0.10 mg/Kg 0.34 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-GJ-01-0'	Cadmium Tungsten	0.10 mg/Kg 0.36 mg/Kg	0.11U mg/Kg 1.1U mg/Kg
TSB-GJ-01-5'	Cadmium Tungsten	0.088 mg/Kg 0.36 mg/Kg	0.11U mg/Kg 1.1U 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-FJ-01-0'MS/MSD (All soil samples in SDG TRNC-D-6)	Antimony	53.1 (75-125)	55.1 (75-125)	-	J- (all detects) UJ (all non-detects)	A
	Copper	62.6 (75-125)	-	-		
	Magnesium	66.2 (75-125)	-	-		
	Tungsten	74.0 (75-125)	74.0 (75-125)	-		
	Zinc	64.7 (75-125)	-	-		
	Zirconium	-	68.9 (75-125)	-		
TSB-FJ-01-0'MS/MSD (All soil samples in SDG TRNC-D-6)	Niobium	170.9 (75-125)	197.3 (75-125)	-	J+ (all detects)	A
	Silicon	200.1 (75-125)	169.5 (75-125)	-	J+ (all detects)	
	Barium	-	146.5 (75-125)	-	J+ (all detects)	
TSB-FJ-01-0'MS/MSD (All soil samples in SDG TRNC-D-6)	Phosphorus	59.3 (75-125)	129.0 (75-125)	-	J (all detects) UJ (all non-detects)	A

VI. Duplicate Sample Analysis

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

VII. Laboratory Control Samples (LCS)

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

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in 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-FJ-01-0'L	Aluminum	12.0 (≤ 10)	All soil samples in SDG TRNC-D-6	J (all detects)	A
	Calcium	18.7 (≤ 10)		J (all detects)	
	Cobalt	11.7 (≤ 10)		J (all detects)	
	Iron	16.7 (≤ 10)		J (all detects)	
	Magnesium	12.8 (≤ 10)		J (all detects)	
	Manganese	18.6 (≤ 10)		J (all detects)	
	Phosphorus	14.3 (≤ 10)		J (all detects)	
	Potassium	10.2 (≤ 10)		J (all detects)	
	Strontium	20.4 (≤ 10)		J (all detects)	
	Titanium	10.9 (≤ 10)		J (all detects)	
	Vanadium	13.7 (≤ 10)		J (all detects)	

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Aluminum	5460 mg/Kg	7740 mg/Kg	35 (≤ 50)	-	-	-
Antimony	0.14 mg/Kg	0.20 mg/Kg	-	0.06 mg/Kg (≤ 1.1)	-	-
Arsenic	2.8 mg/Kg	4.2 mg/Kg	-	1.4 mg/Kg (≤ 2.2)	-	-
Barium	67.0 mg/Kg	122 mg/Kg	58 (≤ 50)	-	J (all detects)	A
Beryllium	0.45 mg/Kg	0.55 mg/Kg	-	0.01 mg/Kg (≤ 0.22)	-	-
Boron	3.7 mg/Kg	4.5 mg/Kg	-	0.8 mg/Kg (≤ 21.6)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Cadmium	0.11 mg/Kg	0.075 mg/Kg	-	0.035 mg/Kg (≤ 0.11)	-	-
Calcium	62400 mg/Kg	23200 mg/Kg	92 (≤ 50)	-	J (all detects)	A
Chromium	7.4 mg/Kg	12.4 mg/Kg	-	5 mg/Kg (≤ 2.2)	J (all detects)	A
Cobalt	5.3 mg/Kg	7.5 mg/Kg	34 (≤ 50)	-	-	-
Copper	10.4 mg/Kg	15.3 mg/Kg	38 (≤ 50)	-	-	-
Iron	9400 mg/Kg	14900 mg/Kg	45 (≤ 50)	-	-	-
Lead	5.1 mg/Kg	7.9 mg/Kg	43 (≤ 50)	-	-	-
Magnesium	7150 mg/Kg	8550 mg/Kg	18 (≤ 50)	-	-	-
Manganese	154 mg/Kg	262 mg/Kg	52 (≤ 50)	-	J (all detects)	A
Molybdenum	0.29 mg/Kg	0.50 mg/Kg	-	0.21 mg/Kg (≤ 1.1)	-	-
Nickel	13.0 mg/Kg	15.7 mg/Kg	19 (≤ 50)	-	-	-
Palladium	0.26 mg/Kg	0.31 mg/Kg	-	0.05 mg/Kg (≤ 0.22)	-	-
Phosphorus	922 mg/Kg	1090 mg/Kg	17 (≤ 50)	-	-	-
Potassium	1340 mg/Kg	1710 mg/Kg	24 (≤ 50)	-	-	-
Silicon	177 mg/Kg	121 mg/Kg	38 (≤ 50)	-	-	-
Silver	0.064 mg/Kg	0.085 mg/Kg	-	0.021 mg/Kg (≤ 0.43)	-	-
Sodium	261 mg/Kg	471 mg/Kg	57 (≤ 50)	-	J (all detects)	A
Strontium	170 mg/Kg	216 mg/Kg	24 (≤ 50)	-	-	-
Thallium	0.18 mg/Kg	0.19 mg/Kg	-	0.01 mg/Kg (≤ 0.43)	-	-
Tin	0.40 mg/Kg	0.55 mg/Kg	-	0.15 mg/Kg (≤ 0.43)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Titanium	356 mg/Kg	590 mg/Kg	49 (≤ 50)	-	-	-
Tungsten	0.33 mg/Kg	0.36 mg/Kg	-	0.03 mg/Kg (≤ 1.1)	-	-
Uranium	0.86 mg/Kg	1.2 mg/Kg	33 (≤ 50)	-	-	-
Vanadium	27.4 mg/Kg	51.7 mg/Kg	61 (≤ 50)	-	J (all detects)	A
Zinc	25.9 mg/Kg	31.7 mg/Kg	20 (≤ 50)	-	-	-
Zirconium	14.4 mg/Kg	21.7 mg/Kg	-	7.3 mg/Kg (≤ 21.6)	-	-
Lithium	7.8 mg/Kg	15.4 mg/Kg	-	7.6 mg/Kg (≤ 10.8)	-	-
Mercury	16.6 ug/Kg	10.3 ug/Kg	-	6.3 ug/Kg (≤ 36.0)	-	-

BRC Tronox Parcel C/D/F/G

Metals - Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' RINSATE-4	Boron	J+ (all detects)	P	Calibration (%R)
TRNC-D-6	RINSATE-4	Niobium Vanadium	J+ (all detects) J+ (all detects)	P	Calibration (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0'	Niobium	J+ (all detects)	P	Calibration (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Antimony Copper Magnesium Tungsten Zinc Zirconium	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Niobium Silicon Barium	J+ (all detects) J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Phosphorus	J (all detects) UU (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Aluminum Calcium Cobalt Iron Magnesium Manganese Phosphorus Potassium Strontium Titanium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	ICP serial dilution (%D)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Barium Calcium Manganese Sodium Vanadium	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Chromium	J (all detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	RINSATE-4	Cadmium Copper Nickel Niobium Tin Tungsten	0.50U ug/L 1.0U ug/L 5.0U ug/L 25.0U ug/L 2.0U ug/L 5.0U ug/L	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FJ-08-0'	Boron Niobium Thallium Mercury	21.2U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 35.4U ug/Kg	A
TRNC-D-6	TSB-FJ-08-10'	Boron Cadmium Niobium Thallium Tungsten Mercury	22.2U mg/Kg 0.11U mg/Kg 5.6U mg/Kg 0.45U mg/Kg 1.1U mg/Kg 37.1U ug/Kg	A
TRNC-D-6	TSB-FR-05-0'	Boron Cadmium Thallium Tungsten Mercury	21.1U mg/Kg 0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.1U ug/Kg	A
TRNC-D-6	TSB-FR-05-10'	Boron Cadmium Thallium Tungsten Mercury	21.9U mg/Kg 0.11U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.4U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'	Boron Thallium Tin Tungsten Lithium Mercury	20.8U mg/Kg 0.42U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 10.4U mg/Kg 34.6U ug/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Boron Cadmium Thallium Tungsten Mercury	21.6U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.0U ug/Kg	A
TRNC-D-6	TSB-FR-04-10'	Boron Cadmium Thallium Tungsten Mercury	21.7U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 36.2U ug/Kg	A
TRNC-D-6	TSB-FJ-01-0'	Boron Cadmium Thallium Tungsten Mercury	20.6U mg/Kg 0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.3U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FJ-01-10'	Boron Cadmium Niobium Thallium Tungsten Mercury	21.4U mg/Kg 0.11U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.6U ug/Kg	A
TRNC-D-6	TSB-GR-01-0'	Boron Thallium Tungsten Mercury	20.9U mg/Kg 0.42U mg/Kg 1.0U mg/Kg 34.8U ug/Kg	A
TRNC-D-6	TSB-GR-01-5'	Boron Thallium Tungsten Mercury	21.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.2U ug/Kg	A
TRNC-D-6	TSB-GJ-06-0'	Boron Thallium Tungsten Mercury	21.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.7U ug/Kg	A
TRNC-D-6	TSB-GJ-06-5'	Boron Cadmium Thallium Tungsten Mercury	21.4U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.7U ug/Kg	A
TRNC-D-6	TSB-GJ-01-0'	Boron Cadmium Thallium Tungsten Mercury	21.1U mg/Kg 0.11U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.1U ug/Kg	A
TRNC-D-6	TSB-GJ-01-5'	Boron Cadmium Thallium Tungsten Mercury	21.5U mg/Kg 0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.8U ug/Kg	A

**BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-6**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FJ-08-0'	Niobium	5.3U mg/Kg	A
TRNC-D-6	TSB-FJ-08-10'	Cadmium Niobium Tungsten	0.11U mg/Kg 5.6U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-05-0'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-FR-05-10'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-FR-04-0'	Tin Tungsten	0.42U mg/Kg 1.0U mg/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-FR-04-10'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-FJ-01-0'	Cadmium Tungsten	0.10U mg/Kg 1.0U mg/Kg	A
TRNC-D-6	TSB-FJ-01-10'	Cadmium Niobium Tungsten	0.11U mg/Kg 5.3U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-GR-01-0'	Tungsten	1.0U mg/Kg	A
TRNC-D-6	TSB-GR-01-5'	Tungsten	1.1U mg/Kg	A
TRNC-D-6	TSB-GJ-06-0'	Tungsten	1.1U mg/Kg	A
TRNC-D-6	TSB-GJ-06-5'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-GJ-01-0'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A
TRNC-D-6	TSB-GJ-01-5'	Cadmium Tungsten	0.11U mg/Kg 1.1U mg/Kg	A

LDC #: 18100F4
 SDG #: TRNC-D-6
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11/17/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/16/07
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)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	Not verified
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	(5, 6)
XIV.	Field Blanks	SW	R=16

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

Validated Samples: All soil except #16, 19, 20 Az.

1	TSB-FJ-08-0'	11	TSB-GR-01-5'	21	PB	31	
2	TSB-FJ-08-10'	12	TSB-GJ-06-0'	22		32	
3	TSB-FR-05-0'	13	TSB-GJ-06-5'	23		33	
4	TSB-FR-05-10'	14	TSB-GJ-01-0'	24		34	
5	TSB-FR-04-0'	15	TSB-GJ-01-5'	25		35	
6	TSB-FR-07-0'-FD	16	RINSATE-4 R	26		36	
7	TSB-FR-04-10'	17	TSB-FJ-01-0'MS	27		37	
8	TSB-FJ-01-0'	18	TSB-FJ-01-0'MSD	28		38	
9	TSB-FJ-01-10'	19	RINSATE-4MS R	29		39	
10	TSB-GR-01-0'	20	RINSATE-4MSD J	30		40	

Notes: _____

DC #: 1810074
 SDG #: TRNC-D-6

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
 Reviewer: MN
 2nd reviewer: J

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-16	Soil/Az	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, V, Zn, Mo, B, Si
M 17, 18	Soil	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si
↓ 19.20	Az	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, V, Zn, Mo, B, Si
1-16	Soil/Az	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
M 17, 18	Soil	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
↓ 19.20	Az	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		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, Ti, V, Zn, Mo, B, Si
ICP-MS		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Zr
GEAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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 #: 18100FY
SDG #: Sed core

VALIDATION FINDINGS WORKSHEET
Calibration

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

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

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

- N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
- N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)?

LEVEL IV ONLY:

- N N/A Was a midrange cyanide standard distilled?
- N N/A Are all correlation coefficients ≥ 0.995 ?
- 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	11/27/07	ccv (2314)	B Nb	112.1 119.7	A11 A2 + 1, 2, PBS All A10 only	J+ J+ / P ↓
2	11/28/07	ccv (00322)	V	111.9	16, 19, 20	J+ J+ / P
3	11/27/07	ccv (2156)	B V	111.5 113.1	PBW ↓	J+ J+ / P ↓
4	11/27/07	ccv (1902)	Nb	118.2	1-8, 17, PBS	J+ J+ / P

Comments:

Analyte	Maximum PB ^a (mg/kg)	Maximum ICB/CCB ^a (ug/l)	Blank Action Limit	Sample Identification																
				1	2	3	4	5	6	7	8	9	10							
Al	2.0																			
Ba	0.076																			
B	3.6	12.8		8.6 / 21.2	8.4 / 22.2	5.2 / 21.1	9.0 / 21.9	3.7 / 20.8	4.5 / 21.6	11.4 / 21.7	6.0 / 20.6	9.4 / 21.4	8.5 / 20.9							
Cd		0.045		0.086 / 0.11	0.095 / 0.11	0.083 / 0.11			0.075 / 0.11	0.083 / 0.11	0.098 / 0.10	0.088 / 0.11								
Ca	22.1																			
Ni		0.5																		
Nb		9.2		3.1 / 5.3	1.8 / 5.6							1.8 / 5.3								
P	1.2																			
Na	3.8																			
Tl	0.17	0.7		0.28 / 0.43	0.26 / 0.45	0.25 / 0.42	0.21 / 0.44	0.18 / 0.42	0.19 / 0.43	0.19 / 0.43	0.16 / 0.41	0.40 / 0.43	0.23 / 0.42							
Sn	0.069	0.2						0.40 / 0.42												
Ti	0.029																			
W	0.24	1.3			0.69 / 1.1	0.55 / 1.1	0.47 / 1.1	0.33 / 1.0	0.36 / 1.1	0.40 / 1.1	0.31 / 1.0	0.68 / 1.1	0.51 / 1.0							
V	0.19	1.9																		
Zn	2.0																			
Li		15.0						7.8 / 10.4												
Hg (ug/Kg)		0.1		21.4 / 35.4	13.5 / 37.1	28.6 / 35.1	10.7 / 36.4	16.6 / 34.6	10.3 / 36.0	9.6 / 36.2	11.7 / 34.3	11.4 / 35.6	9.9 / 34.8							

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.

VALIDATION FINDINGS WORKSHEET

Field Blanks

METHOD: Trace Metals (EPA SW846 6010B/6020/7000)

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

N N/A Were target analytes detected in the field blanks?

Blank units: ug/L **Associated sample units:** mg/Kg

Sampling date: 11/16/07 **Soil factor applied:** 200X

Field blank type: (circle one) Field Blank / Rinsate / Other: R **Associated Samples:** All Soil

Analyte	Blank ID	Sample Identification																			
		1	2	3	4	5	6	7	8	9	10										
	16																				
Cd	0.032		0.086 / 0.11	0.095 / 0.11	0.083 / 0.11		0.075 / 0.11	0.083 / 0.11	0.098 / 0.10	0.088 / 0.11											
Ca	73.4																				
Cu	0.63																				
Fe	17.9																				
Mg	5.7																				
Ni	0.51																				
Nb	8.8	3.1 / 5.3	1.8 / 5.6																		
Si	85.3																				
Na	75.9	151.8																			
Sr	0.42																				
Sn	0.31									0.40 / 0.42											
W	0.66		0.69 / 1.1	0.55 / 1.1	0.47 / 1.1	0.33 / 1.0	0.36 / 1.1	0.40 / 1.1	0.31 / 1.0	0.68 / 1.1	0.51 / 1.0										

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".

VALIDATION FINDINGS WORKSHEET

Field Blanks

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: 11/16/07 Soil factor applied 200X

Field blank type: (circle one) Field Blank / Rinsate / Other: R Associated Samples: All Soil

Analyte	Blank ID	Sample Identification																			
		11	12	13	14	15															
	16																				
Cd	0.032			0.10 / 0.11	0.10 / 0.11	0.088 / 0.11															
Ca	73.4																				
Cu	0.63																				
Fe	17.9																				
Mg	5.7																				
Ni	0.51																				
Nb	8.8																				
Si	85.3																				
Na	75.9	151.8																			
Sr	0.42																				
Sn	0.31																				
W	0.66	0.43 / 1.1	0.53 / 1.1	0.34 / 1.1	0.36 / 1.1	0.36 / 1.1															

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 #: 1810FY
SDG #: TRAC-D-6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: MH
2nd Reviewer: S

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

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Was a matrix spike analyzed for each matrix in this SDG?
 N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

N N/A Were all duplicate sample relative percent differences (RPD) \leq 20% for water samples and \leq 35% for soil samples?
 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	17/18	Soil	Sb	53.1	55.1		All Soil	J- WT/A
			Cu	62.6				↓
			Mg	66.2				JT JT/A
			Nb	170.9	197.3			J/WT/A
			P	59.3	129.2			JT JT/A
			Si	200.1	169.5			JT JT/A
			W	74.0	74.0			J=WT/A
			Zn	64.7				↓
			Ba		146.5			JT JT/A
			Zr		68.9			J=WT/A
			Mn			30.0 (620)		No Qual (Res. N=)
			P			24.1 ↓		↓

Comments:

LDC #: 181004
 SDG #: TRAC-V-6

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

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

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		8	Soil	Al	12.0	All soil	JBT/A
				Ca	18.7		
				Cd	11.7		
				Fe	16.7		
				Mn	12.8		
				Mg	18.6		
				P	14.3		
				K	10.2		
				Sr	28.4		
				Ti	10.9		
				V	13.7		

Comments: Ca, Ni < 100 X MDL

LDC#: 18100F4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

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

Compound	Concentration (mg/kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	5	6	RPD	Difference	Limits	
Aluminum	5460	7740	35			
Antimony	0.14	0.20		0.06	(≤1.1)	
Arsenic	2.8	4.2		1.4	(≤2.2)	
Barium	67.0	122	58			J det / A
Beryllium	0.45	0.55		0.1	(≤0.22)	
Boron	3.7	4.5		0.8	(≤21.6)	
Cadmium	0.11	0.075		0.035	(≤0.11)	
Calcium	62400	23200	92			J det / A
Chromium	7.4	12.4		5	(≤2.2)	J det / A
Cobalt	5.3	7.5	34			
Copper	10.4	15.3	38			
Iron	9400	14900	45			
Lead	5.1	7.9	43			
Magnesium	7150	8550	18			
Manganese	154	262	52			J det / A
Molybdenum	0.29	0.50		0.21	(≤1.1)	
Nickel	13.0	15.7	19			
Palladium	0.26	0.31		0.05	(≤0.22)	
Phosphorus	922	1090	17			

LDC#: 18100F4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

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

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

Compound	Concentration (mg/kg)		(<=50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	5	6				
Potassium	1340	1710	24			
Silicon	177	121	38			
Silver	0.064	0.085		0.021	(<=0.43)	
Sodium	261	471	57			J det / A
Strontium	170	216	24			
Thallium	0.18	0.19		0.01	(<=0.43)	
Tin	0.40	0.55		0.15	(<=0.43)	
Titanium	356	590	49			
Tungsten	0.33	0.36		0.03	(<=1.1)	
Uranium	0.86	1.2	33			
Vanadium	27.4	51.7	61			J det / A
Zinc	25.9	31.7	20			
Zirconium	14.4	21.7		7.3	(<=21.6)	
Lithium	7.8	15.4		7.6	(<=10.8)	
Mercury (ug/Kg)	16.6	10.3		6.3	(<=36.0)	

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 19, 2007
LDC Report Date: January 21, 2008
Matrix: Soil/Water
Parameters: Metals
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD

Introduction

This data review covers 16 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B, 6020, and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Lithium, Magnesium, Manganese, Molybdenum, Mercury, Nickel, Niobium, Palladium, Phosphorus, Platinum, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Sulfur, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, Zinc, and Zirconium.

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

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

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met with the following exceptions:

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
12/27/07	CCV (21:56)	Boron Vanadium	111.5 (90-110) 113.1 (90-110)	PBW	J+ (all detects) J+ (all detects)	P
12/27/07	CCV (23:14)	Boron	112.1 (90-110)	All water samples in SDG TRNC-D-7	J+ (all detects)	P
12/28/07	CCV (00:32)	Vanadium	111.9 (90-110)	RINSATE-5	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)	Copper Manganese Nickel Tin	0.50 ug/L 0.62 ug/L 0.87 ug/L 0.35 ug/L	All water samples in SDG TRNC-D-7
ICB/CCB	Cadmium Copper Molybdenum Nickel Niobium Thallium Tungsten	0.045 ug/L 0.4 ug/L 0.2 ug/L 0.5 ug/L 14.9 ug/L 0.7 ug/L 1.3 ug/L	All water samples in SDG TRNC-D-7

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium Copper Iron Nickel Phosphorus Sodium Mercury	0.55 mg/Kg 0.11 mg/Kg 11.2 mg/Kg 0.12 mg/Kg 2.0 mg/Kg 3.5 mg/Kg 7.5 ug/Kg	All soil samples in SDG TRNC-D-7
PB (prep blank)	Zinc	2.8 mg/Kg	TSB-GR-02-0' TSB-GR-02-5' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'
ICB/CCB	Cadmium Chromium Niobium Thallium Tungsten Vanadium Mercury	0.0329 ug/L 1.4 ug/L 9.8 ug/L 0.6 ug/L 0.6 ug/L 1.3 ug/L 0.1 ug/L	All soil samples in SDG TRNC-D-7

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
RINSATE-5	Cadmium Manganese Molybdenum Niobium Thallium Tin Tungsten	0.024 ug/L 0.63 ug/L 0.42 ug/L 23.3 ug/L 1.5 ug/L 0.65 ug/L 2.5 ug/L	0.50U ug/L 2.0U ug/L 5.0U ug/L 25.0U ug/L 2.0U ug/L 2.0U ug/L 5.0U ug/L
TSB-GR-02-0'	Niobium Thallium Tungsten Mercury	3.0 mg/Kg 0.28 mg/Kg 0.73 mg/Kg 7.6 ug/Kg	5.3U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.3U ug/Kg
TSB-GR-02-0'-FD	Cadmium Niobium Thallium Tungsten Mercury	0.10 mg/Kg 2.2 mg/Kg 0.21 mg/Kg 036 mg/Kg 16.4 ug/Kg	0.11U mg/Kg 5.3U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.3U ug/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GR-02-5'	Cadmium Thallium Tungsten Mercury	0.10 mg/Kg 0.22 mg/Kg 0.44 mg/Kg 15.1 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg
TSB-GJ-04-0'	Cadmium Niobium Thallium Tungsten Mercury	0.077 mg/Kg 3.0 mg/Kg 0.18 mg/Kg 0.33 mg/Kg 16.5 ug/Kg	0.11U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.2U ug/Kg
TSB-GJ-04-5'	Cadmium Thallium Tungsten Mercury	0.092 mg/Kg 0.34 mg/Kg 0.57 mg/Kg 10.6 ug/Kg	0.11U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.5U ug/Kg
TSB-GJ-02-0'	Cadmium Thallium Tungsten Mercury	0.071 mg/Kg 0.22 mg/Kg 0.43 mg/Kg 10.0 ug/Kg	0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.5U ug/Kg
TSB-GJ-02-0'-FD	Cadmium Thallium Tungsten Mercury	0.076 mg/Kg 0.21 mg/Kg 0.38 mg/Kg 8.9 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.4U ug/Kg
TSB-GJ-02-5'	Cadmium Niobium Thallium Tungsten Mercury	0.054 mg/Kg 2.8 mg/Kg 0.16 mg/Kg 0.33 mg/Kg 13.5 ug/Kg	0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg
TSB-GJ-07-0'	Cadmium Thallium Tungsten Mercury	0.088 mg/Kg 0.23 mg/Kg 0.40 mg/Kg 14.9 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.9U ug/Kg
TSB-GJ-07-5'	Cadmium Thallium Tungsten Mercury	0.074 mg/Kg 0.17 mg/Kg 0.38 mg/Kg 22.9 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.8U ug/Kg
TSB-GJ-05-0'	Cadmium Thallium Tungsten Mercury	0.078 mg/Kg 0.17 mg/Kg 0.33 mg/Kg 17.4 ug/Kg	0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.4U ug/Kg
TSB-GJ-05-5'	Thallium Tungsten	0.22 mg/Kg 0.40 mg/Kg	0.42U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GJ-03-0'	Cadmium Thallium Tungsten Mercury	0.081 mg/Kg 0.16 mg/Kg 0.31 mg/Kg 11.8 ug/Kg	0.10U mg/Kg 0.40U mg/Kg 1.0U mg/Kg 33.6U ug/Kg
TSB-GJ-03-5'	Cadmium Thallium Tungsten Mercury	0.091 mg/Kg 0.20 mg/Kg 0.33 mg/Kg 11.5 ug/Kg	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.4U ug/Kg

Sample RINSATE-5 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-5	11/19/07	Boron Cadmium Calcium Iron Magnesium Manganese Molybdenum Niobium Silicon Sodium Strontium Thallium Tin Tungsten	28.8 ug/L 0.024 ug/L 67.1 ug/L 30.0 ug/L 6.6 ug/L 0.63 ug/L 0.42 ug/L 23.3 ug/L 50.3 ug/L 64.4 ug/L 0.37 ug/L 1.5 ug/L 0.65 ug/L 2.5 ug/L	All soil samples in SDG TRNC-D-7

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-GR-02-0'	Boron Molybdenum Thallium Tungsten	10.1 mg/Kg 0.62 mg/Kg 0.28 mg/Kg 0.73 mg/Kg	20.6U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-GR-02-0'-FD	Boron Cadmium Molybdenum Niobium Thallium Tungsten	6.9 mg/Kg 0.10 mg/Kg 0.52 mg/Kg 3.0 mg/Kg 0.21 mg/Kg 0.36 mg/Kg	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.42U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GR-02-5'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	7.3 mg/Kg 0.10 mg/Kg 0.56 mg/Kg 2.2 mg/Kg 0.22 mg/Kg 0.44 mg/Kg	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-GJ-04-0'	Boron Cadmium Molybdenum Thallium Tungsten	6.7 mg/Kg 0.077 mg/Kg 0.59 mg/Kg 0.18 mg/Kg 0.33 mg/Kg	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-GJ-04-5'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	7.9 mg/Kg 0.092 mg/Kg 0.63 mg/Kg 3.0 mg/Kg 0.34 mg/Kg 0.57 mg/Kg	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg
TSB-GJ-02-0'	Boron Cadmium Molybdenum Thallium Tungsten	7.3 mg/Kg 0.071 mg/Kg 0.43 mg/Kg 0.22 mg/Kg 0.43 mg/Kg	20.7U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-GJ-02-0'-FD	Boron Cadmium Molybdenum Thallium Tungsten	6.7 mg/Kg 0.076 mg/Kg 0.52 mg/Kg 0.21 mg/Kg 0.38 mg/Kg	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-GJ-02-5'	Boron Cadmium Molybdenum Thallium Tungsten	5.3 mg/Kg 0.054 mg/Kg 0.44 mg/Kg 0.16 mg/Kg 0.33 mg/Kg	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-GJ-07-0'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	5.6 mg/Kg 0.088 mg/Kg 0.50 mg/Kg 2.8 mg/Kg 0.23 mg/Kg 0.40 mg/Kg	21.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg
TSB-GJ-07-5'	Boron Cadmium Molybdenum Thallium Tungsten	10.2 mg/Kg 0.074 mg/Kg 0.53 mg/Kg 0.17 mg/Kg 0.38 mg/Kg	21.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-GJ-05-0'	Boron Cadmium Molybdenum Thallium Tungsten	8.2 mg/Kg 0.078 mg/Kg 0.54 mg/Kg 0.17 mg/Kg 0.33 mg/Kg	20.6U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg
TSB-GJ-05-5'	Boron Molybdenum Thallium Tungsten	7.7 mg/Kg 0.76 mg/Kg 0.22 mg/Kg 0.40 mg/Kg	21.2U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg
TSB-GJ-03-0'	Boron Cadmium Molybdenum Thallium Tungsten	5.3 mg/Kg 0.081 mg/Kg 0.57 mg/Kg 0.16 mg/Kg 0.31 mg/Kg	20.2U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg
TSB-GJ-03-5'	Boron Cadmium Molybdenum Thallium Tungsten	4.5 mg/Kg 0.091 mg/Kg 0.47 mg/Kg 0.20 mg/Kg 0.33 mg/Kg	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U 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-GJ-04-0' MS/MSD (All soil samples in SDG TRNC-D-7)	Antimony	57.1 (75-125)	50.6 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-GJ-04-0' MS/MSD (All soil samples in SDG TRNC-D-7)	Niobium Silicon	205.5 (75-125) 142.9 (75-125)	187.0 (75-125) 142.8 (75-125)	- -	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	Calcium	80.9 (81-119)	All soil samples in SDG TRNC-D-7	J- (all detects) UJ (all non-detects)	P

VIII. Internal Standards (ICP-MS)

ICP-MS was not reviewed in 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-GJ-04-0'L	Iron Manganese	10.2 (≤ 10) 11.8 (≤ 10)	All soil samples in SDG TRNC-D-7	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-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-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-GR-02-0'	TSB-GR-02-0'-FD				
Aluminum	8470	8560	1 (≤ 50)	-	-	-
Antimony	0.25	0.19	-	0.06 (≤ 1.1)	-	-
Arsenic	2.9	2.4	-	0.5 (≤ 2.1)	-	-
Barium	185	156	17 (≤ 50)	-	-	-
Beryllium	0.60	0.59	-	0.01 (≤ 0.21)	-	-
Boron	10.1	6.9	-	3.2 (≤ 21.2)	-	-
Cadmium	0.13	0.10	-	0.03 (≤ 0.11)	-	-
Calcium	25000	18200	31 (≤ 50)	-	-	-
Chromium	11.7	10.7	9 (≤ 50)	-	-	-
Cobalt	7.9	6.8	15 (≤ 50)	-	-	-
Copper	15.6	13.5	14 (≤ 50)	-	-	-
Iron	14100	12800	10 (≤ 50)	-	-	-
Lead	10.1	10.0	1 (≤ 50)	-	-	-
Magnesium	8910	8120	9 (≤ 50)	-	-	-
Manganese	393	320	20 (≤ 50)	-	-	-
Molybdenum	0.62	0.52	-	0.1 (≤ 1.1)	-	-
Nickel	14.7	13.0	12 (≤ 50)	-	-	-
Niobium	9.2	3.0	-	6.2 (≤ 5.3)	-	-
Palladium	0.44	0.33	-	0.11 (≤ 0.21)	-	-
Phosphorus	1010	811	22 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
Potassium	2150	2270	5 (≤ 50)	-	-	-
Silicon	180	173	4 (≤ 50)	-	-	-
Silver	0.12	0.12	-	0 (≤ 0.42)	-	-
Sodium	687	482	35 (≤ 50)	-	-	-
Strontium	200	151	28 (≤ 50)	-	-	-
Thallium	0.28	0.21	-	0.07 (≤ 0.42)	-	-
Tin	0.63	0.56	-	0.07 (≤ 0.42)	-	-
Titanium	577	546	6 (≤ 50)	-	-	-
Tungsten	0.73	0.36	-	0.37 (≤ 1.1)	-	-
Uranium	1.0	0.80	-	0.2 (≤ 0.21)	-	-
Vanadium	41.4	35.5	15 (≤ 50)	-	-	-
Zinc	30.8	29.8	3 (≤ 50)	-	-	-
Zirconium	22.8	21.2	-	1.6 (≤ 21.2)	-	-
Lithium	14.3	10.0	-	4.3 (≤ 10.6)	-	-
Sulfur	681	498	-	183 (≤ 1060)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
Mercury	7.6	16.4	-	8.8 (≤ 35.3)	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-02-0'	TSB-GJ-02-0'-FD				
Aluminum	7400	7970	7 (≤ 50)	-	-	-
Antimony	0.18	0.19	-	0.01 (≤ 1.1)	-	-
Arsenic	3.4	2.9	-	0.5 (≤ 2.1)	-	-
Barium	171	170	1 (≤ 50)	-	-	-
Beryllium	0.48	0.51	-	0.03 (≤ 0.21)	-	-
Boron	7.3	6.7	-	0.6 (≤ 21.3)	-	-
Cadmium	0.071	0.076	-	0.005 (≤ 0.11)	-	-
Calcium	22800	26900	16 (≤ 50)	-	-	-
Chromium	8.2	11.1	30 (≤ 50)	-	-	-
Cobalt	6.0	7.8	26 (≤ 50)	-	-	-
Copper	13.2	15.6	17 (≤ 50)	-	-	-
Iron	11400	13400	16 (≤ 50)	-	-	-
Lead	7.1	9.8	32 (≤ 50)	-	-	-
Magnesium	9840	10100	3 (≤ 50)	-	-	-
Manganese	262	341	26 (≤ 50)	-	-	-
Molybdenum	0.43	0.52	-	0.09 (≤ 1.1)	-	-
Nickel	12.5	16.7	29 (≤ 50)	-	-	-
Palladium	0.51	0.53	-	0.02 (≤ 0.21)	-	-
Phosphorus	885	1140	25 (≤ 50)	-	-	-
Potassium	1520	1730	13 (≤ 50)	-	-	-

Analyte	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-02-0'	TSB-GJ-02-0'-FD				
Silicon	72.5	147	-	74.5 (≤ 53.2)	J (all detects)	A
Silver	0.086	0.10	-	0.014 (≤ 0.43)	-	-
Sodium	583	542	7 (≤ 50)	-	-	-
Strontium	253	225	12 (≤ 50)	-	-	-
Thallium	0.22	0.21	-	0.01 (≤ 0.43)	-	-
Tin	0.43	0.54	-	0.11 (≤ 0.43)	-	-
Titanium	442	507	14 (≤ 50)	-	-	-
Tungsten	0.43	0.38	-	0.05 (≤ 1.1)	-	-
Uranium	1.5	1.1	31 (≤ 50)	-	-	-
Vanadium	34.8	40.9	16 (≤ 50)	-	-	-
Zinc	27.1	34.0	23 (≤ 50)	-	-	-
Zirconium	18.0	22.0	-	4 (≤ 21.3)	-	-
Lithium	21.9	15.8	-	6.1 (≤ 10.6)	-	-
Sulfur	451	448U	-	3 (≤ 1060)	-	-

Analyte	Concentration (ug/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-02-0'	TSB-GJ-02-0'-FD				
Mercury	10.0	8.9	-	1.1 (≤ 35.4)	-	-

**BRC Tronox Parcel C/D/F/G
Metals - Data Qualification Summary - SDG TRNC-D-7**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-7	RINSATE-5	Boron Vanadium	J+ (all detects) J+ (all detects)	P	Calibration (CCV %R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Antimony	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Niobium Silicon	J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Calcium	J- (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Iron Manganese	J (all detects) J (all detects)	A	ICP serial dilution (%D)
TRNC-D-7	TSB-GJ-02-0' TSB-GJ-02-0'-FD	Silicon	J (all detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Metals - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-7	RINSATE-5	Cadmium Manganese Molybdenum Niobium Thallium Tin Tungsten	0.50U ug/L 2.0U ug/L 5.0U ug/L 25.0U ug/L 2.0U ug/L 2.0U ug/L 5.0U ug/L	A
TRNC-D-7	TSB-GR-02-0'	Niobium Thallium Tungsten Mercury	5.3U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.3U ug/Kg	A
TRNC-D-7	TSB-GR-02-0'-FD	Cadmium Niobium Thallium Tungsten Mercury	0.11U mg/Kg 5.3U mg/Kg 0.42U mg/Kg 1.1U mg/Kg 35.3U ug/Kg	A
TRNC-D-7	TSB-GR-02-5'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg	A
TRNC-D-7	TSB-GJ-04-0'	Cadmium Niobium Thallium Tungsten Mercury	0.11U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.2U ug/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-7	TSB-GJ-04-5'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.44U mg/Kg 1.1U mg/Kg 36.5U ug/Kg	A
TRNC-D-7	TSB-GJ-02-0'	Cadmium Thallium Tungsten Mercury	0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.5U ug/Kg	A
TRNC-D-7	TSB-GJ-02-0'-FD	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.4U ug/Kg	A
TRNC-D-7	TSB-GJ-02-5'	Cadmium Niobium Thallium Tungsten Mercury	0.11U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.5U ug/Kg	A
TRNC-D-7	TSB-GJ-07-0'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.9U ug/Kg	A
TRNC-D-7	TSB-GJ-07-5'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.8U ug/Kg	A
TRNC-D-7	TSB-GJ-05-0'	Cadmium Thallium Tungsten Mercury	0.10U mg/Kg 0.41U mg/Kg 1.0U mg/Kg 34.4U ug/Kg	A
TRNC-D-7	TSB-GJ-05-5'	Thallium Tungsten	0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-03-0'	Cadmium Thallium Tungsten Mercury	0.10U mg/Kg 0.40U mg/Kg 1.0U mg/Kg 33.6U ug/Kg	A
TRNC-D-7	TSB-GJ-03-5'	Cadmium Thallium Tungsten Mercury	0.11U mg/Kg 0.43U mg/Kg 1.1U mg/Kg 35.4U ug/Kg	A

**BRC Tronox Parcel C/D/F/G
Metals - Field Blank Data Qualification Summary - SDG TRNC-D-7**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-7	TSB-GR-02-0'	Boron Molybdenum Thallium Tungsten	20.6U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-7	TSB-GR-02-0'-FD	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GR-02-5'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.3U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-04-0'	Boron Cadmium Molybdenum Thallium Tungsten	21.7U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-04-5'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.9U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.5U mg/Kg 0.44U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-02-0'	Boron Cadmium Molybdenum Thallium Tungsten	20.7U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-7	TSB-GJ-02-0'-FD	Boron Cadmium Molybdenum Thallium Tungsten	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-02-5'	Boron Cadmium Molybdenum Thallium Tungsten	21.3U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-7	TSB-GJ-07-0'	Boron Cadmium Molybdenum Niobium Thallium Tungsten	21.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 5.4U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-07-5'	Boron Cadmium Molybdenum Thallium Tungsten	21.5U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-05-0'	Boron Cadmium Molybdenum Thallium Tungsten	20.6U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.41U mg/Kg 1.0U mg/Kg	A
TRNC-D-7	TSB-GJ-05-5'	Boron Molybdenum Thallium Tungsten	21.2U mg/Kg 1.1U mg/Kg 0.42U mg/Kg 1.1U mg/Kg	A
TRNC-D-7	TSB-GJ-03-0'	Boron Cadmium Molybdenum Thallium Tungsten	20.2U mg/Kg 0.10U mg/Kg 1.0U mg/Kg 0.40U mg/Kg 1.0U mg/Kg	A
TRNC-D-7	TSB-GJ-03-5'	Boron Cadmium Molybdenum Thallium Tungsten	21.2U mg/Kg 0.11U mg/Kg 1.1U mg/Kg 0.43U mg/Kg 1.1U mg/Kg	A

LDC #: 18100G4
 SDG #: TRNC-D-7
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/18/08
 Page: (of 1)
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>11/19/07</u>
II.	Calibration	SW	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	SW	<u>3 MS/MSD</u>
VI.	Duplicate Sample Analysis	N	
VII.	Laboratory Control Samples (LCS)	SW	<u>LCS</u>
VIII.	Internal Standard (ICP-MS)	N	<u>not reviewed</u>
IX.	Furnace Atomic Absorption QC	N	<u>not utilized</u>
X.	ICP Serial Dilution	SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	<u>(1,2), (6,7)</u>
XIV.	Field Blanks	SW	<u>R=15</u>

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

Validated Samples: All soil except # 15 A2

1	TSB-GR-02-0'	11	TSB-GJ-05-0'	21		31	
2	TSB-GR-02-0'-FD	12	TSB-GJ-05-5'	22		32	
3	TSB-GR-02-5'	13	TSB-GJ-03-0'	23		33	
4	TSB-GJ-04-0'	14	TSB-GJ-03-5'	24		34	
5	TSB-GJ-04-5'	15	RINSATE-5 <u>A2</u>	25		35	
6	TSB-GJ-02-0'	16	TSB-GJ-04-0'MS	26		36	
7	TSB-GJ-02-0'-FD	17	TSB-GJ-04-0'MSD	27		37	
8	TSB-GJ-02-5'	18	<u>VB</u>	28		38	
9	TSB-GJ-07-0'	19		29		39	
10	TSB-GJ-07-5'	20		30		40	

Notes: _____

LDC #: 1810064
 SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page: 1 of 1
 Reviewer: MM
 2nd reviewer: *g*

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-15	Soil/A	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, V, Zn, Mo, B, Si
2-16,17	Soil	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, 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, Ti, V, Zn, Mo, B, Si
1-15	Soil/A	Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
		Nb, Pd, P, Pt, Sn, Sr, Ti, W, U, Li, S, Zr
2-16,17	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, Ti, 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, Ti, 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 #: 1810094
 SDG #: PRNC-9-1

VALIDATION FINDINGS WORKSHEET

Calibration

Page: 1 of 1
 Reviewer: J.M.
 2nd Reviewer: R

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	12/27/07	CCV (22156)	B √	111.5 113.1	PBW ↓	J+ ↓ T/P
2	12/27/07	CCV (2314)	B	112.1	All AQ	J+ ↓ T/P
3	12/28/07	CCV (0032)	√	111.9	15	J+ ↓ T/P

Comments:

VALIDATION FINDINGS WORKSHEET

PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 6010B/6020/7000)
Soil preparation factor applied: _____
Sample Concentration units, unless otherwise noted: ug/L Associated Samples: All/AQ

Analyte	Maximum PB ^a (mg/kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	15	Sample Identification														
Cd			0.045		0.024 / 0.50															
Cu		0.50	0.4																	
Mn		0.62			0.63 / 2.0															
Mo			0.2		0.42 / 5.0															
Ni		0.87	0.5																	
Nb			14.9		23.3 / 25.0															
Tl			0.7		1.5 / 2.0															
Sn		0.35			0.65 / 2.0															
W			1.3		2.5 / 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.

Analyte	Maximum PB ^a (mg/kg)	Maximum ICB/CCB ^a (ug/l)	Blank Action Limit	Sample Identification										
				1	2	3	4	5	6	7	8	9	10	
Cd		0.0329			0.10 / 0.11	0.10 / 0.11	0.077 / 0.11	0.092 / 0.11	0.071 / 0.10	0.076 / 0.11	0.054 / 0.11	0.088 / 0.11		
Cr	0.55	1.4												
Cu	0.11													
Fe	11.2		112											
Ni	0.12													
Nb		9.8		3.0 / 5.3	2.2 / 5.3		3.0 / 5.5				2.8 / 5.4			
P	2.0													
Na	3.5													
Tl		0.6		0.28 / 0.41	0.21 / 0.42	0.22 / 0.43	0.18 / 0.44	0.34 / 0.44	0.22 / 0.41	0.21 / 0.43	0.16 / 0.43	0.23 / 0.43	0.17 / 0.43	
W		0.6		0.73 / 1.0	0.36 / 1.1	0.44 / 1.1	0.33 / 1.1	0.57 / 1.1	0.43 / 1.0	0.38 / 1.1	0.33 / 1.1	0.40 / 1.1	0.38 / 1.1	
V		1.3												
Zn	2.8		28											
Hg (ug/Kg)	7.5	0.1		7.6 / 34.3	16.4 / 35.3	15.1 / 35.5	16.5 / 36.2	10.6 / 36.5	10.0 / 34.5	8.9 / 35.4	13.5 / 35.5	14.9 / 35.9	22.9 / 35.8	

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.

18100G.wpd

Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)	Blank Action Limit	Sample Identification																
				11	12	13	14													
Cd		0.0329		0.078 / 0.10		0.081 / 0.10		0.091 / 0.11												
Cr	0.55	1.4																		
Cu	0.11																			
Fe	11.2		112																	
Ni	0.12																			
Nb		9.8																		
P	2.0																			
Na	3.5																			
Tl		0.6		0.17 / 0.41	0.22 / 0.42	0.16 / 0.40	0.20 / 0.43													
W		0.6		0.33 / 1.0	0.40 / 1.1	0.31 / 1.0	0.33 / 1.1													
V		1.3																		
Zn	2.8		28																	
Hg (ug/Kg)	7.5	0.1		17.4 / 34.4		11.8 / 33.6	11.5 / 35.4													

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.

VALIDATION FINDINGS WORKSHEET
Field Blanks

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: 11/19/07 **Soil factor applied:** 200X

Field blank type: (circle one) Field Blank / Rinsate / Other: R **Associated Samples:** All Soil

Analyte	Blank ID	Sample Identification										
		Action Level	1	2	3	4	5	6	7	8	9	10
B	28.8		10.1 / 20.6	6.9 / 21.2	7.3 / 21.3	6.7 / 21.7	7.9 / 21.9	7.3 / 20.7	6.7 / 21.3	5.3 / 21.3	5.6 / 21.5	10.2 / 21.5
Cd	0.024			0.10 / 0.11	0.10 / 0.11	0.077 / 0.11	0.092 / 0.11	0.071 / 0.10	0.076 / 0.11	0.054 / 0.11	0.088 / 0.11	0.074 / 0.11
Ca	67.1											
Fe	30.0											
Mg	6.6											
Mn	0.63											
Mo	0.42		0.62 / 1.0	0.52 / 1.1	0.56 / 1.1	0.59 / 1.1	0.63 / 1.1	0.43 / 1.0	0.52 / 1.1	0.44 / 1.1	0.50 / 1.1	0.53 / 1.1
Nb	23.3			3.0 / 5.3	2.2 / 5.3		3.0 / 5.5				2.8 / 5.4	
Si	50.3											
Na	64.4	128.8										
Sr	0.37											
Tl	1.5		0.28 / 0.41	0.21 / 0.42	0.22 / 0.43	0.18 / 0.44	0.34 / 0.44	0.22 / 0.41	0.21 / 0.43	0.16 / 0.43	0.23 / 0.43	0.17 / 0.43
Sn	0.65											
W	2.5		0.73 / 1.0	0.36 / 1.1	0.44 / 1.1	0.33 / 1.1	0.57 / 1.1	0.43 / 1.0	0.38 / 1.1	0.33 / 1.1	0.40 / 1.1	0.38 / 1.1

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".

VALIDATION FINDINGS WORKSHEET

Field Blanks

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: 11/19/07 **Soil factor applied:** 200X

Field blank type: (circle one) Field Blank / Rinsate / Other: R **Associated Samples:** All Soil

Analyte	Blank ID	Sample Identification									
		Action Level	11	12	13	14					
B	28.8		8.2 / 20.6	7.7 / 21.2	5.3 / 20.2	4.5 / 21.2					
Cd	0.024		0.078 / 0.10		0.081 / 0.10	0.091 / 0.11					
Ca	67.1										
Fe	30.0										
Mg	6.6										
Mn	0.63										
Mo	0.42		0.54 / 1.0	0.76 / 1.1	0.57 / 1.0	0.47 / 1.1					
Nb	23.3										
Si	50.3										
Na	64.4	128.8									
Sr	0.37										
Tl	1.5		0.17 / 0.41	0.22 / 0.42	0.16 / 0.40	0.20 / 0.43					
Sn	0.65										
W	2.5		0.33 / 1.0	0.40 / 1.1	0.31 / 1.0	0.33 / 1.1					

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 #: 1810064
SDG #: TRNC-2-7

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

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

- Y N N/A Was a matrix spike analyzed for each matrix in this SDG?
Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.
 Y N N/A Were all duplicate sample relative percent differences (RPD) $\leq 20\%$ for water samples and $\leq 35\%$ for soil samples?
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	57.1	50.6		All soil	J-N/A
			Nb	205.5	187.0		↓	J-N/A
			Si	142.9	142.8			↓
			Mn			44.1 (20)	Av	No good (Loss)

Comments:

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

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		4	Soil	Fe	10.2	All Soil	JLT/A
				Mn	11.8		

Comments: [Signature]

LDC#: 18100G4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Aluminum	8470	8560	1			
Antimony	0.25	0.19		0.06	(≤1.1)	
Arsenic	2.9	2.4		0.5	(≤2.1)	
Barium	185	156	17			
Beryllium	0.60	0.59		0.01	(≤0.21)	
Boron	10.1	6.9		3.2	(≤21.2)	
Cadmium	0.13	0.10		0.03	(≤0.11)	
Calcium	25000	18200	31			
Chromium	11.7	10.7	9			
Cobalt	7.9	6.8	15			
Copper	15.6	13.5	14			
Iron	14100	12800	10			
Lead	10.1	10.0	1			
Magnesium	8910	8120	9			
Manganese	393	320	20			
Molybdenum	0.62	0.52		0.1	(≤1.1)	
Nickel	14.7	13.0	12			
Niobium	9.2	3.0		6.2	(≤5.3)	J det / A
Palladium	0.44	0.33		0.11	(≤0.21)	

LDC#: 18100G4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 2 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(≤ 50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	1	2	RPD	Difference	Limits	
Phosphorus	1010	811	22			
Potassium	2150	2270	5			
Silicon	180	173	4			
Silver	0.12	0.12		0	(≤ 0.42)	
Sodium	687	482	35			
Strontium	200	151	28			
Thallium	0.28	0.21		0.07	(≤ 0.42)	
Tin	0.63	0.56		0.07	(≤ 0.42)	
Titanium	577	546	6			
Tungsten	0.73	0.36		0.37	(≤ 1.1)	
Uranium	1.0	0.80		0.2	(≤ 0.21)	
Vanadium	41.4	35.5	15			
Zinc	30.8	29.8	3			
Zirconium	22.8	21.2		1.6	(≤ 21.2)	
Lithium	14.3	10.0		4.3	(≤ 10.6)	
Sulfur	681	498		183	(≤ 1060)	
Mercury (ug/Kg)	7.6	16.4		8.8	(≤ 35.3)	

LDC#: 18100G4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 3 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(≤50)	(mg/Kg)	(mg/Kg)	Qualifications (Parent Only)
	6	7	RPD	Difference	Limits	
Aluminum	7400	7970	7			
Antimony	0.18	0.19		0.01	(≤1.1)	
Arsenic	3.4	2.9		0.5	(≤2.1)	
Barium	171	170	1			
Beryllium	0.48	0.51		0.03	(≤0.21)	
Boron	7.3	6.7		0.6	(≤21.3)	
Cadmium	0.071	0.076		0.005	(≤0.11)	
Calcium	22800	26900	16			
Chromium	8.2	11.1	30			
Cobalt	6.0	7.8	26			
Copper	13.2	15.6	17			
Iron	11400	13400	16			
Lead	7.1	9.8	32			
Magnesium	9840	10100	3			
Manganese	262	341	26			
Molybdenum	0.43	0.52		0.09	(≤1.1)	
Nickel	12.5	16.7	29			
Palladium	0.51	0.53		0.02	(≤0.21)	
Phosphorus	993 885	885 1140	12 25			

LDC#: 18100G4
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 4 of 4
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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

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

Compound	Concentration (mg/kg)		(<50) RPD	(mg/Kg) Difference	(mg/Kg) Limits	Qualifications (Parent Only)
	6	7				
Potassium	1520	1730	13			
Silicon	72.5	147		74.5	(≤53.2)	J det / A
Silver	0.086	0.10		0.014	(≤0.43)	
Sodium	583	542	7			
Strontium	253	225	12			
Thallium	0.22	0.21		0.01	(≤0.43)	
Tin	0.43	0.54		0.11	(≤0.43)	
Titanium	442	507	14			
Tungsten	0.43	0.38		0.05	(≤1.1)	
Uranium	1.5	1.1	31			
Vanadium	34.8	40.9	16			
Zinc	27.1	34.0	23			
Zirconium	18.0	22.0		4	(≤21.3)	
Lithium	21.9	15.8		6.1	(≤10.6)	
Sulfur	451	448U		3	(≤1060)	
Mercury (ug/Kg)	10.0	8.9		1.1	(≤35.4)	

**BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100**

Wet Chemistry

LDC

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 9, 2007
LDC Report Date: January 18, 2008
Matrix: Soil/Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
TSB-CR-07-0'DUP
RINSATE 1MS
RINSATE 1DUP

Introduction

This data review covers 14 soil samples and 3 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, Chlorine, 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.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

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	Concentration	Associated Samples
MB	Chloride Orthophosphate as P	0.34 mg/Kg 3.5 mg/Kg	All soil samples in SDG TRNC-D-1
ICB/CCB1	Orthophosphate as P	0.366 mg/L	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0'
ICB/CCB2	Orthophosphate as P	0.152 mg/L	TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0'
ICB/CCB3	Orthophosphate as P	0.146 mg/L	TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'

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

Sample RINSATE 1 was identified as a rinsate. No contaminant concentrations were found in this blank.

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-CR-07-0'MS/MSD (All soil samples in SDG TRNC-D-1)	Oil & grease	68 (75-125)	59 (75-125)	-	J- (all detects) UJ (all non-detects)	A
TSB-CR-07-0'MS (All soil samples in SDG TRNC-D-1)	Nitrate as N	72 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A
	Sulfate	64 (75-125)	-	-	J- (all detects) UJ (all non-detects)	
TSB-CR-07-0'MS (All soil samples in SDG TRNC-D-1)	Nitrite as N	170 (75-125)	-	-	J+ (all detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification

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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
Bromide	0.065U mg/Kg	0.85 mg/Kg	-	0.785 (≤ 2.6)	-	-
Bromine	0.13U mg/Kg	1.7 mg/Kg	-	1.57 (≤ 5.2)	-	-
Chloride	245 mg/Kg	371 mg/Kg	41 (≤ 50)	-	-	-
Chlorine	491 mg/Kg	741 mg/Kg	41 (≤ 50)	-	-	-
Nitrate as N	9.9 mg/Kg	11.1 mg/Kg	11 (≤ 50)	-	-	-
Perchlorate	1110 ug/Kg	821 ug/Kg	30 (≤ 50)	-	-	-
Sulfate	1390 mg/Kg	583 mg/Kg	82 (≤ 50)	-	J (all detects)	A

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-1**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Oil & grease	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Nitrate as N Sulfate	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CR-07-0' TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-0'-FD TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-07-10' TSB-CJ-03-0' TSB-CJ-03-10'	Nitrite as N	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	Sulfate	J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

LDC #: 18100A6
 SDG #: TRNC-D-1
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/15/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate, Nitrite, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 2051B)

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: 11/9/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	3 MS/MSD/MSD
V	Duplicates	A	
VI.	Laboratory control samples	A	MS/MSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(3, 4)
X	Field blanks	ND	R=12

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

Validated Samples: All Soil event # 12, 16, 17 A2

1	TSB-CR-07-0'	11	TSB-CJ-03-10'	21		31
2	TSB-CR-07-10'	12	RINSATE 1	22		32
3	TSB-CJ-08-0'	13	TSB-CR-07-0'MS	23		33
4	TSB-CJ-08-0'-FD	14	TSB-CR-07-0'MSD	24		34
5	TSB-CJ-08-10'	15	TSB-CR-07-0'DUP	25		35
6	TSB-CJ-04-0'	16	RINSATE 1MS	26		36
7	TSB-CJ-04-10'	17	RINSATE 1DUP	27		37
8	TSB-CJ-07-0'	18	MS	28		38
9	TSB-CJ-07-10'	19		29		39
10	TSB-CJ-03-0'	20		30		40

Notes: _____

LDC #: 18100 AB
 SDG #: TRNCD-1

VALIDATION FINDINGS WORKSHEET

Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-11	Soil	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
12	A2	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
16, 17	A2	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
13, 14	Soil	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
13, 15	↓	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		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 #: 181^{CD} A1
 SDG #: TRNC-D-1

VALIDATION FINDINGS WORKSHEET
Blanks

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

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 Were all samples associated with a given method blank?
 (N) N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: ug/kg Associated Samples: MB = All Soils, CCB1 = 1-3, CCB2 = 4-8, CCB3 = 9-11 (NO₂ > RL)

Analyte	Blank ID	Maximum ICB/QCB <u>ug/g</u>	Blank Action Limit	Sample Identification																				
CL	MB																							
0-P04-P	0.34 3.5																							
0-P04-P		0.366																						
0-P04-P		0.152																						
0-P04-P		0.146																						

CCB1
 CCB2
 CCB3

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".

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

METHOD: Inorganics, EPA Method See over

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

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

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

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	1814	soil	o + g	68	59		All soil	J-WJ/A

Comments:

LDC #: 18100A6
SDG #: TRK-K-D-

VALIDATION FINDINGS WORKSHEET
Matrix Spike Analysis

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

METHOD: Inorganics, Method See com

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Was a matrix spike analyzed for each matrix in this SDG?
 Y N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125 (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	13	Soil	NO ₃ -N	72	All Soil	J-INT/A
			NO ₂ -N	170		J-INT/A
			SO ₄	64		J-INT/A

Comments:

LDC#: 18100A6
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	3	4				
Bromide	0.065U	0.85		0.785	(≤ 2.6)	
Bromine	0.13U	1.7		1.57	(≤ 5.2)	
Chloride	245	371	41			
Chlorine	491	741	41			
Nitrate as N	9.9	11.1	11			
Perchlorate (ug/Kg)	1110	821	30			
Sulfate	1390	583	82			J det / A

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 12, 2007
LDC Report Date: January 22, 2008
Matrix: Soil
Parameters: Wet Chemistry
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD
TSB-CR-01-0'DUP

**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 Method 300.0 for Bromide, Bromine, Chlorate, Chloride, Chlorine, 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method.

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	Concentration	Associated Samples
MB	Orthophosphate as P	2.9 mg/Kg	All samples in SDG TRNC-D-2
ICB/CCB	Orthophosphate as P	0.284 mg/L	All samples in SDG TRNC-D-2

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

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-CR-01-0'MS (All samples in SDG TRNC-D-2)	Nitrite as N	174 (75-125)	-	-	J+ (all detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-CR-01-0'MS (All samples in SDG TRNC-D-2)	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 with the following exceptions:

DUP ID (Associated Samples)	Analyte	Difference (Limits)	Flag	A or P
TSB-CR-01-0'DUP (All samples in SDG TRNC-D-2)	Chlorate	11.9 mg/Kg (≤ 5.1)	J (all detects) UJ (all non-detects)	A

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-CJ-01-0'*** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0'***	TSB-CJ-01-0'-FD**				
Chloride	164 mg/Kg	223 mg/Kg	30 (≤ 50)	-	-	-
Chlorine	327 mg/Kg	446 mg/Kg	31 (≤ 50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-01-0***	TSB-CJ-01-0'-FD**				
Nitrate as N	3.1 mg/Kg	3.7 mg/Kg	18 (≤ 50)	-	-	-
Perchlorate	395 ug/Kg	268 ug/Kg	38 (≤ 50)	-	-	-
Sulfate	357 mg/Kg	1090 mg/Kg	101 (≤ 50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
Chloride	1.8 mg/Kg	7.5 mg/Kg	-	5.7 (≤ 2.0)	J (all detects)	A
Chlorine	3.5 mg/Kg	15.1 mg/Kg	-	11.6 (≤ 4.1)	J (all detects)	A
Nitrate as N	0.52 mg/Kg	0.63 mg/Kg	-	0.11 (≤ 0.20)	-	-
Perchlorate	33.3 ug/Kg	88.0 ug/Kg	-	54.7 (≤ 40.9)	J (all detects)	A
Sulfate	5.4 mg/Kg	6.6 mg/Kg	-	1.2 (≤ 5.1)	-	-

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-2**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Nitrite as N	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Oil & grease	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-02-10'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CJ-01-0'-FD** TSB-CR-02-0'*** TSB-CR-02-10' TSB-CR-01-0' TSB-CR-01-10' TSB-CR-03-0' TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	Chlorate	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (Difference)
TRNC-D-2	TSB-CJ-01-0'*** TSB-CJ-01-0'-FD**	Sulfate	J (all detects)	A	Field duplicates (RPD)

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	Chloride Chlorine Perchlorate	J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G

Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B6
 SDG #: TRNC-D-2
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 1/16/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate, Nitrite, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method ~~7091B~~ 9071)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>11/12/07</u>
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	
V	Duplicates	SW	
VI.	Laboratory control samples	A	<u>UCS/UCSD</u>
VII.	Sample result verification	A	Not reviewed for Level III validation.
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	<u>(3,5), (14,15)</u>
X	Field blanks	N	

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

Validated Samples: ** Indicates sample underwent Level IV validation

1	TSB-CJ-02-0***	11	TSB-CR-03-10'	21		31	
2	TSB-CJ-02-10***	12	TSB-CJ-05-0'	22		32	
3	TSB-CJ-01-0***	13	TSB-CJ-05-10'	23		33	
4	TSB-CJ-01-10***	14	TSB-CJ-06-0'	24		34	
5	TSB-CJ-01-0'-FD**	15	TSB-CJ-06-0'-FD	25		35	
6	TSB-CR-02-0***	16	TSB-CJ-06-10'	26		36	
7	TSB-CR-02-10'	17	TSB-CR-01-0'MS	27		37	
8	TSB-CR-01-0'	18	TSB-CR-01-0'MSD	28		38	
9	TSB-CR-01-10'	19	TSB-CR-01-0'DUP	29		39	
10	TSB-CR-03-0'	20	<u>MB</u>	30		40	

Notes: _____

LDC #: 18/00136
 SDG #: TP/C-0

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: hm
 2nd Reviewer: g

Method: Inorganics (EPA Method see over)

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 analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

LDC #: 18100BB
 SDG #: TRNC-0-2

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: MM
 2nd Reviewer: J

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 Duplicate Pairs				
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#: 18100B6
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics, Method: See Cover

Y N NA
 Y N NA

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

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	3	5				
Chloride	164	223	30			
Chlorine	327	446	31			
Nitrate as N	3.1	3.7	18			
Perchlorate (ug/Kg)	395	268	38			
Sulfate	357	1090	101			J det / A

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	14	15				
Chloride	1.8	7.5		5.7	(≤ 2.0)	J det / A
Chlorine	3.5	15.1		11.6	(≤ 4.1)	J det / A
Nitrate as N	0.52	0.63		0.11	(≤ 0.20)	
Perchlorate (ug/Kg)	33.3	88.0		54.7	(≤ 40.9)	J det / A
Sulfate	5.4	6.6		1.2	(≤ 5.1)	

LDC #: 18100B6
 SDG #: TRUC-9-2

Validatin Findings Worksheet
Initial and Continuing Calibration Calculation Verification

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

Method: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of F was recalculated. Calibration date: 11/26/07

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

$\%R = \frac{\text{Found} \times 100}{\text{True}}$ Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
 True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (ug/L)	Area	Recalculated		Reported		Acceptable (Y/N)
					r or r ²	r or r ²			
Initial calibration	F	s1	0	0	0.9998834	0.999930			Y
		s2	100	0.023					
		s3	250	0.054					
		s4	500	0.122					
		s5	1250	0.31					
		s6	2500	0.631					
Calibration verification	S04	8	7.675		95.94	95.94		Y	
Calibration verification	0-P04-P	8	8-620		107.95	107.75		Y	
Calibration verification	U04	100	104.3		104	102		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 #: 1810036
 SDG #: TRNG-2

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
 Reviewer: mmj
 2nd Reviewer: SR

METHOD: Inorganics, Method See notes

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

$\%R = \frac{\text{Found}}{\text{True}} \times 100$ Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, 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		Acceptable (Y/N)
					%R / RPD	%R / RPD	
15	Laboratory control sample	OTG	1257	1330	95	94	Y
17	Matrix spike sample	004	487 (SSR-SR)	510	96	96	Y
19	Duplicate sample	00	46.58	43.74	6.3	6.3	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 #: 1810B6
 SDG #: TRNC-D-V

VALIDATION FINDINGS WORKSHEET
 Sample Calculation Verification

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

METHOD: Inorganics, Method See com

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 1 reported with a positive detect were recalculated and verified using the following equation:

Concentration =

Recalculation:

$$NO_3-N = \frac{Area}{0.000462}$$

$$NO_3-N = \frac{0.295 \times 40ml}{0.9459 \times 4g \times 0.000462} = 6.752 \frac{ug}{kg}$$

#	Sample ID	Analyte	Reported Concentration (ug/g)	Calculated Concentration (ug/kg)	Acceptable (Y/N)
1	1	Cl	268	268	Y
		Cl ₂	536	536	Y
		NO ₃ -N	6.8	6.8	Y
		CO ₄ (ug/L)	504	504	Y
		SO ₄	1160	1160	Y

Note: _____

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 13, 2007
LDC Report Date: January 18, 2008
Matrix: Soil/Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'	TSB-DR-03-0'DUP
TSB-DR-06-10'	RINSATE-2MS
TSB-DR-05-0'	RINSATE-2DUP
TSB-DR-05-0'-FD	
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	
RINSATE-2	
TSB-DR-03-0'MS	
TSB-DR-03-0'MSD	

Introduction

This data review covers 20 soil samples and 3 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, Chlorine, 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.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
RINSATE-2	Nitrite as N Nitrate as N Orthophosphate	51.25 hours 51.25 hours 51.25 hours	48 hours 48 hours 48 hours	J- (all detects) UJ (all non-detects)	P
RINSATE-2MS RINSATE-2DUP	Nitrite as N Nitrate as N Orthophosphate	51.5 hours 51.5 hours 51.5 hours	48 hours 48 hours 48 hours	J- (all detects) UJ (all non-detects)	P

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

II. 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.

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	Concentration	Associated Samples
MB	Orthophosphate as P	2.4 mg/Kg	All soil samples in SDG TRNC-D-3
ICB/CCB	Orthophosphate as P	0.252 mg/L	All soil samples in SDG TRNC-D-3
ICB/CCB	Chloride	0.113 mg/L	TSB-DR-06-10' TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-10' TSB-DR-04-10' TSB-CR-04-10'

Method Blank ID	Analyte	Concentration	Associated Samples
MB	Orthophosphate as P	1.1 mg/L	All water samples in SDG TRNC-D-3
ICB/CCB	Orthophosphate as P	1.05 mg/L	All water samples in SDG TRNC-D-3

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-DR-03-10'	Orthophosphate as P	4.5 mg/Kg	5.3U mg/Kg
RINSATE-2	Orthophosphate as P	0.47 mg/L	0.50U mg/L

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	11/13/07	Orthophosphate as P	0.47 mg/L	All soil samples in SDG TRNC-D-3

Sample concentrations were compared to concentrations detected in the field blank as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-DR-03-10'	Orthophosphate as P	4.5 mg/Kg	5.3U 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)	Flag	A or P
TSB-DR-03-0'MS (All soil samples in SDG TRNC-D-3)	Chlorate	74 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A
	Oil & grease	61 (75-125)	-	-	J- (all detects) UJ (all non-detects)	
TSB-DR-03-0'MS (All soil samples in SDG TRNC-D-3)	Nitrite as N	0 (75-125)	-	-	J- (all detects) R (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-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Chloride	9.9 mg/Kg	6.7 mg/Kg	39 (≤ 50)	-	-	-
Chlorine	19.8 mg/Kg	13.4 mg/Kg	39 (≤ 50)	-	-	-
Nitrate as N	0.96 mg/Kg	2.9 mg/Kg	-	1.94 (≤ 0.20)	J (all detects)	A
Perchlorate	1470 ug/Kg	633 ug/Kg	80 (≤ 50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
Sulfate	233 mg/Kg	8.9 mg/Kg	-	224.1 (≤ 5.0)	J (all detects)	A

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-3**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-3	RINSATE-2	Nitrite as N Nitrate as N Orthophosphate	J- (all detects) UJ (all non-detects)	P	Technical holding times
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Chlorate Oil & grease	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-3	TSB-DR-06-0' TSB-DR-06-10' TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DR-05-10' TSB-DR-03-0' TSB-DR-03-10' TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-10' TSB-CR-06-0' TSB-CR-06-10'	Nitrite as N	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD	Perchlorate	J (all detects)	A	Field duplicates (RPD)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD	Nitrate as N Sulfate	J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-03-10'	Orthophosphate as P	5.3U mg/Kg	A
TRNC-D-3	RINSATE-2	Orthophosphate as P	0.50U mg/L	A

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-3

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-3	TSB-DR-03-10'	Orthophosphate as P	5.3U mg/Kg	A

LDC #: 18100C6
 SDG #: TRNC-D-3
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/17/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/13/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV.	Matrix Spike/Matrix Spike Duplicates	SW	3ms/msd/avg
V.	Duplicates	A	
VI.	Laboratory control samples	A	Leg/USD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(3,4)
X.	Field blanks	SW	R=18

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

Validated Samples: All soil except # 18, 22, 23 A2

1	TSB-DR-06-0'	11	TSB-DR-04-10'	21	TSB-DR-03-0'DUP	31	
2	TSB-DR-06-10'	12	TSB-CR-04-0'	22	RINSTATE-2MS	32	
3	TSB-DR-05-0'	13	TSB-CR-04-10'	23	RINSTATE-2DUP	33	
4	TSB-DR-05-0'-FD	14	TSB-CR-05-0'	24	MB	34	
5	TSB-DR-05-10'	15	TSB-CR-05-10'	25		35	
6	TSB-DR-03-0'	16	TSB-CR-06-0'	26		36	
7	TSB-DR-03-10'	17	TSB-CR-06-10'	27		37	
8	TSB-DJ-01-0'	18	RINSTATE-2	28		38	
9	TSB-DJ-01-10'	19	TSB-DR-03-0'MS	29		39	
10	TSB-DR-04-0'	20	TSB-DR-03-0'MSD	30		40	

Notes: _____

LDC #: 18/03 cb
 SDG #: TRAC-9-3

VALIDATION FINDINGS WORKSHEET
 Field Blanks

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

METHOD: Inorganics, EPA Method See com
 N/A Were field blanks identified in this SDG?
 N/A Were target analytes detected in the field blanks?
 Blank units: mg/kg Associated sample units: mg/kg
 Sampling date: 1/13/07 Soil factor applied:
 Field blank type: (circle one) Field Blank / Rinsate / Other: AM soil

Analyte	Blank ID	Blank Action Limit	Sample Identification																	
0.104-p	18	0.47	7																	
			4.5/5.3																	



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#: 18100C6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 
2nd Reviewer: 

Inorganics, Method: See Cover

- N NA Were field duplicate pairs identified in this SDG?
- 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	9.9	6.7	39			
Chlorine	19.8	13.4	39			
Nitrate as N	0.96	2.9		1.94	(≤ 0.20)	J det / A
Perchlorate (ug/Kg)	1470	633	80			J det / A
Sulfate	233	8.9		224.1	(≤ 5.0)	J det / A

V:\FIELD DUPLICATES\FD_inorganic18100C6.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 14, 2007
LDC Report Date: January 18, 2008
Matrix: Soil
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW DITCH01-0'
JB-NW DITCH01-10'
TSB-FR-01-0'MS
TSB-FR-01-0'MSD
TSB-FR-01-0'DUP

Introduction

This data review covers 19 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate as Phosphorus, and Sulfate, 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.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

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	Concentration	Associated Samples
MB	Orthophosphate as P	1.8 mg/Kg	All samples in SDG TRNC-D-4
ICB/CCB	Orthophosphate as P	0.342 mg/L	All samples in SDG TRNC-D-4
ICB/CCB	Chloride	0.031 mg/L	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-10'

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-DR-01-0'	Orthophosphate as P	4.5 mg/Kg	5.1U mg/Kg

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-FR-01-0'MS (All samples in SDG TRNC-D-4)	Nitrate as N Sulfate	233 (75-125) 135 (75-125)	- -	- -	J+ (all detects) J+ (all detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

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

VII. Sample Result Verification

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-FJ-06-0' and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Chlorate	32.3 mg/Kg	41.0 mg/Kg	24 (≤50)	-	-	-
Chloride	1790 mg/Kg	2630 mg/Kg	38 (≤50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
Chlorine	3580 mg/Kg	5260 mg/Kg	38 (≤ 50)	-	-	-
Fluoride	1.1 mg/Kg	0.44 mg/Kg	-	0.66 (≤ 1.0)	-	-
Nitrate as N	57.4 mg/Kg	95.2 mg/Kg	50 (≤ 50)	-	-	-
Perchlorate	168000 ug/Kg	9990 ug/Kg	178 (≤ 50)	-	J (all detects)	A
Sulfate	150 mg/Kg	553 mg/Kg	115 (≤ 50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
Chloride	25.7 mg/Kg	23.1 mg/Kg	11 (≤ 50)	-	-	-
Chlorine	51.4 mg/Kg	46.2 mg/Kg	11 (≤ 50)	-	-	-
Nitrate as N	1.2 mg/Kg	1.0 mg/Kg	18 (≤ 50)	-	-	-
Perchlorate	92.1 ug/Kg	40.0 ug/Kg	-	52.1 (≤ 80.7)	-	-
Sulfate	165 mg/Kg	99.8 mg/Kg	49 (≤ 50)	-	-	-

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-4**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FR-01-10' TSB-FJ-07-0' TSB-FJ-07-10' TSB-FJ-06-0' TSB-FJ-06-0'-FD TSB-FJ-06-10' TSB-FJ-05-0' TSB-FJ-05-10' TSB-DR-01-0' TSB-DR-01-10' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW DITCH01-0' JB-NW DITCH01-10'	Nitrate as N Sulfate	J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	Perchlorate Sulfate	J (all detects) J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4**

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-4	TSB-DR-01-0'	Orthophosphate as P	5.1U mg/Kg	A

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-4**

No Sample Data Qualified in this SDG

LDC #: 18100D6
 SDG #: TRNC-D-4
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/17/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/14/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV.	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD/MSD
V.	Duplicates	A	
VI.	Laboratory control samples	A	LS/LSO
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(5,6) (12,14)
X.	Field blanks	N	

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

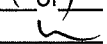

Validated Samples: Soil

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21		31	
2	TSB-FR-01-10'	12	TSB-DR-02-0'	22		32	
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33	
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD	24		34	
5	TSB-FJ-06-0'	15	JB-NW DITCH01-0'	25		35	
6	TSB-FJ-06-0'-FD	16	JB-NW DITCH01-10'	26		36	
7	TSB-FJ-06-10'	17	TSB-FR-01-0'MS	27		37	
8	TSB-FJ-05-0'	18	TSB-FR-01-0'MSD	28		38	
9	TSB-FJ-05-10'	19	TSB-FR-01-0'DUP	29		39	
10	TSB-DR-01-0'	20	MB	30		40	

Notes: _____

LDC#: 18100D6
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: 
 2nd Reviewer: 

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	5	6				
Chlorate	32.3	41.0	24			
Chloride	1790	2630	38			
Chlorine	3580	5260	38			
Fluoride	1.1	0.44		0.66	(≤ 1.0)	
Nitrate as N	57.4	95.2	50			
Perchlorate (ug/Kg)	168000	9990	178			J det / A
Sulfate	150	553	115			J det / A

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	12	14				
Chloride	25.7	23.1	11			
Chlorine	51.4	46.2	11			
Nitrate as N	1.2	1.0	18			
Perchlorate (ug/Kg)	92.1	40.0		52.1	(≤ 80.7)	
Sulfate	165	99.8	49			

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 15, 2007
LDC Report Date: January 21, 2008
Matrix: Soil/Water
Parameters: Wet Chemistry
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**	RINSATE-3MS
TSB-FJ-03-0'-FD**	RINSATE-3DUP
TSB-FJ-03-10'**	
TSB-FJ-10-0'**	
TSB-FJ-10-10'**	
TSB-FJ-04-0'**	
TSB-FJ-04-10'**	
TSB-FJ-02-0'**	
TSB-FJ-02-0'-FD**	
TSB-FJ-02-10'**	
TSB-FR-02-0'**	
TSB-FR-02-10'**	
TSB-FJ-09-0'**	
TSB-FJ-09-10'**	
TSB-FR-03-0'**	
TSB-FR-03-10'**	
RINSATE-3	
TSB-FR-02-0'MS	
TSB-FR-02-0'MSD	
TSB-FR-02-0'DUP	

**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 Method 300.0 for Bromide, Bromine, Chlorate, Chloride, Chlorine, 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

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

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
11/16/07	CCV	Orthophosphate as P	113.0 (90-110)	All water samples in SDG TRNC-D-5	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	Concentration	Associated Samples
MB	Orthophosphate as P	1.1 mg/L	All water samples in SDG TRNC-D-5
ICB/CCB	Orthophosphate as P	1.525 mg/L	All water samples in SDG TRNC-D-5
ICB/CCB	Orthophosphate as P	0.309 mg/Kg	All soil samples in SDG TRNC-D-5

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

Sample RINSATE-3 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-3	11/15/07	Fluoride	0.11 mg/L	All samples in SDG TRNC-D-5

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-FJ-03-10'***	Fluoride	1.1 mg/Kg	1.1J+ mg/Kg
TSB-FJ-10-0'***	Fluoride	0.58 mg/Kg	1.1U mg/Kg
TSB-FJ-02-0'***	Fluoride	0.76 mg/Kg	1.1U mg/Kg
TSB-FJ-02-0'-FD**	Fluoride	0.92 mg/Kg	1.0U mg/Kg
TSB-FJ-02-10'***	Fluoride	0.28 mg/Kg	1.1U mg/Kg
TSB-FR-02-0'***	Fluoride	0.90 mg/Kg	1.0U mg/Kg
TSB-FR-02-10'***	Fluoride	1.9 mg/Kg	1.9J+ mg/Kg
TSB-FJ-09-0'***	Fluoride	2.4 mg/Kg	2.4J+ mg/Kg
TSB-FR-03-0'***	Fluoride	0.42 mg/Kg	1.0U 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)	Flag	A or P
RINSATE-3MS (All water samples in SDG TRNC-D-5)	Orthophosphate as P	136 (75-125)	-	-	J+ (all detects)	A
TSB-FR-02-0'MS (All soil samples in SDG TRNC-D-5)	Nitrite as N	0 (75-125)	-	-	J- (all detects) R (all non-detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-FR-02-0'MS (All soil samples in SDG TRNC-D-5)	Oil & grease	43 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A
	Sulfate	61 (75-125)	-	-	J- (all detects) UJ (all non-detects)	

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-FJ-03-0'*** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'*** and TSB-FJ-02-0'-FD** were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0'***	TSB-FJ-03-0'-FD**				
Chlorate	3.8 mg/Kg	8.2 mg/Kg	-	4.4 (≤ 5.3)	-	-
Chloride	318 mg/Kg	491 mg/Kg	43 (≤ 50)	-	-	-
Chlorine	637 mg/Kg	981 mg/Kg	43 (≤ 50)	-	-	-
Nitrate as N	10.2 mg/Kg	15.4 mg/Kg	41 (≤ 50)	-	-	-
Perchlorate	36500 ug/Kg	226 ug/Kg	198 (≤ 50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0***	TSB-FJ-03-0'-FD**				
Sulfate	600 mg/Kg	904 mg/Kg	40 (≤ 50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-02-0***	TSB-FJ-02-0'-FD**				
Chlorate	119 mg/Kg	166 mg/Kg	33 (≤ 50)	-	-	-
Chloride	2840 mg/Kg	3270 mg/Kg	14 (≤ 50)	-	-	-
Chlorine	5670 mg/Kg	6540 mg/Kg	14 (≤ 50)	-	-	-
Fluoride	0.73 mg/Kg	0.92 mg/Kg	-	0.19 (≤ 1.0)		-
Nitrate as N	133 mg/Kg	184 mg/Kg	32 (≤ 50)	-	-	-
Perchlorate	107000 ug/Kg	3000 ug/Kg	189 (≤ 50)	-	J (all detects)	A
Sulfate	101 mg/Kg	114 mg/Kg	12 (≤ 50)	-	-	-

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-5**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-5	RINSATE-3	Orthophosphate as P	J+ (all detects)	P	Calibration (CCV %R)
TRNC-D-5	RINSATE-3	Orthophosphate as P	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-0'*** TSB-FR-02-10'*** TSB-FJ-09-0'*** TSB-FJ-09-10'*** TSB-FR-03-0'*** TSB-FR-03-10'***	Nitrite as N	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-03-10'*** TSB-FJ-10-0'*** TSB-FJ-10-10'*** TSB-FJ-04-0'*** TSB-FJ-04-10'*** TSB-FJ-02-0'*** TSB-FJ-02-0'-FD** TSB-FJ-02-10'*** TSB-FR-02-0'*** TSB-FR-02-10'*** TSB-FJ-09-0'*** TSB-FJ-09-10'*** TSB-FR-03-0'*** TSB-FR-03-10'***	Oil & grease Sulfate	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'-FD** TSB-FJ-02-0'*** TSB-FJ-02-0'-FD**	Perchlorate	J (all detects) UJ (all non-detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-5

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-5	TSB-FJ-03-10'***	Fluoride	1.1J+ mg/Kg	A
TRNC-D-5	TSB-FJ-10-0'***	Fluoride	1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-02-0'***	Fluoride	1.1U mg/Kg	A
TRNC-D-5	TSB-FJ-02-0'-FD**	Fluoride	1.0U mg/Kg	A
TRNC-D-5	TSB-FJ-02-10'***	Fluoride	1.1U mg/Kg	A
TRNC-D-5	TSB-FR-02-0'***	Fluoride	1.0U mg/Kg	A
TRNC-D-5	TSB-FR-02-10'***	Fluoride	1.9J+ mg/Kg	A
TRNC-D-5	TSB-FJ-09-0'***	Fluoride	2.4J+ mg/Kg	A
TRNC-D-5	TSB-FR-03-0'***	Fluoride	1.0U mg/Kg	A

LDC #: 18100E6
 SDG #: TRNC-D-5
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III/IV

Date: 1/21/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/15/07 11/15/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	SW	
III.	Blanks	SW	
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	(1,2) (8,9)
X	Field blanks	SW	R=17

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

Validated Samples: ** Indicates sample underwent Level IV validation

A1 soil event # 17. 21. 22 A2

1	TSB-FJ-03-0**	11	TSB-FR-02-0**	21	RINSATE-3MS A2	31	
2	TSB-FJ-03-0'-FD**	12	TSB-FR-02-10**	22	RINSATE-3DUP ↓	32	
3	TSB-FJ-03-10**	13	TSB-FJ-09-0**	23	MB	33	
4	TSB-FJ-10-0**	14	TSB-FJ-09-10**	24		34	
5	TSB-FJ-10-10**	15	TSB-FR-03-0**	25		35	
6	TSB-FJ-04-0**	16	TSB-FR-03-10**	26		36	
7	TSB-FJ-04-10**	17	RINSATE-3 A2	27		37	
8	TSB-FJ-02-0**	18	TSB-FR-02-0'MS	28		38	
9	TSB-FJ-02-0'-FD**	19	TSB-FR-02-0'MSD	29		39	
10	TSB-FJ-02-10**	20	TSB-FR-02-0'DUP	30		40	

Notes: _____

LDC #: 1810026
 SDG #: TRAC-0-5

VALIDATION FINDINGS CHECKLIST

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

Method: Inorganics (EPA Method *See copy*)

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?	W	/		
Were titrant checks performed as required? (Level IV only)			/	
Were balance checks performed as required? (Level IV only)	/			
III. Blank				
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 MSD/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		/		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL (≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were < 5X the CRDL.	/			
V. Laboratory Control Samples				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

LDC #: 1810026
 SDG #: TRUC-V5

VALIDATION FINDINGS CHECKLIST

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

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field Duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
X. Field Blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✓			

LDC #: 181036
 SDG #: 1246-25

VALIDATION FINDINGS WORKSHEET

Blanks

Page: 1 of 2
 Reviewer: MH
 2nd Reviewer: R

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were all samples associated with a given method blank?
 N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: WSPV Associated Samples: A11 A2 (Np)

Analyte	Blank ID	Maximum ICB/CCB WSPV	Blank Action Limit	Sample Identification												
0-204-P	M12	15ms	125ms 11ms													

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 #: 6810026
 SDG #: TRJ681-5

VALIDATION FINDINGS WORKSHEET

Blanks

Page: 2 of 2
 Reviewer: MM
 2nd Reviewer: A

METHOD: Inorganics, Method See com

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were all samples associated with a given method blank?
 N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/L Associated Samples: All Sai (No or 70L)

Analyte	Blank ID	Maximum ICB/CCB <u>mg/L</u>	Blank Action Limit	Sample Identification																
<u>0-104-9</u>		<u>0.309</u>																		

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 #: 1810026
 SDG #: TRNLDS

VALIDATION FINDINGS WORKSHEET
 Field Blanks

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

METHOD: Inorganics, EPA Method See com
 Were field blanks identified in this SDG? Y
 Were target analytes detected in the field blanks? N
 Blank units: wf/v Associated sample units: wf/v
 Sampling date: 11/15/07 Soil factor applied: 10x
 Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: All Sor 1

Analyte	Blank ID	Blank Action Limit	Sample Identification														
			3	4	8	9	10	11	12	13	15						
F	0.11	11	1.15+	0.58/1.1	0.76/1.1	0.92/1.0	0.28/1.1	0.90/1.0	1.9J+	2.4J+	0.42/1.0						

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 #: 1810026

SDG #: T-RAC-1-S

VALIDATION FINDINGS WORKSHEET Matrix Spike Analysis

Page: (of)
Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: Inorganics, Method See com

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	21	Ar	O-PO4-P	136	Ar Ar	J+LT/A
2	18	Soil	NO3-N O+G SO4	0 43 61	Ar Soil ↓	U-IP/A JF-MJ/A ↓

Comments: U, NO3-N 7 4X

LDC#: 18100E6
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: 
 2nd Reviewer: 

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	1	2				
Chlorate	3.8	8.2		4.4	(≤ 5.3)	
Chloride	318	491	43			
Chlorine	637	981	43			
Nitrate as N	10.2	15.4	41			
Perchlorate (ug/Kg)	36500	226	198			J det / A
Sulfate	600	904	40			

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	8	9				
Chlorate	119	166	33			
Chloride	2840	3270	14			
Chlorine	5670	6540	14			
Fluoride	0.73	0.92		0.19	(≤ 1.0)	
Nitrate as N	133	184	32			
Perchlorate (ug/Kg)	107000	3000	189			J det / A
Sulfate	101	114	12			

LDC #: 1810021

SDG #: F111111

Validatin Findings Worksheet

Initial and Continuing Calibration Calculation Verification

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

Method: Inorganics, Method See curve

The correlation coefficient (r) for the calibration of 204 was recalculated. Calibration date: 11/16/07

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		Reported		Acceptable (Y/N)
					r or r ²	r or r ²			
Initial calibration	SO4	s1	500	0.079	0.9997967	0.999770			Y
		s2	2000	0.291					
		s3	4000	0.604					
		s4	10000	1.538					
		s5	20000	3.21					
Calibration verification	Chloride	4.0	4.196		104.9	NR		Y	
Calibration verification	NO4-N	8.0	8.326		104.05	104.07		Y	
Calibration verification	NO4	10.0	99.907		99.9	NR		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 #: 1810066
 SDG #: RNLV-5

VALIDATION FINDINGS WORKSHEET
 Level IV Recalculation Worksheet

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

METHOD: Inorganics, Method See column

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

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

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

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

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated		Reported		Acceptable (Y/N)
					%R / RPD	%R / RPD	%R / RPD	%R / RPD	
LCS	Laboratory control sample	06g	1253	1330	94	94	94	94	Y
LS	Matrix spike sample	004	107887 (SSR-SR)	102000	106	105	105	105	Y
DP	Duplicate sample	103-N	41.8	39.6	506	506	506	506	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 #: 1810026
 SDG #: TRNC-15

VALIDATION FINDINGS WORKSHEET
 Sample Calculation Verification

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

METHOD: Inorganics, Method See con

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

- N N/A Have results been reported and calculated correctly?
- N N/A Are results within the calibrated range of the instruments?
- N N/A Are all detection limits below the CRQL?

Compound (analyte) results for 1, 11 reported with a positive detect were recalculated and verified using the following equation:

Concentration =

Recalculation:

$$\#1. NO_3-N = \frac{0.451 \times 40 \text{ ml}}{0.000462 \times 49 \times 0.958} = 102 \text{ } \cancel{\mu\text{g}}/\text{mg} = 10.2 \text{ } \cancel{\mu\text{g}}/\text{mg}$$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	1	chlorte	3.8	3.8	Y
		cl	318	319	Y
		cl ✓	637	638	Y
		NO ₃ -N	10.2	10.2	Y
		CO ₄ (mg/L)	36500	36500	Y
		SO ₄	600	600	Y
2	11	chlorte	31.0	31.0	Y
		cl	1430	1430	Y
		cl ✓	2870	2870	Y
		F	0.90	0.90	Y
		NO ₃ -N	39.6	39.6	Y
		CO ₄ (mg/L)	59800	59800	Y
		SO ₄	55.5	55.5	Y

Note:

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 16, 2007
LDC Report Date: January 18, 2008
Matrix: Soil/Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0' RINSATE-4DUP
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-10'
TSB-FJ-01-0'
TSB-FJ-01-10'
TSB-GR-01-0'
TSB-GR-01-5'
TSB-GJ-06-0'
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD
TSB-FJ-01-0'DUP
RINSATE-4MS

Introduction

This data review covers 18 soil samples and 3 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, Chlorine, 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.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

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

Date	Lab. Reference/ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
11/17/07	CCV (14:57)	Orthophosphate as P	117.6 (90-110)	All water samples in SDG TRNC-D-6	J+ (all detects)	P
11/17/07	CCV (15:59)	Orthophosphate as P	115.8 (90-110)	All water samples in SDG TRNC-D-6	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	Concentration	Associated Samples
MB	Orthophosphate as P	1.3 mg/L	All water samples in SDG TRNC-D-6
ICB/CCB	Orthophosphate as P	0.948 mg/L	All water samples in SDG TRNC-D-6
MB	Orthophosphate as P	3.2 mg/Kg	All soil samples in SDG TRNC-D-6
ICB/CCB	Orthophosphate as P	0.338 mg/L	All soil samples in SDG TRNC-D-6

Method Blank ID	Analyte	Concentration	Associated Samples
ICB/CCB	Chloride	0.070 mg/L	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-04-0' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'
ICB/CCB	Perchlorate	0.485 ug/L	TSB-FJ-08-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-GR-01-5' TSB-GJ-06-5' TSB-FJ-01-0'

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
TSB-FR-04-0'	Perchlorate	30.8 mg/Kg	41.5U mg/Kg
TSB-FR-04-0'-FD	Perchlorate	37.9 mg/Kg	43.2U mg/Kg

Sample RINSATE-4 was identified as a rinsate. No contaminant concentrations were found in this blank.

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
RINSATE-4MS (All water samples in SDG TRNC-D-6)	Orthophosphate as P	145 (75-125)	-	-	J+ (all detects)	A
TSB-FJ-01-0'MS (All soil samples in SDG TRNC-D-6)	Nitrite as N	0 (75-125)	-	-	J- (all detects) R (all non-detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
TSB-FJ-01-0'MS (All soil samples in SDG TRNC-D-6)	Orthophosphate as P	69 (75-125)	-	-	J- (all detects) UJ (all non-detects)	A
	Oil & grease	64 (75-125)	-	-	J- (all detects) UJ (all non-detects)	

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 with the following exceptions:

LCS ID	Analyte	%R (Limits)	Associated Samples	Flag	A or P
LCS	Orthophosphate as P	118 (90-110)	All water samples in SDG TRNC-D-6	J+ (all detects)	P

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-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Chlorate	38.2 mg/Kg	5.4U mg/Kg	-	32.8 (≤ 5.4)	J (all detects) UJ (all non-detects)	A
Chloride	302 mg/Kg	13.7 mg/Kg	183 (≤ 50)	-	J (all detects)	A

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Chlorine	604 mg/Kg	27.3 mg/Kg	183 (≤ 50)	-	J (all detects)	A
Fluoride	1.0 mg/Kg	0.27 mg/Kg	-	0.73 (≤ 1.1)	-	-
Nitrate as N	7.9 mg/Kg	0.74 mg/Kg	-	7.16 (≤ 0.22)	J (all detects)	A
Perchlorate	30.8 ug/Kg	37.9 ug/Kg	-	7.1 (≤ 43.2)	-	-
Sulfate	165 mg/Kg	14.8 mg/Kg	-	150.2 (≤ 5.4)	J (all detects)	A

**BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-6**

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-6	RINSATE-4	Orthophosphate as P	J+ (all detects)	P	Calibration (CCV %R)
TRNC-D-6	RINSATE-4	Orthophosphate as P	J+ (all detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Nitrite as N	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FJ-08-10' TSB-FR-05-0' TSB-FR-05-10' TSB-FR-04-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-0' TSB-GR-01-5' TSB-GJ-06-0' TSB-GJ-06-5' TSB-GJ-01-0' TSB-GJ-01-5'	Orthophosphate Oil & grease	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-6	RINSATE-4	Orthophosphate as P	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Chlorate	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Chloride Chlorine	J (all detects) J (all detects)	A	Field duplicates (RPD)
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Nitrate as N Sulfate	J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6

SDG	Sample	Analyte	Modified Final Concentration	A or P
TRNC-D-6	TSB-FR-04-0'	Perchlorate	41.5U mg/Kg	A
TRNC-D-6	TSB-FR-04-0'-FD	Perchlorate	43.2U mg/Kg	A

BRC Tronox Parcel C/D/F/G

Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-6

No Sample Data Qualified in this SDG

LDC #: 18100F6
 SDG #: TRNC-D-6
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/18/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/16/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	SW	
III.	Blanks	SW	
IV.	Matrix Spike/Matrix Spike Duplicates	SW	3 MS/MSD/MSD
V.	Duplicates	A	
VI.	Laboratory control samples	SW	MS/MSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(5,6)
X.	Field blanks	ND	R=16

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

Validated Samples: All Soil except # 20, 21 / 16 A2

1	TSB-FJ-08-0'	11	TSB-GR-01-5'	21	RINSATE-4DUP A2	31	
2	TSB-FJ-08-10'	12	TSB-GJ-06-0'	22	MS	32	
3	TSB-FR-05-0'	13	TSB-GJ-06-5'	23		33	
4	TSB-FR-05-10'	14	TSB-GJ-01-0'	24		34	
5	TSB-FR-04-0'	15	TSB-GJ-01-5'	25		35	
6	TSB-FR-07-0'-FD A	16	RINSATE-4 A2	26		36	
7	TSB-FR-04-10'	17	TSB-FJ-01-0'MS	27		37	
8	TSB-FJ-01-0'	18	TSB-FJ-01-0'MSD	28		38	
9	TSB-FJ-01-10'	19	TSB-FJ-01-0'DUP	29		39	
10	TSB-GR-01-0'	20	RINSATE-4MS A2	30		40	

Notes: _____

LDC #: 18100 Fb
 SDG #: TRUCED -b

VALIDATION FINDINGS WORKSHEET

Sample Specific Analysis Reference

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

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-16	soil / air	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
20.21	A	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
17.18	soil	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
19.19	↓	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		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: _____

VALIDATION FINDINGS WORKSHEET
Calibration

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

LEVEL (X/D) ONLY:
 Y N N/A
 Y N N/A
 Y N N/A

Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?
 Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110%?
 Are all correlation coefficients ≥ 0.995 ?
 Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.
 Was a balance check conducted prior to the TDS analysis?
 Was the titrant normality checked?

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualifications
1	11/17/07	cal (1457)	0-p04-p	117.6	A11 A2	↑ ↓
2	↓	ew (1559)	0-p04-p	115.8	↓	↓

Comments: _____

LDC #: 1810076
 SDG #: PA-11-0-6

VALIDATION FINDINGS WORKSHEET

Blanks

Page: 2 of 2
 Reviewer: MLY
 2nd Reviewer: S

METHOD: Inorganics, Method See cover

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

- ① N N/A Were all samples associated with a given method blank?
- ② N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/kg Associated Samples: 2-pkg 501, 502, 503, 504, 505 (NO > RL)

Analyte	Blank ID	Maximum ICB/CCB <u>mg/kg</u>	Blank Action Limit	Sample Identification	
	<u>MB</u>				
<u>0.004-P</u>	<u>3.2</u>	<u>0.338</u>			
<u>cl</u>		<u>0.070</u>			

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 #: 180016
 SDG #: 144-16

VALIDATION FINDINGS WORKSHEET Blanks

Page: 3 of 3
 Reviewer: MY
 2nd Reviewer: [Signature]

METHOD: Inorganics, Method See conc

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were all samples associated with a given method blank?
 N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: ug/kg Associated Samples: 2, 5, 6, 8, 11, 13, 18

Analyte	Blank ID	Maximum ICB/CGB	Blank Action Limit	Sample Identification																
				5	6	30.8/41.5	39.9/43.2													
004		0.485																		

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".

BLANKS.e

VALIDATION FINDINGS WORKSHEET Matrix Spike Analysis

LDC #: 18100 P6
SDG #: TRK-10-6

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

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A
 Y N/A
 Were a matrix spike analyzed for each matrix in this SDG?
 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	<u>20</u>	<u>AR</u>	<u>0-P04-P</u>	<u>145</u>	<u>All AS</u>	<u>JT/JT/A</u>
2	<u>17</u>	<u>sol</u>	<u>ce</u> <u>NO3-N</u> <u>NO3-N</u> <u>SO4</u>	<u>0</u> <u>0</u> <u>0</u> <u>0</u>	<u>All sol</u>	<u>J-JR/A (qual OK) (6-2)</u> <u>✓</u> <u>J-JR/A</u>
			<u>0-P04-P</u> <u>0+G</u>	<u>69</u> <u>64</u>	<u>✓</u>	<u>J-JR/A</u>

Comments: 2, NO3-N, SO4, 7 4X

LDC #: 1810076

SDG #: TRPC-06

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Was a laboratory control sample (LCS) analyzed for each matrix in this SDG?
 Y N/A Were all LCS percent recoveries (%R) within the control limits of 80-120% (85-115% for Method 800.0)?
 LEVEL IV ONLY:
 Y 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	0-104-p	118 (90-110)	A1, A2	JE + P

Comments: _____

LDC#: 18100F6
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	5	6				
Chlorate	38.2	5.4U		32.8	(≤ 5.4)	J / UJ / A
Chloride	302	13.7	183			J det / A
Chlorine	604	27.3	183			J det / A
Fluoride	1.0	0.27		0.73	(≤ 1.1)	
Nitrate as N	7.9	0.74		7.16	(≤ 0.22)	J det / A
Perchlorate (ug/Kg)	30.8	37.9		7.1	(≤ 43.2)	
Sulfate	165	14.8		150.2	(≤ 5.4)	J det / A

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 19, 2007
LDC Report Date: March 26, 2008
Matrix: Soil/Water
Parameters: Wet Chemistry
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD
TSB-GJ-04-0'DUP
RINSATE-5MS
RINSATE-5DUP

Introduction

This data review covers 17 soil samples and 3 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, Chlorine, 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.

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 with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
MB	Orthophosphate as P	0.22 mg/L	All water samples in SDG TRNC-D-7
ICB/CCB	Orthophosphate as P Chloride	0.353 mg/L 0.034 mg/L	All water samples in SDG TRNC-D-7
ICB/CCB	Orthophosphate as P	0.203 mg/L	TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'

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

Sample RINSATE-5 was identified as a rinsate. No contaminant concentrations were found in this blank.

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-GJ-04-0'MS (All soil samples in SDG TRNC-D-7)	Bromide	63 (75-125)	-	-	Bromide	J- (all detects)	A
	Chlorate	64 (75-125)	-	-	Bromine	UJ (all non-detects)	
	Oil & grease	59 (75-125)	-	-	Chlorate		
	Orthophosphate as P	71 (75-125)	-	-	Oil & grease Orthophosphate as P		
TSB-GJ-04-0'MS (All soil samples in SDG TRNC-D-7)	Nitrite as N	0 (75-125)	-	-	Nitrite as N	J- (all detects) R (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-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GR-02-0'	TSB-GR-02-0'-FD				
Chlorate	15.5 mg/Kg	13.8 mg/Kg	-	1.7 (≤ 5.3)	-	-
Chloride	1060 mg/Kg	863 mg/Kg	20 (≤ 50)	-	-	-
Chlorine	2120 mg/Kg	1730 mg/Kg	20 (≤ 50)	-	-	-
Nitrate as N	43.1 mg/Kg	36.1 mg/Kg	18 (≤ 50)	-	-	-
Perchlorate	3760 ug/Kg	13000 ug/Kg	110 (≤ 50)	-	J (all detects)	A
Sulfate	578 mg/Kg	399 mg/Kg	37 (≤ 50)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-GJ-02-0'	TSB-GJ-02-0'-FD				
Chloride	13.4 mg/Kg	3.6 mg/Kg	-	9.8 (≤ 2.1)	J (all detects)	A
Chlorine	26.8 mg/Kg	7.3 mg/Kg	-	19.5 (≤ 4.3)	J (all detects)	A
Fluoride	0.26U mg/Kg	0.75 mg/Kg	-	0.49 (≤ 1.1)	-	-
*Nitrate as N	1.7 mg/Kg	0.52 mg/Kg	-	1.18 (≤ 0.21)	J (all detects)	A
Perchlorate	779 ug/Kg	477 ug/Kg	48 (≤ 50)	-	-	-
Sulfate	79.8 mg/Kg	22.1 mg/Kg	-	57.7 (≤ 5.3)	J (all detects)	A

*Corrected the Difference (Limit) for Nitrate as N in the above table.

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Data Qualification Summary - SDG TRNC-D-7

SDG	Sample	Analyte	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Bromide Bromine Chlorate Oil & grease Orthophosphate as P	J- (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD TSB-GR-02-5' TSB-GJ-04-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-02-0'-FD TSB-GJ-02-5' TSB-GJ-07-0' TSB-GJ-07-5' TSB-GJ-05-0' TSB-GJ-05-5' TSB-GJ-03-0' TSB-GJ-03-5'	Nitrite as N	J- (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD	Perchlorate	J (all detects)	A	Field duplicates (RPD)
TRNC-D-7	TSB-GJ-02-0' TSB-GJ-02-0'-FD	Chloride Chlorine Nitrate as N Sulfate	J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (Difference)

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G
Wet Chemistry - Field Blank Data Qualification Summary - SDG TRNC-D-7

No Sample Data Qualified in this SDG

LDC #: 18100G6
 SDG #: TRNC-D-7
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/18/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: (Analyte) Bromide, Bromine, Chlorate, Chloride, Chlorine, Fluoride, Nitrate-N, Nitrite-N, Orthophosphate-P, Sulfate (EPA Method 300.0), Perchlorate (EPA Method 314.0), O & G (EPA SW846 Method 9071B)

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/19/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV.	Matrix Spike/Matrix Spike Duplicates	SW	3 MS / MSD / dup
V.	Duplicates	A	
VI.	Laboratory control samples	A	CS / CCS
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	SW	(1,2) (6,7)
X.	Field blanks	ND	R=15

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

Validated Samples: All soil event # 15, 19, 20 A2

1	TSB-GR-02-0'	11	TSB-GJ-05-0'	21	MVB	31	
2	TSB-GR-02-0'-FD	12	TSB-GJ-05-5'	22		32	
3	TSB-GR-02-5'	13	TSB-GJ-03-0'	23		33	
4	TSB-GJ-04-0'	14	TSB-GJ-03-5'	24		34	
5	TSB-GJ-04-5'	15	RINSATE-5	25	A	35	
6	TSB-GJ-02-0'	16	TSB-GJ-04-0'MS	26		36	
7	TSB-GJ-02-0'-FD	17	TSB-GJ-04-0'MSD	27		37	
8	TSB-GJ-02-5'	18	TSB-GJ-04-0'DUP	28		38	
9	TSB-GJ-07-0'	19	RINSATE-5MS	29	A	39	
10	TSB-GJ-07-5'	20	RINSATE-5DUP	30	J	40	

Notes: _____

LDC #: 1810096
 SDG #: TRNCD-7

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

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



All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-15	Soil/Air	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
1-14	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
19,20	Air	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
16,17	↓	Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		Br Bromine Cl Chlorine F NO ₃ NO ₂ SO ₄ O-PO ₄ Chlorate ClO ₄ O+G/TPH
		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#: 18100G6
 SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: 
 2nd Reviewer: 

Inorganics, Method: See Cover

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

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	1	2				
Chlorate	15.5	13.8		1.7	(≤ 5.3)	
Chloride	1060	863	20			
Chlorine	2120	1730	20			
Nitrate as N	43.1	36.1	18			
Perchlorate (ug/Kg)	3760	13000	110			J det / A
Sulfate	578	399	37			

Analyte	Concentration (mg/Kg)		RPD (≤ 50)	Difference	Limits	Qualification (Parent only)
	6	7				
Chloride	13.4	3.6		9.8	(≤ 2.1)	J det / A
Chlorine	26.8	7.3		19.5	(≤ 4.3)	J det / A
Fluoride	0.26U	0.75		0.49	(≤ 1.1)	
Nitrate as N	1.7	0.52		1.18	(≤ 0.25)	J det / A
Perchlorate (ug/Kg)	779	477	48			
Sulfate	79.8	22.1		57.7	(≤ 5.3)	J det / A

**BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100**

GRO

LDG

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 9, 2007
LDC Report Date: January 23, 2008
Matrix: Soil/Water
Parameters: Gasoline Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
RINSATE 1MS
RINSATE 1MSD

Introduction

This data review covers 13 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 a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

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

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

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

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

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

A Indicates the finding is based upon technical validation criteria.

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

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

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

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

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

b. Calibration Verification

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

The percent 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 1" 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.

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-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG
TRNC-D-1**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-
D-1**

No Sample Data Qualified in this SDG

LDC #: 18100A7
 SDG #: TRNC-D-1
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/21/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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: <u>11/09/07</u>
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	<u>LCS / D</u>
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	<u>D = 3, 4</u>
X.	Field blanks	ND	<u>R = 12</u>

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

Validated Samples:

Soil + Water

1	TSB-CR-07-0'	S	11	TSB-CJ-03-10'	S	21	7324075 MB	31
2	TSB-CR-07-10'		12	RINSATE 1	W	22	7327090 MB	32
3	TSB-CJ-08-0'		13	TSB-CR-07-0'MS	S	23	7325385 MB	33
4	TSB-CJ-08-0'-FD		14	TSB-CR-07-0'MSD		24		34
5	TSB-CJ-08-10'		15	RINSATE 1MS	W	25		35
6	TSB-CJ-04-0'		16	RINSATE 1MSD		26		36
7	TSB-CJ-04-10'		17			27		37
8	TSB-CJ-07-0'		18			28		38
9	TSB-CJ-07-10'		19			29		39
10	TSB-CJ-03-0'		20			30		40

Notes: _____

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

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 12, 2007
LDC Report Date: January 28, 2008
Matrix: Soil
Parameters: Gasoline Range Organics
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'**
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD
TSB-CR-03-0'MS
TSB-CR-03-0'MSD

**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 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.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

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

II. Calibration

a. Initial Calibration

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

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

b. Calibration Verification

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

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

III. Blanks

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

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

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

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-CJ-06-0'	a,a,a-Trifluorotoluene	48 (70-130)	Gasoline 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) and relative percent differences (RPD) 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-CJ-01-0'*** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

BRC Tronox Parcel C/D/F/G

Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-06-0'	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

BRC Tronox Parcel C/D/F/G

Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

BRC Tronox Parcel C/D/F/G

Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-2

No Sample Data Qualified in this SDG

LDC #: 18100B7
 SDG #: TRNC/D-2
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III/IV

Date: 1/21/08
 Page: bf 1
 Reviewer: SVL
 2nd Reviewer: [Signature]

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: 11/12/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS / D
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 ₁ = 3, 5 D ₂ = 14, 15
X.	Field blanks	N	

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

Validated Samples: ** Indicates sample underwent Level IV validation

Soil						
1	TSB-CJ-02-0**	11 ✓	TSB-CR-03-10'	21 /	7325385 MB	31
2	TSB-CJ-02-10**	12 ✓	TSB-CJ-05-0'	22 ✓	733107 MB	32
3	TSB-CJ-01-0** D ₁	13 ✓	TSB-CJ-05-10'	23		33
4	TSB-CJ-01-10**	14 ✓	TSB-CJ-06-0' D ₁	24		34
5 ✓	TSB-CJ-01-0'-FD** D ₁	15 ✓	TSB-CJ-06-0'-FD D ₁	25		35
6	TSB-CR-02-0**	16 ✓	TSB-CJ-06-10'	26		36
7	TSB-CR-02-10**	17 /	TSB-CR-01-0'MS	27		37
8 ✓	TSB-CR-01-0'	18 /	TSB-CR-01-0'MSD	28		38
9	TSB-CR-01-10'	19 ✓	TSB-CR-03-0'MS	29		39
10 ✓	TSB-CR-03-0'	20 ✓	TSB-CR-03-0'MSD	30		40

Notes: _____

LDC #: 18100 B7
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

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

Method: GC HPLC

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

LDC #: 18100 B7
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

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

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.			/	

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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		Recalculated		Reported		Recalculated	
				CF (1-00 std)	CF (1-00 std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD		
1	1CAL GCL	11/15/07	Gasoline	18310327	18310327	18426558	18426558	4.475	4.475	4.475	
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 #: 181 vs B7
 SDG #: See Conty

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

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

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 = $100 * (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ 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 (cal)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	LCAL 979B	11/21/07	Low Boiling HC (GRO)	1.000	0.985	1.5	0.985	1.5
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 #: 18100 17
 SDG #: See Cont

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

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

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: # |

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TFT	RTX-624	0.0400	0.03767	94	74	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	

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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, MS = Matrix spike
 RPD = $(((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD)) * 100$ Where SSC = Sample concentration, MSD = Matrix spike duplicate

MS/MSD samples: 19 / 20

Compound	Spike Added (ms/kg)		Sample Conc. (ms/kg)	Spike Sample Concentration (ms/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)	0.969	0.962	0	0.889	0.904	92	92	94	94	1.7	1.7
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.

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

METHOD: GC HPLC

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 SC = Concentration
 RPD = $1 LCS - LCSD \cdot 2 / (LCS + LCSD)$ SA = Spike added
 LCS = Laboratory control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7325385 LCS

Compound	Spike Added (mg/kg)		Spiked Sample Concentration (mg/kg)		LCS		LCSD		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		Percent Recovery		Percent Recovery		Reported	Recalc.
	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1.00	1.00	0.976	0.959	98	98	96	96	1.8	1.8				
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.

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 13, 2007
LDC Report Date: February 5, 2008
Matrix: Soil/Water
Parameters: Gasoline Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'	TSB-CR-04-0'
TSB-DR-06-0'RE	TSB-CR-04-0'RE
TSB-DR-06-10'	TSB-CR-04-10'
TSB-DR-05-0'	TSB-CR-04-10'RE
TSB-DR-05-0'RE	TSB-CR-05-0'
TSB-DR-05-0'-FD	TSB-CR-05-0'RE
TSB-DR-05-0'-FDRE	TSB-CR-05-10'
TSB-DR-05-10'	TSB-CR-05-10'RE
TSB-DR-05-10'RE	TSB-CR-06-0'
TSB-DR-03-0'	TSB-CR-06-10'
TSB-DR-03-10'	RINSATE-2
TSB-DR-03-10'RE	TSB-DR-03-0'MS
TSB-DJ-01-0'	TSB-DR-03-0'MSD
TSB-DJ-01-0'RE	
TSB-DJ-01-10'	
TSB-DJ-01-10'RE	
TSB-DR-04-0'	
TSB-DR-04-0'RE	
TSB-DR-04-10'	
TSB-DR-04-10'RE	

Introduction

This data review covers 32 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 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 a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

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

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-DR-06-0'RE TSB-DR-05-0'RE TSB-DR-05-0'-FDRE TSB-DR-05-10'RE TSB-DR-03-10'RE	Gasoline range organics	20	14	J- (all detects) UJ (all non-detects)	A
TSB-DJ-01-0'RE TSB-DJ-01-10'RE TSB-DR-04-0'RE TSB-DR-04-10'RE TSB-CR-04-0'RE TSB-CR-04-10'RE TSB-CR-05-10'RE	Gasoline range organics	21	14	J- (all detects) UJ (all non-detects)	A
TSB-CR-05-0'RE	Gasoline range organics	22	14	J- (all detects) UJ (all non-detects)	A

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 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
TSB-DR-06-0'	a,a,a-Trifluorotoluene	13 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-06-0'RE	a,a,a-Trifluorotoluene	1.5 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-05-0'	a,a,a-Trifluorotoluene	27 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-05-0'RE	a,a,a-Trifluorotoluene	3.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-05-0'-FD	a,a,a-Trifluorotoluene	8.2 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-05-0'-FDRE	a,a,a-Trifluorotoluene	46 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-05-10'	a,a,a-Trifluorotoluene	64 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-05-10'RE	a,a,a-Trifluorotoluene	23 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-03-10'	a,a,a-Trifluorotoluene	24 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-03-10'RE	a,a,a-Trifluorotoluene	23 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DJ-01-0'	a,a,a-Trifluorotoluene	2.9 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DJ-01-0'RE	a,a,a-Trifluorotoluene	44 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-DJ-01-10'	a,a,a-Trifluorotoluene	3.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DJ-01-10'RE	a,a,a-Trifluorotoluene	51 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-04-0'	a,a,a-Trifluorotoluene	1.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-04-0'RE	a,a,a-Trifluorotoluene	64 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-04-10'	a,a,a-Trifluorotoluene	2.1 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-04-10'RE	a,a,a-Trifluorotoluene	11 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-CR-04-0'	a,a,a-Trifluorotoluene	4.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-CR-04-0'RE	a,a,a-Trifluorotoluene	11 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-CR-04-10'	a,a,a-Trifluorotoluene	4.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-CR-04-10'RE	a,a,a-Trifluorotoluene	63 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-CR-05-0'	a,a,a-Trifluorotoluene	4.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-CR-05-0'RE	a,a,a-Trifluorotoluene	5.2 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-CR-05-10'	a,a,a-Trifluorotoluene	63 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-CR-05-10'RE	a,a,a-Trifluorotoluene	52 (70-130)	Gasoline 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. Although the MS and MSD relative percent differences (RPD) were not within QC limits for the compounds in this SDG, the MS and MSD percent recoveries (%R) were within QC limits and no data were qualified.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) 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-DR-05-0' and TSB-DR-05-0'-FD and samples TSB-DR-05-0'RE and TSB-DR-05-0'-FDRE were identified as field duplicates. No gasoline range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-3**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-0'RE TSB-DR-05-0'RE TSB-DR-05-0'-FDRE TSB-DR-05-10'RE TSB-DR-03-10'RE TSB-DJ-01-0'RE TSB-DJ-01-10'RE TSB-DR-04-0'RE TSB-DR-04-10'RE TSB-CR-04-0'RE TSB-CR-04-10'RE TSB-CR-05-10'RE TSB-CR-05-0'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-3	TSB-DR-06-0' TSB-DR-05-0' TSB-DR-05-0'-FDRE TSB-DR-05-10' TSB-DR-05-10'RE TSB-DR-03-10' TSB-DR-03-10'RE TSB-DJ-01-0'RE TSB-DJ-01-10'RE TSB-DR-04-0'RE TSB-DR-04-10'RE TSB-CR-04-0'RE TSB-CR-04-10'RE TSB-CR-05-10' TSB-CR-05-10'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-3	TSB-DR-06-0'RE TSB-DR-05-0'RE TSB-DR-05-0'-FD TSB-DJ-01-0' TSB-DJ-01-10' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10' TSB-CR-05-0' TSB-CR-05-0'RE	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG
TRNC-D-3**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

LDC #: 18100C7
 SDG #: TRNC-D-3
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/21/08
 Page: 1 of 1
 Reviewer: SVL
 2nd Reviewer: ✓

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	SW	Sampling dates: 11/13/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	(TRNC-D-1) FK120191-01, FK130262-00 (TRNC-D-2)
IVc.	Laboratory control samples	A	LCS 1/b
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 ₁ = 4, 6 D ₂ = 5, 7
X.	Field blanks	ND	R = 31

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-DR-06-0'	S	11	TSB-DR-03-10'	S	21	TSB-CR-04-0'	S	31	RINSATE-2	W
2	TSB-DR-06-0'RE		12	TSB-DR-03-10'RE		22	TSB-CR-04-0'RE		32	TSB-DR-03-0'MS	S
3	TSB-DR-06-0' 10'		13	TSB-DJ-01-0'		23	TSB-CR-04-10'		33	TSB-DR-03-0'MSD	↓
4	TSB-DR-05-0' D ₁		14	TSB-DJ-01-0'RE		24	TSB-CR-04-10'RE		34	7331107 MB	
5	TSB-DR-05-0'RE D ₁		15	TSB-DJ-01-10'		25	TSB-CR-05-0'		35	7338144 MB	
6	TSB-DR-05-0'-FD D ₁		16	TSB-DJ-01-10'RE		26	TSB-CR-05-0'RE		36	7332310 MB	
7	TSB-DR-05-0'-FDRE D ₁		17	TSB-DR-04-0'		27	TSB-CR-05-10'		37	7338421 MB	
8	TSB-DR-05-10'		18	TSB-DR-04-0'RE		28	TSB-CR-05-10'RE		38	7339111 MB	
9	TSB-DR-05-10'RE		19	TSB-DR-04-10'		29	TSB-CR-06-0'		39	7332313 MB	
10	TSB-DR-03-0'	✓	20	TSB-DR-04-10'RE	↓	30	TSB-CR-06-10'	↓	40	732090 MB	

Notes: _____

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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		FD	C	13 (70 - 130)	J- / N / A
2				1.5 ()	J- / R / A
4				27 ()	J- / N / A
5				3.8 ()	J- / R / A
6				8.2 ()	J- / R / A
7				46 ()	J- / N / A
8				64 ()	
9				23 ()	
11				24 ()	
12				23 ()	
13				2.9 ()	J- / R / A

A	Surrogate Compound	G	Surrogate Compound	M	Surrogate Compound	S	Surrogate Compound
	Chlorobenzene (CBZ)		Octacosane		Benzo(e)Pyrene		1-Chloro-3-Nitrobenzene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene
C	a.a.-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)	U	Triphenyltin
D	Bromochlorobenzene	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

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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".

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

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

#	Sample ID	Detector/Column	Surrogate Compound	%R (Limits)	Qualifications
	14	FID	C	44 (70-170)	J- / UJ / A
	15			3.3 ()	J- / R / A
	16			51 ()	J- / UJ / A
	17			1.6 ()	J- / R / A
	18			64 ()	J- / UJ / A
	19			2.1 ()	J- / R / A
	20			11 ()	J- / UJ / A
	21			4.3 ()	J- / R / A
	22			11 ()	J- / UJ / A
	23			4.0 ()	J- / R / A
	24			63 ()	J- / UJ / A

Surrogate Compound	Surrogate Compound	Surrogate Compound	Surrogate Compound
A Chlorobenzene (CBZ)	G Octacosane	M Benzof(e)Pyrene	S 1-Chloro-3-Nitrobenzene
B 4-Bromofluorobenzene (BFB)	H Ortho-Terphenyl	N Terphenyl-D14	T 3,4-Dinitrotoluene
C a.a.-Trifluorotoluene	I Fluorobenzene (FBZ)	O Decafluorobiphenyl (DCB)	U Triphenyltin
D Bromochlorobenzene	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

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".

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

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

#	Sample ID	Detector/Column	Surrogate Compound	%R (Limits)	Qualifications
	25	FPD	C	4.6 (70-190)	J - / R / A
	26			5.2	
	27			63	J - / NJ / A
	28			52	

Surrogate Compound	Surrogate Compound	Surrogate Compound	Surrogate Compound	Surrogate Compound
A Chlorobenzene (CBZ)	G Octacosane	M Benz(a)Pyrene	S 1-Chloro-3-Nitrobenzene	
B 4-Bromofluorobenzene (BFB)	H Ortho-Terphenyl	N Terphenyl-D14	T 3,4-Dinitrotoluene	
C a.a-Trifluorotoluene	I Fluorobenzene (FBZ)	O Decafluorobiphenyl (DCB)	U Triphenyltin	
D Bromochlorobenzene	J n-Tricaptane	P 1-methylinaphthalene	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	

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates

METHOD: GC HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
 N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
 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
	<u>32/33</u>	<u>GRD</u>	()	()	<u>32 (30)</u>	<u>10</u>	<u>No qual</u> <u>CMS (MSD in)</u>
	<u>F7K150237-001</u>	<u>GRD</u>	<u>12 (26-12)</u>	<u>11 (26-11)</u>	()	<u>None</u>	<u>No qual</u>
			()	()	()		
			()	()	()		
			()	()	()		
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			()	()	()		

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 14, 2007
LDC Report Date: January 23, 2008
Matrix: Soil
Parameters: Gasoline Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'	TSB-DR-02-10'
TSB-FR-01-10'	TSB-DR-02-10'RE
TSB-FR-01-10'RE	TSB-DR-02-0'-FD
TSB-FJ-07-0'	TSB-DR-02-0'-FDRE
TSB-FJ-07-0'RE	JB-NW-DITCH01-0'
TSB-FJ-07-10'	JB-NW-DITCH01-0'RE
TSB-FJ-06-0'	JB-NW-DITCH01-10'
TSB-FJ-06-0'RE	TSB-FR-01-0'MS
TSB-FJ-06-0'-FD	TSB-FR-01-0'MSD
TSB-FJ-06-0'-FDRE	
TSB-FJ-06-10'	
TSB-FJ-05-0'	
TSB-FJ-05-0'RE	
TSB-FJ-05-10'	
TSB-FJ-05-10'RE	
TSB-DR-01-0'	
TSB-DR-01-0'RE	
TSB-DR-01-10'	
TSB-DR-01-10'RE	
TSB-DR-02-0'	

Introduction

This data review covers 29 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 a 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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FR-01-10'RE TSB-FJ-07-0'RE TSB-FJ-06-0'RE TSB-FJ-06-0'-FDRE TSB-FJ-05-0'RE TSB-FJ-05-10'RE TSB-DR-01-0'RE	Gasoline range organics	20	14	J- (all detects) UJ (all non-detects)	A
TSB-DR-01-10'RE TSB-DR-02-10'RE TSB-DR-02-0'-FDRE JB-NW-DITCH01-0'RE	Gasoline range organics	21	14	J- (all detects) UJ (all non-detects)	A

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 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-FR-01-10'	a,a,a-Trifluorotoluene	2.9 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-01-10'RE	a,a,a-Trifluorotoluene	13 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-07-0'	a,a,a-Trifluorotoluene	25 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-07-0'RE	a,a,a-Trifluorotoluene	2.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-06-0'	a,a,a-Trifluorotoluene	13 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-06-0'RE	a,a,a-Trifluorotoluene	30 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-06-0'-FD	a,a,a-Trifluorotoluene	18 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-06-0'-FDRE	a,a,a-Trifluorotoluene	4.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-05-0'	a,a,a-Trifluorotoluene	35 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-05-0'RE	a,a,a-Trifluorotoluene	39 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-05-10'	a,a,a-Trifluorotoluene	2.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-05-10'RE	a,a,a-Trifluorotoluene	14 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-01-0'	a,a,a-Trifluorotoluene	37 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-DR-01-0'RE	a,a,a-Trifluorotoluene	5.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-01-10'	a,a,a-Trifluorotoluene	23 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-01-10'RE	a,a,a-Trifluorotoluene	15 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-02-10'	a,a,a-Trifluorotoluene	37 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-02-10'RE	a,a,a-Trifluorotoluene	67 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-DR-02-0'-FD	a,a,a-Trifluorotoluene	6.6 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-DR-02-0'-FDRE	a,a,a-Trifluorotoluene	6.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
JB-NW-DITCH01-0'	a,a,a-Trifluorotoluene	60 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
JB-NW-DITCH01-0'RE	a,a,a-Trifluorotoluene	31 (70-130)	Gasoline 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. Although the MS and MSD percent recoveries (%R) were not within QC limits for the compounds in this SDG, the LCS percent recoveries (%R) were within QC limits and no data were qualified.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) 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-FJ-06-0' and TSB-FJ-06-0'-FD, samples TSB-FJ-06-0'RE and TSB-FJ-06-0'-FDRE, samples TSB-DR-02-0' and TSB-DR-02-0'-FD, and samples TSB-DR-02-0' and TSB-DR-02-0'-FDRE were identified as field duplicates. No gasoline range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-4**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-10'RE TSB-FJ-07-0'RE TSB-FJ-06-0'RE TSB-FJ-06-0'-FDRE TSB-FJ-05-0'RE TSB-FJ-05-10'RE TSB-DR-01-0'RE TSB-DR-01-10'RE TSB-DR-02-10'RE TSB-DR-02-0'-FDRE JB-NW-DITCH01-0'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-4	TSB-FR-01-10' TSB-FJ-07-0'RE TSB-FJ-06-0'-FDRE TSB-FJ-05-10' TSB-DR-01-0'RE TSB-DR-02-0'-FD TSB-DR-02-0'-FDRE	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-4	TSB-FR-01-10'RE TSB-FJ-07-0' TSB-FJ-06-0' TSB-FJ-06-0'RE TSB-FJ-06-0'-FD TSB-FJ-05-0' TSB-FJ-05-0'RE TSB-FJ-05-10'RE TSB-DR-01-0' TSB-DR-01-10' TSB-DR-01-10'RE TSB-DR-02-10' TSB-DR-02-10'RE JB-NW-DITCH01-0' JB-NW-DITCH01-0'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-4**

No Sample Data Qualified in this SDG

LDC #: 18100D7

VALIDATION COMPLETENESS WORKSHEET

Date: 1/21/08

SDG #: TRNC-D-4

Level III

Page: 1 of 1

Laboratory: Test America

Reviewer: SL2nd Reviewer: ✓**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	SW	Sampling dates: 11/14/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K160235-011 (TRNC-D-5)
IVc.	Laboratory control samples	A	LCS 10
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 ₁ = 7, 9 D ₂ = 8, 10 D ₃ = 20, 23 D ₄ = 20, 24
X.	Field blanks	N	

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

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Soil

1	TSB-FR-01-0'	11	TSB-FJ-06-10'	21	TSB-DR-02-10'	31	7332313 MB	11/27
2	TSB-FR-01-10'	12	TSB-FJ-05-0'	22	TSB-DR-02-10'RE	32	7338421 MB	12/4
3	TSB-FR-01-10'RE	13	TSB-FJ-05-0'RE	23	TSB-DR-02-0'-FD D ₂	33	7339111 MB	12/5
4	TSB-FJ-07-0'	14	TSB-FJ-05-10'	24	TSB-DR-02-0'-FDRE D ₄	34	7332316 MB	11/28
5	TSB-FJ-07-0'RE	15	TSB-FJ-05-10'RE	25	JB-NW-DITCH01-0'	35		
6	TSB-FJ-07-10'	16	TSB-DR-01-0'	26	JB-NW-DITCH01-0'RE	36		
7	TSB-FJ-06-0' D ₁	17	TSB-DR-01-0'RE	27	JB-NW-DITCH01-10'	37		
8	TSB-FJ-06-0'RE D ₂	18	TSB-DR-01-10'	28	TSB-FR-01-0'MS	38		
9	TSB-FJ-06-0'-FD D ₁	19	TSB-DR-01-10'RE	29	TSB-FR-01-0'MSD	39		
10	TSB-FJ-06-0'-FDRE D ₄	20	TSB-DR-02-0' D ₃ D ₄	30		40		

Notes: _____

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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".

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

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

#	Sample ID	Detector/Column	Surrogate Compound	%R (Limits)	Qualifications
2		RTX-624	C	2.9 (70 - 130)	J- / R / A
3				13 ()	J- / NJ / A
4				25 ()	↓
5				2.6 ()	J- / R / A
7				13 ()	J- / NJ / A
8				30 ()	↓
9				18 ()	↓
10				4.6 ()	J- / R / A
12				35 ()	J- / NJ / A
13				39 ()	↓
14				2.3 ()	J- / R / A

Surrogate Compound	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	Z Decachlorobiphenyl
C a,a-Trifluorotoluene	I Fluorobenzene (FBZ)	O Decachlorobiphenyl (DCB)	U Triphenyltin	
D Bromochlorobenzene	J n-Triacontane	P 1-methylinaphthalene	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	

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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
	15	RTX - 624	C	14 (70-130)	J- / N/A
	16			37 ()	↓
	17			5.8 ()	J- / R / A
	18			23 ()	J- / N/A
	19			15 ()	↓
	21			37 ()	↓
	22			67 ()	↓
	23			6.6 ()	J- / R / A
	24			6.8 ()	↓
	25			60 ()	J- / N/A
	26			31 ()	↓

Surrogate Compound	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 Triphenyltin	
D Bromochlorobenzene	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	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 15, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Gasoline Range Organics
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**	TSB-FJ-09-10'**
TSB-FJ-03-0'RE**	TSB-FR-03-0'**
TSB-FJ-03-0'-FD**	TSB-FR-03-0'RE**
TSB-FJ-03-10'**	TSB-FR-03-10'**
TSB-FJ-10-0'**	TSB-FR-03-10'RE**
TSB-FJ-10-0'RE**	RINSATE-3
TSB-FJ-10-10'**	RINSATE-3RE
TSB-FJ-04-0'**	TSB-FJ-10-0'MS
TSB-FJ-04-0'RE**	TSB-FJ-10-0'MSD
TSB-FJ-04-10'**	TSB-FR-02-0'MS
TSB-FJ-02-0'**	TSB-FR-02-0'MSD
TSB-FJ-02-0'RE**	
TSB-FJ-02-0'-FD**	
TSB-FJ-02-0'-FDRE**	
TSB-FJ-02-10'**	
TSB-FR-02-0'**	
TSB-FR-02-0'RE**	
TSB-FR-02-10'**	
TSB-FR-02-10'RE**	
TSB-FJ-09-0'**	

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 29 soil samples and 2 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.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FJ-03-0'RE** TSB-FJ-10-0'RE** TSB-FJ-04-0'RE** TSB-FJ-02-0'RE** TSB-FJ-02-0'-FDRE** TSB-FR-02-10'RE** TSB-FR-03-0'RE** TSB-FR-03-10'RE**	Gasoline range organics	20	14	J- (all detects) UJ (all non-detects)	A
RINSATE-3RE	Gasoline range organics	16	14	J- (all detects) UJ (all non-detects)	A

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

II. Calibration

a. Initial Calibration

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

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

b. Calibration Verification

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

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

III. Blanks

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

Samples RINSATE-3 and RINSATE-3RE were identified as rinsates. No gasoline range organic contaminants were found in these blanks.

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-FJ-03-0***	a,a,a-Trifluorotoluene	26 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-03-0'RE**	a,a,a-Trifluorotoluene	16 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-10-0***	a,a,a-Trifluorotoluene	45 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-10-0'RE**	a,a,a-Trifluorotoluene	25 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-04-0***	a,a,a-Trifluorotoluene	4.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-04-0'RE**	a,a,a-Trifluorotoluene	26 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-02-0***	a,a,a-Trifluorotoluene	7.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-02-0'RE**	a,a,a-Trifluorotoluene	9.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-02-0'-FD**	a,a,a-Trifluorotoluene	14 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-02-0'-FDRE**	a,a,a-Trifluorotoluene	20 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-02-0***	a,a,a-Trifluorotoluene	1.9 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-02-0'RE**	a,a,a-Trifluorotoluene	28 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-02-10***	a,a,a-Trifluorotoluene	42 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-FR-02-10'RE**	a,a,a-Trifluorotoluene	2.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-03-0'***	a,a,a-Trifluorotoluene	25 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-03-0'RE**	a,a,a-Trifluorotoluene	14 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-03-10'***	a,a,a-Trifluorotoluene	65 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-03-10'RE**	a,a,a-Trifluorotoluene	17 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
RINSATE-3	a,a,a-Trifluorotoluene	11 (70-130)	Gasoline 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. Although the MS percent recovery (%R) was not within QC limits for one compound, 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) and relative percent differences (RPD) 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-FJ-03-0'** and TSB-FJ-03-0'-FD** and samples TSB-FJ-03-0'RE** and TSB-FJ-03-0'-FD** were identified as field duplicates. No gasoline range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-5**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0'RE** TSB-FJ-10-0'RE** TSB-FJ-04-0'RE** TSB-FJ-02-0'RE** TSB-FJ-02-0'-FDRE** TSB-FR-02-10'RE** TSB-FR-03-0'RE** TSB-FR-03-10'RE** RINSATE-3RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-5	TSB-FJ-04-0'*** TSB-FJ-02-0'*** TSB-FJ-02-0'RE** TSB-FR-02-0'*** TSB-FR-02-10'RE**	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-5	TSB-FJ-03-0'*** TSB-FJ-03-0'RE** TSB-FJ-10-0'*** TSB-FJ-10-0'RE** TSB-FJ-04-0'RE** TSB-FJ-02-0'-FD** TSB-FJ-02-0'-FDRE** TSB-FR-02-0'RE** TSB-FR-02-10'*** TSB-FR-03-0'*** TSB-FR-03-0'RE** TSB-FR-03-10'*** TSB-FR-03-10'RE** RINSATE-3	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

LDC #: 18100E7
 SDG #: TRNC/D-5
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 1/24/08
 Page: 1 of 1
 Reviewer: SVB
 2nd Reviewer: [Signature]

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	SW	Sampling dates: 11/15/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K120191-012 (TRNC/D-1)
IVc.	Laboratory control samples	A	LCS 10
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 ₁ = 1, 3 D ₂ = 2, 3
X.	Field blanks	ND	R = 26, 27

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Soil + Water

1	TSB-FJ-03-0**	D ₁	S	11	3	TSB-FJ-02-0**	D ₃	S	21	3	TSB-FJ-09-10**	S	31	1	TSB-FR-02-0'MSD	S
2	TSB-FJ-03-0'RE**	D ₂		12	2	TSB-FJ-02-0'RE**	D ₄		22	3	TSB-FR-03-0**		32	1	7332316 MB	11/28
3	TSB-FJ-03-0-FD**	D ₁ , D ₂		13	3	TSB-FJ-02-0-FD**	D ₃		23	2	TSB-FR-03-0'RE**		33	2	7339111 MB	12/05
4	TSB-FJ-03-10**			14	2	TSB-FJ-02-0-FDRE**	D ₄		24	3	TSB-FR-03-10**		34	3	7333271 MB	11/24
5	TSB-FJ-10-0**			15	3	TSB-FJ-02-10**			25	2	TSB-FR-03-10'RE**		35	4	7327090 MB	11/23
6	TSB-FJ-10-0'RE**			16	1	TSB-FR-02-0**			26	4	RINSATE-3	W	36	5	7335098 MB	12/01
7	TSB-FJ-10-10**			17	3	TSB-FR-02-0'RE**			27	5	RINSATE-3RE		37			
8	TSB-FJ-04-0**			18	3	TSB-FR-02-10**			28	3	TSB-FJ-10-0'MS	S	38			
9	TSB-FJ-04-0'RE**			19	2	TSB-FR-02-10'RE**			29	3	TSB-FJ-10-0'MSD		39			
10	TSB-FJ-04-10**			20	2	TSB-FJ-09-0**			30	1	TSB-FR-02-0'MS		40			

Notes: _____

LDC #: 18100 E7
 SDG #: See label

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: JV
 2nd Reviewer: [Signature]

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		<input checked="" type="checkbox"/>		
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>			
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>			
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	<input checked="" type="checkbox"/>			
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?		<input checked="" type="checkbox"/>		
Did the initial calibration meet the curve fit acceptance criteria?			<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>			
IV. Continuing calibration				
What type of continuing calibration calculation was performed? <u> </u> %D or %R	<input checked="" type="checkbox"/>			
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>			
Were all percent differences (%D) < 15% or percent recoveries 85-115%?	<input checked="" type="checkbox"/>			
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>			
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>			
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		<input checked="" type="checkbox"/>		
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?		<input checked="" type="checkbox"/>		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input checked="" type="checkbox"/>			
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input checked="" type="checkbox"/>			
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>			
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		<input checked="" type="checkbox"/>		
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>			
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>			

LDC #: 18100 E7
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: JVB
 2nd Reviewer: [Signature]

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.			✓	

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC							
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2, 6, 9, 12, 14, 19, 23, 25	S	N	11/15/07	—	12/05/07	20	J- / NS / A
27	W	Y	11/15/07	—	12/05/07 12/01/07	16	J- / NS / A

TECHNICAL HOLDING TIME CRITERIA
VOLATILES: Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
 Water preserved: Both within 14 days of sample collection.
 Soils: Both within 14 days of sample collection.
EXTRACTABLES:
 Water: Extracted within 7 days, analyzed within 40 days.
 Soil: Extracted within 14 days, analyzed within 40 days.

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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".

N N/A Were surrogates spiked into all samples and blanks?
 N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
1		RTX-624	C	26 (70-130)	J- / NJ / A
2				16 ()	
5				45 ()	
6				25 ()	
8				4.8 ()	J- / R / A
9				26 ()	J- / NJ / A
11				7.0 ()	J- / R / A
12				9.0 ()	
13				14 ()	J- / NJ / A
14				20 ()	
16				1.9 ()	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
B 4-Bromofluorobenzene (BFB)	H Ortho-Terphenyl	N Terphenyl-D14	T 3,4-Dinitrotoluene
C a,a-Trifluorotoluene	I Fluorobenzene (FBZ)	O Decachlorobiphenyl (DCB)	U Triphenyltin
D Bromochlorobenzene	J n-Triacontane	P 1-methylphthalene	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
			Y Tetrachloro-m-xylene
			Z Decachlorobiphenyl

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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".

Were surrogates spiked into all samples and blanks? Y N N/A
 Did all surrogate recoveries (%R) meet the QC limits? Y N N/A

#	Sample ID	Detector/Column	Surrogate Compound	%R (Limits)	Qualifications
17		RFX-G24	C	28 (70-130)	J-MS/A
18				42 ()	↓
19				2.3 ()	J-R/A
22				25 ()	J-MS/A
23				14 ()	
24				65 ()	
25				17 ()	
26				11 ()	↓

Surrogate Compound	Surrogate Compound	Surrogate Compound	Surrogate Compound
A Chlorobenzene (CBZ)	G Octacosane	M Benzol(e)Pyrene	S 1-Chloro-3-Nitrobenzene
B 4-Bromofluorobenzene (BFB)	H Ortho-Terphenyl	N Terphenyl-D14	T 3,4-Dinitrotoluene
C a,a,-Trifluorotoluene	I Fluorobenzene (FBZ)	O Decachlorobiphenyl (DCB)	U Triphenyltin
D Bromochlorobenzene	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

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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 = $100 \cdot (S/X)$
- 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		Recalculated		Reported		Recalculated	
				CF (1.0 std)	CF (1.0 std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD		
1	1CAL	11/15/07	GRD (Low Boiling Hc)	183/0327	183/0327	18426558	18426558	4.475	4.475		
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 #: 18/07 E7

SDG #: See cover

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: JNT
2nd Reviewer: [Signature]

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 = $100 \cdot (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ 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 (cal)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	LCAL 100B	11/28/07	GRD	1.000	0.9723	2.8	0.9723	2.8
2	LCAL 111B	11/29/07		±	0.8608	13.9	0.8608	13.9
3	LCAL 094B	11/28/07			0.9616	3.8	0.9616	3.8
	LCAL 296B	12/05/07			0.9764	2.4	0.9764	2.4
4	LCAL 307B	12/05/07			0.9682	3.7	0.9682	3.7

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.

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

LDC #: 18100 E7
 SDG #: See Corey
 METHOD: GC HPLC

Page: 1 of 1
 Reviewer: JVC
 2nd reviewer: [Signature]

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

Where: SF = Surrogate Found
 SS = Surrogate Spiked

% Recovery: $SF/SS * 100$

Sample ID: # |

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TFT	RX-024	0.04	0.01033 0.03938	26	26	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	

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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
 RPD = $((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD) * 100$ Where MS = Matrix spike, MSD = Matrix spike duplicate

MS/MSD samples: 30/31

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)	1.07	1.01	0	0.1836	0.677	18	18	66	66	114	114
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.

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

METHOD: GC HPLC

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 = $100 \times \frac{SSC-SA}{SSC-LCSD} \times \frac{1}{2} \times \frac{1}{LCS+LCSD}$

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery

SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7 3 3 3 2 7 1 LCS

Compound	Spike Added (mg/L)		Spiked Sample Concentration (mg/L)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1.00	NA	6.94	NA	94	94				
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.

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

LDC #: 18/00 E7
 SDG #: See Copy

Page: 1 of 1
 Reviewer: JTC
 2nd Reviewer: _____

METHOD: GC HPLC

Y/N N/A
Y/N N/A

Were all reported results recalculated and verified for all level IV samples?
 Were all recalculated results for detected target compounds 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: # 5 Compound Name GR0

Concentration = $\frac{(4925680)}{(18426558)} \frac{(5.0ml)}{(5.01ml)} = 0.285$
 $\approx 0.29 \text{ mg/kg}$

#	Sample ID	Compound	Reported Concentrations	Recalculated Results Concentrations	Qualifications

Comments: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 16, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Gasoline Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'	TSB-GJ-06-0'RE
TSB-FJ-08-0'RE	TSB-GJ-06-5'
TSB-FJ-08-10'	TSB-GJ-01-0'
TSB-FR-05-0'	TSB-GJ-01-5'
TSB-FR-05-0'RE	TSB-GJ-01-5'RE
TSB-FR-05-10'	RINSATE-4
TSB-FR-04-0'	TSB-FJ-08-0'MS
TSB-FR-04-0'-FD	TSB-FJ-08-0'MSD
TSB-FR-04-0'-FDRE	TSB-FJ-01-0'MS
TSB-FR-04-10'	TSB-FJ-01-0'MSD
TSB-FR-04-10'RE	
TSB-FJ-01-0'	
TSB-FJ-01-0'RE	
TSB-FJ-01-10'	
TSB-FJ-01-10'RE	
TSB-GR-01-0'	
TSB-GR-01-0'RE	
TSB-GR-01-5'	
TSB-GR-01-5'RE	
TSB-GJ-06-0'	

Introduction

This data review covers 29 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 Gasoline Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-FJ-08-0'RE TSB-FR-05-0'RE	Gasoline range organics	19	14	J- (all detects) UJ (all non-detects)	A
TSB-FR-04-0'-FDRE TSB-FR-04-10'RE TSB-FJ-01-0'RE TSB-FJ-01-10'RE TSB-GR-01-0'RE TSB-GR-01-5'RE TSB-GJ-06-0'RE TSB-GJ-01-5'RE	Gasoline range organics	25	14	J- (all detects) UJ (all non-detects)	A

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No gasoline range organic contaminants were found in the method blanks.

Sample RINSATE-4 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
TSB-FJ-08-0'	a,a,a-Trifluorotoluene	50 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-08-0'RE	a,a,a-Trifluorotoluene	2.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-05-0'	a,a,a-Trifluorotoluene	3.0 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-05-0'RE	a,a,a-Trifluorotoluene	0.64 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-04-0'-FD	a,a,a-Trifluorotoluene	59 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-04-0'-FDRE	a,a,a-Trifluorotoluene	0.39 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FR-04-10'	a,a,a-Trifluorotoluene	67 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FR-04-10'RE	a,a,a-Trifluorotoluene	2.3 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-FJ-01-0'	a,a,a-Trifluorotoluene	42 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-FJ-01-10'	a,a,a-Trifluorotoluene	11 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GR-01-0'	a,a,a-Trifluorotoluene	8.9 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GR-01-0'RE	a,a,a-Trifluorotoluene	7.5 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GR-01-5'	a,a,a-Trifluorotoluene	31 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
TSB-GJ-06-0'	a,a,a-Trifluorotoluene	7.8 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GJ-01-5'	a,a,a-Trifluorotoluene	61 (70-130)	Gasoline 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. Although the MS percent recovery (%R) and MS/MSD relative percent difference (RPD) was not within QC limits for one compound, 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) 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-FR-04-0' and TSB-FR-04-0'-FD and samples TSB-FR-04-0' and TSB-FR-04-0'-FDRE were identified as field duplicates. No gasoline range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-6**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-FJ-08-0'RE TSB-FR-05-0'RE TSB-FR-04-0'-FDRE TSB-FR-04-10'RE TSB-FJ-01-0'RE TSB-FJ-01-10'RE TSB-GR-01-0'RE TSB-GR-01-5'RE TSB-GJ-06-0'RE TSB-GJ-01-5'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-6	TSB-FJ-08-0'RE TSB-FR-05-0' TSB-FR-05-0'RE TSB-FR-04-0'-FDRE TSB-FR-04-10'RE TSB-GR-01-0' TSB-GR-01-0'RE TSB-GJ-06-0'	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-6	TSB-FJ-08-0' TSB-FR-04-0'-FD TSB-FR-04-10' TSB-FJ-01-0' TSB-FJ-01-10' TSB-GR-01-5' TSB-GJ-01-5'	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

LDC #: 18100F7
 SDG #: TRNC/D-6
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/23/08
 Page: 1 of 1
 Reviewer: SV6
 2nd Reviewer: ✓

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	SW	Sampling dates: 11/16/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K120191-017 (TRNC/D-1); F7K200203-004 (TRNC/D-7)
IVc.	Laboratory control samples	A	LCS / D
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 ₁ = 7, 8 D ₂ = 7, 9
X.	Field blanks	ND	R = 26

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-FJ-08-0'	S	114	TSB-FR-04-10'RE	S	21	TSB-GJ-06-0'RE	S	31	7333501 MB	11/24
2	TSB-FJ-08-0'RE		12	TSB-FJ-01-0'		22	TSB-GJ-06-5'		32	7339111 MB	11/25
3	TSB-FJ-08-10'		13	TSB-FJ-01-0'RE		23	TSB-GJ-01-0'		33	7333596 MB	11/20
4	TSB-FR-05-0'		14	TSB-FJ-01-10'		24	TSB-GJ-01-5'		34	7345296 MB	12/11
5	TSB-FR-05-0'RE		15	TSB-FJ-01-10'RE		25	TSB-GJ-01-5'RE		35	7335097 MB	11/20
6	TSB-FR-05-10'		16	TSB-GR-01-0'		26	RINSATE-4	W	36	7327090 MB	11/22
7	TSB-FR-04-0'	D ₁ D ₂	17	TSB-GR-01-0'RE		27	TSB-FJ-08-0'MS	S	37		
8	TSB-FR-07-0'-FD	D ₁	18	TSB-GR-01-5'		28	TSB-FJ-08-0'MSD		38		
9	TSB-FR-07-0'-FDRE	D ₁	19	TSB-GR-01-5'RE		29	TSB-FJ-01-0'MS		39		
10	TSB-FR-04-10'		20	TSB-GJ-06-0'		30	TSB-FJ-01-0'MSD		40		

Notes: _____

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

LDC #: 18100 F7
 SDG #: See Copy

Page: 1 of 2
 Reviewer: JN
 2nd Reviewer: W

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".

N N/A Were surrogates spiked into all samples and blanks?
 Y (N/A) Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/Column	Surrogate Compound	%R (Limits)	Qualifications
1		RTX-624	C	50 (70-120)	J- / UJ / A
2				2.0 ()	J- / R / A
4				3.0 ()	
5				0.64 ()	
8				59 ()	J- / UJ / A
9				0.39 ()	J- / R / A
10				67 ()	J- / UJ / A
11				2.3 ()	J- / R / A
12				42 ()	J- / UJ / A
14				11 ()	
16				8.9 ()	J- / R / A

Surrogate Compound	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	Z Decachlorobiphenyl
C a,a-Trifluorotoluene	I Fluorobenzene (FBZ)	O Decachlorobiphenyl (DCB)	U Triphenyltin	
D Bromochlorobenzene	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	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 19, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Gasoline Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'	TSB-GJ-03-5'
TSB-GR-02-0'RE	RINSATE-5
TSB-GR-02-0'-FD	TSB-GJ-04-0'MS
TSB-GR-02-5'	TSB-GJ-04-0'MSD
TSB-GR-02-5'RE	TSB-GJ-07-5'MS
TSB-GJ-04-0'	TSB-GJ-07-5'MSD
TSB-GJ-04-5'	
TSB-GJ-04-5'RE	
TSB-GJ-02-0'	
TSB-GJ-02-0'RE	
TSB-GJ-02-0'-FD	
TSB-GJ-02-5'	
TSB-GJ-02-5'RE	
TSB-GJ-07-0'	
TSB-GJ-07-0'RE	
TSB-GJ-07-5'	
TSB-GJ-05-0'	
TSB-GJ-05-0'RE	
TSB-GJ-05-5'	
TSB-GJ-03-0'	

Introduction

This data review covers 25 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 Gasoline Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.

UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Analysis	Required Holding Time (in Days) From Sample Collection Until Analysis	Flag	A or P
TSB-GR-02-0'RE TSB-GR-02-5'RE TSB-GJ-04-5'RE TSB-GJ-02-0'RE TSB-GJ-02-5'RE TSB-GJ-07-0'RE TSB-GJ-05-0'RE	Gasoline range organics	22	14	J- (all detects) UJ (all non-detects)	A

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No gasoline range organic contaminants were found in the method blanks.

Sample RINSATE-5 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
TSB-GR-02-0'	a,a,a-Trifluorotoluene	2.5 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GR-02-5'	a,a,a-Trifluorotoluene	42 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-04-5'	a,a,a-Trifluorotoluene	2.4 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GJ-02-0'	a,a,a-Trifluorotoluene	6.4 (70-130)	Gasoline range organics	J- (all detects) R (all non-detects)	A
TSB-GJ-02-5'	a,a,a-Trifluorotoluene	64 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-02-5'RE	a,a,a-Trifluorotoluene	63 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-07-0'	a,a,a-Trifluorotoluene	30 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-05-0'	a,a,a-Trifluorotoluene	36 (70-130)	Gasoline range organics	J- (all detects) UJ (all non-detects)	A
TSB-GJ-05-0'RE	a,a,a-Trifluorotoluene	3.4 (70-130)	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 and MSD relative percent difference (RPD) was not within QC limits for one compound, the MS and MSD percent recoveries (%R) were within QC limits and no data were qualified.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) 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-GR-02-0' and TSB-GR-02-0'-FD, samples TSB-GR-02-0'RE and TSB-GR-02-0'-FD, samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD, and samples TSB-GJ-02-0'RE and TSB-GJ-02-0'-FD were identified as field duplicates. No gasoline range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Data Qualification Summary - SDG TRNC-D-7**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0'RE TSB-GR-02-5'RE TSB-GJ-04-5'RE TSB-GJ-02-0'RE TSB-GJ-02-5'RE TSB-GJ-07-0'RE TSB-GJ-05-0'RE	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Technical holding times
TRNC-D-7	TSB-GR-02-5' TSB-GJ-02-5' TSB-GJ-02-5'RE TSB-GJ-07-0' TSB-GJ-05-0'	Gasoline range organics	J- (all detects) UJ (all non-detects)	A	Surrogate recovery (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GJ-04-5' TSB-GJ-02-0' TSB-GJ-05-0'RE	Gasoline range organics	J- (all detects) R (all non-detects)	A	Surrogate recovery (%R)

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

LDC #: 18100G7
 SDG #: TRNC/D-7
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/23/08
 Page: 1 of 1
 Reviewer: JVG
 2nd Reviewer: [Signature]

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	SW	Sampling dates: 11/9/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K120191-012 (TRNC/D-)
IVc.	Laboratory control samples	A	LCS/D
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 ₁ = 1, 3 D ₂ = 2, 3 D ₃ = 9, 11 D ₄ = 10, 11
X.	Field blanks	ND	R = 22

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples:

Soil + Water

1	✓	TSB-GR-02-0' D ₁	S	11	✓	TSB-GJ-02-0'-FD D ₂ , D ₃	S	21	3	TSB-GJ-03-5'	S	31	1	7327090 MB	11/20
2	✓	TSB-GR-02-0'RE D ₂		12	✓	TSB-GJ-02-5'		22	1	RINSATE-5	W	32	✓	7335097 MB	11/20
3	✓	TSB-GR-02-0'-FD D ₁ , D ₂		13	✓	TSB-GJ-02-5'RE		23	✓	TSB-GJ-04-0'MS	S	33	✓	7336019 MB	12/07
4	✓	TSB-GR-02-5'		14	✓	TSB-GJ-07-0'		24	✓	TSB-GJ-04-0'MSD		34	✓	7345296 MB	12/11
5	✓	TSB-GR-02-5'RE		15	✓	TSB-GJ-07-0'RE		25	✓	TSB-GJ-07-5'MS		35			
6	✓	TSB-GJ-04-0'		16	✓	TSB-GJ-07-5'		26	✓	TSB-GJ-07-5'MSD		36			
7	✓	TSB-GJ-04-5'		17	✓	TSB-GJ-05-0'		27				37			
8	✓	TSB-GJ-04-5'RE		18	✓	TSB-GJ-05-0'RE		28				38			
9	✓	TSB-GJ-02-0' D ₃		19	✓	TSB-GJ-05-5'		29				39			
10	✓	TSB-GJ-02-0'RE D ₄		20	✓	TSB-GJ-03-0'		30				40			

Notes: _____

VALIDATION FINDINGS WORKSHEET
 Technical Holding Times

LDC #: 18100 G7
 SDG #: See Cover

Page: 1 of 1
 Reviewer: JVL
 2nd Reviewer: [Signature]

All circled dates have exceeded the technical holding times.
 X N N/A Were all cooler temperatures within validation criteria?

METHOD: <input checked="" type="checkbox"/> GC <input type="checkbox"/> HPLC							
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2, 5, 8, 10, 12, 15, 18	S	N	11/19/07	-	12/11/07	22	J-145/A

TECHNICAL HOLDING TIME CRITERIA
 VOLATILES: Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
 Water preserved: Both within 14 days of sample collection.
 Soils: Both within 14 days of sample collection.
 EXTRACTABLES: Water: Extracted within 7 days, analyzed within 40 days.
 Soil: Extracted within 14 days, analyzed within 40 days.

SDG #: See Cover

Surrogate Recovery

Reviewer: JVG

2nd Reviewer: [Signature]

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	RTX-624	C	2.5 (70-120)	J-R/A
	4			42	J-N/A
	7			2.4	J-R/A
	9			6.4	↓
	12			64	J-N/A
	13			63	
	14			30	
	17			36	
	18			3.4	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
B 4-Bromofluorobenzene (BFB)	H Ortho-Terphenyl	N Terphenyl-D14	T 3,4-Dinitrotoluene
C a.a.-Trifluorotoluene	I Fluorobenzene (FBZ)	O Decafluorobiphenyl (DCB)	U Triphenyltin
D Bromochlorobenzene	J n-Triacontane	P 1-methylanthracene	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 C/D/F/G
Data Validation Reports
LDC# 18100**

DRO

ILDC

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 9, 2007
LDC Report Date: January 24, 2008
Matrix: Soil/Water
Parameters: Diesel Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1
TSB-CR-07-0'MS
TSB-CR-07-0'MSD
TSB-CJ-04-0'MS
TSB-CJ-04-0'MSD
RINSATE 1MS
RINSATE 1MSD

Introduction

This data review covers 15 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 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 a 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 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 diesel range organic contaminants were found in the method blanks.

Sample "RINSATE 1" 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
7318087MB	ortho-Terphenyl	52 (53-171)	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. Although the MSD percent recoveries (%R) and relative percent differences (RPD) were not within QC limits for the compound in this SDG, the MS percent recoveries (%R) were within QC limits and no data were qualified.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples TSB-CJ-08-0' and TSB-CJ-08-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

LDC #: 18100A8
 SDG #: TRNC-D-1
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/31/08
 Page: 1 of 1
 Reviewer: JV
 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: <u>11/09/07</u>
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	
IVc.	Laboratory control samples	A	<u>LCS</u>
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	<u>D = 3, 4</u>
X.	Field blanks	ND	<u>R = 12</u>

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: soil + water

1	TSB-CR-07-0'	S	11	TSB-CJ-03-10'	S	21	7318066 MB	31
2	TSB-CR-07-10'		12	RINSATE 1	W	22	7318087 MB	32
3	TSB-CJ-08-0'		13	TSB-CR-07-0'MS	S	23	7325501 MB	33
4	TSB-CJ-08-0'-FD		14	TSB-CR-07-0'MSD		24		34
5	TSB-CJ-08-10'		15	TSB-CJ-04-0'MS		25		35
6	TSB-CJ-04-0'		16	TSB-CJ-04-0'MSD	↓	26		36
7	TSB-CJ-04-10'		17	RINSATE 1MS	W	27		37
8	TSB-CJ-07-0'		18	RINSATE 1MSD	↓	28		38
9	TSB-CJ-07-10'		19			29		39
10	TSB-CJ-03-0'	✓	20			30		40

Notes: _____

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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".
 N/A Were surrogates spiked into all samples and blanks?
 N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector Column	Surrogate Compound	%R (Limits)	Qualifications
	7318087 MB	EP-RTK-5	H	52 (53 - 171)	J- / NJ / P
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				()	
				()	
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	Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)
D	Bromochlorobenzene	J	n-Triacontane	P	1-methylnaphthalene
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol
				S	1-Chloro-3-Nitrobenzene
				T	3,4-Dinitrotoluene
				U	Triphenyltin
				V	Tri-n-propyltin
				W	Tributyl Phosphate
				X	Triphenyl Phosphate

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 12, 2007
LDC Report Date: January 28, 2008
Matrix: Soil
Parameters: Diesel Range Organics
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'
TSB-CR-01-0'
TSB-CR-01-10'
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No diesel range organic contaminants were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. 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-CJ-01-0'** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-06-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-2**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-2**

No Sample Data Qualified in this SDG

LDC #: 18100B8
 SDG #: TRNC/D-2
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 1/21/08
 Page: 1 of 1
 Reviewer: JVB
 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: 11/12/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
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 ₁ = 3, 5 D ₂ = 14, 15
X.	Field blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

1	TSB-CJ-02-0**	11	TSB-CR-03-10'	21	7319098 MB	31	
2	TSB-CJ-02-10**	12	TSB-CJ-05-0'	22		32	
3	TSB-CJ-01-0** D ₁	13	TSB-CJ-05-10'	23		33	
4	TSB-CJ-01-10**	14	TSB-CJ-06-0' D ₂	24		34	
5	TSB-CJ-01-0'-FD** D ₁	15	TSB-CJ-06-0'-FD D ₁	25		35	
6	TSB-CR-02-0**	16	TSB-CJ-06-10'	26		36	
7	TSB-CR-02-10'	17	TSB-CR-01-0'MS	27		37	
8	TSB-CR-01-0'	18	TSB-CR-01-0'MSD	28		38	
9	TSB-CR-01-10'	19		29		39	
10	TSB-CR-03-0'	20		30		40	

Notes: _____

LDC #: 1810018
 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: JZ
 2nd Reviewer: [Signature]

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? <input checked="" type="checkbox"/> %D or <input type="checkbox"/> %R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) < 15%.0 or percent recoveries 85-115%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 18100 B 8
 SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: JV
 2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field duplicates.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Field blanks were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

LDC #: 18100 BS
 SDG #: See Copy

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
 Reviewer: NZ
 2nd Reviewer: [Signature]

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 = $100 \cdot (S/X)$
 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		Recalculated		Reported		Recalculated	
				CF (1000 std)	CF (1000 std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD		
1	ICAL	10/31/07	Diesel	13520	13519.657	13454	13454	3.480	3.479		
	GCE										
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 #: 18110 b8
 SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
 Reviewer: JLC
 2nd Reviewer: [Signature]

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 = $100 * (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ Where: ave. CF = initial calibration average CF
 CF = A/C CF = continuing calibration CF
 A = Area of compound
 C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF (cal)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	ECAV069	11/21/07	Diesel	1000	1091.6047	9.7	1091.6047	9.7
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.

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
 Reviewer: N/b
 2nd reviewer: C

LDC #: 18/10/22
 SDG #: See Copy

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: 41

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
0-Terphenyl	RTX-5	25	15.9087	64	64	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	

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

MS = Matrix spike

SC = Sample concentration

MSD = Matrix spike duplicate

RPD = $(((SSCMS - SSCMSD) * 2) / ((SSCMS + SSCMSD))) * 100$

MS/MSD samples: 17 / 18

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	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)	84.7	85.0	0	74.2		90		87		3.1	3.1
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 #: 18 110 28

SDG #: Lee Cery

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1

Reviewer: ML

2nd Reviewer: U

METHOD: GC HPLC

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:

$$\% \text{ Recovery} = 100 * (\text{SSC}-\text{SC}) / \text{SA}$$

$$\text{RPD} = | \text{LCS} - \text{LCSD} | * 2 / (\text{LCS} + \text{LCSD})$$

Where: SSC = Spiked sample concentration

SA = Spike added

SC = Concentration

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 7319698 LCS

Compound	Spike Added (mg/kg)		Spiked Sample Concentration (mg/kg)		LCS		LCSD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)								
Diesel (8015)	82.7	NA	78.3	NA	94	94		
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 #: 18160 B3
SDG #: See Caret

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: SVB
2nd Reviewer: [Signature]

METHOD: GC HPLC

Y N N/A
Y N N/A

Were all reported results recalculated and verified for all level IV samples?
Were all recalculated results for detected target compounds 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: MD
Concentration = _____

#	Sample ID	Compound	Reported Concentrations	Recalculated Results Concentrations	Qualifications

Comments: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 13, 2007
LDC Report Date: February 5, 2008
Matrix: Soil/Water
Parameters: Diesel Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'	RINSATE-2MS
TSB-DR-06-10'	RINSATE-2MSD
TSB-DR-05-0'	
TSB-DR-05-0'-FD	
TSB-DR-05-10'	
TSB-DR-03-0'	
TSB-DR-03-10'	
TSB-DJ-01-0'	
TSB-DJ-01-10'	
TSB-DR-04-0'	
TSB-DR-04-10'	
TSB-CR-04-0'	
TSB-CR-04-10'	
TSB-CR-05-0'	
TSB-CR-05-10'	
TSB-CR-06-0'	
TSB-CR-06-10'	
RINSATE-2	
TSB-DR-03-0'MS	
TSB-DR-03-0'MSD	

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 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 a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent 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 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.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Although the MSD relative percent differences (RPD) were not within QC limits for the compounds in this SDG, the MS and MSD percent recoveries (%R) were within QC limits and no data were qualified.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples TSB-DR-05-0' and TSB-DR-05-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

LDC #: 18100C8
 SDG #: TRNC-D-3
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/21/08
 Page: 1 of 1
 Reviewer: JTB
 2nd Reviewer: [Signature]

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: 11/13/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	SW	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	D = 3, 4
X.	Field blanks	ND	R = 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: Soil + Water

1	TSB-DR-06-0'	S	11	TSB-DR-04-10'	S	21	RINSYATE-2MS	W	31	7319098	MB
2	TSB-DR-06-40'	10'	12	TSB-CR-04-0'		22	RINSYATE-2MSD	↓	32	7322044	MB
3	TSB-DR-05-0'	D	13	TSB-CR-04-10'		23			33	7324111	MB
4	TSB-DR-05-0'-FD	D	14	TSB-CR-05-0'		24			34		
5	TSB-DR-05-10'		15	TSB-CR-05-10'		25			35		
6	TSB-DR-03-0'		16	TSB-CR-06-0'		26			36		
7	TSB-DR-03-10'		17	TSB-CR-06-10'	↓	27			37		
8	TSB-DJ-01-0'		18	RINSYATE-2	W	28			38		
9	TSB-DJ-01-10'		19	TSB-DR-03-0'MS	S	29			39		
10	TSB-DR-04-0'	↓	20	TSB-DR-03-0'MSD	↓	30			40		

Notes: _____

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 14, 2007
LDC Report Date: January 23, 2008
Matrix: Soil
Parameters: Diesel Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW-DITCH01-0'
JB-NW-DITCH01-10'

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 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 a P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent 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 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
JB-NW-DITCH01-10'	ortho-Terphenyl	56 (59-164)	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 not within QC limits. Since there were no associated samples, no data were qualified.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples TSB-FJ-06-0' and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
 Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-4**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	JB-NW-DITCH01-10'	Diesel range organics	J- (all detects) UJ (all non-detects)	P	Surrogate recovery (%R)

**BRC Tronox Parcel C/D/F/G
 Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
 Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-4**

No Sample Data Qualified in this SDG

LDC #: 18100D8

VALIDATION COMPLETENESS WORKSHEET

Date: 1/21/08

SDG #: TRNC-D-4

Level III

Page: 1 of 1

Laboratory: Test America

Reviewer: STG

2nd Reviewer: [Signature]

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: 11/14/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K160225-011 (TRNC-D-5)
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 ₁ = 5, 6 D ₂ = 12, 14
X.	Field blanks	N	

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples: Soil

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21	7322044 MB	31
2	TSB-FR-01-10'	12	TSB-DR-02-0' D✓	22	7324074 MB	32
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD D✓	24		34
5	TSB-FJ-06-0' D ₁	15	JB-NW-DITCH01-0'	25		35
6	TSB-FJ-06-0'-FD D ₁	16	JB-NW-DITCH01-10'	26		36
7	TSB-FJ-06-10'	17		27		37
8	TSB-FJ-05-0'	18		28		38
9	TSB-FJ-05-10'	19		29		39
10	TSB-DR-01-0'	20		30		40

Notes: _____

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 15, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Diesel Range Organics
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-03-10'**
TSB-FJ-10-0'**
TSB-FJ-10-10'**
TSB-FJ-04-0'**
TSB-FJ-04-10'**
TSB-FJ-02-0'**
TSB-FJ-02-0'-FD**
TSB-FJ-02-10'**
TSB-FR-02-0'**
TSB-FR-02-10'**
TSB-FJ-09-0'**
TSB-FJ-09-10'**
TSB-FR-03-0'**
TSB-FR-03-10'**
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 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.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No diesel range organic contaminants were found in the method blanks.

Sample RINSATE-3 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.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

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-FJ-03-0'*** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'*** and TSB-FJ-02-0'-FD** were identified as field duplicates. No diesel range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

LDC #: 18100E8
 SDG #: TRNC/D-5
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 1/29/08
 Page: 1 of 1
 Reviewer: SVL
 2nd Reviewer: [Signature]

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: 11/15/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K 140171-021 (TRNC/D-3); F7K190148-008 (TRNC/D-6)
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	MD	D ₁ = 1, 2 D ₂ = 8, 9
X.	Field blanks	ND	R = 17

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

Soil + Water

1	TSB-FJ-03-0**	D ₁ S	11	TSB-FR-02-0**	S	21	7324074 MB	11/28	31
2	TSB-FJ-03-0-FD**	D ₁	12	TSB-FR-02-10**		22	7325273 MB	11/21	32
3	TSB-FJ-03-10**		13	TSB-FJ-09-0**		23	7324111 MB	11/20	33
4	TSB-FJ-10-0**		14	TSB-FJ-09-10**		24			34
5	TSB-FJ-10-10**		15	TSB-FR-03-0**		25			35
6	TSB-FJ-04-0**		16	TSB-FR-03-10**		26			36
7	TSB-FJ-04-10**		17	RINSATE-3	W	27			37
8	TSB-FJ-02-0**	D ₂	18	TSB-FR-02-0'MS	S	28			38
9	TSB-FJ-02-0-FD**	D ₂	19	TSB-FR-02-0'MSD		29			39
10	TSB-FJ-02-10**		20			30			40

Notes: _____

LDC #: 18100 EB
 SDG #: See Copy

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
 Reviewer: JV6
 2nd Reviewer: V

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cooler temperature criteria was met.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
II. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a linear fit used for evaluation? If yes, were all percent relative standard deviations (%RSD) < 20%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a curve fit used for evaluation? If Yes, what was the acceptance criteria used?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Did the initial calibration meet the curve fit acceptance criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Were the RT windows properly established?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IV. Continuing calibration				
What type of continuing calibration calculation was performed? <u> </u> %D or <u> </u> %R	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a continuing calibration analyzed daily?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all percent differences (%D) < 15%.0 or percent recoveries 85-115%?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all the retention times within the acceptance windows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
V. Blanks				
Was a method blank associated with every sample in this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a method blank analyzed for each matrix and concentration?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VI. Surrogate spikes				
Were all surrogate %R within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was a MS/MSD analyzed every 20 samples of each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

LDC #: 1810EB
 SDG #: See Currey

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: JV
 2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
IX. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		<input checked="" type="checkbox"/>		
Were the performance evaluation (PE) samples within the acceptance limits?			<input checked="" type="checkbox"/>	
X. Target compound identification				
Were the retention times of reported detects within the RT windows?	<input checked="" type="checkbox"/>			
XI. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>			
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>			
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>			
Target compounds were detected in the field duplicates.		<input checked="" type="checkbox"/>		
XV. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>			
Target compounds were detected in the field blanks.		<input checked="" type="checkbox"/>		

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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 Were 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	DRO	()	* 132 (37-116)	()	11	N o qual (MS; US in)
			()	()	()		
			()	()	()		
			()	()	()		
	F7k140171-021	DRO	()	()	20 (20)	N one	No qual.
			()	()	()		
			()	()	()		
			()	()	()		
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			()	()	()		

(* value from recalculations; parent conc. not used in calc. from lab)

LDC #: 18100 EB
 SDG #: See copy

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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 = $100 \cdot (S/X)$
- 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		Recalculated		Reported		Recalculated	
				CF (100% std)	CF (100% std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD		
1	1CAL	11/21/07	Dioxin ↓	19777	19777	21081	21081	15.162	15.162		
	GCE										
2	1CAL	11/20/07		17911	17910.768	17675	17675	12.219	12.219		
	GCE										
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 #: 18100 E8

SDG #: See Copy

VALIDATION FINDINGS WORKSHEET Continuing Calibration Results Verification

Page: 1 of 1

Reviewer: JZ

2nd Reviewer: [Signature]

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 = $100 * (\text{ave. CF} - \text{CF}) / \text{ave. CF}$ 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 (cal)/ CCV Conc.	Reported		Recalculated	
					CF/Conc. CCV	%D	CF/Conc. CCV	%D
1	ECAL 296	12/07/07	Diesel	1000	1016.0379	1.6	1016.0359	1.6
2	ECAL 309	12/07/07			1069.5371	7.0	1069.5357	7.0
3	OCAL 485	12/06/07			1078.2174	7.8	1078.1919	7.8
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.

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

LDC #: 181008
 SDG #: See Cover

Page: 1 of 1
 Reviewer: STB
 2nd reviewer: [Signature]

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: # /

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
<u>o-Terphenyl</u>	<u>RTX-5</u>	<u>25</u>	<u>16.1011</u>	<u>64</u>	<u>64</u>	<u>0</u>

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	

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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
 RPD = $(((SSCMS - SSCMSD) * 2) / ((SSCMS + SSCMSD))) * 100$ MS = Matrix spike, MSD = Matrix spike duplicate

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)											
Diesel (8015)	84.3	83.7	66.0	151	176	179	101	212	132	15	15
Benzene (80218)											
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.

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

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 sample concentration SC = Sample concentration
 SA = Spike added
 RPD = $((SSCLCS - SSCLCSD) * 2) / ((SSCLCS + SSCLCSD)) * 100$ LCS = Laboratory Control Sample LCS = Laboratory Control Sample duplicate

LCS/LCSD samples: 7325273 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	70.0	NA	84	84				
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.

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

LDC #: 18/0049
 SDG #: See Cover

METHOD: GC HPLC

Y/N/A
Y/N/A

Were all reported results recalculated and verified for all level IV samples?
 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: # 11 Compound Name PRO

Concentration = $(341.05719) (1 \text{ ml}) = 65.68$
 $(17675) (20.19) (0.976) \approx 66 \text{ mg/kg}$

#	Sample ID	Compound	Reported Concentrations	Recalculated Results Concentrations	Qualifications

Comments: _____

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 16, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Diesel Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FJ-08-10'
TSB-FR-05-0'
TSB-FR-05-10'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FR-04-10'
TSB-FJ-01-0'
TSB-FJ-01-10'
TSB-GR-01-0'
TSB-GR-01-5'
TSB-GJ-06-0'
TSB-GJ-06-5'
TSB-GJ-01-0'
TSB-GJ-01-5'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD

Introduction

This data review covers 17 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-4 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. Surrogate recoveries (%R) were not within QC limits for TSB-FR-04-0' and TSB-FR-04-0'-FD. Since the samples were diluted out, no data were qualified.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags have been summarized at the end of this report if data has been qualified.

IX. Field Duplicates

Samples TSB-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples with the following exceptions:

Compound	Concentration (mg/Kg)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FR-04-0'	TSB-FR-04-0'-FD				
Diesel range organics	280	5500	-	5220 (≤ 1100)	J (all detects)	A

**BRC Tronox Parcel C/D/F/G
 Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-6**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-FR-04-0' TSB-FR-04-0'-FD	Diesel range organics	J (all detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
 Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG


**BRC Tronox Parcel C/D/F/G
 Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

LDC #: 18100F8
 SDG #: TRNC/D-6
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/23/18
 Page: 1 of 1
 Reviewer: SVL
 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: 11/16/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
IVa.	Surrogate recovery	SW	
IVb.	Matrix spike/Matrix spike duplicates	SW	F7K140171-021 C TRNC/D-3)
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	SW	D = 5, 6
X.	Field blanks	ND	R = 16

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-FJ-08-0'	S	11	TSB-GR-01-5'	S 21	7325273 MB	31
2	TSB-FJ-08-10'		12	TSB-GJ-06-0'	22	7324111 MB	32
3	TSB-FR-05-0'		13	TSB-GJ-06-5'	23		33
4	TSB-FR-05-10'		14	TSB-GJ-01-0'	24		34
5	TSB-FR-04-0'	D	15	TSB-GJ-01-5'	25		35
6	TSB-FR-07-0'-FD	D	16	RINSATE-4	W 26		36
7	TSB-FR-04-10'		17	TSB-FJ-01-0'MS	S 27		37
8	TSB-FJ-01-0'		18	TSB-FJ-01-0'MSD	28		38
9	TSB-FJ-01-10'		19		29		39
10	TSB-GR-01-0'		20		30		40

Notes: _____

VALIDATION FINDINGS WORKSHEET

Surrogate Recovery

LDC #: 18100 FB
 SDG #: See Cover

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".

Were surrogates spiked into all samples and blanks? N/A
 Did all surrogate recoveries (%R) meet the QC limits? N/A

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	5 (20x)	Rtx-5	H	100 (50-164)	No qual
	6 (20x)				

Surrogate Compound	Surrogate Compound	Surrogate Compound	Surrogate Compound	Surrogate Compound
A Chlorobenzene (CBZ)	G Octacosane	M	Benzo(e)Pyrene	S 1-Chloro-3-Nitrobenzene
B 4-Bromofluorobenzene (BFB)	H Ortho-Terphenyl	N	Terphenyl-D14	T 3,4-Dinitrotoluene
C a,a-Trifluorotoluene	I Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U Triphenylin
D Bromochlorobenzene	J n-Triacotane	P	1-methylnaphthalene	V Tri-n-propylin
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
				Y Tetrachloro-m-xylene
				Z Decachlorobiphenyl

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

LDC #: 18100 F8
 SDG #: See Curve

Page: 1 of 1
 Reviewer: JVC
 2nd Reviewer: [Signature]

METHOD: GC HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
- N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
- 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
	F7K140171-021	DRO	()	()	26 (20)	None	No qual
			()	()	()		
			()	()	()		
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LDC #: 18100 FB
 SDG #: See Copy

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
 Reviewer: JVG
 2nd reviewer: [Signature]

METHOD: GC HPLC

Y/N N/A Were field duplicate pairs identified in this SDG?

Y/N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (mg/kg)		%RPD Limit	Qualification Parent only / All Samples
	5	6		
DRD	280	5500	5220 (± 1100 Diff)	J 1-15 / A

Compound	Concentration ()		%RPD Limit	Qualification Parent only / All Samples

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 19, 2007
LDC Report Date: January 28, 2008
Matrix: Soil/Water
Parameters: Diesel Range Organics
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'
TSB-GR-02-0'-FD
TSB-GR-02-5'
TSB-GJ-04-0'
TSB-GJ-04-5'
TSB-GJ-02-0'
TSB-GJ-02-0'-FD
TSB-GJ-02-5'
TSB-GJ-07-0'
TSB-GJ-07-5'
TSB-GJ-05-0'
TSB-GJ-05-5'
TSB-GJ-03-0'
TSB-GJ-03-5'
RINSATE-5
TSB-GJ-04-0'MS
TSB-GJ-04-0'MSD
RINSATE-5MS
RINSATE-5MSD

Introduction

This data review covers 18 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.

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- 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-5 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. Surrogate recoveries (%R) were not within QC limits for TSB-GJ-03-0'. Since the sample was diluted out, no data were qualified.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were 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-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-FD were identified as field duplicates. No diesel range organics were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Diesel Range Organics - Field Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

LDC #: 18100G8
 SDG #: TRND-7
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/23/08
 Page: 1 of 1
 Reviewer: JVL
 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: 11/19/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	
III.	Blanks	A	
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 ₁ = 1, 2 D ₂ = 6, 7
X.	Field blanks	ND	R = 15

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: *Soil + Water*

1	TSB-GR-02-0'	D ₁ S	11	TSB-GJ-05-0'	S 21	7330081 MB	31
2	TSB-GR-02-0'-FD	D ₁	12	TSB-GJ-05-5'	22	7330147 MB	32
3	TSB-GR-02-5'		13	TSB-GJ-03-0'	23		33
4	TSB-GJ-04-0'		14	TSB-GJ-03-5'	24		34
5	TSB-GJ-04-5'		15	RINSATE-5	W 25		35
6	TSB-GJ-02-0'	D ₂	16	TSB-GJ-04-0'MS	S 26		36
7	TSB-GJ-02-0'-FD	D ₁	17	TSB-GJ-04-0'MSD	27		37
8	TSB-GJ-02-5'		18	RINSATE-5MS	28		38
9	TSB-GJ-07-0'		19	RINSATE-5MSD	29		39
10	TSB-GJ-07-5'		20		30		40

Notes: _____

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

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 (100x)	RTX-5	H	DD (59-164)	No Qual

	Surrogate Compound	Surrogate Compound	Surrogate Compound	Surrogate Compound	Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14
C	a.a.a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decafluorobiphenyl (DCB)
D	Bromochlorobenzene	J	n-Triacontane	P	1-methylnaphthalene
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol
				S	1-Chloro-3-Nitrobenzene
				T	3,4-Dinitrotoluene
				U	Triphenyltin
				V	Tri-n-propyltin
				W	Tributyl Phosphate
				X	Triphenyl Phosphate

**BRC Tronox Parcel C/D/F/G
Data Validation Reports
LDC# 18100**

Dioxins

IDC

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 9, 2007
LDC Report Date: January 24, 2008
Matrix: Soil/Water
Parameters: Dioxins/Dibenzofurans
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-1

Sample Identification

TSB-CR-07-0'
TSB-CR-07-10'
TSB-CJ-08-0'
TSB-CJ-08-0'-FD
TSB-CJ-08-10'
TSB-CJ-04-0'
TSB-CJ-04-10'
TSB-CJ-07-0'
TSB-CJ-07-10'
TSB-CJ-03-0'
TSB-CJ-03-10'
RINSATE 1

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25% .

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
11/29/07	1,2,3,7,8,9-HxCDD	20.5	TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-03-0' TSB-CJ-03-10'	1,2,3,7,8,9-HxCDD	J- (all detects) UJ (all non-detects)	P

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
7334440MB	11/30/07	OCDD	5.1 pg/g	TSB-CR-07-0' TSB-CJ-07-10'

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.

Sample "RINSATE 1" was identified as a rinsate. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. The percent recoveries (%R) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits with the following exceptions:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
732429MB	¹³ C-OCDD	33 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-CR-07-10'	¹³ C-OCDD	32 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-08-0'	¹³ C-2,3,7,8-TCDF ¹³ C-2,3,7,8-TCDD ¹³ C-1,2,3,7,8-PeCDF ¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	28 (40-135) 30 (40-135) 31 (40-135) 36 (40-135) 38 (40-135) 27 (40-135)	2,3,7,8-TCDF 2,3,7,8-TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CJ-08-10'	¹³ C-OCDD	30 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-04-0'	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-OCDD	37 (40-135) 18 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CJ-04-10'	¹³ C-OCDD	30 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-07-0'	¹³ C-OCDD	35 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

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-CR-07-0'	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	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-CJ-08-0' and TSB-CJ-08-0'-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-CJ-08-0'	TSB-CJ-08-0'-FD				
2,3,7,8-TCDF	2.1	92	191 (≤ 50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	3.3	210	194 (≤ 50)	-	J (all detects)	A
1,2,3,4,7,8-HxCDF	5.9	330	193 (≤ 50)	-	J (all detects)	A
1,2,3,6,7,8-HxCDF	4.2	250	193 (≤ 50)	-	J (all detects)	A
1,2,3,4,6,7,8-HpCDF	9.9	570	193 (≤ 50)	-	J (all detects)	A
1,2,3,4,7,8,9-HpCDF	4.1	230	193 (≤ 50)	-	J (all detects)	A
OCDF	21	1100	193 (≤ 50)	-	J (all detects)	A
2,3,7,8-TCDD	1.0U	2.6	-	1.6 (≤ 1.0)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-08-0'	TSB-CJ-08-0'-FD				
1,2,3,7,8-PeCDD	1.2U	11	-	9.8 (≤ 1.2)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	0.63U	6.8	-	6.17 (≤ 0.63)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	0.68U	16	-	15.32 (≤ 0.68)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	0.52U	13	-	12.48 (≤ 0.52)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDD	1.3U	38	-	36.7 (≤ 1.3)	J (all detects) UJ (all non-detects)	A
OCDD	3.5U	30	-	26.5 (≤ 3.5)	J (all detects) UJ (all non-detects)	A
2,3,4,7,8-PeCDF	1.8U	94	-	92.2 (≤ 1.8)	J (all detects) UJ (all non-detects)	A
2,3,4,6,7,8-HxCDF	1.1U	55	-	53.9 (≤ 1.1)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDF	0.63U	31	-	30.4 (≤ 0.63)	J (all detects) UJ (all non-detects)	A

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-1**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CR-07-10' TSB-CJ-08-0' TSB-CJ-08-10' TSB-CJ-04-0' TSB-CJ-04-10' TSB-CJ-07-0' TSB-CJ-03-0' TSB-CJ-03-10'	1,2,3,7,8,9-HxCDD	J- (all detects) UJ (all non-detects)	P	Routine calibration (%D)
TRNC-D-1	TSB-CR-07-10' TSB-CJ-08-10' TSB-CJ-04-10' TSB-CJ-07-0'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-1	TSB-CJ-08-0'	2,3,7,8-TCDF 2,3,7,8-TCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-1	TSB-CJ-04-0'	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-1	TSB-CR-07-0'	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	P	Compound quantitation and CRQLs
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	2,3,7,8-TCDF 1,2,3,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-1	TSB-CJ-08-0' TSB-CJ-08-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,4,7,8-PeCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-1**

No Sample Data Qualified in this SDG

LDC #: 18100A21
 SDG #: TRNC-D-1
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 11/5/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/9/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	W	
V.	Blanks	W	
VI.	Matrix spike/Matrix spike duplicates	N	diethyl purified
VII.	Laboratory control samples	A	ACS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	W	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	SW	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	W	D = 3+4
XV.	Field blanks	ND	R = 12

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet

ND = No compounds detected
 R = Rinsate
 FB = Field blank

D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

1	TSB-CR-07-0'	5/11	TSB-CJ-03-10'	5/21	7323429 MB	31	S
2	TSB-CR-07-10'	12	RINSATE 1	W/22	7325331 MB	32	
3	TSB-CJ-08-0'	13		23	7334440 MB	33	S
4	TSB-CJ-08-0'-FD	14		24		34	
5	TSB-CJ-08-10'	15		25		35	
6	TSB-CJ-04-0'	16		26		36	
7	TSB-CJ-04-10'	17		27		37	
8	TSB-CJ-07-0'	18		28		38	
9	TSB-CJ-07-10'	19		29		39	
10	TSB-CJ-03-0'	20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

LDC #: 18102A21
 SDG #: See COM

Page: 6 of 9
 Reviewer: 9
 2nd Reviewer: 1

Blanks

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA 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 analyzed for each matrix?
- Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 1/29/07 Blank analysis date: 12/4/07

Conc. units: pg/g Associated Samples: 1, 9

Compound	Blank ID	Sample Identification
	<u>33440N15</u>	
<u>9</u>	<u>5.1</u>	

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:
 All contaminants within five times the method blank concentration were qualified as not detected, "U".

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:

VALIDATION FINDINGS WORKSHEET
Internal Standards

LDC #: B100A-21
SDG #: See com

Page: 1 of 1
Reviewer: CL
2nd Reviewer: CL

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N/A Are all internal standard recoveries within the 40-135% criteria?

Y/N N/A Was the S/N ratio all internal standard peaks ≥ 10 ?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
		<u>7323429MB</u>	<u>I</u>	<u>33</u> (<u>40-135</u>)	<u>Y/N/P (F.A)</u>
		<u>2</u>	<u>I</u>	<u>32</u>	<u>Y</u>
		<u>3</u>	<u>A</u>	<u>28</u>	<u>Y/N/P (H)</u>
			<u>B</u>	<u>30</u>	<u>(A)</u>
			<u>C</u>	<u>31</u>	<u>(F.N)</u>
			<u>G</u>	<u>36</u>	<u>(O.P)</u>
			<u>H</u>	<u>38</u>	<u>(F)</u>
			<u>I</u>	<u>27</u>	<u>(F.A)</u>
		<u>5</u>	<u>I</u>	<u>30</u>	<u>Y/N/P (F.A)</u>
		<u>6</u>	<u>G</u>	<u>37</u>	<u>(O.P)</u>
		<u>7</u>	<u>I</u>	<u>18</u>	<u>(F.A)</u>
		<u>8</u>	<u>I</u>	<u>30</u>	
			<u>I</u>	<u>35</u>	<u>Y</u>
Internal Standards					
A.	Internal Standards			Recovery Standards	Check Standard Used
	¹³ C-2,3,7,8-TCDF		Check Standard Used	K.	¹³ C-1,2,3,4-TCDD
	¹³ C-2,3,7,8-TCDD			L.	¹³ C-1,2,3,7,8,9-HxCDD
	¹³ C-1,2,3,7,8-PeCDF			M.	
	¹³ C-1,2,3,7,8-PeCDD			N.	
	¹³ C-1,2,3,6,7,8-HxCDF			O.	
	¹³ C-1,2,3,6,7,8-HxCDD			P.	
	¹³ C-1,2,3,4,6,7,8-HpCDF			Q.	
	¹³ C-1,2,3,4,6,7,8-HpCDD			R.	
	¹⁴ C-OCDD			T.	

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
		<u>1</u>	<u>apt > calib range</u>	<u>1</u>	<u>sketches</u>
		<u>2</u>	<u>K.L.O.P.R.</u>		

Comments: See sample calculation verification worksheet for recalculations

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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 (µg/g)		D 2 RPD (≤50)
	3	4	
H	2.1	92	191 ✓dets/A
H	3.3	210	194
K	5.9	330	193
L	4.2	250	193
O	9.9	570	193

Compound	Concentration ()		RPD
P	4.1	230	193
Q	2.1	1100	193
A	1.0 U	2.6	1.6 (≤1.0) ✓N/A
B	1.2 U	11	9.8 (≤1.2)
C	0.63 U	6.8	6.17 (≤0.63)

Compound	Concentration ()		RPD
D	0.68 U	16	15.32 (≤0.68)
E	0.52 U	13	12.48 (≤0.52)
F	1.3 U	38	36.7 (≤1.3)
G	3.5 U	30	26.5 (≤3.5)
J	1.8 U	94	92.2 (≤1.8)

Compound	Concentration ()		RPD
M	1.1 U	55	53.9 (≤1.1)
N	0.63 U	31	30.4 (≤0.63) ✓

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 12, 2007
LDC Report Date: January 24, 2008
Matrix: Soil
Parameters: Dioxins/Dibenzofurans
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-2

Sample Identification

TSB-CJ-02-0'**
TSB-CJ-02-10'**
TSB-CJ-01-0'**
TSB-CJ-01-10'**
TSB-CJ-01-0'-FD**
TSB-CR-02-0'**
TSB-CR-02-10'**
TSB-CR-01-0'**
TSB-CR-01-10'**
TSB-CR-03-0'
TSB-CR-03-10'
TSB-CJ-05-0'
TSB-CJ-05-10'
TSB-CJ-06-0'
TSB-CJ-06-0'-FD
TSB-CJ-06-10'
TSB-CR-01-0'MS
TSB-CR-01-0'MSD

**Indicates sample underwent EPA Level IV review

Introduction

This data review covers 18 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
TSB-CJ-02-0'*** TSB-CJ-01-10'*** TSB-CR-02-0'*** TSB-CR-02-10'*** TSB-CR-01-0'*** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD	All TCL compounds	31	30	J- (all detects) UJ (all non-detects)	P
TSB-CJ-01-0'***	All TCL compounds	36	30	J- (all detects) UJ (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. 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 with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
12/14/07	1,2,3,4,7,8-HxCDD	20.3	TSB-CJ-02-0'*** TSB-CJ-01-10'*** TSB-CR-02-0'*** TSB-CR-02-10'*** TSB-CR-01-0'*** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7347435MB	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	A
12/15/07	2,3,7,8-TCDF	38.3	TSB-CR-02-10'*** TSB-CJ-06-10' 7347435MB	2,3,7,8-TCDF	J- (all detects) UJ (all non-detects)	P
12/15/07	¹³ C-OCDD	36.1	TSB-CJ-02-0'*** TSB-CJ-01-10'*** TSB-CR-02-0'*** TSB-CR-02-10'*** TSB-CR-01-0'*** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10' TSB-CR-01-0'MS TSB-CR-01-0'MSD 7347435MB	OCDD OCDF	J+ (all detects) J+ (all detects)	P
12/10/07	1,2,3,4,7,8-HxCDD	20.5	TSB-CJ-01-0'-FD** TSB-CR-01-10'*** TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0' 7338592MB	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	P

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
7334440MB	11/30/07	OCDD	5.1 pg/g	TSB-CJ-02-10'***

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.

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. 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.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. The percent recoveries (%R) were within the QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
7352533LCS	2,3,4,6,7,8-HxCDF	158 (73-157)	TSB-CJ-01-0'*** 7352533MB	J+ (all detects)	P

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits with the following exceptions:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-CJ-02-0'***	¹³ C-2,3,7,8-TCDF	31 (40-135)	All TCL compounds	J (all detects) UJ (all non-detects)	P
	¹³ C-2,3,7,8-TCDD	32 (40-135)			
	¹³ C-1,2,3,7,8-PeCDF	33 (40-135)			
	¹³ C-1,2,3,7,8-PeCDD	33 (40-135)			
	¹³ C-1,2,3,4,7,8-HxCDF	28 (40-135)			
	¹³ C-1,2,3,6,7,8-HxCDD	36 (40-135)			
	¹³ C-1,2,3,4,6,7,8-HpCDF	21 (40-135)			
	¹³ C-1,2,3,4,6,7,8-HpCDD	25 (40-135)			
¹³ C-OCDD	27 (40-135)				

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-CJ-02-10'***	¹³ C-OCDD	34 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-01-10'***	¹³ C-1,2,3,4,6,7,8-HpCDF	37 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CR-01-10'***	¹³ C-OCDD	32 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CJ-05-10'	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	30 (40-135) 30 (40-135) 21 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CJ-06-0'	¹³ C-OCDD	32 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

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-CJ-05-0'	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	P
TSB-CJ-06-0'-FD	1,2,3,4,6,7,8-HpCDF	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	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-CJ-01-0'** and TSB-CJ-01-0'-FD** and samples TSB-CJ-06-0' and TSB-CJ-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-CJ-01-0'**	TSB-CJ-01-0'-FD**				
2,3,7,8-TCDF	1.7	0.45U	-	1.25 (≤ 0.45)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDF	2.9	2.4U	-	0.50 (≤ 2.4)	-	-
1,2,3,4,6,7,8-HpCDF	5.6	4.3	26 (≤ 50)	-	-	-
OCDF	11	11	0 (≤ 50)	-	-	-

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
2,3,7,8-TCDD	0.30U	12	-	11.7 (≤ 0.30)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	1.1U	44	-	42.9 (≤ 1.1)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	0.53U	18	-	17.47 (≤ 0.53)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	1.6U	60	-	58.4 (≤ 1.6)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	1.0U	46	-	45.0 (≤ 1.0)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-CJ-06-0'	TSB-CJ-06-0'-FD				
1,2,3,4,6,7,8-HpCDD	3.2	150	192 (≤ 50)	-	J (all detects)	A
OCDD	3.5U	110	-	106.5 (≤ 3.5)	J (all detects) UJ (all non-detects)	A
2,3,7,8-TCDF	7.5	340	191 (≤ 50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	16	720	191 (≤ 50)	-	J (all detects)	A
2,3,4,7,8-PeCDF	8.2	350	191 (≤ 50)	-	J (all detects)	A
1,2,3,4,7,8-HxCDF	24	1100	191 (≤ 50)	-	J (all detects)	A
1,2,3,6,7,8-HxCDF	18	790	191 (≤ 50)	-	J (all detects)	A
2,3,4,6,7,8-HxCDF	5.3	200	190 (≤ 50)	-	J (all detects)	A
1,2,3,7,8,9-HxCDF	4.1	91	183 (≤ 50)	-	J (all detects)	A
1,2,3,4,6,7,8-HpCDF	42	2000	192 (≤ 50)	-	J (all detects)	A
1,2,3,4,7,8,9-HpCDF	24	990	191 (≤ 50)	-	J (all detects)	A
OCDF	95	3700	190 (≤ 50)	-	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-2

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-01-0'*** TSB-CJ-01-10'*** TSB-CR-02-0'*** TSB-CR-02-10'*** TSB-CR-01-0'*** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	All TCL compounds	J- (all detects) UJ (all non-detects)	P	Technical holding times
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-01-10'*** TSB-CR-02-0'*** TSB-CR-02-10'*** TSB-CR-01-0'*** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	A	Routine calibration (%D)
TRNC-D-2	TSB-CR-02-10'*** TSB-CJ-06-10'	2,3,7,8-TCDF	J- (all detects) UJ (all non-detects)	P	Routine calibration (%D)
TRNC-D-2	TSB-CJ-02-0'*** TSB-CJ-01-10'*** TSB-CR-02-0'*** TSB-CR-02-10'*** TSB-CR-01-0'*** TSB-CR-03-0' TSB-CJ-06-0'-FD TSB-CJ-06-10'	OCDD OCDF	J+ (all detects) J+ (all detects)	P	Routine calibration (%D)
TRNC-D-2	TSB-CJ-01-0'-FD** TSB-CR-01-10'*** TSB-CR-03-10' TSB-CJ-05-0' TSB-CJ-05-10' TSB-CJ-06-0'	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	P	Routine calibration (%D)
TRNC-D-2	TSB-CJ-01-0'***	2,3,4,6,7,8-HxCDF	J+ (all detects)	P	Laboratory control samples (%R)
TRNC-D-2	TSB-CJ-02-0'***	All TCL compounds	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-2	TSB-CJ-02-10'*** TSB-CR-01-10'*** TSB-CJ-06-0'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-2	TSB-CJ-01-10'***	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-2	TSB-CJ-05-10'	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-2	TSB-CJ-05-0'	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	J (all detects) J (all detects) J (all detects)	P	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-06-0'-FD	1,2,3,4,6,7,8-HpCDF	J (all detects)	P	Compound quantitation and CRQLs
TRNC-D-2	TSB-CJ-01-0'*** TSB-CJ-01-0'-FD**	2,3,7,8-TCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD OCDD	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-2	TSB-CJ-06-0' TSB-CJ-06-0'-FD	1,2,3,4,6,7,8-HpCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-2**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-2**

No Sample Data Qualified in this SDG

LDC #: 18100B21
 SDG #: TRNC-D-2
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Level III/IV

Date: 11/22/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/12/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	SW	
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	SW	
VII.	Laboratory control samples	SW	LC9
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	SW	
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 = 3 + 5, 14 + 15
XV.	Field blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Level IV validation

MSOIS

13	TSB-CJ-02-0**	X	11	TSB-CR-03-10'	✓	21	T334440MB	✓	31
21	TSB-CJ-02-10**	✓	12	TSB-CJ-05-0'	✗	22	T338592MB		32
34	TSB-CJ-01-0**	✓	13	TSB-CJ-05-10'	✓	23	T347435MB		33
43	TSB-CJ-01-10**	X	14	TSB-CJ-06-0'	✓	24	T352533MB		34
53	TSB-CJ-01-0'-FD**	✓	15	TSB-CJ-06-0'-FD	✗	25			35
63	TSB-CR-02-0**	X	16	TSB-CJ-06-10'	X	26			36
73	TSB-CR-02-10**	X	17	TSB-CR-01-0'MS	✓	27			37
83	TSB-CR-01-0**	X	18	TSB-CR-01-0'MSD	X	28			38
92	TSB-CR-01-10**	✓	19			29			39
103	TSB-CR-03-0'	X	20			30			40

Notes: _____

LDC #: 18100B21
 SDG #: Soil/et

VALIDATION FINDINGS CHECKLIST

Page: 1 of 3
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

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 ≥ 2.5 and for each recovery and internal standard ≥ 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 #: B100B21
 SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		/		
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 ≥ 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 ≥ 2.5 ?	/			
Does the maximum intensity of each specified characteristic ion coincide within ± 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 #: 18100 B21
SDG #: See cover

VALIDATION FINDINGS CHECKLIST

Page: 3 of 3
Reviewer: [Signature]
2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
Target compounds were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Field blanks were identified in this SDG.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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 #: 18100 B2
 SDG #: See copy

VALIDATION FINDINGS WORKSHEET
 Routine Calibration

Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Was a routine calibration performed at the beginning and end of each 12 hour period?

N N/A Were all percent differences (%D) of RRFs $\leq 20\%$ for unlabeled compounds and $\leq 30\%$ for labeled?

Y N N/A Did all routine calibration standards meet the Ion Abundance Ratio criteria?

#	Date	Standard ID	Compound	Finding %D (Limit: $\leq 30.0\%$)	Finding Ion Abundance Ratio	Associated Samples	Qualifications
	12/15/07	14DE075DS2	C	20.3		1.4.6-8.10.15-16 17-18.734735MB	✓ N/A ✓ A (C)
	12/15/07	14DE075DS20	H BC=OCDD	38.3 36.1		7.16.734735MB 1.4.6-8.10.15-18 734735MB	✓ N/A ✓ P ✓ + dots ✓ P (G)
	12/10/07	10DE079DS	C	20.5		5.9.11-14 7338592MB	✓ N/A ✓ P (C)

PCDDs	Selected ions (m/z)	Ion Abundance Ratio	PCDFs	Selected ions (m/z)	Ion Abundance Ratio
Tetra-	M/M+2	0.65-0.89	Tetra-	M/M+2	0.65-0.89
Penta-	M+2/M+4	1.32-1.78	Penta-	M+2/M+4	1.32-1.78
Hexa-	M+2/M+4	1.05-1.43	Hexa-	M+2/M+4	1.05-1.43
Hexa- ¹³ C-HxCDF (IS) only	M/M+2	0.43-0.59	Hexa- ¹³ C-HxCDF (IS) only	M/M+2	0.43-0.59
Hepta- ¹³ C-HpCDF (IS) only	M/M+2	0.37-0.51	Hepta- ¹³ C-HpCDF (IS) only	M/M+2	0.37-0.51
Hepta-	M+2/M+4	0.88-1.20	Hepta-	M+2/M+4	0.88-1.20
Octa-	M+2/M+4	0.76-1.02	Octa-	M+2/M+4	0.76-1.02

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A
Are all internal standard recoveries within the 40-135% criteria?

Y N N/A
Was the S/N ratio all internal standard peaks ≥ 10 ?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
			A	31 (40-135)	N/A (all)
			B	32	
			C	33	
			D	33	
			E	28	
			F	36	
			G	21	
			H	25	
			I	27	
		2	J	34	N/A (F.R)
		4	K	37	10.P
		9	L	32	N/A (F.R)
		13	M	30	N/A (O.P)
			N	30	(F)
			O	21	(F.R)

Internal Standards	Check Standard Used	Recovery Standards	Check Standard Used
A. ¹³ C-2,3,7,8-TCDF		K. ¹³ C-1,2,3,4-TCDD	
B. ¹³ C-2,3,7,8-TCDD		L. ¹³ C-1,2,3,7,8,9-HxCDD	
C. ¹³ C-1,2,3,7,8-PeCDF		M. ¹³ C-1,2,3,7,8-PeCDD	
D. ¹³ C-1,2,3,7,8-PeCDD		N. ¹³ C-1,2,3,7,8-HxCDF	
E. ¹³ C-1,2,3,7,8-HxCDF		O. ¹³ C-1,2,3,6,7,8-HxCDD	
F. ¹³ C-1,2,3,6,7,8-HxCDD		P. ¹³ C-1,2,3,4,6,7,8-HpCDF	
G. ¹³ C-1,2,3,4,6,7,8-HpCDF		Q. ¹³ C-1,2,3,4,6,7,8-HpCDD	
H. ¹³ C-1,2,3,4,6,7,8-HpCDD		R. ¹³ C-OCDD	
I. ¹³ C-OCDD		T. ¹³ C-OCDD	

LDC #: 18/00B2/
SDG #: See column

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: [Signature]
2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Were the correct internal standard (IS), quantitation ions and relative response factors (RRF) used to quantitate the compound?
 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
		12	H.O. & > calibration range	12	Notes P
		15	0	15	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 18/00 B21
 SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: 9
 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 (<u>PSG</u>)		RPD ≤ 50. D ≤ PL RPD or D
	<u>3</u>	<u>5</u>	
<u>H</u>	<u>1.7</u>	<u>0.45 U</u>	<u>1.75 (≤ 0.45) ↓ U/A</u>
<u>K</u>	<u>2.9</u>	<u>2.4 U</u>	<u>0.50 (≤ 2.4) No Anal</u>
<u>O</u>	<u>5.6</u>	<u>4.3</u>	<u>26 (≤ 50) ↓</u>
<u>Q</u>	<u>11</u>	<u>11</u>	<u>0 ↓ ↓</u>

Compound	Concentration (<u>PSG</u>)		RPD
	<u>14</u>	<u>15</u>	
<u>A</u>	<u>0.30 U</u>	<u>12</u>	<u>11.7 (≤ 0.30) ↓ U/A</u>
<u>B</u>	<u>1.1 U</u>	<u>44</u>	<u>42.9 (≤ 1.1)</u>
<u>C</u>	<u>0.53 U</u>	<u>18</u>	<u>17.47 (≤ 0.53)</u>
<u>D</u>	<u>1.6 U</u>	<u>60</u>	<u>58.4 (≤ 1.6)</u>
<u>E</u>	<u>1.0 U</u>	<u>46</u>	<u>45.0 (≤ 1.0) ↓</u>

Compound	Concentration ()		RPD ≤ 50. D ≤ PL RPD
<u>F</u>	<u>3.2</u>	<u>150</u>	<u>192 (≤ 50) ↓ det/A</u>
<u>G</u>	<u>3.5 U</u>	<u>110</u>	<u>106.5 (≤ 3.5) ↓ U/A</u>
<u>H</u>	<u>7.5</u>	<u>340</u>	<u>191 (≤ 50) ↓ det/A</u>
<u>I</u>	<u>16</u>	<u>720</u>	<u>191</u>
<u>J</u>	<u>8.2</u>	<u>350</u>	<u>191</u>

Compound	Concentration ()		RPD
<u>K</u>	<u>24</u>	<u>1100</u>	<u>191</u>
<u>L</u>	<u>18</u>	<u>790</u>	<u>191</u>
<u>M</u>	<u>5.3</u>	<u>200</u>	<u>190</u>
<u>N</u>	<u>4.1</u>	<u>91</u>	<u>183</u>
<u>O</u>	<u>42</u>	<u>200</u>	<u>192</u>
<u>P</u>	<u>24</u>	<u>990</u>	<u>191</u>
<u>Q</u>	<u>95</u>	<u>3700</u>	<u>190 ↓ ↓</u>

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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:

$RRF = (A_x)(C_{is}) / (A_{is})(C_x)$
 $average\ RRF = \sum of\ the\ RRFs / number\ of\ standards$
 $\%RSD = 100 * (S/X)$
 $A_x = Area\ of\ compound,$
 $C_x = Concentration\ of\ compound,$
 $S = Standard\ deviation\ of\ the\ RRFs,$
 $A_{is} = Area\ of\ associated\ internal\ standard$
 $C_{is} = Concentration\ of\ internal\ standard$
 $X = Mean\ of\ the\ RRFs$

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported		Recalculated		Reported		Recalculated	
				Average RRF (Initial)	RRF (Initial)	Average RRF (Initial)	RRF (CS-3 std)	%RSD	%RSD	RRF (CS-3 std)	%RSD
1	1CAL	9/29/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.167	1.13	1.167	1.13	3.65	3.65	1.13	3.46
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.254	1.22	1.254	1.22	4.69	4.69	1.22	4.82
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	1.310	1.27	1.310	1.27	8.4	8.4	1.310	8.4
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	1.111	1.07	1.111	1.07	6.58	6.58	1.07	6.68
			OCDF (¹³ C-OCDF)	3.332	3.25	3.332	3.25	5.72	5.80	3.25	5.80
2	1CAL	12/5/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.988	0.97	0.988	0.97	3.71	3.71	0.97	3.84
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.173	1.18	1.173	1.18	2.59	2.59	1.18	2.52
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	0.976	0.99	0.976	0.99	1.42	1.17	0.99	0.917
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	0.911	0.90	0.911	0.90	0.657	0.917	0.90	0.833
			OCDF (¹³ C-OCDF)	2.337	2.32	2.337	2.32	0.817	0.833	2.32	0.833
3	1CAL	12/4/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.883	0.86	0.883	0.86	4.12	4.12	0.86	4.56
			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-OCDF)								

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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:

$RRF = (A_x/C_x)/(A_s/C_s)$
 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_s = Area of associated internal standard
 C_s = Concentration of internal standard
 X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported		Recalculated		Reported		Recalculated	
				Average RRF (Initial)	Average RRF (Initial)	RRF (CS3 std)	RRF (CS3 std)	RRF (CS3 std)	RRF (CS3 std)	%RSD	%RSD
1	10A	11/7/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.966	0.966	0.95	0.95	7.17	7.13		
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.009	1.009	0.97	0.97	9.76	9.65		
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	0.868	0.868	0.92	0.92	9.19	9.16		
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	0.919	0.919	0.94	0.94	7.69	7.72		
			OCDF (¹³ C-OCDD)	2.579	2.579	2.64	2.64	9.58	9.52		
2	10A	12/4/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.039	1.039	0.98	0.98	5.30	5.42		
			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 Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

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 = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$ Where: ave. RRF = initial calibration average RRF
 RRF = $(A_x)(C_s) / (A_s)(C_x)$ RRF = continuing calibration RRF
 A_x = Area of compound, A_s = Area of associated internal standard
 C_x = Concentration of compound, C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	03DE01A11	12/4/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.167	1.16	0.9	1.16	0.9
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.254	1.24	0.9	1.24	0.9
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	1.007	1.02	1.4	1.02	1.5
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	1.111	1.11	0.5	1.11	0.5
			OCDF (¹³ C-OCDD)	3.332	3.50	4.9	3.50	4.9
2	020DE01D5	12/29/17	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.167	1.11	4.7	1.11	4.7
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.254	1.23	1.8	1.23	1.8
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	1.007	0.99	1.3	0.99	1.2
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	1.111	1.08	3.0	1.08	3.1
			OCDF (¹³ C-OCDD)	3.332	3.12	6.4	3.12	6.4
3	14DE01D5	12/14/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.966	0.60	38.3	0.60	38.3
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.009	0.78	22.4	0.78	22.4
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	0.868	0.82	5.2	0.82	5.2
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	0.919	0.87	4.8	0.87	4.8
			OCDF (¹³ C-OCDD)	2.579	2.36	8.3	2.36	8.3

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 #: 18100 B21
SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Page: 2 of 2
Reviewer: [Signature]
2nd Reviewer: [Signature]

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 = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$ Where: ave. RRF = initial calibration average RRF
 RRF = $(A_x)(C_s) / (A_s)(C_x)$ RRF = continuing calibration RRF
 A_x = Area of compound, A_s = Area of associated internal standard
 C_x = Concentration of compound, C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	14207572	12/14/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.966	0.84	13.7	0.84	12.7
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.009	0.94	6.4	0.94	6.4
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	0.868	0.86	0.4	0.86	0.4
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	0.919	0.91	0.4	0.91	0.4
			OCDF (¹³ C-OCDD)	2.579	2.28	11.4	2.28	11.4
2	1020795	12/10/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.988	0.98	1.2	0.98	1.2
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.173	1.13	3.6	1.13	3.6
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	0.976	0.94	4.0	0.94	4.0
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	0.911	0.91	0.2	0.91	0.2
			OCDF (¹³ C-OCDD)	2.337	2.45	4.9	2.45	4.9
3	10207572	12/10/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.887	0.84	5.2	0.84	5.2
			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)					

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 #: 18100 B2
SDG #: Se CDLW

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Page: 3 of 3
Reviewer: [Signature]
2nd Reviewer: [Signature]

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 = $100 * ((\text{ave. RRF} - \text{RRF}) / \text{ave. RRF})$
 RRF = $(A_x)(C_s) / (A_s)(C_x)$
 Where: ave. RRF = initial calibration average RRF
 RRF = continuing calibration RRF
 A_x = Area of compound,
 C_x = Concentration of compound,
 A_s = Area of associated internal standard
 C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	042601B52	12/5/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.883	0.92	4.5	0.92	4.5
			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	112601D2	12/17/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.039	0.90	13.1	0.90	13.1
			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	192601D2	12/20/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.039	1.03	0.9	1.03	0.9
			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 #: 18100B21
 SDG #: See calcs

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
 Reviewer: _____
 2nd Reviewer: _____

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 = $|MSR - MSDR| * 2 / (MSR + MSDR)$ MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 17/18

Compound	Spike Added (P5/S)		Sample Concentration (P5/S)	Spiked Sample Concentration (P5/S)		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	20.4		20.4	ND	20.6	27.6	101	101		
1,2,3,7,8-PeCDD	10.2	10.2	↓	10.2	14.5	100	100	142	142	35	35
1,2,3,4,7,8-HxCDD	↓	↓	↓	78.9	10.5	77	77	103	103	29	28
1,2,3,4,7,8,9-HpCDF	↓	↓	13	129	183	114	114	167	167	34	35
OCDF	20.4	20.4	57	210	353	75	75	145	145	51	51

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.

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 ₃₅ Cl ₉ O	TCDF	4	407.7818	M+2	C ₁₂ H ³⁵ Cl ₇ ³⁷ ClO	HpCDF		
	305.8987	M+2	C ₁₂ H ₄ ³⁵ Cl ₉ ³⁷ ClO	TCDF		409.7788	M+4	C ₁₂ H ³⁵ Cl ₅ ³⁷ Cl ₂ O	HpCDF		
	315.9419	M	¹³ C ₁₂ H ₄ ³⁵ Cl ₄ O	TCDF (S)		417.8250	M	¹³ C ₁₂ H ³⁵ Cl ₇ O	HpCDF (S)		
	317.9389	M+2	¹³ C ₁₂ H ₂ 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 ₄ O 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 ClO ₂	TCDD		425.7737	M+4	C ₁₂ H ³⁵ Cl ₅ ³⁷ Cl ₂ O ₂	HpCDD		
	331.9368	M	¹³ C ₁₂ H ₂ ³⁵ Cl ₃ O 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 ₂ ³⁵ Cl ₃ ³⁷ ClO ₂	TCDD (S)		437.8140	M+4	¹³ C ₁₂ H ³⁵ Cl ₅ ³⁷ Cl ₂ O ₂	HpCDD (S)		
	375.8364	M+2	C ₁₂ H ₄ ³⁵ Cl ₅ ³⁷ ClO	HxCDFPE		479.7165	M+4	C ₁₂ H ³⁵ Cl ₇ ³⁷ Cl ₂ O	NCDFPE		
	[354.9792]	LOCK	C ₉ F ₁₃	PFK		[430.9728]	LOCK	C ₉ F 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 ₂ O		PeCDF		443.7399	M+4	C ₁₂ ³⁵ Cl ₆ ³⁷ Cl ₂ O	OCDF
		351.9000	M+2	¹³ C ₁₂ H ₃ ³⁵ Cl ₄ ³⁷ ClO		PeCDF (S)		457.7377	M+2	C ₁₂ ³⁵ Cl ₉ ³⁷ ClO ₂	OCDD
		353.8970	M+4	¹³ C ₁₂ H ₃ ³⁵ Cl ₃ ³⁷ Cl ₂ O		PeCDF (S)		459.7348	M+4	C ₁₂ ³⁵ Cl ₆ ³⁷ Cl ₂ O 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 ₂ O ₂	PeCDD	471.7750	M+4		¹³ C ₁₂ ³⁵ Cl ₆ ³⁷ Cl ₂ O ₂	OCDD (S)		
367.8949		M+2	¹³ C ₁₂ H ₃ ³⁵ Cl ₃ ³⁷ ClO ₂	PeCDD (S)	513.6775	M+4		C ₁₂ ³⁵ Cl ₈ ³⁷ Cl ₂ O	DCDFPE		
369.8919		M+4	¹³ C ₁₂ H ₃ ³⁵ Cl ₃ ³⁷ Cl ₂ O ₂	PeCDD (S)	[422.9278]	LOCK		C ₁₀ F ₁₇	PFK		
409.7974		M+2	C ₁₂ H ₃ ³⁵ Cl ₆ ³⁷ ClO	HpCDFPE							
[354.9792]		LOCK	C ₉ F 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 ₂ O	HxCDF						
		383.8639	M	¹³ C ₁₂ H ₂ ³⁵ Cl ₆ O	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 ₂ O 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 ₂ O ₂	HxCDD (S)							
	445.7555	M+4	C ₁₂ H ₂ ³⁵ Cl ₆ ³⁷ Cl ₂ O	HxCDD (S)							
	[430.9728]	LOCK	C ₉ F ₁₇	OCDFPE							
				PFK							

(a) The following nuclidic masses were used:

H = 1.007825
 C = 12.000000
¹³C = 13.003355
 F = 18.9984
 O = 15.994915
³⁵Cl = 34.968853
³⁷Cl = 36.965903

S = internal/recovery standard

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 13, 2007
LDC Report Date: February 5, 2008
Matrix: Soil
Parameters: Dioxins/Dibenzofurans
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-3

Sample Identification

TSB-DR-06-0'
TSB-DR-06-10'
TSB-DR-05-0'
TSB-DR-05-0'-FD
TSB-DR-05-10'
TSB-DR-03-0'
TSB-DR-03-10'
TSB-DJ-01-0'
TSB-DJ-01-10'
TSB-DR-04-0'
TSB-DR-04-10'
TSB-CR-04-0'
TSB-CR-04-10'
TSB-CR-05-0'
TSB-CR-05-10'
TSB-CR-06-0'
TSB-CR-06-10'
TSB-DR-03-0'MS
TSB-DR-03-0'MSD

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 8290 for Polychlorinated Dioxins/Dibenzofurans.

This review follows USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.

J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.

J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.

R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25% .

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

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.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. The percent recoveries (%R) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits with the following exceptions:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-DR-06-10'	¹³ C-OCDD	38 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-DR-05-0'	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	26 (40-135) 25 (40-135) 12 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-DR-05-0'-FD	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	23 (40-135) 22 (40-135) 10 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-DR-03-0'	¹³ C-OCDD	24 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-DR-03-10'	¹³ C-2,3,7,8-TCDF ¹³ C-2,3,7,8-TCDD ¹⁸ C-1,2,3,7,8-PeCDF ¹³ C-1,2,3,7,8-PeCDD ¹³ C-1,2,3,4,7,8-HxCDF ¹³ C-1,2,3,6,7,8-HxCDD ¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	33 (40-135) 31 (40-135) 26 (40-135) 29 (40-135) 27 (40-135) 23 (40-135) 16 (40-135) 13 (40-135) 9.1 (40-135)	All TCL compounds	J (all detects) UJ (all non-detects)	P
TSB-DJ-01-0'	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	28 (40-135) 24 (40-135) 13 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-DJ-01-10'	¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	35 (40-135) 28 (40-135)	1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-DR-04-0'	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	33 (40-135) 32 (40-135) 17 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-DR-04-10'	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	39 (40-135) 37 (40-135) 25 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CR-04-0'	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	34 (40-135) 32 (40-135) 15 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CR-04-10'	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	39 (40-135) 38 (40-135) 31 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-CR-05-0'	¹³ C-OCDD	24 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-CR-05-10'	¹³ C-OCDD	34 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

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-DJ-01-0'	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	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-DR-05-0' and TSB-DR-05-0'-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-DR-05-0'	TSB-DR-05-0'-FD				
2,3,7,8-TCDD	1.5	0.54U	-	0.96 (≤ 0.54)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	9.6	1.3U	-	8.3 (≤ 1.3)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	4.7	1.8U	-	2.9 (≤ 1.8)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	11	1.9U	-	9.1 (≤ 1.9)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	5.5	1.5U	-	4.0 (≤ 1.5)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDD	25	4.3U	-	20.7 (≤ 4.3)	J (all detects) UJ (all non-detects)	A
OCDD	79	22	113 (≤ 50)	-	J (all detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-05-0'	TSB-DR-05-0'-FD				
2,3,7,8-TCDF	50	0.45U	-	49.55 (≤ 0.45)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDF	100	0.73U	-	99.27 (≤ 0.73)	J (all detects) UJ (all non-detects)	A
2,3,4,7,8-PeCDF	49	0.75U	-	48.25 (≤ 0.75)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDF	160	1.1U	-	158.9 (≤ 1.1)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDF	120	1.1U	-	118.9 (≤ 1.1)	J (all detects) UJ (all non-detects)	A
2,3,4,6,7,8-HxCDF	26	1.2U	-	24.8 (≤ 1.2)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDF	14	1.2U	-	12.8 (≤ 1.2)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDF	310	2.4U	-	307.6 (≤ 2.4)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8,9-HpCDF	160	2.8U	-	157.2 (≤ 2.8)	J (all detects) UJ (all non-detects)	A
OCDF	800	3.1U	-	796.9 (≤ 3.1)	J (all detects) UJ (all non-detects)	A

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-3**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-3	TSB-DR-06-10' TSB-DR-03-0' TSB-CR-05-0' TSB-CR-05-10'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD TSB-DJ-01-0' TSB-DR-04-0' TSB-DR-04-10' TSB-CR-04-0' TSB-CR-04-10'	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-3	TSB-DR-03-10'	All TCL compounds	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-3	TSB-DJ-01-10'	1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-3	TSB-DJ-01-0'	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	J (all detects) J (all detects) J (all detects)	P	Compound quantitation and CRQLs
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-3	TSB-DR-05-0' TSB-DR-05-0'-FD	OCDD	J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-3**

No Sample Data Qualified in this SDG

LDC #: 18100C21
 SDG #: TRNC-D-3
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 11/21/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/13/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	A	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	W	
VII.	Laboratory control samples	A	LC7
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	W	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	W	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	W	D = 3 + 4
XV.	Field blanks	N	RTS

Note: A = Acceptable
 N = Not provided/applicable
 SW = See worksheet
 ND = No compounds detected
 R = Rinsate
 FB = Field blank
 D = Duplicate
 TB = Trip blank
 EB = Equipment blank

Validated Samples:

1	TSB-DR-06-0'	11	TSB-DR-04-10'	21	7325524MB	31	S
2	TSB-DR-06-10'	12	TSB-CR-04-0'	22		32	
3	TSB-DR-05-0'	13	TSB-CR-04-10'	23		33	
4	TSB-DR-05-0'-FD	14	TSB-CR-05-0'	24		34	
5	TSB-DR-05-10'	15	TSB-CR-05-10'	25		35	
6	TSB-DR-03-0'	16	TSB-CR-06-0'	26		36	
7	TSB-DR-03-10'	17	TSB-CR-06-10'	27		37	
8	TSB-DJ-01-0'	18	RINSTATE-2	28		38	
9	TSB-DJ-01-10'	19	TSB-DR-03-0'MS	29		39	
10	TSB-DR-04-0'	20	TSB-DR-03-0'MSD	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: _____

VALIDATION FINDINGS WORKSHEET
Internal Standards

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)
 Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
 Y N N/A Are all internal standard recoveries within the 40-135% criteria?
 Y N N/A Was the S/N ratio all internal standard peaks ≥ 10 ?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
		2	I	38	(A-135) <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P (F.R)
		3	F	26	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P (P.F)
			H	25	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P (F)
			H	12	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P (F.R)
		4	F	23	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
			H	22	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
			H	10	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
		6	I	24	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P (F.R)
		7	A	33	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P (all)
			B	31	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
			C	26	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
			A	29	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
			V	27	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
			4	23	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
			H	16	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
			H	13	<input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> P
		Internal Standards	Check Standard Used	Recovery Standards	Check Standard Used
A.		¹³ C-2,3,7,8-TCDF		K.	
B.		¹³ C-2,3,7,8-TCDD		L.	¹³ C-1,2,3,4-TCDD
C.		¹³ C-1,2,3,7,8-PeCDF		M.	¹³ C-1,2,3,7,8,9-HxCDD
D.		¹³ C-1,2,3,7,8-PeCDD		N.	
E.		¹³ C-1,2,3,6,7,8-HxCDF		O.	
F.		¹³ C-1,2,3,6,7,8-HxCDD		P.	
G.		¹³ C-1,2,3,4,6,7,8-HpCDF		Q.	
H.		¹³ C-1,2,3,4,6,7,8-HpCDD		R.	
I.		¹³ C-OCDD		T.	

Page: 2 of 3
 Reviewer: gws
 2nd Reviewer: gws

VALIDATION FINDINGS WORKSHEET

Internal Standards

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/A Are all internal standard recoveries within the 40-135% criteria?

Y/N/A Was the S/N ratio all internal standard peaks ≥ 10 ?

#	Date	Lab ID/Reference	Internal Standard	% Recovery (Limit: 40-135%)	Qualifications
		T	F	9.1 (40-135)	N/A (all)
		8	F	28	N/A (O.P)
			H	24	(F)
			I	13	(G.R)
		9	H	35	
			I	28	
		10	F	33	
			H	32	
			I	17	
		11	F	39	
			H	37	
			I	25	
		12	F	34	
			H	32	
			I	15	
Internal Standards					
A.	Internal Standards			Recovery Standards	Check Standard Used
	¹³ C-2,3,7,8-TCDF			K.	¹³ C-1,2,3,4-TCDD
	¹³ C-2,3,7,8-TCDD			L.	
	¹³ C-1,2,3,7,8-PeCDF			M.	¹³ C-1,2,3,7,8,9-HxCDD
	¹³ C-1,2,3,7,8-PeCDD			N.	
	¹³ C-1,2,3,6,7,8-HxCDF			O.	
	¹³ C-1,2,3,6,7,8-HxCDD			P.	
	¹³ C-1,2,3,4,6,7,8-HpCDF			Q.	
	¹³ C-1,2,3,4,6,7,8-HpCDD			R.	
	¹³ C-OCDD			T.	

VALIDATION FINDINGS WORKSHEET
Field Duplicates

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 (PS/9)		D or RPD RPD
	3	4	
A	1.5	0.54U	0.96 (≤ 0.54) ✓/N/A
B	9.6	1.3U	8.3 (≤ 1.3)
C	4.7	1.8U	2.9 (≤ 1.8)
D	11	1.9U	9.1 (≤ 1.9)
E	5.5	1.5U	4.0 (≤ 1.5)

Compound	Concentration ()		RPD
F	25	4.3U	20.7 (≤ 4.3) ✓
G	79	22	113 (≤ 50)* J/J ✓/A
H	50	0.45U	49.55 (≤ 0.45) J/J ✓/A
I	100	0.73U	99.27 (≤ 0.73)
J	49	0.75U	18.25 (≤ 0.75)

Compound	Concentration ()		RPD
K	160	1.1U	158.9 (≤ 1.1)
L	120	1.1U	118.9 (≤ 1.1)
M	26	1.2U	24.8 (≤ 1.2)
N	14	1.2U	12.8 (≤ 1.2)
O	310	2.4U	307.6 (≤ 2.4)

Compound	Concentration ()		RPD
P	160	2.8U	157.2 (≤ 2.8)
Q	800	3.1U	796.9 (≤ 3.1) ✓

* RPD. allows all ~~xxx~~ D
equal percent and dup.

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 14, 2007
LDC Report Date: January 24, 2008
Matrix: Soil
Parameters: Dioxins/Dibenzofurans
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-4

Sample Identification

TSB-FR-01-0'
TSB-FR-01-10'
TSB-FJ-07-0'
TSB-FJ-07-10'
TSB-FJ-06-0'
TSB-FJ-06-0'-FD
TSB-FJ-06-10'
TSB-FJ-05-0'
TSB-FJ-05-10'
TSB-DR-01-0'
TSB-DR-01-10'
TSB-DR-02-0'
TSB-DR-02-10'
TSB-DR-02-0'-FD
JB-NW-DITCH01-0'
JB-NW-DITCH01-10'

Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8290 for Polychlorinated Dioxins/Dibenzofurans.

This review follows USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25% .

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
12/14/07	¹³ C-2,3,7,8-TCDF	60.7	TSB-FR-01-0' TSB-FJ-07-0' TSB-FJ-06-0' TSB-DR-01-0' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	2,3,7,8-TCDF	J+ (all detects)	P

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. The percent recoveries (%R) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits with the following exceptions:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-FJ-07-0'	¹³ C-2,3,7,8-TCDF ¹³ C-2,3,7,8-TCDD ¹³ C-1,2,3,7,8-PeCDF ¹³ C-1,2,3,7,8-PeCDD ¹³ C-1,2,3,4,7,8-HxCDF ¹³ C-1,2,3,6,7,8-HxCDD ¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	21 (40-135) 22 (40-135) 25 (40-135) 26 (40-135) 28 (40-135) 35 (40-135) 39 (40-135) 29 (40-135) 31 (40-135)	All TCL compounds	J (all detects) UJ (all non-detects)	P
TSB-FJ-05-10'	¹³ C-OCDD	28 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of the report if data has been qualified.

XIV. Field Duplicates

Samples TSB-FJ-06-0' and TSB-FJ-06-0'-FD and samples TSB-DR-02-0' and TSB-DR-02-0'-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-FJ-06-0'	TSB-FJ-06-0'-FD				
2,3,7,8-TCDD	3.9	0.70U	-	3.2 (≤ 0.70)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	7.0	1.1U	-	5.9 (≤ 1.1)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	3.2	0.80U	-	2.4 (≤ 0.80)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	8.3	0.86U	-	7.44 (≤ 0.86)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	7.2	0.66U	-	6.54 (≤ 0.66)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDD	28	0.60U	-	27.4 (≤ 0.60)	J (all detects) UJ (all non-detects)	A
OCDD	52	1.0U	-	51 (≤ 1.0)	J (all detects) UJ (all non-detects)	A
2,3,7,8-TCDF	92	0.54U	-	91.46 (≤ 0.54)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDF	75	0.77U	-	74.23 (≤ 0.77)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-06-0'	TSB-FJ-06-0'-FD				
2,3,4,7,8-PeCDF	40	0.79U	-	39.21 (≤ 0.79)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDF	120	0.54U	-	119.46 (≤ 0.54)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDF	79	0.53U	-	78.47 (≤ 0.53)	J (all detects) UJ (all non-detects)	A
2,3,4,6,7,8-HxCDF	19	0.56U	-	18.44 (≤ 0.56)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDF	9.8	0.56U	-	9.24 (≤ 0.56)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDF	250	0.74U	-	249.26 (≤ 0.74)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8,9-HpCDF	94	0.62U	-	93.38 (≤ 0.62)	J (all detects) UJ (all non-detects)	A
OCDF	850	1.5U	-	848.5 (≤ 1.5)	J (all detects) UJ (all non-detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
2,3,7,8-TCDD	2.6	0.72U	-	1.88 (≤ 0.72)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	9.6	2.3U	-	7.3 (≤ 2.3)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDD	5.5	1.3U	-	4.2 (≤ 1.3)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	16	3.6	127 (≤ 50)	-	J (all detects)	A
1,2,3,7,8,9-HxCDD	12	2.5	131 (≤ 50)	-	J (all detects)	A
1,2,3,4,6,7,8-HpCDD	55	13	124 (≤ 50)	-	J (all detects)	A
OCDD	55	13	124 (≤ 50)	-	J (all detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-DR-02-0'	TSB-DR-02-0'-FD				
2,3,7,8-TCDF	66	15	126 (≤ 50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	150	34	126 (≤ 50)	-	J (all detects)	A
2,3,4,7,8-PeCDF	73	18	121 (≤ 50)	-	J (all detects)	A
1,2,3,4,7,8-HxCDF	290	66	126 (≤ 50)	-	J (all detects)	A
1,2,3,6,7,8-HxCDF	220	53	122 (≤ 50)	-	J (all detects)	A
2,3,4,6,7,8-HxCDF	53	14	116 (≤ 50)	-	J (all detects)	A
1,2,3,7,8,9-HxCDF	20	5.7	111 (≤ 50)	-	J (all detects)	A
1,2,3,4,6,7,8-HpCDF	800	180	126 (≤ 50)	-	J (all detects)	A
1,2,3,4,7,8,9-HpCDF	260	56	129 (≤ 50)	-	J (all detects)	A
OCDF	1800	380	130 (≤ 50)	-	J (all detects)	A

BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-4

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-FR-01-0' TSB-FJ-07-0' TSB-FJ-06-0' TSB-DR-01-0' TSB-DR-02-0' TSB-DR-02-10' TSB-DR-02-0'-FD JB-NW-DITCH01-0' JB-NW-DITCH01-10'	2,3,7,8-TCDF	J+ (all detects)	P	Routine calibration (%D)
TRNC-D-4	TSB-FJ-07-0'	All TCL compounds	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-4	TSB-FJ-05-10'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-4	TSB-FJ-06-0' TSB-FJ-06-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-4	TSB-DR-02-0' TSB-DR-02-0'-FD	2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDD	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-4	TSB-DR-02-0' TSB-DR-02-0'-FD	1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-4**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-4**

No Sample Data Qualified in this SDG

LDC #: 18100D21
 SDG #: TRNC-D-4
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/21/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/14/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	TW	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	N	eluent purified
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	TW	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	TW	D = 5 + 6, 12 + 14
XV.	Field blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples:

MS 1013

1	TSB-FR-01-0'	11	TSB-DR-01-10'	21	7345-23MB	31	
2	TSB-FR-01-10'	12	TSB-DR-02-0'	22		32	
3	TSB-FJ-07-0'	13	TSB-DR-02-10'	23		33	
4	TSB-FJ-07-10'	14	TSB-DR-02-0'-FD	24		34	
5	TSB-FJ-06-0'	15	JB-NW-DITCH01-0'	25		35	
6	TSB-FJ-06-0'-FD	16	JB-NW-DITCH01-10'	26		36	
7	TSB-FJ-06-10'	17		27		37	
8	TSB-FJ-05-0'	18		28		38	
9	TSB-FJ-05-10'	19		29		39	
10	TSB-DR-01-0'	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:

LDC #: 18/00 *1021*
 SDG #: *Seacover*

VALIDATION FINDINGS WORKSHEET
 Field Duplicates

Page: *1 of 1*
 Reviewer: *[Signature]*
 2nd reviewer: *[Signature]*

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 (PS/G)		RPD
	5	6	
A	3.9	0.70 <i>U</i>	3.2 (≤0.70) <i>U/A</i>
B	7.0	1.1	5.9 (≤1.1)
C	3.2	0.80	2.4 (≤0.80)
D	8.3	0.86	7.4 (≤0.86)
E	7.2	0.66	6.5 (≤0.66)

Compound	Concentration ()		RPD
F	28	0.60	27.4 (≤0.60)
G	52	1.0	51 (≤1.0)
H	92	0.54	91.46 (≤0.54)
I	75	0.77	74.23 (≤0.77)
J	40	0.79	39.21 (≤0.79)

Compound	Concentration ()		RPD
K	120	0.54	119.46 (≤0.54)
L	79	0.53	78.47 (≤0.53)
M	19	0.56	18.44 (≤0.56)
N	9.8	0.56	9.24 (≤0.56)
O	250	0.74	249.26 (≤0.74)

Compound	Concentration ()		RPD
P	91	0.62	90.38 (≤0.62)
Q	850	1.5 <i>U</i>	848.5 (≤1.5) <i>U</i>

LDC #: 18/0001
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
 Field Duplicates

Page: 2 of 2
 Reviewer: [Signature]
 2nd reviewer: [Signature]

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)		RPD or D
	12	14	
A	2.6	0.72U	1.88 (≤ 0.72) # y/n/A*
B	9.6	2.3U	7.3 (≤ 2.3)
C	5.5	1.3U	4.2 (≤ 1.3)
D	16	3.6	127 (≤ 50) ↓ dete/18
E	12	2.5	131

Compound	Concentration ()		RPD
F	55	13	124
G	55	13	124
H	66	15	126
I	150	34	126
J	73	18	121

Compound	Concentration ()		RPD
K	290	66	126
L	220	53	122
M	53	14	116
N	20	5.7	111
O	800	180	126

Compound	Concentration ()		RPD
P	260	56	129
Q	1800	380	130 ↓ ↓

* D. other RPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 15, 2007
LDC Report Date: January 24, 2008
Matrix: Soil/Water
Parameters: Dioxins/Dibenzofurans
Validation Level: EPA Level III & IV
Laboratory: TestAmerica, Inc.
Sample Delivery Group (SDG): TRNC-D-5

Sample Identification

TSB-FJ-03-0'**
TSB-FJ-03-0'-FD**
TSB-FJ-10-0'**
TSB-FJ-04-0'**
TSB-FJ-02-0'**
TSB-FJ-02-0'-FD**
TSB-FR-02-0'**
TSB-FJ-09-0'**
TSB-FR-03-0'**
RINSATE-3
TSB-FR-02-0'MS
TSB-FR-02-0'MSD

**Indicates sample underwent EPA Level IV review

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.

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.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25% .

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.

Sample RINSATE-3 was identified as a rinsate. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank

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) 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.

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 for samples on which EPA Level IV review was performed. 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-FJ-03-0'*** and TSB-FJ-03-0'-FD** and samples TSB-FJ-02-0'*** and TSB-FJ-02-0'-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-FJ-03-0'***	TSB-FJ-03-0'-FD**				
2,3,7,8-TCDD	1.1	0.095U	-	1.005 (≤ 0.095)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8-PeCDD	3.5	0.13U	-	3.37 (≤ 0.13)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDD	5.1	0.18U	-	4.92 (≤ 0.18)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDD	4.7	0.23U	-	4.47 (≤ 0.23)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDD	16	0.42U	-	15.58 (≤ 0.42)	J (all detects) UJ (all non-detects)	A
OCDD	52	2.0U	-	50 (≤ 2.0)	J (all detects) UJ (all non-detects)	A
2,3,7,8-TCDF	240	1.7	197 (≤ 50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	64	0.99U	-	63.01 (≤ 0.99)	J (all detects) UJ (all non-detects)	A
2,3,4,7,8-PeCDF	63	0.67U	-	62.33 (≤ 0.67)	J (all detects) UJ (all non-detects)	A
1,2,3,4,7,8-HxCDF	65	1.6U	-	63.4 (≤ 1.6)	J (all detects) UJ (all non-detects)	A
1,2,3,6,7,8-HxCDF	51	0.98U	-	50.02 (≤ 0.98)	J (all detects) UJ (all non-detects)	A
2,3,4,6,7,8-HxCDF	12	0.25U	-	11.75 (≤ 0.25)	J (all detects) UJ (all non-detects)	A
1,2,3,7,8,9-HxCDF	6.2	0.18U	-	6.02 (≤ 0.18)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDF	150	2.9	192 (≤ 50)	-	J (all detects)	A

Compound	Concentration (pg/g)		RPD (Limits)	Difference (Limits)	Flag	A or P
	TSB-FJ-03-0**	TSB-FJ-03-0'-FD**				
1,2,3,4,7,8,9-HpCDF	52	1.1U	-	50.9 (≤ 1.1)	J (all detects) UJ (all non-detects)	A
OCDF	360	7.0	192 (≤ 50)	-	J (all detects)	A

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-5**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-5	TSB-FJ-03-0*** TSB-FJ-03-0'-FD**	2,3,7,8-TCDD 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 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8,9-HpCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-5	TSB-FJ-03-0*** TSB-FJ-03-0'-FD**	2,3,7,8-TCDF 1,2,3,4,6,7,8-HpCDF OCDF	J (all detects) J (all detects) J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-5**

No Sample Data Qualified in this SDG

LDC #: 18100E21
 SDG #: TRNC-D-5
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III/IV

Date: 1/22/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/15/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	A	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	TW	
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	A	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	TW	D = 1 + 2 . 5 + 6 *
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: ** Indicates sample underwent Level IV validation

1 ✓	TSB-FJ-03-0'**	S	11	TSB-FR-02-0'MS	S	21	7330370 MB	31
2 ✓	TSB-FJ-03-0'-FD**		12	TSB-FR-02-0'MSD	↓	22	733228 MB	32
3 ✓	TSB-FJ-10-0'**		13			23		33
4 ✓	TSB-FJ-04-0'**		14			24		34
5 ✓	TSB-FJ-02-0'**		15			25		35
6 ✓	TSB-FJ-02-0'-FD**		16			26		36
7 ✓	TSB-FR-02-0'**		17			27		37
8 ✓	TSB-FJ-09-0'**		18			28		38
9 ✓	TSB-FR-03-0'**		19			29		39
10	RINSATE-3	W	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-PeCDD	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:

LDC #: 18100221
 SDG #: See COLEY

VALIDATION FINDINGS CHECKLIST

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 2nd Reviewer: [Signature]

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 ≥ 2.5 and for each recovery and internal standard ≥ 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?	/			

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 SDG #: See COLLE

VALIDATION FINDINGS CHECKLIST

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Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
VIII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were the performance evaluation (PE) samples within the acceptance limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
IX. Internal standards				
Were internal standard recoveries within the 40-135% criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the minimum S/N ratio of all internal standard peaks ≥ 10 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Did compound spectra contain all characteristic ions listed in the table attached?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5 ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For PCDF identification, was any signal ($S/N \geq 2.5$, at \pm seconds RT) detected in the corresponding PCDPE channel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was an acceptable lock mass recorded and monitored?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
XI. Compound quantitation/CRQLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XII. System performance				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XIV. Field duplicates				
Field duplicate pairs were identified in this SDG.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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SDG #: See cover

VALIDATION FINDINGS CHECKLIST

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Reviewer: [Signature]
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Validation Area	Yes	No	NA	Findings/Comments
Target compounds were detected in the field duplicates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
XV. Field blanks				
Field blanks were identified in this SDG.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Target compounds were detected in the field blanks.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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
		<u>11/12</u>	<u>F</u>	()	()	<u>32 (≤ 25)</u>	<u>7</u>	<u>No error</u>
			<u>H</u>	<u>39 (80-146)</u>	<u>168 (80-146)</u>	<u>2. ()</u>		
			<u>K</u>	<u>142 (18-141)</u>	()	()		
			<u>Q</u>	<u>0 (70-158)</u>	<u>0 (70-158)</u>	()		<u>[Signature]</u>
				()	()	()		
				()	()	()		
				()	()	()		
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				()	()	()		
				()	()	()		

LDC #: 1810052
 SDG #: sa coker

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: 9
 2nd reviewer: ✓

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

N N/A Were field duplicate pairs identified in this SDG.
 N N/A Were target compounds detected in the field duplicate pairs?

Compound	Concentration (pg/g)		RPD ≤ 50. D ≤ RL
	1	2	RPD or D
A	1.1	0.095U	1.005 (≤ 0.095) ↓/U/A
B	3.5	0.13U	3.37 (≤ 0.13)
D	5.1	0.18U	4.92 (≤ 0.18)
E	4.7	0.23U	4.47 (≤ 0.23)
F	16	0.42U	15.58 (≤ 0.42)

Compound	Concentration ()		RPD
	1	2	RPD
G	52	2.0U	50 (≤ 2.0) ↓
H	240	1.7	38.3 (≤ 1.7) 197 (≤ 50) ↓/U/A
I	64	0.99U	63.01 (≤ 0.99) ↓/U/A
J	63	0.67U	62.33 (≤ 0.67)
K	65	1.6U	63.4 (≤ 1.6)

Compound	Concentration ()		RPD
	1	2	RPD
L	51	0.98U	50.02 (≤ 0.98)
M	12	0.25U	11.75 (≤ 0.25)
N	6.2	0.18U	60.2 (≤ 0.18) ↓
O	150	2.9	192 (≤ 50) ↓/U/A
P	52	1.1U	50.9 (≤ 1.1) ↓/U/A

Compound	Concentration ()		RPD
	1	2	RPD
Q	360	7.0	192 (≤ 50) ↓/U/A

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

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,
 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		Recalculated		Reported		Recalculated		
				Average RRF (Initial)	RRF (Initial)	Average RRF (Initial)	RRF (CS3 std)	RRF (CS3 std)	RRF (CS3 std)	%RSD	%RSD	
1	1CAL	9/25/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.167	1.13	1.167	1.13	1.13	1.13	3.65	3.46	
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.254	1.22	1.254	1.22	1.22	1.22	4.69	4.80	
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	1.318	1.29	1.318	1.29	0.97	0.97	8.4	1.310	8.27
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	1.111	1.07	1.111	1.07	1.07	1.07	6.58	6.68	
			OCDF (¹³ C-OCDF)	3.332	3.25	3.332	3.25	3.25	3.25	5.72	5.80	
2	1CAL	12/5/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.988	0.97	0.988	0.97	0.97	0.97	3.71	3.84	
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.173	1.18	1.173	1.18	1.18	1.18	2.59	2.52	
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	0.976	0.99	0.976	0.99	0.99	0.99	1.42	1.17	
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	0.911	0.90	0.911	0.90	0.90	0.90	0.634	0.917	
			OCDF (¹³ C-OCDF)	2.337	2.32	2.337	2.32	2.32	2.32	0.817	0.823	
3	1CAL	12/4/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.883	0.86	0.883	0.86	0.86	0.86	4.12	4.56	
			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-OCDF)									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

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 = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$ Where: ave. RRF = initial calibration average RRF
 $\text{RRF} = (A_x)(C_s) / (A_s)(C_x)$ RRF = continuing calibration RRF
 A_x = Area of compound, A_s = Area of associated internal standard
 C_x = Concentration of compound, C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D	RRF (CC)	%D
1	13D2011DS	12/2/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.167	1.09	6.7	1.09	6.7	1.09	6.7
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.254	1.10	12.4	1.10	12.4	1.10	12.4
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	1.310 1.007	0.97	3.6	0.97	3.6	0.97	3.6
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	1.111	1.07	3.5	1.07	3.5	1.07	3.5
			OCDF (¹³ C-OCDD)	3.332	3.58	7.5	3.58	7.5	3.58	7.5
2	13D2011DS	12/14/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	1.167	1.20	3.1	1.20	3.1	1.20	3.1
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.254	1.23	2.3	1.23	2.3	1.23	2.3
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	1.007	1.02	1.5	1.02	1.5	1.02	1.5
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	1.111	1.09	1.8	1.09	1.8	1.09	1.8
			OCDF (¹³ C-OCDD)	3.332	3.39	1.6	3.39	1.6	3.39	1.6
3	13D2011DS	12/7/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.988	0.96	3.0	0.96	3.0	0.96	3.0
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.173	1.07	8.6	1.07	8.6	1.07	8.6
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	0.976	1.00	2.4	1.00	2.4	1.00	2.4
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	0.911	0.92	0.9	0.92	0.9	0.92	0.9
			OCDF (¹³ C-OCDD)	2.337	2.43	3.8	2.43	3.8	2.43	3.8

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.

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

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 = $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$ Where: ave. RRF = initial calibration average RRF
 RRF = $(A_x)(C_s) / (A_s)(C_x)$ RRF = continuing calibration RRF
 A_x = Area of compound, A_s = Area of associated internal standard
 C_x = Concentration of compound, C_s = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported		Recalculated	
					RRF (CC)	%D	RRF (CC)	%D
1	10D2079D5	12/11/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.988	0.97	2.2	0.97	2.2
			2,3,7,8-TCDD (¹³ C-2,3,7,8-TCDD)	1.173	1.12	4.4	1.12	4.4
			1,2,3,6,7,8-HxCDD (¹³ C-1,2,3,6,7,8-HxCDD)	0.976	0.95	2.5	0.95	2.5
			1,2,3,4,6,7,8-HpCDD (¹³ C-1,2,4,6,7,8-HpCDD)	0.911	0.91	0.2	0.91	0.2
			OCDF (¹³ C-OCDD)	2.337	2.47	5.7	2.47	5.7
2	10D2075D2	12/10/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.883	0.84	5.2	0.84	5.2
			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)					
3	10D2075D2	12/11/07	2,3,7,8-TCDF (¹³ C-2,3,7,8-TCDF)	0.883	0.85	3.5	0.85	3.5
			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)					
			OCDF (¹³ C-OCDD) H (13C-H)	0.883	0.86	2.6	0.86	2.7

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.

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

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 = $|MSR - MSDR| * 2 / (MSR + MSDR)$ MSR = Matrix spike percent recovery MSDR = Matrix spike duplicate percent recovery

MS/MSD samples: 11/12

Compound	Spike Added (PS/S)		Sample Concentration (PS/S)	Spiked Sample Concentration (PS/S)		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	20.5	20.5	ND	21.7	22.3	106	106	109	109	3.1	2.7
1,2,3,7,8-PeCDD	10.2	10.2	↓	10.1	10.4	99	99	102	102	2.6	2.9
1,2,3,4,7,8-HxCDD	↓	↓	59	128	111	125	125	109	109	14	14
1,2,3,4,7,8,9-HpCDF	205	205	1700	193	181	131	131	119	120	6.7	6.4
OCDF				875	980	0	0	0	0	0	11

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.

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 ₄ O	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 Cl ₂ O	TCDF		409.7788	M+4	C ₁₂ H ₄ ³⁵ Cl ₅ ³⁷ Cl ₂ O	HpCDF		
	315.9419	M	¹³ C ₁₂ H ₄ ³⁵ Cl ₄ O	TCDF (S)		417.8220	M	¹³ C ₁₂ H ₄ ³⁵ Cl ₇ O	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 ₄ ³⁵ Cl ₆ ³⁷ ClO	HpCDF		
	319.8965	M	C ₁₂ H ₄ ³⁵ Cl ₄ O ₂	TCDD		423.7767	M+2	C ₁₂ H ³⁵ Cl ₅ ³⁷ ClO ₂	HpCDD		
	321.8936	M+2	C ₁₂ H ₄ ³⁵ Cl ₃ ³⁷ Cl ₂ O ₂	TCDD		425.7737	M+4	C ₁₂ H ³⁵ Cl ₆ ³⁷ Cl ₂ O ₂	HpCDD		
	331.9368	M	¹³ C ₁₂ H ₄ ³⁵ Cl ₄ O ₂	TCDD (S)		435.8169	M+2	¹³ C ₁₂ H ³⁵ Cl ₅ ³⁷ Cl ₂ O ₂	HpCDD (S)		
	333.9338	M+2	¹³ C ₁₂ H ₄ ³⁵ Cl ₃ ³⁷ Cl ₂ O ₂	TCDD (S)		437.8140	M+4	¹³ C ₁₂ H ³⁵ Cl ₆ ³⁷ Cl ₂ O ₂	HpCDD (S)		
	375.8364	M+2	C ₁₂ H ₄ ³⁵ Cl ₅ ³⁷ ClO	HxCDFE		479.7165	M+4	C ₁₂ H ³⁵ Cl ₆ ³⁷ Cl ₂ O	NCDFE		
	[354.9792]	LOCK	C ₉ F ₁₀	PFK		[430.9728]	LOCK	C ₉ F 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 ₂ O		PeCDF		443.7399	M+4	C ₁₂ ³⁵ Cl ₆ ³⁷ Cl ₂ O	OCDF
		351.9000	M+2	¹³ C ₁₂ H ₃ ³⁵ Cl ₄ ³⁷ ClO		PeCDF (S)		457.7377	M+2	¹³ C ₁₂ ³⁵ Cl ₇ ³⁷ ClO ₂	OCDD
		353.8970	M+4	¹³ C ₁₂ H ₃ ³⁵ Cl ₃ ³⁷ Cl ₂ O		PeCDF (S)		459.7348	M+4	¹³ C ₁₂ ³⁵ Cl ₆ ³⁷ Cl ₂ O ₂	OCDD
355.8546		M+2	C ₁₂ H ₃ ³⁵ Cl ₄ ³⁷ ClO ₂	PeCDD	469.7780	M+2		C ₁₂ ³⁵ Cl ₅ ³⁷ ClO ₂	OCDD (S)		
357.8516		M+4	C ₁₂ H ₃ ³⁵ Cl ₃ ³⁷ Cl ₂ O ₂	PeCDD	471.7750	M+4		¹³ C ₁₂ ³⁵ Cl ₆ ³⁷ Cl ₂ O 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 ₅ ³⁷ Cl ₂ O	DCDFE		
369.8919		M+4	¹³ C ₁₂ H ₃ ³⁵ Cl ₃ ³⁷ Cl ₂ O ₂	PeCDD (S)	[422.9278]	LOCK		C ₁₀ F ₁₇	PFK		
409.7974		M+2	C ₁₂ H ₃ ³⁵ Cl ₆ ³⁷ ClO	HxCDFE							
[354.9792]		LOCK	C ₉ F 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 ₂ O	HxCDF						
		383.8639	M	¹³ C ₁₂ H ₂ ³⁵ Cl ₅ O	HxCDF (S)						
		385.8610	M+2	¹³ C ₁₂ H ₂ ³⁵ Cl ₄ 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 ₂ O 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 ₂ O ₂	HxCDD (S)							
	445.7555	M+4	C ₁₂ H ₂ ³⁵ Cl ₆ ³⁷ Cl ₂ O	OCDFE							
	[430.9728]	LOCK	C ₉ F ₁₇	PFK							

(a) The following nucleidic masses were used:

H = 1.007825
 C = 12.000000
¹³C = 13.003355
 F = 18.9984
 O = 15.994915
³⁵Cl = 34.968853
³⁷Cl = 36.965903

S = internal/recovery standard

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: BRC Tronox Parcel C/D/F/G
Collection Date: November 16, 2007
LDC Report Date: January 24, 2008
Matrix: Soil/Water
Parameters: Dioxins/Dibenzofurans
Validation Level: EPA Level III
Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-6

Sample Identification

TSB-FJ-08-0'
TSB-FR-05-0'
TSB-FR-04-0'
TSB-FR-04-0'-FD
TSB-FJ-01-0'
TSB-GR-01-0'
TSB-GJ-06-0'
TSB-GJ-01-0'
RINSATE-4
TSB-FJ-01-0'MS
TSB-FJ-01-0'MSD

Introduction

This data review covers 10 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% .

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

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.

Sample RINSATE-4 was identified as a rinsate. No polychlorinated dioxin/dibenzofuran contaminants were found in this blank

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 with the following exceptions:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-FR-05-0'	¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	38 (40-135) 38 (40-135) 29 (40-135)	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-GJ-01-0'	¹³ C-1,2,3,7,8-PeCDD ¹³ C-1,2,3,4,7,8-HxCDF ¹³ C-1,2,3,6,7,8-HxCDD ¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	37 (40-135) 27 (40-135) 28 (40-135) 18 (40-135) 18 (40-135) 11 (40-135)	1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of the report if data has been qualified.

XIV. Field Duplicates

Samples TSB-FR-04-0' and TSB-FR-04-0'-FD were identified as field duplicates. No polychlorinated dioxins/dibenzofurans were detected in any of the samples.

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-6**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-6	TSB-FR-05-0'	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-6	TSB-GJ-01-0'	1,2,3,7,8-PeCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-6**

No Sample Data Qualified in this SDG

LDC #: 18100F21
 SDG #: TRNC-D-6
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/21/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/16/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	A	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	A/W	7R and 4PD out for 10/11 No final (ACS)
VII.	Laboratory control samples	A	ICS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	W	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	ND	D = 3 + 4
XV.	Field blanks	ND	R = 9

Note: A = Acceptable ND = No compounds detected D = Duplicate
 N = Not provided/applicable R = Rinsate TB = Trip blank
 SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples:

1	TSB-FJ-08-0'	S	11	TSB-FJ-01-0'MSD	S	21	733248 LB	31
2	TSB-FR-05-0'		12			22	7330370 MB	32
3	TSB-FR-04-0'		13			23		33
4	TSB-FR-07-0'-FD		14			24		34
5	TSB-FJ-01-0'		15			25		35
6	TSB-GR-01-0'		16			26		36
7	TSB-GJ-06-0'		17			27		37
8	TSB-GJ-01-0'		18			28		38
9	RINSATE-4	W	19			29		39
10	TSB-FJ-01-0'MS	S	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:

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: BRC Tronox Parcel C/D/F/G

Collection Date: November 19, 2007

LDC Report Date: January 24, 2008

Matrix: Soil

Parameters: Dioxins/Dibenzofurans

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): TRNC-D-7

Sample Identification

TSB-GR-02-0'

TSB-GR-02-0'-FD

TSB-GJ-04-0'

TSB-GJ-02-0'

TSB-GJ-02-0'-FD

TSB-GJ-07-0'

TSB-GJ-05-0'

TSB-GJ-03-0'

TSB-GJ-04-0'MS

TSB-GJ-04-0'MSD

Introduction

This data review covers 10 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8290 for Polychlorinated Dioxins/Dibenzofurans.

This review follows USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- J+ Data are qualified as estimated, with a high bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25% .

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Affected Compound	Flag	A or P
12/10/07	1,2,3,4,7,8-HxCDD	20.5	TSB-GR-02-0' 7338592MB	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	P

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

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 some compounds, the MSD 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) were within the QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits with the following exceptions:

Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
TSB-GJ-04-0'	¹³ C-1,2,3,4,7,8-HxCDF ¹³ C-1,2,3,6,7,8-HxCDD ¹³ C-1,2,3,4,6,7,8-HpCDF ¹³ C-1,2,3,4,6,7,8-HpCDD ¹³ C-OCDD	33 (40-135) 39 (40-135) 15 (40-135) 17 (40-135) 7.5 (40-135)	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P
TSB-GJ-07-0'	¹³ C-OCDD	32 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P
TSB-GJ-05-0'	¹³ C-OCDD	39 (40-135)	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of the report if data has been qualified.

XIV. Field Duplicates

Samples TSB-GR-02-0' and TSB-GR-02-0'-FD and samples TSB-GJ-02-0' and TSB-GJ-02-0'-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-GR-02-0'	TSB-GR-02-0'-FD				
OCDD	1.7U	10	-	8.3 (≤ 1.7)	J (all detects) UJ (all non-detects)	A
2,3,7,8-TCDF	1.5	3.1	70 (≤ 50)	-	J (all detects)	A
1,2,3,7,8-PeCDF	1.7U	3.1	-	1.4 (≤ 1.7)	-	-
1,2,3,4,7,8-HxCDF	1.9U	4.2	-	2.3 (≤ 1.9)	J (all detects) UJ (all non-detects)	A
1,2,3,4,6,7,8-HpCDF	2.2U	4.7	-	2.5 (≤ 2.2)	J (all detects) UJ (all non-detects)	A
OCDF	5.5	12	74 (≤ 50)	-	J (all detects)	A

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Data Qualification Summary - SDG TRNC-D-7**

SDG	Sample	Compound	Flag	A or P	Reason
TRNC-D-7	TSB-GR-02-0'	1,2,3,4,7,8-HxCDD	J- (all detects) UJ (all non-detects)	P	Routine calibration (%D)
TRNC-D-7	TSB-GJ-04-0'	1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF 1,2,3,4,6,7,8-HpCDD OCDD OCDF	J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-7	TSB-GJ-07-0' TSB-GJ-05-0'	OCDD OCDF	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Internal standards (%R)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD	OCDD 1,2,3,4,7,8-HxCDF 1,2,3,4,6,7,8-HpCDF	J (all detects) UJ (all non-detects)	A	Field duplicates (Difference)
TRNC-D-7	TSB-GR-02-0' TSB-GR-02-0'-FD	2,3,7,8-TCDF OCDF	J (all detects) J (all detects)	A	Field duplicates (RPD)

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

**BRC Tronox Parcel C/D/F/G
Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG TRNC-D-7**

No Sample Data Qualified in this SDG

LDC #: 18100G21
 SDG #: TRNC-D-7
 Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
 Level III

Date: 1/22/08
 Page: 1 of 1
 Reviewer: [Signature]
 2nd Reviewer: [Signature]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/19/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration	TW	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	TW	
VII.	Laboratory control samples	A	LCG
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	TW	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	TW	D = 1 + 2 . A + 5 *
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:

All soils

1	TSB-GR-02-0'	11	7338592 MB	21		31	
2	TSB-GR-02-0'-FD	12		22		32	
3	TSB-GJ-04-0'	13		23		33	
4	TSB-GJ-02-0'	14		24		34	
5	TSB-GJ-02-0'-FD	15		25		35	
6	TSB-GJ-07-0'	16		26		36	
7	TSB-GJ-05-0'	17		27		37	
8	TSB-GJ-03-0'	18		28		38	
9	TSB-GJ-04-0'MS	19		29		39	
10	TSB-GJ-04-0'MSD	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:

LDC #: B100421
 SDG #: See cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
 Reviewer: [Signature]
 2nd reviewer: [Signature]

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)		RPD N D
	1	2	
<u>G</u>	1.7 U	1.0	8.3 (≤ 1.7) <u>N/A</u>
<u>H</u>	1.5	3.1	70 (≤ 50) <u>det/A</u> *
<u>F</u>	1.7 U	3.1	1.4 (≤ 1.7) <u>No Equal</u>
<u>K</u>	1.9 U	4.2	2.3 (≤ 1.9) <u>N/A</u>
<u>O</u>	2.2 U	4.7	2.5 (≤ 2.2) <u>↓</u>

Compound	Concentration ()		RPD
<u>K</u>	5.5	12	74 (≤ 50) <u>det/A</u> *

Compound	Concentration ()		RPD

Compound	Concentration ()		RPD

* RPD. affects ~~D~~