

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.

December 4, 2009

1100 Quail Street Ste. 102 Newport Beach, CA 92660 ATTN: Ms. Cindy Amold

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

Data Validation

Dear Ms. Amold,

Enclosed is the revised data validation report for the fraction listed below. The data validation was performed under Stage 4 guidelines. Please replace the previously submitted report with the enclosed revised report.

LDC Project # 21423:

SDG#

Fraction

TRX09072041

Organic Acids

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

Sincerely,

Erlinda T. Rauto

Operations Manager/Senior Chemist



LABORATORY DATA CONSULTANTS, INC.

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

Northgate Environmental Management, Inc.

September 14, 2009

1100 Quail Street Ste. 102 New Port beach, CA 92660 ATTN: Ms. Cindy Arnold

SUBJECT:

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada

Data Validation

Dear Ms. Arnold,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on August 20, 2009. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 21423:

TRX09073051, TRX09080450

SDG # Fraction

TRX09052940, TRX09060140, TRX09060141, Organic Acids TRX09072852, TRX09060256, TRX09060456, TRX09060457, TRX09060566, TRX09060567, TRX09060840, TRX09061850, TRX09061951, TRX09070755, TRX09071051, TRX09071450, TRX09072041, TRX09072352, TRX09072741.

The data validation was performed under Stage 2B & 4 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 Inorganic Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

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

Sincerely.

Erlinda T. Rauto

Operations Manager/Senior Chemist

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EDD CHECKLIST

LDC #: 21423

Page: 1 of 1 Reviewer: JE 2nd Reviewer: BC

Tronox Northgate Henderson Worksheet

EDD Area	Yes	COMPTRIBOUNDED NAME	National State of Street	Findings/Comments
1. Completeness				
Is there an EDD for the associated Tronox validation report?	X	į		
HEDD Qualities Population was a little and the same				
Were all qualifiers from the validation report populated into the EDD?	X	COLUMN TO THE PARTY OF THE PART		
III. BDIDELEBIANSTERIES L. GENERALBERGE L. GENERALBERGE				
Were EDD anomalies identified?	X			
If yes, were they corrected or documented for the client?	X			See EDD_discrepancy_ form_LDC21423_091409.doc
IV. EDD Deliverya. II. III. 1844				
Was the final EDD sent to the client?	X			

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Data Validation Reports LDC# 21423

Organic Acids

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: May 27, 2009

LDC Report Date: September 1, 2009

Matrix: Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09052940

Sample Identification

EB052709 EB052709MS EB052709MSD

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.
- 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

Sample EB052709 was identified as an equipment blank. No organic acid contaminants were found in this blank with the following exceptions:

Equipment Blank ID	Sampling Date	Compound	Concentration	Associated Samples
EB052709	5/27/09	Benzenesulfonic acid Diethyl phosphorodithioic acid 4-Chlorobenzenesulfonic acid	3.8 mg/L 17 mg/L 4.1 mg/L	No associated samples in this SDG

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were not within QC limits. Since the sample concentration was greater than the spiked concentration, no data were qualified.

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09052940	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09052940

SDG	Sample	Compound	Flag	A or P	Reason
TRX09052940	EB052709	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09052940

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09052940

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

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LDC #: 21423A47	VALIDATION COMPLETENESS WORKSHEET	Date: 8/31/09
SDG #: TRX09052940	Stage 2B	Page: 1 of 1
Laboratory: Alpha Analytical,	Inc.	Reviewer:
	A COMPANY TO A COM	2nd Reviewer:
METHOD: HPLC Organic A	cids (HPLC Method)	

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
<u> </u>	Technical holding times	A	Sampling dates: 5/27/69
IIa.	Initial calibration	A	r>
Hb.	Calibration verification/ICV	A	CCV = 20 ? ICV = 30 ?
III.	Blanks	A	
IVa.	Surrogate recovery	N	Nat reid.
IVb.	Matrix spike/Matrix spike duplicates	SW	b
IVc.	Laboratory control samples	A	lCs
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	SW	EB = 1

Note:

A = Acceptable N = Not provided/applicable

R = Rinsate

ND = No compounds detected

D = Duplicate TB = Trip blank

SW = See worksheet

FB = Field blank

EB = Equipment blank

Validated Samples:

	Water			
1	EB052709	11	21	31
2	EB052709MS	12	22	32
3	EB052709MSD	13	23	33
4	MALK - 22124	14	24	34
5		15	25	35
6		16	26	36
7		17	27	37
8		18	28	38
9		19	29	39
10		20	30	40

Notes:		

VALIDATION FINDINGS WORKSHEET

METHOD: GC / HPLC

8310	8330	8151	8141	8141 _(Con't)	8021B
A. Acenaphthene	А. НМХ	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,l)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	1. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	0.		O. Chlorpyrifos	organic Acide	(4)
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В.			R. Trichloronate	c. Phthalic acid	
Ġ.			S. Merphos	D. Diethyl phospho	Diethyl phosphorodithioic acid
			T. Stirofos	E. 4- chlorobenze	4- chlorobenzene sulfonic acid
			U. Tokuthlon		

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Notes:

LDC # 21 423 A47

VALIDATION FINDINGS WORKSHEET Field Blanks

Reviewer: WL 2nd Reviewer:

Were target compounds detected in the field blanks? GC / HPLC Were field blanks identified in this SDG? METHOD:

名ampling date: かの ル Associated sample units: 私子 Sampling date: ケノスフノの Pield Blank / Trip Blank / Atmospheric Blank / Ambient Blank

Rinsate / Equipment Rinsate / Equipment Blank / Source Blank / Other.

Associated Samples:

Compound	Blank ID	Blank 10	Campa Landing and
	-		Sarrippe redutification
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a	8.		
٥	17		
47	4.		
CROL			
7100	•	•	

Associated sample units: Blank units:

Sampling date:

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

Associated Samples:

Sample Identification Blank 10 Blank ID Compound

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

LDC #: 21423 447 SDG #: Sta Com

VALIDATION FINDINGS WORKSHEET

Page: of

2nd Reviewer:

Reviewer:___

Matrix Spike/Matrix Spike Duplicates

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

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

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

X N N/A

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

>4x Spile and Parent come. Qualifications No rus Associated Samples RPD (Limits) (00-140) MSD %R (Limits) 50 23 (60-140) %R (Limits) 7 7 Compound MS/MSD ID

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: May 28, 2009

LDC Report Date: September 1, 2009

Matrix: Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09060140

Sample Identification

M-127B

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.

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- 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09060140	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09060140

SDG	Sample	Compound	Flag	A or P	Reason
TRX09060140	M-127B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09060140

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09060140

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC	#: <u>21423B47</u>	_ VA				IESS WORK	SHEET		Date:_2	8/21/0
	#: TRX09060140		_	S	Stage 2E	3			Page:	1 of /
Labo	ratory: <u>Alpha Analytical, I</u>	nc.	_					F	Reviewer:_ Reviewer:_	200
MET	H OD: HPLC Organic Aci	ds (H	PLC Method	d)				2nd F	deviewer:_	#
	•	,		,						/
The s	samples listed below wer ation findings worksheets	e revi	ewed for ea	ch of the f	ollowing	validation areas.	Validation find	dings are i	noted in at	tached
vallud	ation indings worksneets	·.								
	Validation	Area	7. 11 1144				Comments			
1.	Technical holding times			A	Sampling	dates: 5/28/	109			
lla.	Initial calibration		· · · · · · · · · · · · · · · · · · ·	Δ		~				
IIb.	Calibration verification/ICV			Δ	C	CV = 20 }	1W = 30	2		
111.	Blanks			A						
IVa.				N	No-	rejd.				
IVb.	Matrix spike/Matrix spike du	ınlicate	ie.	Sh)		2940-01	(No acc	(i)-1 1	sample,	Ala ca
IVc.	Laboratory control samples			A	l .	125740-07 1CS	(/,35	vuntea	sample,	-
V.	Target compound identifica	-		N		<u>~</u>			 .	
				<u> </u>						
VI.	Compound Quantitation and	a CRQ	LS	N						
VII.	System Performance			N			 · · · · · · · · · · · · · · · · · ·			
VIII.		1		A		·····				
IX.	Field duplicates			N .						
X.	Field blanks			<u> </u>	<u> </u>					
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	e	R = Rins	o compound: sate eld blank	s detected	D = Duplic TB = Trip I EB = Equi _l				
	red Samples: Water									
1	M-127B	11			21		31		· · · · · · · · · · · · · · · · · · ·	
2	-M-127BMS-	12			22		32			
3	-M-127BMSD-	13			23		33			
4	MB1K - 22124	14			24		34			
5		15			25		35			
6		16	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	26		36			
7		17			27		37			
8		18			28		38			
9		19			29		39			
10		20			30		40			
				*						

Notes:___

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: May 29, 2009

LDC Report Date: September 1, 2009

Matrix: Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09060141

Sample Identification

MC-45B

Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.
- 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09060141	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09060141

SDG Sample		Compound	Flag	A or P	Reason	
TRX09060141	MC-45B	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)	

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09060141

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09060141

No Sample Data Qualified in this SDG

SDG # _abora	t: 21423C47 t: TRX09060141 atory: Alpha Analytical, Ii	nc.	ALIDATIOI - -	8	LE.		ESS		SHEET		Pa	Date: <u>8/</u> age:lo ewer:	of
The savalidat	amples listed below were tion findings worksheets	e revi	ewed for ea	ch of the f	ollow	ing v	alidatio	on areas.	. Validatior	n find	dings are note	d in attad	ched
	Validation	Area			<u>l</u>				Comme	nts			
I.	Technical holding times			A	Sam	-	lates:	5/29	101				
IIa.	Initial calibration			<u> </u>		<u></u>	~	•					
IIb.	Calibration verification/ICV			A	ļ	CCV	€ 20	<u>ک</u>	100 E	3	603		
111.	Blanks			A	 								
IVa.	Surrogate recovery	•		N			reg						
IVb.	Matrix spike/Matrix spike du	plicate	es	SW	<u> </u>			10-01	(No as	SOC	iated sample	No gr	<u>()</u>
IVc.	Laboratory control samples		A	<u> </u>	\mathcal{U}	<u>ع</u>							
V.	Target compound identificat		7	N	ļ								
VI.	Compound Quantitation and	CRQ	Ls	N	<u> </u>				· · · · · · · · · · · · · · · · · · ·				
VII.	System Performance			N	<u> </u>						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
VIII.	Overall assessment of data			A	<u> </u>	·							
IX.	Field duplicates			N	 							····	
Χ.	Field blanks		***************************************	N									
Note: /alidate	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples: Water	;	R = Rins	o compound sate eld blank	s dete	cted		D = Duplic TB = Trip I EB = Equi					
1 1	MC-45B	11				21	,	****		31			
2	MBL - 22124	12				22				32			$-\parallel$
3		13				23				33			
4		14				24				34			
5		15				25				35			ᅦ
6		16				26				36			ᅦ
7		17				27				37			$\neg \parallel$
8		18				28				38	****		

Notes:	

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: July 21 through July 22, 2009

LDC Report Date: September 10, 2009

Matrix: Soil

Parameters: Organic Acids

Validation Level: Stage 4

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09072852

Sample Identification

SA166-10BSSPLP

SA166-10BSSPLPpH(SPLP)

SA166-10BSSPLP(DI SPLP)

SA182-10BSPLP

SA182-10BSPLPpH(SPLP)

SA182-10BSPLP(DI SPLP)

Introduction

This data review covers 6 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.

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.
- 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

All target compound identifications were within validation criteria.

VI. Project Quantitation Limit

All project quantitation limits were within validation criteria.

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09072852	All compounds reported below the PQL.	J (all detects)	Α

VII. System Performance

The system performance was acceptable.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09072852

SDG	Sample	Compound	Flag	A or P	Reason
TRX09072852	SA166-10BSSPLP SA166-10BSSPLPpH(SPLP) SA166-10BSSPLP(DI SPLP) SA182-10BSPLP SA182-10BSPLPpH(SPLP) SA182-10BSPLP(DI SPLP)	All compounds reported below the PQL	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09072852

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09072852

No Sample Data Qualified in this SDG

LDC i	#: <u>21423D47</u>	Tro VALIDATIO		hgate Hend LETENESS		HEET	Date: 9 / 10 / 10
	#:TRX09072852		S	tage 4			Page: of
Labor	ratory: <u>Alpha Analytical, Ir</u>	nc		_		0	Reviewer: 3V6
METH	HOD: HPLC Organic Acid	ds (HPLC Method	٦)			2	nd Reviewer:
	· ·	`	,				/
The s	samples listed below were ation findings worksheets.	e reviewed for ea	ch of the fo	llowing validat	tion areas. V	alidation findings	are noted in attached
Vallua	ilion iindings worksneets.	•					
	Validation	<u>Area</u>				Comments	
1.	Technical holding times		A	Sampling dates:	7/21-	22/09	
lla.	Initial calibration		A	r~			
IIb.	Calibration verification/ICV		A		202	10V € 30 Z	
III.	Blanks		A	<u> </u>			
IVa.	Surrogate recovery		N	Not re	id.		
IVb.	Matrix spike/Matrix spike du	plicates	A			, 090730	51-02
IVc.	Laboratory control samples		A	LES		,	
V.	Target compound identificat	tion	A				
VI.	Compound Quantitation and	d CRQLs	A				
VII.	System Performance		À				
VIII.	Overall assessment of data		Ą				
IX.	Field duplicates		N				
X.	Field blanks		N				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R = Rin	o compounds sate eld blank	detected	D = Duplicate TB = Trip bla EB = Equipm	nk	
Validat	ted Samples:						
1	SA166-10BSSPLP	11 / MBLK.	22436	21		31	
2	SA166-10BSSPLP(SPLP)	12 MBLK	- 22436 - 22449	22		32	
3	SA166-10BSSPLP(DISPLP)	13		23		33	
4	SA182-10BSPLP	14		24		34	
5	SA182-10BSPLP(SPLP)	15		25		35	
6	SA182-10BSPLP(DISPLP)	16		26		36	
7	. A	17		27		37	
8	· · · · · · · · · · · · · · · · · · ·	18		28		38	
		1.0				I	

Notes:_

VALIDATION FINDINGS CHECKLIST

Page: Lof 2
Reviewer: TVC
2nd Reviewer: ______

Method: GC HPLC

Validation Area	Yes	No	NA Maria	Findings/Comments
De recontect holding times as the second sec		1		100 m
All technical holding times were met.				
Cooler temperature criteria was met.		/		
In initial Calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?				
Were all percent relative standard deviations (%RSD) ≤ 20%?		_		
Was a curve fit used for evaluation?				
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?				
Were the RT windows properly established?				
IV ≥ Continum e geal litration i.e.				
Was a continuing calibration analyzed daily?				
Were all percent differences (%D) < 26%.0 or percent recoveries 86-126%?				
Were all the retention times within the acceptance windows?				
Viblanks				Motor Factors
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed for each matrix and concentration?	_			
Was there contamination in the method blanks? If yes, please see the Blanks				
validation completeness worksheet. VI. Surrocatespikes		i farit	3	
Were all surrogate %R within the QC limits?	,		_	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?				
Mis Maurkspike/Mainkspikeidublicares				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.		-		
Was a MS/MSD analyzed every 20 samples of each matrix?				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		_		
Villi Laboratory control samples .			7.	
Was an LCS analyzed for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
TO THE REAL PROPERTY OF THE PR	*			
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: JV6
2nd Reviewer: 4

Validation Area			T	Fig. 15 and Community
X (the electron continuation are	Yes	No Total	NA P	Findings/Comments
Were the retention times of reported detects within the RT windows?				
XII. compound quentitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?				
XIII. Sykitem celifolimance.			î. iz,	
System performance was found to be acceptable.				
XIII) Overall assessment of data		g Lak	i dei	
Overall assessment of data was found to be acceptable.		-		
XIV. Field duplicates as a				
Field duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.			_	
XV-strieldiplanks	4			in the second control of the second control
Field blanks were identified in this SDG.		/	_	
Target compounds were detected in the field blanks.			_	

LDC # 21 423 947 SDG# See (122)

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: 1 of 1

Reviewer: 3/6 2nd Reviewer: ___

METHOD: HPLC

Parameter: 4-Chlorobenzenesulfonic acid

			×	٨	ZvA
Date	Detector	Compound	Conc	Area	
			(mdd)		
6/02 to 6/03/09	ΛN	4-Chlorobenzenesulfonic acid	0.025	105332	
	HPLC 3	7.7.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2	0.050	201649	
			0.100	464100	
			0.250	1152183	
			0.500	2262016	
			1.000	4485504	
			1.500	6636299	
			2.000	8851547	

4641000 4608732 4524032 4485504 4464199

4425774 Ave 4424438

RF 4213280 4032980

Regression Output:		Reported	rted
Constant	-4.19374E-003	II 0	-0.004194
Std Err of Y Est	0.00735		
R Squared	0.999917	12	0.999917
No. of Observations	8.00000		
Degrees of Freedom	00000'9		
X Coefficient(s) 2.254E-007	-9.41E-015	= q	2.254E-007

21 423 047 See Cover LDC#: SDG #:

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

Page: 1 of / 2nd Reviewer. Reviewer:

> HPLC METHOD: GC_

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

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

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

					Reported	Recalculated	Reported	Recalculated
*	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	CF/Conc. CCV	CF/Conc. CCV	у,	%R
-	B478300).001 7 /20/09	60/04/2	P-(BSA)	0.500	205.0	6. 502	100.3	€ '00]
7	P493001, DIV	69/0E/ L		0.00°	67.6.0 6.070	0.979	626	6 25
ო	134805001.023 7/n/64	43 164 E		0.500	0. 578	0. wg	7 101	9 .101
4	\$ 4819001.D37 8/61/64	7 8/61/64		1.000	1.003	1,008	100.8	100. 8
		,						

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

LDC #: 21 423 047 SDG #: See Cover

Matrix Spike/Matrix Spike Duplicates Results Verification VALIDATION FINDINGS WORKSHEET

Page: of /	Reviewer: JR	2nd Reviewer:
		•

GC HPLC METHOD:

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

the following calculation: %Recovery = 100 * (SSC - SC)/SA

Where

SC = Sample concentration

RPD =(((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD))*100

SSC = Spiked sample concentration SA = Spike added MS = Matrix spike

MSD = Matrix spike duplicate

as 10-02006 7090 MS/MSD samples:

	Spike	ike	Sample	Spike Sa	ample	Matrix	Matrix spike	Matrix Spike Duplicate	Duplicate	QSW/SW	SD
Compound	(M 0)	7	(mg /L)		ration (1)	Percent F	Percent Recovery	Percent Recovery	ecovery	RPD	
	MS	MSD	1	WS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
PCDSA (HPLC)	1.00	- 8	0	1.008	1.030	101	101	49)	705	7,7	7,

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

LDC # 31423 247 See Guer SDG #:

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

-Jo Reviewer:_ Page:

2nd Reviewer:___

METHOD: __GC _HPLC

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

% Recovery = 100* (SSC-SC)/SA RPD = I LCS - LCSD I * 2/(LCS + LCSD)

SC = Concentration

Where: SSC = Spiked sample concentration SA = Spike added LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

115-22469 LCS/LCSD samples:

	o d	Spike	Spiked	Sample	1	rcs	רכ	rcsp	TCS	TCS/FCSD
Compound	· ()	2/60	Σω)	(ms /ec)	Percent	Percent Recovery	Percent	Percent Recovery		RPD
	SOT	LCSD	rcs	CSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
PCBSA (HPLC)	2.0	¥57	1.89	MA	45	95				

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

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VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Reviewer: Page: \of

> GC HPLC METHOD:

((A/N	N/A/	/
	Z	Z	_
	>	>	

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

(A)(Fv)(Df)	RF)(Vs or Ws)(%S/100)	
Concentration=		

Compound Name _

Sample ID.

Example:

A= Area or height of the compound to be measured Fv= Final Volume of extract

RF= Average response factor of the compound in the initial calibration Df= Dilution Factor

Concentration =_

Vs= Initial volume of the sample Ws= Initial weight of the sample %S= Percent Solid

Qualifications Recalculated Results
Concentrations Reported Concentrations Compound Sample ID #

Comments:

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: June 1, 2009

LDC Report Date: September 1, 2009

Matrix: Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09060256

Sample Identification

PC-40B PC-4009B

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09060256	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples PC-40B and PC-4009B were identified as field duplicates. No organic acids were detected in any of the samples with the following exceptions:

	Concentration (mg/L) PC-40B PC-4009B		DDD	D:#		
Compound			RPD (Limits)	Difference (Limits)	Flags	A or P
Benzenesulfonic acid	0.053	0.053	-	0 (≤0.050)	-	-

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09060256

SDG	Sample	Compound	Flag	A or P	Reason
TRX09060256	PC-40B PC-4009B	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09060256

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09060256

No Sample Data Qualified in this SDG

LDC #	: <u>21423E47</u>	_ VAI			_	Henderson ESS WOR			Date: 8/21/ Page: 1 of / Reviewer: 54/ 2nd Reviewer: 9
SDG#	#: TRX09060256			S	Stage 2E	3			Page: 1 of 1
Labora	atory: <u>Alpha Analytical,</u>	Inc.							Reviewer: <u> </u>
	OD: HPLC Organic Ac	•					V 61 6	ć	/
	amples listed below wel		wed for ead	cn of the f	ollowing v	/alidation area	as. Validatio	n tino	dings are noted in attached
	Validatio	n Area					Comm	ents	
I.	Technical holding times			4	Sampling	dates: 6/01	109		
IIa.	Initial calibration			*	r				
IIb.	Calibration verification/ICV	,		A	ca	1 = 202	ICV =	30	· Z
III.	Blanks			A					_
IVa.	Surrogate recovery			N	No	t resid			
IVb.	Matrix spike/Matrix spike d	luplicates		5n)	1) (No as	5500	iated sample. No qual
IVc.	Laboratory control sample			H	ĸ	•			
V.	Target compound identific			N					
VI.	Compound Quantitation ar		s	N					
VII.	System Performance			N					
VIII.	Overall assessment of dat	а		A					
IX.	Field duplicates		***************************************	>W)	D =	. 1,2			
Χ.	Field blanks			N					
Note:	A = Acceptable N = Not provided/applicab SW = See worksheet	le	R = Rin	o compound sate eld blank	is detected		plicate rip blank quipment blanl	k	
	ed Samples: Wa <i>l</i> ter								
+ 1	PC-40B	11	*		21			31	
1 2 3	PC-4009B	12			22			32	
3	MBLK - 22124	13			23			33	
4		14			24			34	
5		15			25			35	
6		16			26			36	
7		17		·	27			37	
8		18			28			38	
1 1						ı			

Notes:_

VALIDATION FINDINGS WORKSHEET

METHOD: GC /HPLC

8310	8330	8151	8141	8141(con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,l)perylene	G. 2.4.8-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Dlazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethlon	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	·o		O. Chlorpyrifos	(corganic Acids	3
P. Pyrene	Э.		P. Fenthlon	A Pimethyl phosphopodithioic	rodithioic acid
Ö	Ø		Q. Parathion-ethyl	B. Benzene sulfonic	aud
χ.			R. Trichloronate	c. Phthalic acid	
ÿ			S. Merphos	D. Diethyl phosphi	Diethyl phosphorodithioic acid
			T. Stirofos	E. 4- chlorobenze	4- chlorobenzene sulfonic acid
			U. Tokuthion		

VALIDATION FINDINGS WORKSHEET

LDC#: 21423 #47 SDG#: 24 Gray

METHOD:

Field Duplicates

Reviewer. 3%

Page: of /

Parent only / All Samples Qualification #10 050.0 = Limit 4307 0 0.053 λ Concentration (mg 1) GC / HPLC
Were field duplicate pairs identified in this SDG?
Were target compounds detected in the field duplicate pairs? 6.053 Compound

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

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: June 3, 2009

LDC Report Date: September 2, 2009

Matrix: Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09060456

Sample Identification

M-7BB M-7BBMS M-7BBMSD

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P	
All samples in SDG TRX09060456	All compounds reported below the PQL.	J (all detects)	А	

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09060456

SDG	Sample	Compound	Flag	A or P	Reason
TRX09060456	M-78B	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09060456

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09060456

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

DC #: 21423F47	_ VALIDATION COMPLETENESS WORKSHEET	Date: <u>-</u> 2	3/31	/
DG #: TRX09060456	Stage 2B	Page:	<u>_</u> of	
aboratory: Alpha Analytical,	Inc.	Reviewer:_	W	Ç
,		2nd Reviewer:	\mathcal{L}	7
IETHOD: HPLC Organic Ac	ids (HPLC Method)	"	7	

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

	Validation Area		Comments
l.	Technical holding times	A	Sampling dates: 6/03/09
IIa.	Initial calibration	A	r ~
IIb.	Calibration verification/ICV	A	COV = 20] 19 = 30]
111.	Blanks	Á	
IVa.	Surrogate recovery	N	Not regid.
IVb.	Matrix spike/Matrix spike duplicates	A	,
IVc.	Laboratory control samples	A	KS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	*	
IX.	Field duplicates	N	
X.	Field blanks	1 2	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank
EB = Equipment blank

Validated Samples:

Michael

	· wer				
1	M-7BB	11	21	31	
2	M-7BBMS	12	22	32	
3	M-7BBMSD	13	23	33	
4	MB1K-22184	14	24	34	
5		15	25	35	
6		16	26	36	
7		17	27	37	
8		18	28	38	
9		19	29	39	
10		20	30	40	

Notes:	

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: June 3, 2009

LDC Report Date: September 1, 2009

Matrix: Soil

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09060457

Sample Identification

RSAM3-0.5B RSAM2-0.5B

Introduction

This data review covers 2 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.

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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.

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- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- R Data are qualified as rejected. There is a significant potential for the reporting of false negatives or false positives.
- 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P	
All samples in SDG TRX09060457	All compounds reported below the PQL.	J (all detects)	Α	

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09060457

SDG	Sample	Compound	Flag	A or P	Reason
TRX09060457	RSAM3-0.5B RSAM2-0.5B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09060457

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09060457

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

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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
<u>l.</u>	Technical holding times	A	Sampling dates: 6/03/09
IIa.	Initial calibration	A	r
IIb.	Calibration verification/ICV	A	CON = 20 Z 1CN = 30 Z
111.	Blanks	A	
IVa.	Surrogate recovery	N	
IVb.	Matrix spike/Matrix spike duplicates	SW	09060566-01 (No 450ciated sample, No gral)
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
Χ.	Field blanks	N	

Note:

ND = No compounds detected R = Rinsate

D = Duplicate

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

FB = Field blank

TB = Trip blank EB = Equipment blank

Validated Samples:

Coil

	3011				
1	RSAM3-0.5B	11	21	31	
2	RSAM2-0.5B	12	22	32	
3	MBLK-22155	13	23	33	
4		14	24	34	
5		15	25	35	
6		16	26	36	
7		17	27	37	
8		18	28	38	
9		19	29	39	
10		20	30	40	

Notes:		

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: June 4, 2009

LDC Report Date: September 1, 2009

Matrix: Soil

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09060566

Sample Identification

RSAJ3-0.5B RSAJ3-0.5BMS RSAJ3-0.5BMSD

Introduction

This data review covers 3 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

Sample FB060409 (from SDG TRX09060567) was identified as a field blank. No organic acid contaminants were found in this blank.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09060566	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09060566

SDG	Sample	Compound	Flag	A or P	Reason
TRX09060566	RSAJ3-0.5B	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09060566

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09060566

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #:_	21423H47	VALIDATION COMPLETENESS WORKSHEET	
SDG #:_	TRX09060566	Stage 2B	
Laborato	ory: <u>Alpha Analytical, I</u>	nc.	2n
метно	D: HPLC Organic Acid	ds (HPLC Method)	211

Date: <u>&</u>	/31	/6 g
Page:	of_	1
Reviewer:_	<u> </u>	16
2nd Reviewer:_	Q	_
	/	

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: 6/64/69
IIa.	Initial calibration	A	Γ ^γ
IIb.	Calibration verification/ICV	Α	ca ≤ 20 2 10 × ≤ 30 3
III.	Blanks	A	
IVa.	Surrogate recovery	x)	Not regid.
IVb.	Matrix spike/Matrix spike duplicates	SW	•
IVc.	Laboratory control samples	A	les
V.	Target compound identification	N	•
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
Χ.	Field blanks	ND	78 = #B060409 from TRX09060567

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

Validated Samples:

Soil

1	RSAJ3-0.5B	11	21	31	
2	RSAJ3-0.5BMS	12	22	32	
3	RSAJ3-0.5BMSD	13	23	33	
4	MBLK - 22155	14	24	34	
5		15	25	35	
6		16	26	36	
7		17	27	37	
8		18	28	38	
9		19	29	39	
10		20	30	40	

Notes:		

VALIDATION FINDINGS WORKSHEET

METHOD: GC / HPLC

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	А. НМХ	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Вепzепе
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
1. Chrysene	1. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathlon	II. Sulprofos	/
O. Phenanthrene	0.		O. Chlorpyrifos	Corganic Acides	\
P. Pyrene	Ъ,		P. Fenthion	A Pimethal phosphoradithioic	pdithioic acid
	О		Q. Parathion-ethyl	B. Benzene sulfonic	aud
R.			R. Trichloronate	c. Phthalic acid	
Ġ.			S. Merphos	D. Diethyl phospho	Diethyl phosphorodithioic acid
			T. Stirofos	E. 4- chlorobenze	4- chlorobenzene sul fonic acid
			U. Tokuthion		

-

Notes:

LDC # 2 1423 H4-SDG#:

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

2nd Reviewer: Page: Reviewer:_

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

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

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

Y N N/A

	Qualifications	No rual (LCS)	1																						
	Associated Samples																								
	RPD (Limits)		(')	()	()					`)	(-	()	()	()					
MSD	%K (Limits)	(40-140)			()	(-)				()	(1)	()	(()))			
MS No. 17 de 2	70 (Cillins)	(91-00)	(,	()		()	()			()	()	(_	()		()	,	())	,	
Compound)																							
MS/MSD ID	7/2																								
**											T		1				T		1		\exists				

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: June 4, 2009

LDC Report Date: September 2, 2009

Matrix: Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09060567

Sample Identification

M-5AB FB060409

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

Sample FB060409 was identified as a field blank. No organic acid contaminants were found in this blank.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09060567	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09060567

SDG	Sample	Compound	Flag	A or P	Reason
TRX09060567	M-5AB FB060409	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09060567

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09060567

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

	Tronox Hortilgate Heriacison	
LDC #: 21423I47	VALIDATION COMPLETENESS WORKSHEET	Date: 8/31/60
SDG #: TRX09060567	Stage 2B	Page: of /
Laboratory: Alpha Analytical, I	nc.	Reviewer:
		2nd Reviewer:
METHOD: HPLC Organic Aci	ds (HPLC Method)	/

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

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: 6/04/0 g
lla.	Initial calibration	A	1 ²
IIb.	Calibration verification/ICV	A	CCV £ 20 2 1CV £ 30 3
111.	Blanks	Á	
IVa.	Surrogate recovery	N	Not regid. 09060456-01 US
IVb.	Matrix spike/Matrix spike duplicates	A	09060456-01
IVc.	Laboratory control samples	A	lCs
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	ND	FB = 2

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank

D = Duplicate TB = Trip blank

EB = Equipment blank

Validated Samples:

Meter

	<u> Water</u>				
+ 1	M-5AB	11	21	31	
2	FB060409	12	22	32	
3	MBLK-22184	13	23	33	
4		14	24	34	
5		15	25	35	
6		16	26	36	
7		17	27	37	
8		18	28	38	
9		19	29	39	
10		20	30	40	

Notes:	

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: June 5, 2009

LDC Report Date: September 2, 2009

Matrix: Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09060840

Sample Identification

M-23B M-23009B

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09060840	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples M-23B and M-23009B were identified as field duplicates. No organic acids were detected in any of the samples.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09060840

SDG	Sample	Compound	Flag	A or P	Reason
TRX09060840	M-23B M-23009B	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09060840

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09060840

No Sample Data Qualified in this SDG

SDG ;	#: <u>21423J47</u> #: <u>TRX09060840</u> atory: <u>Alpha Analytical, In</u>			N COMP	thgate Hen PLETENES: Stage 2B		HEET	Date: 9/6\/00 Page: 1 of 1 Reviewer: 3/6 2nd Reviewer: 6
	HOD: HPLC Organic Acid	•		•		,	. بر بو بر د د د د	P
	amples listed below were ation findings worksheets.		ewed for ead	ch of the re	ollowing valida	ation areas. V	/alidation findir	ngs are noted in attached
	Validation	Area					Comments	
I.	Technical holding times			A	Sampling dates		9	
IIa.	Initial calibration			A	rr	,		
IIb.	Calibration verification/ICV			A	COVE	20%	W = 302	
III.	Blanks			Ą				
IVa.	Surrogate recovery			N		rejd.		
IVb.	Matrix spike/Matrix spike dup	plicate	S	A	09060	456-01		
IVc.	Laboratory control samples			A	LCS	<u>. </u>		
V.	Target compound identificati	ion		N				
VI.	Compound Quantitation and	CRQL	_S	N	<u> </u>			
VII.	System Performance			N	<u> </u>			
VIII.	Overall assessment of data			A				
IX.	Field duplicates			ND	D =	1,~		
Χ.	Field blanks			L N				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	:	R = Rins	o compound: sate eld blank	s detected	D = Duplicat TB = Trip bla EB = Equipr	ank	
	red Samples: Water							
1	M-23B	11			21		31	
1 2 3	M-23009B	12			22		32	
3	MBLK - 22184	13			23		33	
4		14			24		34	
5		15			25		35	
al I	,	1			1 1			

3	MBLK - 22184	13	23	33
4		14	24	34
5		15	25	35
6		16	26	36
7		17	27	37
8		18	28	38
9		19	29	39
10		20	30	40

Notes:			
	· · · · · · · · · · · · · · · · · · ·		

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: June 9 through June 17, 2009

LDC Report Date: September 2, 2009

Matrix: Soil

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09061850

Sample Identification

SA35-0.5B

SA176-0.5B

SA166-0.5B

SA182-0.5B

SA85-0.5B

SA92-0.5B

SA85-0.5BMS

SA85-0.5BMSD

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09061850	All compounds reported below the PQL.	J (all detects)	A

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09061850

SDG	Sample	Compound	Flag	A or P	Reason
TRX09061850	SA35-0.5B SA176-0.5B SA166-0.5B SA182-0.5B SA85-0.5B SA92-0.5B	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09061850

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09061850

No Sample Data Qualified in this SDG

SDG Labo	#:21423K47 #:TRX09061850 ratory:_Alpha Analytical, Ii H OD: HPLC Organic Acid	nc.	LIDATIO	N COMF		ENE	lenderson ESS WORKSH	EET	Date: 8/31/09 Page: 1 of 1 Reviewer: 5/4 2nd Reviewer:
The s	samples listed below were ation findings worksheets	e revi	ewed for ea	ich of the f	followin	ng va	alidation areas. Val	lidation find	lings are noted in attached
	Validation	Area		<u> </u>	l T		(omments /	
1.	Technical holding times			<u> </u>	Sampli			17/09	
lla.	Initial calibration			<u> </u>	1	<u>r</u> ?			
IIb.	Calibration verification/ICV			<u> </u>	-	<u> </u>	0.620	10 =	30 1
111.	Blanks			I A	 		† .		
IVa.				, N	<u> </u>	Not	rand.		
IVb.	Matrix spike/Matrix spike du	plicate	S	A	-				
IVc.	Laboratory control samples	Laboratory control samples				u	Ś		
<u>V.</u>	Target compound identificat	tion		N					
VI.	Compound Quantitation and	CRQ	_S	N	ļ				
VII.	System Performance			N					
VIII.	Overall assessment of data			*					
IX.	Field duplicates			N.			77 		
X.	Field blanks			N					
Note: Valida	A = Acceptable N = Not provided/applicable SW = See worksheet ted Samples:	÷	R = Rin	lo compound isate eld blank	ds detect	ted	D = Duplicate TB = Trip blank EB = Equipme		
1	SA35-0.5B	11	mork-	22247		21		31	
2	SA176-0.5B	12	7,,,,,			22		32	
3	SA166-0.5B	13				23		33	
4	SA182-0.5B	14				24		34	
5	SA85-0.5B	15				25		35	:
6	SA92-0.5B	16				26		36	
7	SA85-0.5BMS	17				27		37	
8	SA85-0.5BMSD	18				28		38	

Notes:	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

Collection Date:

June 8 through June 17, 2009

LDC Report Date:

September 2, 2009

Matrix:

Water

Parameters:

Organic Acids

Validation Level:

Stage 2B

Laboratory:

Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09061951

Sample Identification

M-44B

M-6AB

M-142B

M-39B

M-123B

M-123009B

M-44BMS

M-44BMSD

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09061951	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples M-123B and M-123009B were identified as field duplicates. No organic acids were detected in any of the samples.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09061951

SDG	Sample	Compound	Flag	A or P	Reason
TRX09061951	M-44B M-6AB M-142B M-39B M-123B M-123009B	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09061951

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09061951

No Sample Data Qualified in this SDG

SDG#	#: 21423L47 #: TRX09061951		Tron LIDATION		_	ENES				Date: <u></u>
Labora	atory: <u>Alpha Analytical, In</u>	IC.	-		-				5 . 1	Page: 1 of 1
METH	HOD: HPLC Organic Acid	40 (H[⊃I ⊂ Method	47					2nd	Reviewer:
	· ·	`		•						1
	amples listed below were		ewed for eac	ch of the f	followir	ng valid	ation area	s. Validation fi	ndings are	e noted in attached
validat	tion findings worksheets.									
	Validation	Δrea			T			Comment	e	
I.	Technical holding times	<u> </u>		A	Samp	ling dates	6/0	8-17/09	.3	
lla.	Initial calibration			A		r V				
IIb.	Calibration verification/ICV			A	1	cov E	202	101 £ 30°	 ス _	
III.	Blanks			A					<i>,</i> , , , , , , , , , , , , , , , , , ,	
IVa.	Surrogate recovery			N	n'	10+r	end.			
IVb.	Matrix spike/Matrix spike dup	plicate	s				v			
IVc.	Laboratory control samples					LCS				
V.	Target compound identificat	Target compound identification								
VI.	Compound Quantitation and	I CRQI	_S	N						
VII.	System Performance			N						
VIII.	Overall assessment of data			A	<u> </u>					
IX.	Field duplicates			ND	<u> </u>	b =	5,6			
<u> X.</u>	Field blanks			N						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	;	R = Rins	o compound sate eld blank	ds detec	ted	D = Dup TB = Tri EB = Eq		-	
Validate	ed Samples:			···			· · · · · · · · · · · · · · · · · · ·			
1 - 1	M-44B	11	nolk-	22256		21		31		
_ 2 N	M-6AB	12				22		32		
11	M-142B	13				23		33		
11	M-39B	14				24		34		
5 1	м-123В	15		****		25		35		
	M-123009B ⊅	16				26		36		
7 1	M-44BMS	17				27		37		······································
II	M-44BMSD	18	<u> </u>			28		38		
ا ما	,	10	1		[,	20		30		

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20

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Notes:_

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: June 18 through July 1, 2009

LDC Report Date: September 1, 2009

Matrix: Soil

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09070755

Sample Identification

SA86-0.5B

SA129-0.5B

SA106-0.5B

SA82-0.5B

SA82-10B

SA82-29B

SA82-0.5BMS

SA82-0.5BMSD

Introduction

This data review covers 8 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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:

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- 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.
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- 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09070755	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09070755

SDG	Sample	Compound	Flag	A or P	Reason
TRX09070755	SA86-0.5B SA129-0.5B SA106-0.5B SA82-0.5B SA82-10B SA82-29B	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09070755

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09070755

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #:	21423M47	VALIDATION COMPLETENESS WORKSHEET
SDG #:	TRX09070755	Stage 2B
Laborato	ry: <u>Alpha Analytical, In</u>	<u>C</u>
METHO	D: HPLC Organic Acid	s (HPLC Method)

Date:	9/01/09
Page:_	
Reviewer:	2 VG
2nd Reviewer:	
	$\overline{}$

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: 6 /18 - 7/01/09
lla.	Initial calibration	A	12
IIb.	Calibration verification/ICV	A	COV = 202 OV = 30?
111.	Blanks	A	
IVa.	Surrogate recovery	N	Not regid.
IVb.	Matrix spike/Matrix spike duplicates	SW	U
IVc.	Laboratory control samples	A	VCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	Α	
IX.	Field duplicates	N	
X.	Field blanks	7)	

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:

Ca:1

	201				 	
1	SA86-0.5B	11	Mb LK - 22316	21	31	
2	SA129-0.5B	12		22	32	
<i>‡</i> 3	SA106-0.5B	13		23	33	
4	SA82-0.5B	14		24	34	
5	SA82-10B	15		25	35	
16	SA82-29B	16		26	36	
7	SA82-0.5BMS	17		27	37	
88	SA82-0.5BMSD	18		28	38	
9		19		29	39	
10		20		30	40	

Notes:_				

VALIDATION FINDINGS WORKSHEET

METHOD: GC /HPLC

8310	8330	8151	8141	8141(con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyi	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathlon	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	0.		O. Chlorpyrifos	organic Acids	3
P. Pyrene	P.		P. Fenthion	A Dimethyl phosphonodithioic	rodithioic acid
Ġ	ø		Q. Parathlon-ethyl	B. Benzene sulfonic	aid
R.			R. Trichloronate	c. Phthalic acid	
S.			S. Merphos	D. Diethyl phospho	Diethyl phosphopodithioic acid
			T. Stirofos	E. 4- chlorobenze	4- chloro benzene sulfonic acid
			U. Tokuthlon		

cmnd list word

Notes:

LDC #: 21423 M47 SDG #: See Cons

VALIDATION FINDINGS WORKSHEET

Page: of /

Reviewer 2nd Reviewer:

Matrix Spike/Matrix Spike Duplicates

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

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

Y N N/A X/N N/A

			(. cs w/ sw)	W. 11 / 5 . 11																					
	Associated Samples	4		((-
	RPD (Limits)	1 21.7 20))) ()) () ()))))))) () () (,	
MSD	%R (Limits)		•		J		•))))))))))))))	
SE SE	%K (CIMITS)		()		((()	()	((`		()	()	()	()	())	()	())		
7	Compound																								
N N N N N N N N N N N N N N N N N N N	ľ	7/X	,							·															

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: June 19 through June 29, 2009

LDC Report Date: September 2, 2009

Matrix: Water

Parameters: Organic Acids

Validation Level: Stage 4

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09071051

Sample Identification

M-34B M-125B EB062609-SO M-111AB EB062909-GW M-125BMS M-125BMSD

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

Retention time windows were evaluated and considered technically acceptable.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

Retention times (RT) of all compounds in the calibration standards were within QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

Samples EB062609-SO and EB062909-GW were identified as equipment blanks. No organic acid contaminants were found in these blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

All target compound identifications were within validation criteria.

VI. Project Quantitation Limit

All project quantitation limits were within validation criteria.

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09071051	All compounds reported below the PQL.	J (all detects)	А

VII. System Performance

The system performance was acceptable.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09071051

SDG	Sample	Compound	Flag	A or P	Reason
TRX09071051	M-34B M-125B EB062609-SO M-111AB EB062909-GW	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09071051

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09071051

No Sample Data Qualified in this SDG

	± 21423N47	VA		N COMP	LĚTENE	enderson SS WORK	SHEET	Date: 9/61/6			
	#: <u>TRX09071051</u> atory: <u>Alpha Analytical, In</u>			3	itage 2B	4		Page: \ of \ Reviewer: \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
	•							2nd Reviewer:			
VIETH	IOD: HPLC Organic Acid	s (HF	LC Metho	d)				/			
	amples listed below were tion findings worksheets.		wed for ea	ach of the fo	ollowing val	idation areas.	. Validation findir	ngs are noted in attached			
	Validation	Area					Comments				
I.	Technical holding times			A	Sampling da	tes: 6/19.	- 29 /0g				
lla.	Initial calibration			A	rr						
IIb.	Calibration verification/ICV			T *	ca	1 € 207	10N ≤ 30	7			
III.	Blanks			Ā							
IVa.	Surrogate recovery			N	Not	resid.					
IVb.	Matrix spike/Matrix spike dup	olicate	S	A							
IVc.	Laboratory control samples			A	ıcs						
V.	Target compound identificati	ion		N							
VI.	Compound Quantitation and	CRQL	_S	N							
VII.	System Performance	_		N							
VIII.	Overall assessment of data			Á							
IX.	Field duplicates			N							
Χ.	Field blanks		· · · · · · · · · · · · · · · · · · ·	ND	EB = 3 5						
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Ri	No compounds insate Field blank	s detected	D = Duplio TB = Trip EB = Equ					
/alidate	ed Samples:				· · · · · · · · · · · · · · · · · · ·						
	M-34B	11	MBLK	- 22 33 3	21		31				
2	M-125B	12			22	, .	32				
-	EB062609-SO	13			23		33				
	M-111AB	14			24		34				
5	EB062909-GW	15			25		35				
6	M-125BMS	16			26		36				
7	M-125BMSD	17			27		37				
8		18			28		38				
ا ه		19	ĺ		29		39				

Notes:_

VALIDATION FINDINGS CHECKLIST

Page: ___of_2 Reviewer: _____0 2nd Reviewer: ______

Method: GC HPLC

Metnod: GC / HPLC				\
Validation Area	Yes	No	NA	Findings/Comments
LV is a Gradual state of a market of the state of the sta				and the second
All technical holding times were met.				
Cooler temperature criteria was met.				
ii juita ealibration :				
Did the laboratory perform a 5 point calibration prior to sample analysis?				
Were all percent relative standard deviations (%RSD) ≤ 20%?	<u> </u>			
Was a curve fit used for evaluation?				
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?				
Were the RT windows properly established?				
M Continuing scaling attor.				
Was a continuing calibration analyzed daily?				
Were all percent differences (%D) ≤ 15%.0 or percent recoveries 85-115%?				
Were all the retention times within the acceptance windows?			4000	
V/Blanks				
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.				
VI-Surrogate spikes: 3.5.5.5.5.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.				
Were all surrogate %R within the QC limits?			_	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			_	
VII≘Matrix spike/Matrix spike duplicatest		M aria		Same and the same of the same
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				
Was a MS/MSD analyzed every 20 samples of each matrix?				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VIII» Laboratory control samples				ANTERNA PERSONAL PROPERTY.
Was an LCS analyzed for this SDG?				
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?				
IX. Regional Quality Assurance and Quality Control			* *	
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				
			/	

VALIDATION FINDINGS CHECKLIST

Validation Area	Yes	No	NA	Findings/Comments
& Princia compound deminication				
Were the retention times of reported detects within the RT windows?	_			
XXXSdnpound quantitation/eRolas				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?		\		
XI System commune:				
System performance was found to be acceptable.				
XXIII (OVICIAI) alsalasamentojadala (Companya) IIIXX			31	A STATE OF THE STA
Overall assessment of data was found to be acceptable.				
XV-Field duplicates 1				
Field duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.				
XV. Frield Dlanks				
Field blanks were identified in this SDG.				
Target compounds were detected in the field blanks.				

LDC # 21 423 N7 SDG# 20 Cm-/

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: Of /

Reviewer: 3V6 2nd Reviewer:

METHOD: HPLC

Parameter: 4-Chlorobenzenesulfonic acid

			×	⋆	7^2
Date	Detector	Compound	Conc	Area	
			(mdd)		
6/02 to 6/03/09	3	4-Chlorobenzenesulfonic acid	0.025	105332	
	HPLC3		0.050	201649	
			0.100	464100	
			0.250	1152183	
•			0.500	2262016	
			1.000	4485504	
			1.500	6636299	
			2.000	8851547	

4641000 4608732 4524032 4485504 4464199 4425774

Ave 4424438

RF 4213280 4032980

Regression Output:			Reported	rted
Constant		-4.19374E-003	≌ o	-0.004194
Std Err of Y Est		0.00735		
R Squared		0.999917	12	0.999917
No. of Observations		8.00000		
Degrees of Freedom		000009		
X Coefficient(s)	2.254E-007	-9.41E-015	11	2 254E-007

7 4 23 NZ Sec Cover LDC #: SDG #:

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

Page: 1 of 2nd Reviewer:___ Reviewer:

> HPLC METHOD: GC_

Where: ave. CF = initial calibration average CF % Difference = 100 * (ave. CF - CF)/ave. CF CF = A/C using the following calculation:

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

CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

						Reported	Recalculated	Reported	Recalculated
	Standard ID	Calibration Date		Compound	Average CF(Ical)/ CCV Conc.	CF/Conc. CCV	CF/Conc. CCV	d *	д%
1	B4665001. D14		4- CBSA	¥5°	1,00	0. 991	0,991	49.1	99,
		1/1-1/2							
		6 0/ = / /						-	
72	2 B4678001. DD7	75		<u></u>	005'0	1 es 0	185.0	2 an/	حر001
		7/2/64							
		,							
3									
\vdash								·	
4									
		-							

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

CONCLC.18

SDG #: Sec Corry LDC #: 21423 N47

Matrix Spike/Matrix Spike Duplicates Results Verification VALIDATION FINDINGS WORKSHEET

Page: of Reviewer: 3Vb 2nd Reviewer:

> GC /HPLC METHOD:

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

the following calculation: %Recovery = 100 * (SSC - SC)/SA

Where

SC = Sample concentration

6/7 MS/MSD samples:

SSC = Spiked sample concentration SA = Spike added MS = Matrix spike RPD =(((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD))*100

MSD = Matrix spike duplicate

	ďs	Spike	Sample	Spike Sample	ample	Matrix	Matrix spike	Matrix Spike Duplicate) Duplicate	MS/WSD	ISD
Compound	Added (でg A	ded ん)	Conc. ($m_{ij}^{\prime} A_{ij}^{\prime}$)	Concentration ($^{\sim}$ $^{<}$ $^{\sim}$	itration (2)	Percent F	Percent Recovery	Percent Recovery	ecovery	RPD	۵
	MS	MSD	**	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1,0	1,0	0.224	1.226	1. 234	01	1 en	101	107	a7	0.7
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0%	pike/Matrix	Spike Dup	licates findino	s worksheet	or list of qualif	ications and a	ssociated san	ar uples when re	ported result:	s do not agree	within 10.0°

of the recalculated results.

LDC # 21 423 x47 SDG #: See Guer

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

Page: lof / Reviewer: 11/2

2nd Reviewer:

GC HPLC METHOD:

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

% Recovery = 100* (SSC-SC)/SA RPD = I LCS - LCSD I * 2/(LCS + LCSD)

Where: SSC = Spiked sample concentration SA = Spike added LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

SC = Concentration

LCS/LCSD samples:

	Ś	pike	Spiked	Sample	רכ	SOT	TCSD	SD	/SOI	CS/CSD
Compound	₹ €	(\(\tau \)	Sonce (Concentration (かん / L)	Percent F	Percent Recovery	Percent F	Percent Recovery	~	RPD
	SOT	CSD	SOT	CSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015) - P-CBCA	5'0	∡ Z	6,504	ΑZ	101	101				
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										:
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
	·						-			

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

LDC #: 31 423 N47 SDG#: See Cont

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: \ of Reviewer: 377 2nd Reviewer:

> GC HPLC METHOD:

∀ Z Z

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

(RF)(Vs or Ws)(%S/100) (A)(Fv)(Df) Concentration=

Sample ID. Example:

4

Compound Name

PICBSA

= 0.724 mg/

ď

0 004,94

1

(515 426) (2.254 0-7)

Concentration ≠

A= Area or height of the compound to be measured Fv= Final Volume of extract

Df= Dilution Factor

RF= Average response factor of the compound

In the initial calibration

Vs= Initial volume of the sample Ws= Initial weight of the sample %S= Percent Solid

Qualifications				
Recalculated Results Concentrations (
Reported Concentrations				
Compound				
Sample ID				
#				

SAMPCALew.wpd

Comments:

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: July 9 through July 13, 2009

LDC Report Date: September 11, 2009

Matrix: Soil

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09071450

Sample Identification

SA85-33B

RSAM2-10B

RSAM2-35B

SA35-10B

SA35-32B

SA35009-32B

RSAM3-30B

SA176-10B

SA176009-37B

SA176-37B

SA176-37BMS

SA176-37BMSD

Introduction

This data review covers 12 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

No field blanks were identified in this SDG.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09071450	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples SA35-32B and SA35009-32B and samples SA176009-37B and SA176-37B were identified as field duplicates. No organic acids were detected in any of the samples.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09071450

SDG	Sample	Compound	Flag	A or P	Reason
TRX09071450	SA85-33B RSAM2-10B RSAM2-35B SA35-10B SA35-32B SA35009-32B RSAM3-30B SA176-10B SA176009-37B SA176-37B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09071450

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09071450

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

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LDC #: 21423O47	VALIDATION COMPLETENESS WORKSHEET	Date: <u>8 / ጓ / </u>
SDG #: TRX09071450	Stage 2B	Page: <u> </u>
Laboratory: Alpha Analytical, li	nc.	Reviewer: 3/6
, <u> </u>		2nd Reviewer:
METHOD: HPI C Organic Acid	ds (HPLC Method)	/

METHOD: HPLC Organic Acids (HPLC Method)

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

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: 7/69 - 13/09
IIa.	Initial calibration	A	r~
IIb.	Calibration verification/ICV	A	COV = 20 7 101 = 30 %
III.	Blanks	Á	
IVa.	Surrogate recovery	N_	Not rigid.
IVb.	Matrix spike/Matrix spike duplicates	A_	U
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	$D_1 = 5.6$ $D_2 = 9.0$
X.	Field blanks	Nd	EB = +B071009-50 from TRX 1967201P

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:

1002

		901						
1	SA85-33B		11	SA176-37BMS	21	MBLK - 22342	31	
2	RSAM2-10B		12	SA176-37BMSD	22		32	
3`	RSAM2-35B		13		23		33	
4	SA35-10B		14		24		34	
5	SA35-32B	D ,	15		25		35	
6	SA3509-32B	b,	16		26		36	
7	RSAM3-30B	1	17		27		37	
1 8	SA176-10B		18		28		38	
9	SA176009-37B	p_{γ}	19		29		39	
10	SA176-37B	9~	20		30		40	

Notes:	,

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Tronox LLC Facility, 2009 Phase B Investigation,

Henderson, Nevada

Collection Date:

July 10 through July 17, 2009

LDC Report Date:

December 3, 2009

Matrix:

Water

Parameters:

Organic Acids

Validation Level:

Stage 4

Laboratory:

Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09072041

Sample Identification

EB071009-SO

TR-8B

M-97B

TR-6B

EB-071709-GW

EB071009-SOMS

EB071009-SOMSD

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.

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- 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.
- U 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (2) was greater than or equal to 0.990.

Retention time windows were evaluated and considered technically acceptable.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

Retention times (RT) of all compounds in the calibration standards were within QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

Samples EB-071709-GW and EB071009-SO were identified as equipment blanks. No organic acid contaminants were found in these blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

All target compound identifications were within validation criteria.

VI. Project Quantitation Limit

All project quantitation limits were within validation criteria.

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Ftag	A or P
All samples in SDG TRX09072041	All compounds reported below the PQL	J (all detects)	A

VII. System Performance

The system performance was acceptable.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09072041

SDG	Sample	Compound	Flag	A or P	Reason
TRX09072041	E3071009-SO TR-88 M-978 TR-68 E3-071709-GW	All compounds reported below the PQL	J (all detects)	A	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09072041

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09072041

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #:	21423P47	VALIDATION COMPLETENESS WORKSHEET	Date: 9/61/69
	TRX09072041	Stage 2B	Page: 1 of 1
Laborator	y: Aloha Analytical, I	Inc.	Reviewer: NG 2nd Reviewer:
METHOD	: HPLC Organic Aci	ids (HPLC Method)	

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

	Validation Area		Comments
J.	Technical holding times	A	Sampting dates: 7/10 - 17/01
Na	tnisial cationation	A	r*
līb	Calibration verification/ICV	k	CCV 5 20 5 1CV 5 30 3.
13.	Blanks	_ A _	
ſVa.	Surrogate recovery	Ŋ	Not regid
Mb.	Matrix scike/Matrix spike duclicates	A	
IVc.	Laboratory control samples	A_	us
ν.	Target compound identification =	N	
VI.	Compound Quaretation and CRQLs	N	
VII.	System Performance	_ N	
VIII.	Overall assessment of data	A	3 3 3 3 3
IX.	Field aupticates	A	
X.	Field planks	Q4	EB = 5 1

Note:

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

ND = No compounds detected

R = Rinsate FB = Fried blank D = Duplicate TB = Trip olarik EB = Equipment olarik

Validated Samples

Water

	W W(C	<i></i>			
1	EB071009-SO	11- MRIK - 22318	21	31	
2	TR-86	12	22	32	
3	M-978	13	23	33	
4	TR-65	14	24	34	
5	EB-071709-GW	15 :	25	35	
6	EB07:009-SOMS	15	25	36	
7	EB071009-SOMSO	17 -	27	37	
æ		18	28	38	19-
9		19 -	29	39	
10	1	20 ·	30	40	

Notes:		%	W 488
		· · · · · · · · · · · · · · · · ·	
•	#		

21423P47W.wpd

21423 P47 LDC#: SDG#: Scc Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 7
Reviewer: JVC
2nd Reviewer: 7

Method:	GC 4	HPLC
metrou:	GC/	RPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times			<u>. </u>	190 190
All technical holding times were met.				
Cooler temperature criteria was met.				
II. Initial calibration				3 9
Did the laboratory perform a 5 point calibration prior to sample analysis?	_			
Were all percent relative standard deviations (%RSD) < 20%?	-			
Was a curve fit used for evaluation?	1			
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?				
Were the RT windows properly established?		<u> </u>		
IV. Continuing cafforation		_		
Was a continuing calibration analyzed daily?	/			
Were all percent differences (%D) < 20%.0 or percent recoveries 80-120%?	/			
Were all the retention times within the acceptance windows?	\angle	l		
V. Blanks		r '		\$
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
VI. Surrogate spikes	<u> </u>			
Were all surrogate %R within the QC limits?				
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			_	
VII. Marix spike Marix spike duplicates	,	i	{	
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.				
Was a MS/MSD analyzed every 20 samples of each matrix?				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			/	
VIII. Laboratory control samples and the samples are the samples and the samples are the sampl	-		[,9,	
Was'an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?				2 7 70
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			
DX. Regional Quality Assurance and Quality Control	 		<u> </u>	
Were performance evaluation (PE) samples performed?		(L	
Were the performance evaluation (PE) samples within the acceptance limits?				

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2 Reviewer: 5 VC 2nd Reviewer: 5

Validation Area	Yes	No	NA	Findings/Comments
X. Target compound identification	•	!		
Were the retention times of reported detects within the RT windows?				
XI. Compound quantitation/CRQLs			2	
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?		/		
XII. Sysiem performance	3	3		
System performance was found to be acceptable.		-		
XIII, Overall assessment of data			N 528	A *
Overall assessment of data was found to be acceptable.				
XIV. Field duplicates			5 3	
Field-duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.			1	
XV. Field blanks		- 1		25
Field blanks were identified in this SDG.				
Target compounds were detected in the field blanks,		/		

LOC# 21 423 847 SDG# Sec Con-

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Vorification

Pago: of)
Rovlower: VC
2nd Revlower:

HPLO METHOD:

4-Chlorobenzenesulfenic ecid

Paramotor:

			×	\	ZvA
Date	Detector	Compound	Conc	Area	
			(mdd)		
6/02 to 6/03/09	^^	4-Chlorobenzenesulfonio sold	0.025	106332	
	HPLC3		0.050	201649	
			0.100	464100	
			0.250	1162183	
			0.500	2262016	05
			1.000	4485504	
			1.600	6696299	
			2,000	8851547	

Regression Output:		Неропед	90
Constant	-4,19374E-003	-003	-0.004194
Bid En of Y Est	0.0	0.00735	
R Bquared	0.00	0.000017	0.000017
No, of Observations	0,6	0,00000	
Degrees of Preedom	6.0	0000	
	300		1
X Coeffolent(s)	2.2846-007 -9.416-016	-016 b=	2.2546-007

4641000	4524032	4485504	4464199	4425774	4424438
					Ave
	4641000	4608732 4624032	4641000 4606732 4624032 4485504	4606732 4524032 4485564 446189	4606732 4624032 4465604 4464169 4425774

21473747. Sec Cone LDC #: SDG #:

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

Page: | of | 2nd Reviewer. Roviewor

> HPLC METHOD: GC.

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

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

Where: ave. CF ≈ Initial calibration average CF CF ≈ continuing calibration CF

A = Area of compound
C = Concentration of compound

5.5%								
	٠				nemoduu	TWCMCIMING.	Hapodad	HACAICUIAIAG
25	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	CF/Conc.	CP/Cone. CCV	*	⊈
-	B46 (000), DO	100		0.500	0.499	0.499.	99.7	99.7
1		7/32/00					-	
		1			•			
7	2 13 467100 1c DIX	7		0001	1.023	1.073	€ 201	102,3
	2	7/20/04	6536					
		1.						
0				100 mg/s			e de	
	Select of							
		ř						
4		٠	100					
			\$ COOK 1					

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

SDG # 21423 P47

Matrix Spike/Matrix Spike Duplicates Results Verification VALIDATION FINDINGS WÖRKSHEET

Page: of Reviewer: 2nd Reviewer:

METHOD: ___ GC / __HPLC . __ GC / _ HPLC . The percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using

the following calculation: %Recovery = 100 * (SSC - SC)/SA

Where

SC = Sample concentration

RPD =(((SSCMS - SSCMSD) ' 2) / (SSCMS + SSCMSD))"100

M3/M3D samples:

SSC = Spiked sample concentration SA = Spike added MS = Matrix spike

MSO - Marrix spike duplicate

Compound Gasoline (8015)		004										
esoline		, 2m2	77	1 mg /4	Concentration	7-100 (V	Percent Recovery	lecovery	Percent R	Percent Recovery	RPD	٥
90		8W	MBO	\ I	တ		Reported	Recalc.	Reported	Recalc.	Reported	Recelo.
	િ	5										
	5)	79.0										l
Benzene (80218)	18)											20
Methane (RSK	(RSK-175)											
2,4-D (8151)	()	g										
Dinoseb (8151)	1)											
Naphthalana (8310)	((
Anthracane (8310)	1				21							
HMX (8330)	6											
2.4.6-Trinitrotoluene (8330)	(8330)											
4-cBSA (H)	(Hrc)	0.1	6.1	٥	1.004	1.01	8	as 1	7.91	(0)	4-	ر ا
						,						
										15		

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

744847 SDG #: Sie Guer

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

2nd Reviewer:_

Page:

GC /HPLC METHOD:

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

% Rocovery = 100* (88C-8C)/SA RPD = 1 LC9 - LCSD 1 * 2(LC9 + LCSD)

Where: SSC = Spiked sample concentration SA = Spike added Laboratory control sample percent recovery

SC - Concentration

US. 22318 LCS/LCSD samples:_

LCSD = Laboratory control sample duplicate percent recovery

-	8	Spike	Spiked	Bample	רנ	rcs	CSD	30	1C8/	LC8/LC8D
Compound	MA	7	(C)	Concentration Concentration	Percent	Percent Recovery	Percent Recovery	Secovery	2	RPD
	rcs .	LC8D	. LCS	aeon	Reported	Recato.	Reported	Receie	Reported	Recelo
Gasoline (8015)		TO TECHNOLOGY	tr second						,	
Diesel (8015)							27			
Benzene (8021B)										
Mothane (RSK-175)										
2,4-D (8151)								25		
Dinoseb (8151)										
Naphthalono (8310)										
Anthracono (8310)										
HMX (8330)										
2,4,8-Trinitrotoluene (8330)										
4- CBSA (HPIC)	0.5	₹2	0. 417	XX	66	42	-	ä		<u>-</u>
					\ \ \					

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

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4	7
#	#
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J	S

VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: Lof Reviewer: SALL 2nd Reviewer.

> 00 / APLC METHOD:

_		\	Ā
/	\X	₩ N	7
	ž	Z	
	`	7	

Were all reported results recalculated and verified for all lovel IV samples? Were all recalculated results for detected target compounds within 10% of the reported results?

Area or height of the compound to be measured Final Volume of extract

RF= Average response factor of the compound in the initial calibration Ve= Initial volume of the sample We= Initial weight of the sample %8= Percent Solid Ollution Factor

Sample ID.

Example:

. Compound Name Concentration =

Compound	ŏ
	 •

Comments:

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: July 21 through July 22, 2009

LDC Report Date: September 8, 2009

Matrix: Soil/Water

Parameters: Organic Acids

Validation Level: Stage 4

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09072352

Sample Identification

EB072109-SO

FB072109-SO

SA166-10B

SA166-31B

SA182-10B

SA182-38B

EB072209-SO

EB072109-SOMS

EB072109-SOMSD

SA166-10BMS

SA166-10BMSD

Introduction

This data review covers 6 soil samples and 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.

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.
- 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

Retention time windows were evaluated and considered technically acceptable.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

Retention times (RT) of all compounds in the calibration standards were within QC limits.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

Samples EB072109-SO and EB072209-SO were identified as equipment blanks. No organic acid contaminants were found in these blanks.

Sample FB072109-SO was identified as a field blank. No organic acid contaminants were found in this blank.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

All target compound identifications were within validation criteria.

VI. Project Quantitation Limit

All project quantitation limits were within validation criteria.

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09072352	All compounds reported below the PQL.	J (all detects)	А

VII. System Performance

The system performance was acceptable.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09072352

SDG	Sample	Compound	Flag	A or P	Reason
TRX09072352	EB072109-SO FB072109-SO SA166-10B SA166-31B SA182-10B SA182-38B EB072209-SO	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09072352

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09072352

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

LDC #	#: 21423Q47		٧A			_		ESS WORKSHE	ET		Date: 9/6
SDG	#: TRX09072352				S	Stage	e 2B	- 4			Page: 1 of
Laboi	ratory: <u>Alpha Analytic</u>	al, Ir	IC.							2nd	Reviewer:
METI	HOD: HPLC Organic	Acid	ls (HF	PLC Method)						7
The s	amples listed below	were	e revi	ewed for eac	ch of the fo	ollow	ina va	alidation areas. Valid	ation find	linas are	/ e noted in attache
	tion findings workshe										
	Notice .	4!	A			Τ		0-			
,	Valida		Area	<u> </u>	A	Com	pling d	/ /	<u>mments</u>	<u> </u>	
I.	Technical holding times Initial calibration	<u> </u>			A		piirig α γγ	ates.	~ 7		
IIa.	Calibration verification/l	CV			A		·	16 20 2 10	V £ 30	3	
III.	Blanks				A						
IVa.	Surrogate recovery				N	ļ	λ	ot regid.			
IVb.	Matrix spike/Matrix spik	e dup	licates		A						
IVc.	Laboratory control samp				A			us		<u>.</u>	
V.	Target compound ident		on		N					•	
VI.	Compound Quantitation	and	CRQL	s	N						
VII.	System Performance				N						
VIII.	Overall assessment of o	data			Α						
IX.	Field duplicates				N	ļ					
X.	Field blanks				ND		E,	B= 1,7		FB =	2
Note:	A = Acceptable N = Not provided/applic SW = See worksheet	cable		R = Rins	o compounds sate eld blank	s detec	ted D	= Duplicate TB = Trip blank EB = Equipment	blank		
Validat	ed Samples: Wc	ter	<u> </u>	- Soil							
1 1	EB072109-SO		I	SA166-10BM	SD	5	21	MB1K-2240	4 31		
2 1	FB072109-SO	1	12				22	MBK-2240	i) 32		
3	SA166-10B	S	13				23		33		-
4	SA166-31B	1	14				24		34		
5	SA182-10B		15				25		35		
6	SA182-38B	<u> </u>	16				26		36		
1	EB072209-SO	W	17				27		37		
8	EB072109-SOMS		18				28		38		

29

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39

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| EB072109-SOMSD

10 SA166-10BMS

Notes:___

19

9 20

LDC #: 21423 Q 47 SDG #: See Cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 506
2nd Reviewer: 6

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
ts (\$500 mbed 400 films addicts		an artism elisters	د داد در	and the second s
All technical holding times were met.	/			
Cooler temperature criteria was met.				
ii. (sitia) valloration				
Did the laboratory perform a 5 point calibration prior to sample analysis?				
Were all percent relative standard deviations (%RSD) ≤ 20%?				
Was a curve fit used for evaluation?	/			
Did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?				
Were the RT windows properly established?				
LV. Continum excellistration.				
Was a continuing calibration analyzed daily?				
Were all percent differences (%D) ≤ 25 %.0 or percent recoveries 8 8 -1 16 %?				
Were all the retention times within the acceptance windows?			ari vaneu.	
V Blanks				
Was a method blank associated with every sample in this SDG?				
Was a method blank analyzed for each matrix and concentration?				
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.			_	
VI-Surrogate spikes	7	1 20		
Were all surrogate %R within the QC limits?				
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?				
VII sMatrix spike/Matrix spike duplicates			(A)	Marine and the second of
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	/			
Was a MS/MSD analyzed every 20 samples of each matrix?				
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?				
VIII. Laboratory control samples			4	
Was an LCS analyzed for this SDG?				
Was an LCS analyzed per extraction batch?				
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		Te- 400	es ande	
IX. Regional Quality Assurance and Quality Control ⇒ **				
Were performance evaluation (PE) samples performed?				
Were the performance evaluation (PE) samples within the acceptance limits?				

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: 3VC
2nd Reviewer: 4

Validation Area	Yes	No	NA	Findings/Comments
in tender continues continuentes.				
Were the retention times of reported detects within the RT windows?				
28 Senigenne duardhaite (45 Gilas				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?				
ŽM Spkagla oddrionagales				
System performance was found to be acceptable.				
kill taylakillakkees nitatojakejih, milita ka			2.04	
Overall assessment of data was found to be acceptable.				
XV Felocopolicaes XXV W		1		
Field duplicate pairs were identified in this SDG.	1		\	
Target compounds were detected in the field duplicates.				
XV-SPEIG-olenks				
Field blanks were identified in this SDG.				
Target compounds were detected in the field blanks.				

LDC # 2/423 & 47 SDG# 5/4 (22)

VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: of)

Reviewer: 2

METHOD: HPLC

Parameter: 4-Chlorobenzenesulfonic acid

Y Area		105332	201649	464100	1152183	2262016	4485504	6636299	8851547
X Conc	(ppm)	0.025	0.050	0.100	0.250	0.500	1.000	1.500	2.000
Compound		4-Chlorobenzenesulfonic acid							
Detector		ΛN	HPLC 3						
Date		5/02 to 6/03/09		•					

4641000 4608732

RF 4213280 4032980 4485504 4464199

4425774 Ave 4424438

4524032

Regression Output:		Reported	ted	
	4.19374E-003	II O	-0.004194	
Std Err of Y Est	0.00735			
R Squared	0.999917	12	0.999917	
No. of Observations	8.00000			
Degrees of Freedom	000009			
X Coefficient(s) 2.254E-007	-9.41E-015	= 4	2.254E-007	

21 423 847 Sec Cover LDC #: SDG #

Continuing Calibration Results Verification VALIDATION FINDINGS WORKSHEET

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

> HPLC METHOD: GC_

using the following calculation:

Where: ave. CF = initial calibration average CF CF = continuing calibration CF A = Area of compound C = Concentration of compound % Difference = 100 * (ave. CF - CF)/ave. CF CF = A/C

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

					Reported	Recatculated	Reported	Recalculated
#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	CF/Conc. CCV	CF/Conc. CCV	*	%
-	B4701001.D0	Īĝ.	p-cbsA	0,5	0, 50C	905 '0	101, 1	1.101
		7/4/09						,
		10,145						
7	2 B 4710 601. P10	310		a',	1.016	1.016	101.0	7 /9/
		7/24/05						
		20;63						
ო	B4719001.09 = ,	7 1		0,50	Ses 0	262.0	101	6 101
		6952//						
		<<: ·						
4	1847 52601.	B47 52.001. D37		1.0	1.02	1.021	102.1	102.1
		6950/2						
		10:00						

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

LDC#: 21 423 847 SDG #: See Cover

Matrix Spike/Matrix Spike Duplicates Results Verification VALIDATION FINDINGS WORKSHEET

Page: Reviewer:_ 2nd Reviewer:_

> GC /HPLC METHOD:

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

the following calculation: %Recovery = 100 * (SSC - SC)/SA

Where

SC = Sample concentration

RPD =(((SSCMS - SSCMSD) * 2) / (SSCMS + SSCMSD))*100

SSC = Spiked sample concentration SA = Spike added MS = Matrix spike

ڡ MS/MSD samples:___

MSD = Matrix spike duplicate

	ď	ike	Sample	Spike	Spike Sample	Matrix spike	spike	Matrix Spike Duplicate	Duplicate	GSW/SW	SD
Compound	Adged (Mg/ks	989 KS)	Conc.	Concei (77,	oncentration	Percent Recovery	ecovery	Percent Recovery	ecovery	RPD	
	MS	MSD	0.	MS	- Grad	Reported	Recalc.	Reported	Recalc.	Reported	Receio
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
4-CBSA (vm. Acies	2,0	۵. د	٥	1,91	1.97	95	56	15.	99	3.3	£.
IN HOLC)											
`											
	ļ										
									4		

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

21423 847 SDG #: See Guer LDC #:

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

lof l Reviewer: 37(Page:

2nd Reviewer:__

METHOD: __ GC __HPLC

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

% Recovery = 100* (SSC-SC)/SA RPD = I LCS - LCSD I * 2/(LCS + LCSD)

Where: SSC = Spiked sample concentration SA = Spike added LCS = Laboratory control sample percent recovery

SC = Concentration

LCSD = Laboratory control sample duplicate percent recovery

22400 252 LCS/LCSD samples:

	ຶ່ວ ຈ	Spike	Spiked	Sample	רו	SOT	רכ	TCSD	SOT	CS/LCSD
Compound	3	(34)	2000C	(% /c </th <th>Percent</th> <th>Percent Recovery</th> <th>Percent</th> <th>Percent Recovery</th> <th>, a</th> <th>RPD</th>	Percent	Percent Recovery	Percent	Percent Recovery	, a	RPD
	SOT	GSOT _	SOT	TCSD	Reported	Recalc.	Reported	Recalc	Renorted	Paral
Gasoline (8015)										200
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
4-0854 (my. Acids	2.0	¥	1.98	A.A.	2	44	-			
by HPLC)					1					1

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

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VALIDATION FINDINGS WORKSHEET Sample Calculation Verification

Page: \ of \	Reviewer: 576	2nd Reviewer:

GC HPLC

N N N N N N N N N N N N N N N N N N N	Were all reported results recalcu Were all recalculated results for	reported results recalculated and verified for all level IV samples? recalculated results for detected target compounds within 10% of the reported results?	s? of the reported results?	
Concentration=	(A)(Fv)(Df) (RF)(Vs or Ws)(%S/100)	Example:		``
A= Area or heigh Fv= Final Volums Df= Dilution Fact	Area or height of the compound to be measured Final Volume of extract Dilution Factor	Sample ID	Compound Name	2
RF= Average response factor of t In the initial calibration Vs= Initial volume of the sample Ws= initial weight of the sample %S= Percent Solid	oonse factor of the compound calibration s of the sample t of the sample	Concentration =		

#	Sample ID	Compound	Reported Concentrations (Recalculated Results Concentrations	Qualifications
Comments:	ents:				

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: July 23 through July 24, 2009

LDC Report Date: September 1, 2009

Matrix: Soil/Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09072741

Sample Identification

EB072309-SO

SA131-0.5B

SA131009-0.5B

SA131-10B

SA131-27B

EB072409-SO

RSAH3-0.5B

RSAH3009-0.5B

RSAH3-32B

EB072309-SOMS

EB072309-SOMSD

RSAH3009-0.5BMS

RSAH3009-0.5BMSD

Introduction

This data review covers 9 soil samples and 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

Samples EB072309-SO and EB072409-SO were identified as equipment blanks. No organic acid contaminants were found in these blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09072741	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

Samples SA131-0.5B and SA131009-0.5B and samples RSAH3-0.5B and RSAH3009-0.5B were identified as field duplicates. No organic acids were detected in any of the samples.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09072741

SDG	Sample	Compound	Flag	A or P	Reason
TRX09072741	EB072309-SO SA131-0.5B SA131009-0.5B SA131-10B SA131-27B EB072409-SO RSAH3-0.5B RSAH3009-0.5B RSAH3-32B	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09072741

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09072741

No Sample Data Qualified in this SDG

Tronox Northgate Henderson

_DC #: <u>21423R47</u> \	VALIDATION COMPLETENESS WORKSHEET	Date:
SDG #: TRX09072741	Stage 2B	Page:
_aboratory: <u>Alpha Analytical, Inc.</u>		Reviewer:
		2nd Reviewer:

METHOD: HPLC Organic Acids (HPLC Method)

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

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: 7/2 3 - 24 /0 9
IIa.	Initial calibration	A	ry
IIb.	Calibration verification/ICV	8	COV € 20 ? 1CV € 30 ?
III.	Blanks	A	
IVa.	Surrogate recovery	N	Not regid.
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	us
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	ND	$D_1 = 2, 2$ $D_2 = 78$
X.	Field blanks	ND	EB = 1 6 BR

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:

Validat	ted Samples:	Wat	Υ		t Soil					
1	EB072309-SO		W	11 7	EB072309-SOMSD	n	21 /	MBIK-22410	31	
2	SA131-0.5B	D,	2	12	RSAH3009-0.5BMS	5	22 Y	MB1K-22410 MB1K-22409	32	
3	SA131009-0.5B	b,		13	RSAH3009-0.5BMSD	И	23		33	
4	SA131-10B			14			24		34	
5	SA131-27B		V	15			25		35	
$\frac{1}{6}$	EB072409-SO		W	16			26		36	
7	RSAH3-0.5B	D√	S	17			27		37	
8	RSAH3009-0.5B	04		18			28		38	
9	RSAH3-32B		\downarrow	19			29		39	
10 7	EB072309-SOMS		W	20			30		40	

Notes:	 		

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: July 29, 2009

LDC Report Date: September 10, 2009

Matrix: Soil/Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09073051

Sample Identification

FB072909-SO SA73-0.5B SA73-30B RSAU4-20

RSAU4-50

SA73-0.5BMS

SA73-0.5BMSD

Introduction

This data review covers 6 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.
- 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

Sample FB072909-SO was identified as a field blank. No organic acid contaminants were found in this blank.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09073051	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09073051

SDG	Sample	Compound	Flag	A or P	Reason
TRX09073051	FB072909-SO SA73-0.5B SA73-30B RSAU4-20 RSAU4-50	All compounds reported below the PQL.	J (all detects)	А	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09073051

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09073051

No Sample Data Qualified in this SDG

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Labor	#:TRX09073051 atory: <u>Alpha Analytical,</u> HOD: HPLC Organic Ad		— — HPLC Method		tage 2B			Page: of / Reviewer: 5V6 2nd Reviewer:
The s		ere re			ollowing vali	dation areas.	Validation findi	ngs are noted in attached
	Validatio	n Are	a				Comments	
l.	Technical holding times			4	Sampling date	es: 7 /2	9/09	
IIa.	Initial calibration			A	12	/		
IIb.	Calibration verification/ICV	/		À	COV S	= 207 10	W & 30 D	
III.	Blanks			A				
IVa.	Surrogate recovery			. 2	Not ,	regid		
IVb.	Matrix spike/Matrix spike	duplica	tes	A		0		
IVc.	Laboratory control sample	Laboratory control samples						
V.	Target compound identific	ation		N				
VI.	Compound Quantitation a	nd CR	QLs_	N				
VII.	System Performance			N				
VIII.	Overall assessment of da	ta		A				
IX.	Field duplicates			N				
X.	Field blanks			M	FB.	=		
Note: √alidate	A = Acceptable N = Not provided/applicat SW = See worksheet ed Samples: WAter		R = Rin	o compounds sate eld blank	detected	D = Duplic TB = Trip t EB = Equip		
1-1		A) 11	1 MBLK	-22 436	21		31	
2	SA73-0.5B	<u>5</u> 12		- 82444	22		32	
3	SA73-30B	13			23		33	
4	RSAU4-20	14			24		34	
5	RSAU4-50	15			25		35	
6	SA73-0.5BMS	16			26		36	
7	SA73-0.5BMSD	17			27		37	
8		18			28		20	

Laboratory Data Consultants, Inc. Data Validation Report

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

Henderson, Nevada

Collection Date: July 31 through August 3, 2009

LDC Report Date: September 11, 2009

Matrix: Soil/Water

Parameters: Organic Acids

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): TRX09080450

Sample Identification

RSAU4-20BSPLP

RSAU4-20BSPLPpH(SPLP)

RSAU4-20BSPLP(DI SPLP)

RSAU4-50BSPLP

RSAU4-50BSPLPpH(SPLP)

RSAU4-50BSPLP(DI SPLP)

RSAJ3-10BSPLP

RSAJ3-10BSPLPpH(SPLP)

RSAJ3-10BSPLP(DI SPLP)

RSAJ3-29BSPLP

RSAJ3-29BSPLPpH(SPLP)

RSAJ3-29BSPLP(DI SPLP)

FB080309-SO

RSAJ3-29BSPLPMS

RSAJ3-29BSPLPMSD

FB080309-SOMS

FB080309-SOMSD

Introduction

This data review covers 14 soil samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per HPLC Method for Organic Acids.

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.

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- J- Data are qualified as estimated, with a low bias likely to occur. False positives or false negatives are unlikely to have been reported.
- J Data are qualified as estimated; it is not possible to assess the direction of the potential bias. False positives or false negatives are unlikely to have been reported.
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- 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. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

b. Calibration Verification

Calibration verification was performed at the 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 30.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organic acids were found in the method blanks.

Sample FB080309-SO was identified as a field blank. No organic acid contaminants were found in this blank.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were not required by the method.

b. Matrix Spike/(Matrix Spike) Duplicates

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

c. Laboratory Control Samples

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

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Project Quantitation Limit

All compounds reported below the PQL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG TRX09080450	All compounds reported below the PQL.	J (all detects)	А

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

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

IX. Field Duplicates

No field duplicates were identified in this SDG.

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Data Qualification Summary - SDG TRX09080450

SDG	Sample	Compound	Flag	A or P	Reason
TRX09080450	RSAU4-20BSPLP RSAU4-20BSPLPpH(SPLP) RSAU4-20BSPLP(DI SPLP) RSAU4-50BSPLP RSAU4-50BSPLPpH(SPLP) RSAU4-50BSPLP(DI SPLP) RSAJ3-10BSPLP RSAJ3-10BSPLPpH(SPLP) RSAJ3-10BSPLP(DI SPLP) RSAJ3-29BSPLP(DI SPLP) RSAJ3-29BSPLP RSAJ3-29BSPLP(DI SPLP) RSAJ3-29BSPLP(DI SPLP) RSAJ3-29BSPLP(DI SPLP) FB080309-SO	All compounds reported below the PQL.	J (all detects)	A	Project Quantitation Limit (PQL) (sp)

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Laboratory Blank Data Qualification Summary - SDG TRX09080450

No Sample Data Qualified in this SDG

Tronox LLC Facility, 2009 Phase B Investigation, Henderson, Nevada Organic Acids - Field Blank Data Qualification Summary - SDG TRX09080450

No Sample Data Qualified in this SDG

LDC #	± 21423T47	Tro VALIDATIO	nox Nor N COMF	thg LE	ate H TENE	enderson	KSHEET		Date: 9/10/60
	#: TRX09080450		S	Stag	e 2B		Page: <u>\</u> of <u></u>		
Labora	atory: <u>Alpha Analytical, I</u>	Inc.							Page: \(\frac{9\\ 0\\ 00}{\\ 00}\) Reviewer: \(\frac{5\\ 0}{\\ 00}\) 2nd Reviewer: \(\frac{5\\ 0}{\\ 00}\)
METH	IOD: HPLC Organic Aci	ds (HPLC Metho	d)						2nd Reviewer:
									•
The sa validat	amples listed below wer tion findings worksheets	e reviewed for ea	ich of the f	ollow	ing va	lidation area	s. Validatio	n findin	gs are noted in attached
·). 							
	Validation	Area					Comm	ents	
1.	Technical holding times		A	Sam	pling da	ntes: 7/3	1 - 8/0	3/19	
lla.	Initial calibration		A		۲2				
IIb.	Calibration verification/ICV		Á			€202	101 5	302	1
111.	Blanks		A					70	
IVa.	Surrogate recovery		N		No+	regid.	-		
IVb.	Matrix spike/Matrix spike du	uplicates	A						
IVc.	Laboratory control samples		A		ı	€S			
V.	Target compound identifica		N						
VI.	Compound Quantitation an		N						
VII.	System Performance	a 011420	N						
VIII.	Overall assessment of data		A		 -		· · · · · · · · · · · · · · · · · · ·		
IX.	Field duplicates		L N						
Х.	Field blanks		ND		FB	= 13			
	1 Tota Diame		1 '\V	<u> </u>	10				
Note:	A = Acceptable N = Not provided/applicable	ND = N e R = Rin	o compound: sate	s dete	cted	D = Dup TB = Tri			
	SW = See worksheet		eld blank				uipment blan	k	
/alidate	ed Samples:	t water							
1 F			рĦ		-1	No. 7.17			
	рн		Λ	3	21	MBLK-2	•	31	
	RSAU4-20BSPLP(SPLP)	12 RSAJ3-29BS			22 7	MB1K -2		32	
	RSAU4-20BSPLP(DI SPLP)	13 \ RB080309-S		<u> W</u>	23 3	Mblk-	22473	33	
	RSAU4-50BSPLP	14 RSAJ3-29BS		<u> </u>	24			34	
	RSAU4-50BSPLP(SPLP)	15 RSAJ3-29BS		_	25			35	
	RSAU4-50BSPLP(DI SPLP)	16 RB080309-S0			26			36	
	RSAJ3-10BSPLP	17 KB080309-S0	DMSD	·	27			37	
	RSAJ3-10BSPLP(SPLP)	18			28			38	
9 F	RSAJ3-10BSPLP(DI SPLP)	19			29			39	

29

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RSAJ3-29BSPLP

Notes:_

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