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

Northgate Environmental Management, Inc.
1100 Quail Street Ste. 102
Newport Beach, CA 92660
ATTN: Ms. Cindy Arnold

January 28, 2010

SUBJECT: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada, Data Validation

Dear Ms. Arnold,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on January 4, 2010. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 22335:

SDG #	Fraction
R0904085	Volatiles, Semivolatiles, Chlorinated Pesticides, Metals, Wet Chemistry

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Standard Operating Procedures (SOP) 40, Data Review/Validation, BRC 2009
- Quality Assurance Project Plan Tronox LLC Facility, Henderson Nevada, June 2009
- NDEP Guidance, May 2006
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004

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

Sincerely,

ERauto

Erlinda T. Rauto
Operations Manager/Senior Chemist

Stage 2B/4

LDC #22335 (Tronox LLC-Northgate, Henderson NV / Tronox Phase B 2009)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		SVOA (8270C)		Pest. (8081A)		Metals (SW846)		Alk. (2320B)		NH_3-N (350.1M)		Br Cl,SO_4 (9056)		NO_2-N (9056)		NO_3-N (353.2)		CN- (9012)		Cond. (120.1)		Cr(VI) (218.6/ (7199)		pH (9040 /9045)		Phos-phorus (365.1)		CLO_4 (314.0)		TSS (2540D)			
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	R0904085	01/04/10	01/25/10	15	0	6	0	6	0	8	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0		
Total	T/LR			15	0	6	0	6	0	8	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	6	0	0	107

Stage 2B/4

LDC #22335 (Tronox LLC-Northgate, Henderson NV / Tronox Phase B 2009)

LDC	SDG#	DATE REC'D	(3) DATE DUE	TDS (2540C)		MBAS (5540C)		TOC (9060/ L/K)		Chlorate (300.1)																											
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	R0904085	01/04/10	01/25/10	6	0	6	0	6	0	6	0																										
Total	T/LR			6	0	6	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B validation). These sample counts do not include MS/MSD, and DUPs

LDC #: 22335
SDG #: R09004085,

Reviewer: JE
2nd Reviewer: BC

Tronox Northgate Henderson Worksheet

EDD Area	Yes	No	NA	Findings/Comments
I. Completeness				
Is there an EDD for the associated Tronox validation report?	X			
II. EDD Qualifier Population				
Were all qualifiers from the validation report populated into the EDD?	X			
III. EDD Lab Anomalies				
Were EDD anomalies identified?	X			
If yes, were they corrected or documented for the client?	X			See EDD_discrepancy_ form_LDC22335_012210.doc
IV. EDD Delivery				
Was the final EDD sent to the client?	X			

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Data Validation Reports
LDC #22335

Volatiles

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada

Collection Date: July 22 through July 27, 2009

LDC Report Date: January 19, 2010

Matrix: Water

Parameters: Volatiles

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0904085

Sample Identification

CLD-4RB
CLD-4RBDL
TB072209-GW1
TB072209-W1
MW-6RB
TB072309-GW1
TB072309-W1
M-52B
M-52BDL
M-35B
M-35BDL
TB072409-GW1
M-11B
M-11009B
TB071709-GW1
CLD-4RBDLMS
CLD-4RBDLMSD

Introduction

This data review covers 17 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 the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

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

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

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

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

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

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

B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JK The analytical result is an estimated maximum possible concentration (EMPC).

X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.

J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.

J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.

J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.

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
8/3/09	2-Methyl-2-propanol	0.045 (≥0.05)	M-52BDL M-35BDL 164191-MB	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
7/31/09	Acetone	28.0	CLD-4RBDL MW-6RB	J- (all detects) UJ (all non-detects)	A
	2-Butanone	27.5	TB072309-W1 M-52B M-35B TB072409-GW1 M-11B M-11009B TB071709-GW1 CLD-4RBDLMS CLD-4RBDLMSD 163744-MB	J- (all detects) UJ (all non-detects)	

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
8/4/09	2-Methyl-2-propanol	0.044 (≥0.05)	M-52BDL M-35BDL 164191-MB	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.

Samples TB072209-GW1, TB072209-W1, TB072309-GW1, TB072309-W1, TB072409-GW1, and TB071709-GW1 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
TB072209-W1	7/22/09	Dichloromethane Toluene	0.62 ug/L 0.30 ug/L	CLD-4RB CLD-4RBDL
TB072309-GW1	7/23/09	Toluene	0.23 ug/L	MW-6RB
TB071709-GW1	7/27/09	Acetone	1.8 ug/L	M-11B M-11009B

Sample concentrations were compared to concentrations detected in the trip blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
CLD-4RB	Dichloromethane	0.41 ug/L	0.41U ug/L

Sample PB102309-A3 (from SDG R0906095) was identified as a pump blank. No volatile contaminants were found in this blank with the following exceptions:

Pump Blank ID	Sampling Date	Compound	Concentration	Associated Samples
PB102309-A3	10/23/09	Acetone Chloroform	5.1 ug/L 0.28 ug/L	CLD-4RB CLD-4RBDL MW-6RB M-52B M-52BDL M-35B M-35BDL M-11B M-11009B

Sample concentrations were compared to concentrations detected in the pump blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
M-52B	Acetone	1.9 ug/L	1.9U ug/L

VI. Surrogate Spikes

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

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 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.

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 and 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. Project Quantitation Limit

All project quantitation limits were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
CLD-4RB M-52B M-35B	Chloroform	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0904085	All compounds reported below the PQL.	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

The overall assessment of data was acceptable. In the case where more than one result was reported for an individual sample, the least technically acceptable results were rejected as follows:

Sample	Compound	Flag	A or P
CLD-4RB M-52B M-35B	Chloroform	X	A
CLD-4RBDL M-52BDL M-35BDL	All TCL compounds except Chloroform	X	A

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

XVI. Field Duplicates

Samples M-11B and M-11009B were identified as field duplicates. No volatiles were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-11B	M-11009B				
Chloroform	150	150	0 (≤30)	-	-	-
Tetrachloroethene	0.43	0.43	-	0 (≤1.0)	-	-

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Volatiles - Data Qualification Summary - SDG R0904085

SDG	Sample	Compound	Flag	A or P	Reason (Code)
R0904085	M-52BDL M-35BDL	2-Methyl-2-propanol	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF) (c)
R0904085	CLD-4RBDL MW-6RB TB072309-W1 M-52B M-35B TB072409-GW1 M-11B M-11009B TB071709-GW1	Acetone 2-Butanone	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	A	Continuing calibration (%D) (c)
R0904085	M-52BDL M-35BDL	2-Methyl-2-propanol	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF) (c)
R0904085	CLD-4RB M-52B M-35B	Chloroform	J (all detects)	A	Project Quantitation Limit (e)
R0904085	CLD-4RB CLD-4RBDL TB072209-GW1 TB072209-W1 MW-6RB TB072309-GW1 TB072309-W1 M-52B M-52BDL M-35B M-35BDL TB072409-GW1 M-11B M-11009B TB071709-GW1	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (PQL) (sp)
R0904085	CLD-4RB M-52B M-35B	Chloroform	X	A	Overall assessment of data (o)
R0904085	CLD-4RBDL M-52BDL M-35BDL	All TCL compounds except Chloroform	X	A	Overall assessment of data (o)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Volatiles - Laboratory Blank Data Qualification Summary - SDG R0904085

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Volatiles - Trip Blank Data Qualification Summary - SDG R0904085

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
R0904085	CLD-4RB	Dichloromethane	0.41U ug/L	A	bt

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Volatiles - Pump Blank Data Qualification Summary - SDG R0904085

SDG	Sample	Compound	Modified Final Concentration	A or P	Code
R0904085	M-52B	Acetone	1.9U ug/L	A	bp

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
Stage 2B

LDC #: 22335A1
SDG #: R0904085
Laboratory: Columbia Analytical Services

Date: 1/15/10
Page: 1 of 1
Reviewer: JVC
2nd Reviewer: W

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 7/22-27/09
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	2 RSD r²
IV.	Continuing calibration ~~ICV~~	SW	CW ≤ 25 2
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	SW	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	SW	
XVI.	Field duplicates	SW	D = 13, 14
XVII.	Field blanks	SW	TB = 3, 4, 6, 7, 12, 15 PB = PB102309A3 (R0906

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: Water

1 1	CLD-4RB	11 3	M-35BDL	21 1	163602- MB	31	
2 2	CLD-4RBDL	12 2	TB072409-GW1	22 2	163744-	32	
3 1	TB072209-GW1	13 2	M-11B D	23 3	164191-	33	
4 1	TB072209-W1	14 2	M-11009B D	24		34	
5 2	MW-6RB	15 2	TB071709-GW1	25		35	
6 1	TB072309-GW1	16 2	CLD-4RBDLMS	26		36	
7 2	TB072309-W1	17 2	CLD-4RBDLMSD	27		37	
8 2	M-52B	18		28		38	
9 3	M-52BDL	19		29		39	
10 2	M-35B	20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. ~~Methylene chloride~~ Dichloromethane	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-Methyl-2-propanol
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

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

LDC #: 20775A1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: JVG
2nd Reviewer: ✓

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

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

(Y) N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
(Y) N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
(Y) N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? r² ≥0.99
(Y) N N/A Did the initial calibration meet the acceptance criteria?
Y (N) N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	8/03/09	ICAL	NNNN		0.045	9, 11, 16, 19, 19-MB	J/UJ/A (C)

LDC #: 22335A1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: JVL
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 continuing calibration standard analyzed at least once every 12 hours for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: <25.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	7/31/09	X3117	F (-)	28.0		2,5,7,8,10,12-17,	J-/UJ/A (c)
			M (-)	27.5		163744-MB	
	8/04/09	X3180	NNNN		0.044	9,11,164191-MB	J/UJ/A

CONCAL 1SB

LDC #: 22335A1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JM
2nd Reviewer:

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

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

Blank units: ug/L **Associated sample units:** ug/L
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other: Associated Samples: 1, 2 (bt)

Compound	Blank ID 4	Blank ID	Sample Identification							
Sampling Date	7/22/09		1							
E	0.62		0.41 J							
CC	0.30									

Blank units: ug/L **Associated sample units:** ug/L
Field blank type: (circle one) Field Blank / Rinsate / (Trip Blank) / Other: Associated Samples: 5 (ND)

Compound	Blank ID 6	Blank ID	Sample Identification							
Sampling Date	7/23/09									
CC	0.23									

LDC #: 22335A1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JVG
2nd Reviewer:

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

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

Blank units: ug/L **Associated sample units:** ug/L
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: Associated Samples: 13, 14 (ND)

Compound	Blank ID 15	Blank ID	Sample Identification							
Sampling Date	7/27/09									
F	1.8									

Blank units: ug/L **Associated sample units:** ug/L
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: PB Associated Samples: 1, 2, 5, 8-11, 13, 14 (6p)

Compound	PB 102309-A3 Blank ID	Blank ID	Sample Identification							
Sampling Date	10/23/09		8							
F	5.1		1.9/4							
K	0.28									
		(All others either ND or > PB)								

LDC #: 22335A1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

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

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		16/17	FF	67 (70-130)	( )	( )	2	No qual (MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	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 #: 22335A1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

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

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		163744-LCS	M	74 (75-125)	( )	( )	2,5,7,8,10,12-15,	No qual
			F	74 (↓)	( )	( )	163744-MB	(MS/MSD in)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 27335A1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and CRQLs

Reviewer: JVG
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 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
		1, 8, 10	K > cal range		J dets/A (e)

Comments: See sample calculation verification worksheet for recalculations

LDC #: 22335A1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

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

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

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

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Date	Sample ID	Finding	Associated Samples	Qualifications
		1, 8, 10	k > cal range		X (A (O)
		2, 9, 11	All except k dil		

Comments: _____

LDC #: 22335A1
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JV6
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 (ug/L)		RPD (Parent only)
	13	14	
K	150	150	0 (≤ 30% RPD)
AA	0.93	0.93	0 (≤ 1.0 D)

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Compound	Concentration ( )		RPD

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Data Validation Reports
LDC #22335

Semivolatiles

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada

Collection Date: July 22 through July 27, 2009

LDC Report Date: January 19, 2010

Matrix: Water

Parameters: Semivolatiles

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0904085

Sample Identification

CLD-4RB
MW-6RB
M-52B
M-35B
M-11B
M-11009B

Introduction

This data review covers 6 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 the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

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

The following are definitions of the data qualifiers:

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

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

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

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

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

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

B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JK The analytical result is an estimated maximum possible concentration (EMPC).

X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.

J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.

J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.

J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.

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.

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
8/3/09	Di-n-octylphthalate	25.2	MW-6RB M-35B M-11B M-11009B 92043-MB8/04 92391-MB	J- (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were greater than or equal to 0.05 .

V. Blanks

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

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
92043-MB8/03	8/3/09	Butylbenzylphthalate Di-n-butylphthalate	0.30 ug/L 2.0 ug/L	CLD-4RB MW-6RB M-52B M-35B
92043-MB8/04	8/4/09	Butylbenzylphthalate Di-n-butylphthalate Bis(2-ethylhexyl)phthalate Diethylphthalate	0.27 ug/L 1.6 ug/L 0.23 ug/L 0.20 ug/L	CLD-4RB MW-6RB M-52B M-35B

Sample concentrations were compared to concentrations detected in the method blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
M-35B	Butylbenzylphthalate	0.11 ug/L	0.11U ug/L

Sample PB102309-A3 (from SDG R0906095) was identified as a pump blank. No semivolatile contaminants were found in this blank with the following exceptions:

Pump Blank ID	Sampling Date	Compound	Concentration	Associated Samples
PB102309-A3	10/23/09	Bis(2-ethylhexyl)phthalate Butylbenzylphthalate	1.5 ug/L 0.11 ug/L	All samples in SDG R0904085

Sample concentrations were compared to concentrations detected in the pump blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
M-35B	Butylbenzylphthalate	0.11 ug/L	0.11U ug/L

VI. Surrogate Spikes

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

VII. 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.

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
92391-LCS/D (M-11B M-11009B 92391-MB)	Pyridine 1,4-Dioxane	40 (50-120) 42 (50-120)	37 (50-120) 41 (50-120)	- -	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	P
92043-LCS/D (CLD-4RB MW-6RB M-52B M-35B 92043-MB8/03 92043-MB8/04)	Pyridine 1,4-Dioxane	26 (50-120) 44 (50-120)	28 (50-120) 46 (50-120)	- -	J- (all detects) UJ (all non-detects) 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.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0904085	All compounds reported below the PQL.	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

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

XVI. Field Duplicates

Samples M-11B and M-11009B were identified as field duplicates. No semivolatiles were detected in any of the samples.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Semivolatiles - Data Qualification Summary - SDG R0904085

SDG	Sample	Compound	Flag	A or P	Reason (Code)
R0904085	MW-6RB M-35B M-11B M-11009B	Di-n-octylphthalate	J- (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D) (c)
R0904085	CLD-4RB MW-6RB M-52B M-35B M-11B M-11009B	Pyridine 1,4-Dioxane	J- (all detects) UJ (all non-detects) J- (all detects) UJ (all non-detects)	P	Laboratory control samples (%R) (l)
R0904085	CLD-4RB MW-6RB M-52B M-35B M-11B M-11009B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG R0904085

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P	Code
R0904085	M-35B	Butylbenzylphthalate	0.11U ug/L	A	bl

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Semivolatiles- Pump Blank Data Qualification Summary - SDG R0904085

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P	Code
R0904085	M-35B	Butylbenzylphthalate	0.11U ug/L	A	bp

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. 1,4- Dioxane
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU Octachloro styrene
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

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

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
Stage 2B

LDC #: 22335A2a
SDG #: R0904085
Laboratory: Columbia Analytical Services

Date: 1/18/10
Page: 1 of 1
Reviewer: SVG
2nd Reviewer:

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: 7/22-27/09
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	%RSD r²
IV.	Continuing calibration/ICV	SW	CCV/ICV ≤ 25 D
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	client spec
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	ND	D = 5, 6
XVII.	Field blanks	SW	PB = PB102309-A3 (R0906095)

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

Validated Samples: water

+ 1	CLD-4RB	+ 11	92043-MB 8/03	21		31	
- 2	MW-6RB	+ 12	92043-MB 8/04	22		32	
+ 3	M-52B	- 13 X	92391-MB	23		33	
+ 4	M-35B	14		24		34	
- 5	M-11B	15		25		35	
- 6	M-11009B	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 22335A2a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVL
2nd Reviewer:

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

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

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

#	Date	Standard ID	Compound	Finding %D (Limit: <25.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	8/07/04	AU435 (ICV)	FFF (-)	25.2		2, 4-6, 92043-MB 8/04, 92391-MB	J-/UJ/A (C)

CONCAL.2S

LDC #: 22335 A 2a
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: JVG
2nd Reviewer: [signature]

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

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

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

Blank extraction date: 7/27/09 **Blank analysis date:** 8/03/09 ; 8/04/09
Conc. units: ug/L Associated Samples: 1 - 4 (b l)

Compound	Blank ID		Sample Identification							
	92043-MB 8/03	92043-MB 8/04		4						
AAA	0.30	0.27		0.11 /4						
XX	2.0	1.6								
EEE		0.23								
LL		0.26								

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

Compound	Blank ID	Sample Identification								

5x Phthalates
2x all others

LDC #: 22335A2a
SDG #: Sa Cr

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: JM
2nd Reviewer:

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

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: 10/23/09
Field blank type: (circle one) Field Blank / Rinsate / Other: PB Associated Samples: All (bp)

Compound	Blank ID	Sample Identification								
	PB102309-A3	4								
EEE	1.5									
AAA	0.11		0.11/U							
CRQL										

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

Compound	Blank ID	Sample Identification								
CRQL										

5x Phthalates
2x all others

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

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

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

(Y) N N/A Was a LCS required?

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

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		92391-LCS/D	RKR	40 (50-120)	37 (50-120)	( )	5, 6, 92391-MB	J-/UJ/P (L)
			TTT	42 ( )	41 ( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		92043-LCS/D	RKR	26 ( )	28 ( )	( )	1-4, 92043-MB8/03,	
			TTT	44 ( )	46 ( )	( )	92043-MB8/04	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Data Validation Reports
LDC #22335

Chlorinated Pesticides

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada

Collection Date: July 22 through July 27, 2009

LDC Report Date: January 19, 2010

Matrix: Water

Parameters: Chlorinated Pesticides

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0904085

Sample Identification

CLD-4RB
MW-6RB
M-52B
M-35B
M-11B
M-11009B

Introduction

This data review covers 6 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 the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

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

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

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

The following are definitions of the data qualifiers:

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

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

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

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

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

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

B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JK The analytical result is an estimated maximum possible concentration (EMPC).

X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.

J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.

J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.

J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.

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 compounds were 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 20.0% QC limits.

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% 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 PB102309-A3 (from SDG R0906095) was identified as a pump blank. 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.

VII. 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.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Although the LCS/LCSD relative percent difference (RPD) was not within QC limits for one compound, the LCS/LCSD 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. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0904085	All compounds reported below the PQL.	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 M-11B and M-11009B were identified as field duplicates. No chlorinated pesticides were detected in any of the samples.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Chlorinated Pesticides - Data Qualification Summary - SDG R0904085

SDG	Sample	Compound	Flag	A or P	Reason (Code)
R0904085	CLD-4RB MW-6RB M-52B M-35B M-11B M-11009B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG R0904085

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Chlorinated Pesticides - Pump Blank Data Qualification Summary - SDG R0904085

No Sample Data Qualified in this SDG

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
Stage 2B

LDC #: 22335A3a
SDG #: R0904085
Laboratory: Columbia Analytical Services

Date: 1/15/10
Page: 1 of 1
Reviewer: JM
2nd Reviewer: [illegible]

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

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

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 7/22-27/09
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	CCV/ICV ≤ 20%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	Client Spec
VIII.	Laboratory control samples	SW	LCS/D
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 = 5, 6
XV.	Field blanks	ND	PB = PB102309-A3 (R0906095)

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: water

1	CLD-4RB	11	92045-MB	21		31	
2	MW-6RB	12	92390-[illegible]	22		32	
3	M-52B	13		23		33	
4	M-35B	14		24		34	
5	M-11B D	15		25		35	
6	M-11009B D	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

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

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

Notes:_____

LDC #: 22335A34

SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples

Reviewer: SVG

2nd Reviewer: [illegible]

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?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		92390-LCS/D	F	( )	( )	31 (30)	5, 6, 92390-MB	No qual (LC
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Data Validation Reports
LDC #22335

Metals

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada

Collection Date: July 22 through July 27, 2009

LDC Report Date: January 19, 2010

Matrix: Water

Parameters: Metals

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0904085

Sample Identification

CLD-4RB
MW-6RB
M-52B
M-35B
M-11B
M-11B DISSOLVED
M-11009B
M-11009B DISSOLVED
CLD-4RBMS
CLD-4RBDUP
M-52BMS
M-52BDUP

Introduction

This data review covers 12 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, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Platinum, Potassium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Tungsten, Uranium, Vanadium, and Zinc.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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.

Blanks are summarized in Section IV.

Field duplicates are summarized in Section XIV.

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

The following are definitions of the data qualifiers:

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

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

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

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

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

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

B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JK The analytical result is an estimated maximum possible concentration (EMPC).

X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.

J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.

J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.

J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.

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. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5% .

III. Calibration

An initial calibration was performed.

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

IV. 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 Magnesium Potassium	0.9 ug/L 3.0 ug/L 59 ug/L	All samples in SDG R0904085
ICB/CCB	Sodium Titanium Tungsten	82 ug/L 0.4 ug/L 0.05 ug/L	All samples in SDG R0904085
ICB/CCB	Boron Barium Potassium Antimony Thallium Uranium	8.4 ug/L 0.4 ug/L 78 ug/L 0.029 ug/L 0.004 ug/L 0.004 ug/L	CLD-4RB
ICB/CCB	Potassium Lead	84 ug/L 0.015 ug/L	MW-6RB M-52B M-35B M-11B M-11B DISSOLVED M-11009B M-11009B DISSOLVED

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Boron	19.3 ug/L	MW-6RB M-52B M-35B M-11B M-11B DISSOLVED
ICB/CCB	Boron	19.9 ug/L	M-11009B M-11009B DISSOLVED

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
CLD-4RB	Copper Thallium	2.0 ug/L 0.067 ug/L	10.0U ug/L 0.200U ug/L
MW-6RB	Copper Titanium	4.2 ug/L 5.3 ug/L	10.0U ug/L 10.0U ug/L
M-52B	Copper Titanium	7.9 ug/L 2.8 ug/L	10.0U ug/L 10.0U ug/L
M-35B	Copper	2.7 ug/L	10.0U ug/L
M-11B	Copper	0.9 ug/L	10.0U ug/L
M-11B DISSOLVED	Copper	0.8 ug/L	10.0U ug/L
M-11009B	Copper	1.1 ug/L	10.0U ug/L

Sample PB102309-A3 (from SDG R0906095) was identified as a pump blank. No metal contaminants were found in this blank with the following exceptions:

Pump Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
PB102309-A3	10/23/09	Boron Calcium Chromium Copper Magnesium Manganese Sodium Strontium Thallium Tungsten Uranium	7.0 ug/L 73 ug/L 0.6 ug/L 1.3 ug/L 4.8 ug/L 1.1 ug/L 103 ug/L 0.5 ug/L 0.005 ug/L 0.02 ug/L 0.038 ug/L	CLD-4RB MW-6RB M-52B M-35B M-11B M-11009B

Sample concentrations were compared to concentrations detected in the pump blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
CLD-4RB	Copper Thallium	2.0 ug/L 0.067 ug/L	10.0U ug/L 0.200U ug/L
MW-6RB	Copper Manganese Thallium	4.2 ug/L 1.7 ug/L 0.085 ug/L	10.0U ug/L 5.0U ug/L 0.200U ug/L
M-52B	Copper Thallium	7.9 ug/L 0.146 ug/L	10.0U ug/L 0.200U ug/L
M-35B	Copper Thallium	2.7 ug/L 0.077 ug/L	10.0U ug/L 0.200U ug/L
M-11B	Copper Thallium	0.9 ug/L 0.075 ug/L	10.0U ug/L 0.200U ug/L
M-11009B	Copper Thallium	1.1 ug/L 0.070 ug/L	10.0U ug/L 0.200U ug/L

Sample FiltB092509-A2 (from SDG R0905462) was identified as a filter blank. No metal contaminants were found in this blank with the following exceptions:

Filter Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
FiltB092509-A2	9/25/09	Boron Calcium Lead Magnesium Manganese Sodium Strontium Tungsten Zinc	11.0 ug/L 34 ug/L 0.006 ug/L 3.8 ug/L 0.6 ug/L 398 ug/L 0.2 ug/L 0.02 ug/L 3.6 ug/L	M-11B DISSOLVED M-11009B DISSOLVED

Sample concentrations were compared to concentrations detected in the filter blanks as required by the QAPP. No sample data was qualified with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
M-11B DISSOLVED	Zinc	0.7 ug/L	10.0U ug/L

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike Analysis

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

VII. Duplicate Sample Analysis

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

Raw data were not reviewed for this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. 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
CLD-4RBL	Sodium	115.7 (≤10)	All samples in SDG R0904085	J (all detects) UJ (all non-detects)	A

XII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0904085	All analytes reported below the PQL.	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 M-11B and M-11009B and samples M-11B DISSOLVED and M-11009B DISSOLVED were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-11B	M-11009B				
Aluminum	10.3	6.2	-	4.1 (≤50.0)	-	-
Barium	13.8	12.2	-	1.6 (≤5.0)	-	-
Boron	13600	12900	5 (≤30)	-	-	-
Calcium	53500	52300	2 (≤30)	-	-	-
Chromium	3670	3650	1 (≤30)	-	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-11B	M-11009B				
Cobalt	0.9	0.6	-	0.3 (≤10.0)	-	-
Copper	0.9	1.1	-	0.2 (≤10.0)	-	-
Iron	1560	1700	9 (≤30)	-	-	-
Magnesium	46900	45100	2 (≤30)	-	-	-
Manganese	20.2	23.3	-	3.1 (≤5.0)	-	-
Mercury	0.06	0.04	-	0.02 (≤0.20)	-	-
Molybdenum	19.6	19.4	1 (≤30)	-	-	-
Nickel	1	0.7U	-	0.3 (≤2.0)	-	-
Platinum	0.08	0.08	-	0 (≤1.00)	-	-
Potassium	22300	21900	2 (≤30)	-	-	-
Silver	0.8	0.8	-	0 (≤2.0)	-	-
Sodium	832000	862000	4 (≤30)	-	-	-
Strontium	1430	1410	1 (≤30)	-	-	-
Thallium	0.075	0.07	-	0.005 (≤0.200)	-	-
Tungsten	4.56	4.43	-	0.13 (≤1.00)	-	-
Uranium	14.9	15.2	2 (≤30)	-	-	-
Vanadium	127	125	2 (≤30)	-	-	-
Zinc	3	3	-	0 (≤10.0)	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-11B DISSOLVED	M-11009B DISSOLVED				
Aluminum	2.0U	2.5	-	0.5 (≤50.0)	-	-
Barium	11.5	11.1	-	0.4 (≤5.0)	-	-
Boron	13400	13400	0 (≤30)	-	-	-
Calcium	52800	52700	0 (≤30)	-	-	-
Chromium	3300	3310	0 (≤30)	-	-	-
Cobalt	1	0.5	-	0.5 (≤10.0)	-	-
Copper	0.8	0.8U	-	0 (≤10.0)	-	-
Iron	19	9.7	-	9.3 (≤20.0)	-	-
Magnesium	46500	46100	1 (≤30)	-	-	-
Manganese	5.5	9.4	-	3.9 (≤5.0)	-	-
Mercury	0.06	0.06	-	0 (≤0.20)	-	-
Molybdenum	19.4	19.9	3 (≤30)	-	-	-
Platinum	0.07U	0.08	-	0.01 (≤1.00)	-	-
Potassium	22100	22200	0 (≤30)	-	-	-
Silver	0.8	0.7U	-	0.1 (≤2.0)	-	-
Sodium	839000	843000	0 (≤30)	-	-	-
Strontium	1420	1420	0 (≤30)	-	-	-
Thallium	0.07	0.073	-	0.003 (≤0.200)	-	-
Tungsten	4.53	4.39	-	0.14 (≤1.00)	-	-
Uranium	14.5	14.8	2 (≤30)	-	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-11B DISSOLVED	M-11009B DISSOLVED				
Vanadium	108	108	0 (≤30)	-	-	-
Zinc	0.7	0.7U	-	0 (≤10.0)	-	-

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Data Qualification Summary - SDG R0904085

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0904085	CLD-4RB MW-6RB M-52B M-35B M-11B M-11B DISSOLVED M-11009B M-11009B DISSOLVED	Sodium	J (all detects) UJ (all non-detects)	A	ICP serial dilution (%D) (sd)
R0904085	CLD-4RB MW-6RB M-52B M-35B M-11B M-11B DISSOLVED M-11009B M-11009B DISSOLVED	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Laboratory Blank Data Qualification Summary - SDG R0904085

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0904085	CLD-4RB	Copper Thallium	10.0U ug/L 0.200U ug/L	A	bl
R0904085	MW-6RB	Copper Titanium	10.0U ug/L 10.0U ug/L	A	bl
R0904085	M-52B	Copper Titanium	10.0U ug/L 10.0U ug/L	A	bl
R0904085	M-35B	Copper	10.0U ug/L	A	bl
R0904085	M-11B	Copper	10.0U ug/L	A	bl
R0904085	M-11B DISSOLVED	Copper	10.0U ug/L	A	bl
R0904085	M-11009B	Copper	10.0U ug/L	A	bl

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Pump Blank Data Qualification Summary - SDG R0904085

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0904085	CLD-4RB	Copper Thallium	10.0U ug/L 0.200U ug/L	A	bp
R0904085	MW-6RB	Copper Manganese Thallium	10.0U ug/L 5.0U ug/L 0.200U ug/L	A	bp
R0904085	M-52B	Copper Thallium	10.0U ug/L 0.200U ug/L	A	bp
R0904085	M-35B	Copper Thallium	10.0U ug/L 0.200U ug/L	A	bp
R0904085	M-11B	Copper Thallium	10.0U ug/L 0.200U ug/L	A	bp
R0904085	M-11009B	Copper Thallium	10.0U ug/L 0.200U ug/L	A	bp

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Metals - Filter Blank Data Qualification Summary - SDG R0904085

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0904085	M-11B DISSOLVED	Zinc	10.0U ug/L	A	br

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
Stage 2B

LDC #: 22335A4
SDG #: R0904085
Laboratory: Columbia Analytical Services

Date: 1-11-10
Page: 1 of 1
Reviewer: CE
2nd Reviewer: W

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

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: 7/22/09 - 7/27/09
II.	ICP/MS Tune	A	
III.	Calibration	A	
IV.	Blanks	SW	
V.	ICP Interference Check Sample (ICS) Analysis	A	
VI.	Matrix Spike Analysis	A	MS
VII.	Duplicate Sample Analysis	A	DUP
VIII.	Laboratory Control Samples (LCS)	A	LCS
IX.	Internal Standard (ICP-MS)	N	Not reviewed
X.	Furnace Atomic Absorption QC	N	Not utilized
XI.	ICP Serial Dilution	SW	
XII.	Sample Result Verification	N	
XIII.	Overall Assessment of Data	A	
XIV.	Field Duplicates	SW	(5,7), (6,8)
XV	Field Blanks	SW	PumpBlank = PB102309-A3 (R0906095), FilterBlank = FltB092509 (R0905462)

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: water

1	CLD-4RB	11	M-52BMS	21	PBW	31	
2	MW-6RB	12	M-52BDUP	22		32	
3	M-52B	13		23		33	
4	M-35B	14		24		34	
5	M-11B	15		25		35	
6	M-11B DISSOLVED	16		26		36	
7	M-11009B	17		27		37	
8	M-11009B DISSOLVED	18		28		38	
9	CLD-4RBMS	19		29		39	
10	CLD-4RBDUP	20		30		40	

Notes: _____

LDC #: 22335A4
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

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

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-8	Water	Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
QC: 9, 10		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
11, 12		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
Analysis Method		
ICP	W	Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
ICP-MS	W	Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn
GFAA		Al, Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mo, Mn, Hg, Ni, Pt, K, Se, Ag, Na, Sr, Tl, Sn, Ti, W, U, V, Zn

Comments: Mercury by CVAA if performed

LDC #: 22335A4
SDG #: See Cover
METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)
Sample Concentration units, unless otherwise noted: ug/L

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA
Associated Samples: All

Reason Code: bl

Reviewer: SR
2nd Reviewer: LW

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	1	2	3	4	5	6	7			
Cu		0.9			2.0 / 10.0	4.2/ 10.0	7.9 / 10.0	2.7 / 10.0	0.9 / 10.0	0.8 / 10.0	1.1 / 10.0			
Mg		3.0												
K		59												
Na			82											
Ti			0.4			5.3 / 10.0	2.8 / 10.0							
W			0.05											

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 1

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	1									
B			8.4											
Ba			0.4											
K			78											
Sb			0.029											
Tl			0.004		0.067 / 0.200									
U			0.004											

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 2-8

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	No Qualifiers									
K			84											
Pb			0.015											

LDC #: 22335A4
SDG #: See Cover
METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA
Reason Code: bl

Sample Concentration units, unless otherwise noted: ug/L
Associated Samples: 2-6

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	No Qualifiers									
B			19.3											

Sample Concentration units, unless otherwise noted: ug/L
Associated Samples: 7, 8

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Action Limit	No Qualifiers									
B			19.9											

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

LDC #: 22335A4
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: CR
2nd Reviewer: [illegible]

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? Reason Code: bp

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 10/23/09 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Pump Blank Associated Samples: ~~All~~ 1-5, 7

Analyte	Blank ID	Sample Identification										
	PB102309-A3 (SDG#: R0906095)	Action Level	1	2	3	4	5	~~8~~ CR	7	~~8~~ CR		
B	7.0											
Ca	73	730										
Cr	0.6											
Cu	1.3		2.0 / 10.0	4.2/ 10.0	7.9 / 10.0	2.7 / 10.0	0.9 / 10.0	~~0.8 / 10.0~~	1.1 / 10.0			
Mg	4.8											
Mn	1.1			1.7 / 5.0								
Na	103											
Sr	0.5											
Tl	0.005		0.067 / 0.200	0.085 / 0.200	0.146 / 0.200	0.077 / 0.200	0.075 / 0.200	~~0.070 / 0.200~~	0.070 / 0.200	~~0.073 / 0.200~~		
W	0.02											
U	0.038	0.38										

LDC #: 22335A4
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: CR
2nd Reviewer: LW

METHOD: Trace Metals (EPA SW846 6010B/7000)

br

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:** ug/L
Sampling date: 9/25/09 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Filter Blank Associated Samples: 6, 8

Analyte	Blank ID	Sample Identification										
	FiltB092509-A2 (SDG#: R0905462)	Action Level	6									
B	11.0											
Ca	34											
Pb	0.006											
Mg	3.8											
Mn	0.6											
Na	398	3980										
Sr	0.2											
W	0.02											
Zn	3.6		0.7 / 10.0									

LDC #: 22335A4
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: CR
2nd Reviewer: L

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 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	water	Na	115.7	All	J | UJ | A (sd)

Comments: _____

LDC 22335A4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: CR
2nd Reviewer: W

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

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 (ug/L) 5	Concentration (ug/L) 7	(≤30) RPD	Difference	Limits	Qualifications (Parent Only)
Aluminum	10.3	6.2		4.1	(≤50.0)	
Barium	13.8	12.2		1.6	(≤5.0)	
Boron	13600	12900	5			
Calcium	53500	52300	2			
Chromium	3670	3650	1			
Cobalt	0.9	0.6		0.3	(≤10.0)	
Copper	0.9	1.1		0.2	(≤10.0)	
Iron	1560	1700	9			
Magnesium	~~16900~~ 46900	45100	~~9~~ 2			~~JdetA (fd)~~
Manganese	20.2	23.3		3.1	(≤5.0)	
Mercury	0.06	0.04		0.02	(≤0.20)	
Molybdenum	19.6	19.4	1			
Nickel	1.0	0.7U		0.3	(≤2.0)	
Platinum	0.08	0.08		0	(≤1.00)	
Potassium	22300	21900	2			
Silver	0.8	0.8		0	(≤2.0)	
Sodium	832000	862000	4			
Strontium	1430	1410	1			
Thallium	0.075	0.070		0.005	(≤0.200)	

LDC#: 22335A4
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: CS
2nd Reviewer:

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

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 (ug/L) 5	Concentration (ug/L) 7	(≤30) RPD	Difference	Limits	Qualifications (Parent Only)
Tungsten	4.56	4.43		0.13	(≤1.00)	
Uranium	14.9	15.2	2			
Vanadium	127	125	2			
Zinc	3.0	3.0		0	(<10.0)	

V:\FIELD DUPLICATES\FD_inorganic\22335A4.wpd

Compound	Concentration (ug/L) 6	Concentration (ug/L) 8	(≤30) RPD	Difference	Limits	Qualifications (Parent Only)
Aluminum	2.0U	2.5		0.5	(<50.0)	
Barium	11.5	11.1		0.4	(<5.0)	
Boron	13400	13400	0			
Calcium	52800	52700	0			
Chromium	3300	3310	0			
Cobalt	1.0	0.5		0.5	(≤10.0)	
Copper	0.8	0.8U		0	(≤10.0)	
Iron	19.0	9.7		9.3	(<20.0)	
Magnesium	46500	46100	1			
Manganese	5.5	9.4		3.9	(≤5.0)	
Mercury	0.06	0.06		0	(<0.20)	
Molybdenum	19.4	19.9	3			

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

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 (ug/L)		(≤30) RPD	Difference	Limits	Qualifications (Parent Only)
	6	8				
Platinum	0.07U	0.08		0.01	(≤1.00)	
Potassium	22100	22200	0			
Silver	0.8	0.7U		0.1	(≤2.0)	
Sodium	839000	843000	0			
Strontium	1420	1420	0			
Thallium	0.070	0.073		0.003	(≤0.200)	
Tungsten	4.53	4.39		0.14	(≤1.00)	
Uranium	14.5	14.8	2			
Vanadium	108	108	0			
Zinc	0.7	0.7U		0	(<10.0)	

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Data Validation Reports
LDC #22335

Wet Chemistry

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada

Collection Date: July 22 through July 27, 2009

LDC Report Date: January 19, 2010

Matrix: Water

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): R0904085

Sample Identification

CLD-4RB
MW-6RB
M-52B
M-35B
M-11B
M-11009B

Introduction

This data review covers 6 water samples listed on the cover sheet. The analyses were per Standard Method 2320B for Alkalinity, EPA Method 350.1 for Ammonia as Nitrogen, EPA SW 846 Method 9056 for Bromide, Chloride, Nitrate as Nitrogen, and Sulfate, EPA Method 300.1 for Chlorate, EPA Method 120.1 for Conductivity, EPA SW 846 Method 9012A for Cyanide, EPA Method 218.6 for Dissolved Hexavalent Chromium, EPA Method 353.2 for Nitrite as Nitrogen, EPA SW 846 Method 9040B for pH, Standard Method 5540C for Surfactants, EPA Method 314.0 for Perchlorate, EPA Method 365.1 for Total Phosphorus, EPA SW 846 Method 9060 for Total Organic Carbon, Standard Method 2540C for Total Dissolved Solids, and Standard Method 2540D for Total Suspended Solids.

This review follows the Standard Operating Procedures (SOP) 40, Data Review/Validation (BRC 2009), the Quality Assurance Project Plan Tronox LLC Facility, Henderson, Nevada (June 2009), NDEP guidance (May 2006), and 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 X.

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.

B The analytical result may be a false positive totally attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JB The analytical result may be biased high and partially attributable to blank contamination. This qualifier is applicable to radiochemistry analysis only.

JK The analytical result is an estimated maximum possible concentration (EMPC).

X The analytical result is not used for reporting because a more accurate and precise result is reported in its place.

J-TDS The analytical result is estimated based on failure of the Total Dissolved Solids (TDS) correctness check performed in accordance with the Standard Method 1030E.

J-CAB The analytical result is estimated based on failure of the cation-anion balance correctness check performed in accordance with Standard Method 1030E.

J-TDS & CAB The analytical result is unreliable based on the failure of the cation-anion balance and TDS correctness check performed in accordance with standard Method 1030E.

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
CLD-4RB	Hexavalent chromium	13 days	24 hours	J- (all detects) R (all non-detects)	P
MW-6RB	Hexavalent chromium	12 days	24 hours	J- (all detects) R (all non-detects)	P
M-52B M-35B	Hexavalent chromium	11 days	24 hours	J- (all detects) R (all non-detects)	P
M-11B M-11009B	Hexavalent chromium	8 days	24 hours	J- (all detects) R (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 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
PB (prep blank)	Alkalinity, total Alkalinity, bicarbonate	0.9 mg/L 0.9 mg/L	CLD-4RB MW-6RB
ICB/CCB	Alkalinity, total Alkalinity, bicarbonate Bromide	1.0 mg/L 1.0 mg/L 0.063 mg/L	CLD-4RB MW-6RB

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Sulfate	0.12 mg/L	CLD-4RB
ICB/CCB	Sulfate Total organic carbon	0.117 mg/L 0.126 mg/L	CLD-4RB
PB (prep blank)	Chloride	0.1 mg/L	M-52B M-35B
ICB/CCB	Sulfate	0.118 mg/L	M-52B M-35B
PB (prep blank)	Chloride Sulfate	0.11 mg/L 0.18 mg/L	M-11B M-11009B
ICB/CCB	Chloride Sulfate	0.108 mg/L 0.178 mg/L	M-11B M-11009B
ICB/CCB	Alkalinity, total Alkalinity, bicarbonate	0.9 mg/L 0.9 mg/L	M-52B M-35B M-11B M-11009B
ICB/CCB	Ammonia as N	0.0264 mg/L	M-35B M-11B M-11009B
ICB/CCB	Chloride	0.095 mg/L	CLD-4RB MW-6RB M-52B M-35B

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
MW-6RB	Bromide	0.7 mg/L	1.0U mg/L
M-11009B	Ammonia as N	0.017 mg/L	0.050U mg/L

Sample PB102309-A3 (from SDG R0906095) was identified as a pump blank. No contaminant concentrations were found in this blank with the following exceptions:

Pump Blank ID	Sampling Date	Analyte	Concentration	Associated Samples
PB102309-A3	10/23/09	Alkalinity, total Alkalinity, bicarbonate Ammonia as N Total organic carbon Chloride Conductivity Nitrate as N pH Total dissolved solids Sulfate Chlorate	1.1 mg/L 1.1 mg/L 2.60 mg/L 0.2 mg/L 0.9 mg/L 3.83 umhos/cm 0.69 mg/L 5.79 units 9 mg/L 1.5 mg/L 23 ug/L	All samples in SDG R0904085

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
CLD-4RB	Ammonia as N	0.596 mg/L	0.596J+ mg/L
MW-6RB	Nitrate as N	3.95 mg/L	3.95J+ mg/L
M-52B	Ammonia as N	0.049 mg/L	0.050U mg/L
M-35B	Ammonia as N Nitrate as N	0.092 mg/L 5.49 mg/L	0.092J+ mg/L 5.49J+ mg/L
M-11B	Ammonia as N Nitrate as N	0.136 mg/L 3.69 mg/L	0.136J+ mg/L 3.69J+ mg/L
M-11009B	Ammonia as N Nitrate as N	0.017 mg/L 3.75 mg/L	0.050U mg/L 3.75J+ mg/L

Sample MC-3B-FILT (from SDG R0902886) was identified as a filter blank. No contaminant concentrations were found in this blank.

IV. Matrix Spike/Matrix Spike Duplicates

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

V. Duplicates

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

VI. Laboratory Control Samples

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

VII. Surrogate Spikes

Surrogates were added to all samples and blanks as required by method 300.1. All surrogate recoveries (%R) were within QC limits.

VIII. Sample Result Verification and Project Quantitation Limit

All analytes reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG R0904085	All analytes reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

IX. Overall Assessment

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

X. Field Duplicates

Samples M-11B and M-11009B 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)	Flags	A or P
	M-11B	M-11009B				
Ammonia as N	0.136 mg/L	0.017 mg/L	-	0.119 (≤0.050)	J (all detects)	A
Alkalinity, total	188 mg/L	190 mg/L	1 (≤30)	-	-	-
Alkalinity, bicarbonate	188 mg/L	190 mg/L	1 (≤30)	-	-	-
Bromide	0.7 mg/L	0.7 mg/L	-	0 (≤1.0)	-	-
Chloride	291 mg/L	293 mg/L	1 (≤30)	-	-	-
Conductivity	4160 umhos/cm	4290 umhos/cm	3 (≤30)	-	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flags	A or P
	M-11B	M-11009B				
Diss. hexavalent chromium	3.21 mg/L	3.23 mg/L	1 (≤30)	-	-	-
Nitrate as N	3.69 mg/L	3.75 mg/L	2 (≤30)	-	-	-
Nitrite as N	0.032 mg/L	0.031	-	0.001 (≤0.010)	-	-
pH	7.99 units	8.00 units	0 (≤30)	-	-	-
Sulfate	1350 mg/L	1330 mg/L	1 (≤30)	-	-	-
Surfactants	0.081 mg/L	0.070 mg/L	-	0.011 (≤0.020)	-	-
Total dissolved solids	3290 mg/L	3270 mg/L	1 (≤30)	-	-	-
Total organic carbon	1.5 mg/L	1.4 mg/L	-	0.1 (≤1.0)	-	-
Total phosphorus	0.025 mg/L	0.023 mg/L	-	0.002 (≤0.050)	-	-
Total suspended solids	1.7 mg/L	1.5 mg/L	-	0.2 (≤1.0)	-	-
Chlorate	563000 ug/L	492000 ug/L	13 (≤30)	-	-	-
Perchlorate	42300 ug/L	55600 ug/L	27 (≤30)	-	-	-

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Wet Chemistry - Data Qualification Summary - SDG R0904085

SDG	Sample	Analyte	Flag	A or P	Reason (Code)
R0904085	CLD-4RB MW-6RB M-52B M-35B M-11B M-11009B	Hexavalent chromium	J- (all detects) R (all non-detects)	P	Technical holding times (h)
R0904085	CLD-4RB MW-6RB M-52B M-35B M-11B M-11009B	All analytes reported below the PQL.	J (all detects)	A	Sample result verification (sp)
R0904085	M-11B M-11009B	Ammonia as N	J (all detects)	A	Field duplicates (Difference) (fd)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG R0904085

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0904085	MW-6RB	Bromide	1.0U mg/L	A	bl
R0904085	M-11009B	Ammonia as N	0.050U mg/L	A	bl

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Wet Chemistry - Pump Blank Data Qualification Summary - SDG R0904085

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0904085	CLD-4RB	Ammonia as N	0.596J+ mg/L	A	bp
R0904085	MW-6RB	Nitrate as N	3.95J+ mg/L	A	bp
R0904085	M-52B	Ammonia as N	0.050U mg/L	A	bp
R0904085	M-35B	Ammonia as N Nitrate as N	0.092J+ mg/L 5.49J+ mg/L	A	bp

SDG	Sample	Analyte	Modified Final Concentration	A or P	Code
R0904085	M-11B	Ammonia as N Nitrate as N	0.136J+ mg/L 3.69J+ mg/L	A	bp
R0904085	M-11009B	Ammonia as N Nitrate as N	0.050U mg/L 3.75J+ mg/L	A	bp

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada
Wet Chemistry - Filter Blank Data Qualification Summary - SDG R0904085

No Sample Data Qualified in this SDG

Tronox Northgate Henderson
VALIDATION COMPLETENESS WORKSHEET
Stage 2B

LDC #: 22335A6
SDG #: R0904085
Laboratory: Columbia Analytical Services

Date: 1-12-10
Page: 1 of 1
Reviewer: CR
2nd Reviewer: W

METHOD: (Analyte) Alkalinity (SM2320B), Ammonia-N (EPA Method 350.1), Bromide, Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056), Chlorate (EPA Method 300.1), Conductivity (EPA Method 120.1), Cyanide (EPA SW846 Method 9012A), Dissolved Hexavalent Chromium (EPA Method 218.6), Nitrite-N (EPA Method 353.2), pH (EPA SW846 Method 9040B~~/9045D~~), Surfactants (SM5540C), Perchlorate (EPA Method 314.0), Total Phosphorus (EPA Method 365.1), TOC ~~(Lloyd/Kahn /~~ EPA SW846 Method 9060), TDS (SM2540C), TSS (SM2540D)

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~~ SW	Sampling dates: 7/22/09 - 7/27/09
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Surrogate Spikes	A	
V	Matrix Spike/Matrix Spike Duplicates	N	Client specified ↓
VI.	Duplicates	N	
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	(5 6)
XI	Field blanks	SW	Filter Blank = MC-3B-FILT, Pump Blank = PB102309-A3 (R0902886) (R0906095)

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: water

1	CLD-4RB	11		21		31	PBW
2	MW-6RB	12		22		32	
3	M-52B	13		23		33	
4	M-35B	14		24		34	
5	M-11B	15		25		35	
6	M-11009B	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 22335T6
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: [signature]
2nd reviewer: [signature]

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-6		(Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4)
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4
		Alk pH Br Cl NO_3 NO_2 SO_4 NH_3 TOC CN Cr^{6+} T-P MBAS TDS TSS Cond ClO_3 ClO_4

Comments:

LDC #: 22335A6
SDG #: R0904085

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

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

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:		218.6					
Parameters:		Cr6+					
Technical holding time:		24hrs (samples not preserved)					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
1	7/22/09 09:50	8/4/09 12:44	(13 days)				J-/R/P
2	7/23/09 09:17	13:16	(12 days)				
3	7/24/09 08:10	13:26	(11 days)				
4	1110	13:36					
5	7/27/09 09:15	13:47	(8 days)				
6	09:15	13:57					

Ch

LDC #: 22335A6
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: ar
2nd Reviewer: w

METHOD: Inorganics, Method See Cover

Reason Code: bl

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?

Y 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: 1, 2**

Analyte	Blank ID	Maximum ICB/CCB (mg/L)	Blank Action Limit	Sample Identification									
	PB (mg/L)			2									
Alk., Total	0.9	1.0											
Alk., Bicarb.	0.9	1.0											
Br		0.063		0.7 / 1.0									

Conc. units: mg/L **Associated Samples: 1**

Analyte	Blank ID	Maximum ICB/CCB (mg/L)	Blank Action Limit	Sample Identification									
	PB (mg/L)			No Qualifiers									
SO4	0.12	0.117											
TOC		0.126											

Conc. units: mg/L **Associated Samples: 3, 4**

Analyte	Blank ID	Maximum ICB/CCB (mg/L)	Blank Action Limit	Sample Identification									
	PB (mg/L)			No Qualifiers									
Cl	0.1												
SO4		0.118											

LDC #: 22335A6
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: CR
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See Cover

Reason Code: bl

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?
Y 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:** 5, 6

Analyte	Blank ID	Maximum ICB/CCB (mg/L)	Blank Action Limit	Sample Identification									
	PB (mg/L)			No Qualifiers									
Cl	0.11	0.108											
SO4	0.18	0.178											

Conc. units: mg/L **Associated Samples:** 3-6

Analyte	Blank ID	Maximum ICB/CCB (mg/L)	Blank Action Limit	Sample Identification									
	PB (mg/L)			No Qualifiers									
Alk., Total		0.9											
Alk., Bicarb.		0.9											

Conc. units: mg/L **Associated Samples:** 4-6

Analyte	Blank ID	Maximum ICB/CCB (mg/L)	Blank Action Limit	Sample Identification									
	PB (mg/L)			3	6								
NH3-N		0.0264		0.049 / 0.050	0.017 / 0.050								

Conc. units: mg/L **Associated Samples:** 1-4

Analyte	Blank ID	Maximum ICB/CCB (mg/L)	Blank Action Limit	Sample Identification									
	PB (mg/L)			No Qualifiers									
Cl		0.095											

LDC #: 22335A6
SDG #: See Cover

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: CR
2nd Reviewer:

METHOD: Inorganics, Method See Cover

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

Blank units: mg/L **Associated sample units:** mg/L

Reason Code: bp

Sampling date: 10/23/09 Soil factor applied NA

Field blank type: (circle one) Field Blank / Rinsate / Other: Pump Blank Associated Samples: All

Analyte	Blank ID	Sample Identification								
	PB102309-A3 (SDG#R0906095)	Action Level	1	2	3	4	5	6		
Total Alkalinity	1.1									
Bicarbonate Alkalinity	1.1									
Ammonia as N	2.60	26.0	0.596 J+		0.049 / 0.050	0.092 J+	0.136 J+	0.017 / 0.050		
TOC (average)	0.2									
Chloride	0.9									
Conductivity (umhos/cm)	3.83	38.3								
Nitrate as Nitrogen	0.69	6.9		3.95 J+		5.49 J+	3.69 J+	3.75 J+		
pH (pH Units)	5.79									
TDS	9									
SO4	1.5									
Chlorate (ug/L)	23	230								

LDC#: 22335A6
SDG#: See Cover

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: CR
2nd Reviewer:

Inorganics, Method See Cover

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

Analyte	Concentration (mg/L) 5	Concentration (mg/L) 6	RPD (≤30)	Difference	Limits	Qualification (Parent only)
Ammonia as N	0.136	0.017		0.119	(≤0.050)	Jdet/A (fd)
Total Alkalinity	188	190	1			
Bicarbonate Alkalinity	188	190	1			
Bromide	0.7	0.7		0	(≤1.0)	
Chloride	291	293	1			
Conductivity (umhos/cm)	4160	4290	3			
Dissolved Hexavalent Chromium	3.21	3.23	1			
Nitrate as N	3.69	3.75	2			
Nitrite as N	0.032	0.031		0.001	(≤0.010)	
pH (pH Units)	7.99	8.00	0			
Sulfate	1350	1330	1			
Surfactants	0.081	0.070		0.011	(≤0.020)	
TDS	3290	3270	1			
TOC, Average	1.5	1.4		0.1	(≤1.0)	
Total Phosphorus	0.025	0.023		0.002	(≤0.050)	
TSS	1.7	1.5		0.2	(≤1.0)	
Chlorate (ug/L)	563000	492000	13			
Perchlorate (ug/L)	42300	55600	27			