DATA VALIDATION REPORT (2017)

4707-15 EUCLID AVENUE

INCLUDES:

Chain of Custody

Validated Results

Case Narrative

Laboratory QC

PREPARED BY:

SULTRAC

DATE:

02/22/2017

USEPA
DateShipped: 1/20/2017
Lab Address: 2242 W. Harrison
Suite 200

CHAIN OF CUSTODY RECORD
Site #: C
Cooler #: 209

No: 5-012017-123747-0209
Lab: STAT Analysis Corporation
Lab Contact: Craig Chawla
Lab Phone: (312) 733-0551

Lab #	Sample #	Analyses	TAT (Days)	Matrix	Collection Method	Collected	Sample Time	Numb Cont	Container	Lab QC	Sampler	Comments
001	EUCL4707-00-06-S	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	09:20	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	
002	EUCL4707-06-12-S	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	09:20	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	
003	EUCL4707-12-18-S	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	09:20	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	
004	EUCL4707-18-24-S	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	09:20	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	
005	EUCL4707-18-24-S-D	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	09:20	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	
006	EUCL4707-24-30-S	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	09:20	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	
007	EUCL4737-00-06-B	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	10:00	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	

Special Instructions: Custody Seals: 13721, 13722
48 hour PR

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	CARLOS MENDOZA SCST, Inc	1/20/17 1300		1/20/17 17:20	
		1/20/17 1406		1/20/17 14:06	

USEPA
DateShipped: 1/20/2017
Lab Address: 2242 W. Harrison
Suite 200

CHAIN OF CUSTODY RECORD
Site #: C
Cooler #: 209

No: 5-012017-123747-0209
Lab: STAT Analysis Corporation
Lab Contact: Craig Chawla
Lab Phone: (312) 733-0551

Lab #	Sample #	Analyses	TAT (Days)	Matrix	Collection Method	Collected	Sample Time	Numb Cont	Container	Lab QC	Sampler	Comments
008	EUCL4737-06-12-B	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	10:00	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	
009	EUCL4737-12-18-B	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	10:00	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	
010	EUCL4737-18-24-B	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	10:00	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	
011	EUCL4737-24-30-B	SW846 EPA Method 6020A ICP-MS - As, Pb only	7	Soil	Composite	1/20/2017	10:00	1	8 oz glass Jar		Sultrac: CSL, DBH, LML, TMB, C	

Special Instructions: Custody Seals: 13721, 13722
48 hour PR

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	Carlos Mendez SCST, Inc	1/20/17 1300		1/20/17 13:20	
		1/20/17 14:06		1/20/17 14:06	

#17011715 34 JAN 19. 12.15 PM

Remedial Sampling

Sampling Notes

Front

1:
2: SAMPLED /OK
3: 12/4/15
4:
5:

~~Back~~ S-side

1: 30 BT
2: 30 BT
3: 30 BT
4: —
5: —

- START Remediated
- Building Location
- Pavement Location
- Approximate Aliquot Location

Detail

Note: The entire parcel is referred to as 4707- 15 Euclid on the Lake Co. Tax Assessor web site. The parcel referred to as 4717 Euclid is the southernmost portion of the property, which was sampled in January 2017 and named "EUCL4707"

Parcel Info

1. Access Agreement
   11/10/2014
   Access signed for sampling and removal
2. Date/Time Sampled 1/20/17
   S=0920
3. Sequential Number

Sample Intervals

Front SAMPLED 12/4/15

	00-06	06-12	12-18	18-24	24-30
1					
2					
3					
4					
5					

~~Back~~ S-SIDE

	00-06	06-12	12-18	18-24	24-30
1					X
2					X
3					X
4					
5					

Revisions

#	Date	Drawn By	Revision	QC'd By	Date
0					
1					
2					
3					
4					
5					
6					
7					

US SMELTER & LEAD REFINERY
LAKE COUNTY, EAST CHICAGO, INDIANA

4707 EUCLID AVE
Parcel # 450328431001000024

EPA REGION 5 RAC 2 Date Created: 11/24/2015

ST SulTRAC

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations: IEPA ELAP 100445; ORELAP IL300001; AIHA-LAP, LLC 101160; NVLAP LabCode 101202-0

Date Reported: January 25, 2017
Date Printed: January 25, 2017

ANALYTICAL RESULTS

Client: SCST, Inc.
Project: USS Lead

Work Order: 17010576 Revision 1

Lab ID: 17010576-001 **Collection Date:** 1/20/2017 9:20:00 AM
Client Sample ID: EUCL4707-00-06-S **Matrix:** Soil

Analyses	Result	RL	MDL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS		**SW6020A (SW3050B)**			Prep Date: **1/23/2017**		Analyst: **JG**
Arsenic	12	1.0	0.35		mg/Kg-dry	10	1/24/2017
Lead	130	0.50	0.09		mg/Kg-dry	10	1/24/2017
Percent Moisture		**D2974**			Prep Date: **1/20/2017**		Analyst: **RW**
Percent Moisture	13.3	0.2	0.1	*	wt%	1	1/23/2017

Lab ID: 17010576-002 **Collection Date:** 1/20/2017 9:20:00 AM
Client Sample ID: EUCL4707-06-12-S **Matrix:** Soil

Analyses	Result	RL	MDL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS		**SW6020A (SW3050B)**			Prep Date: **1/23/2017**		Analyst: **JG**
Arsenic	7.6	1.0	0.35		mg/Kg-dry	10	1/24/2017
Lead	65	0.50	0.091		mg/Kg-dry	10	1/24/2017
Percent Moisture		**D2974**			Prep Date: **1/20/2017**		Analyst: **RW**
Percent Moisture	11.5	0.2	0.1	*	wt%	1	1/23/2017

Lab ID: 17010576-003 **Collection Date:** 1/20/2017 9:20:00 AM
Client Sample ID: EUCL4707-12-18-S **Matrix:** Soil

Analyses	Result	RL	MDL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS		**SW6020A (SW3050B)**			Prep Date: **1/23/2017**		Analyst: **JG**
Arsenic	4.6	1.0	0.35		mg/Kg-dry	10	1/24/2017
Lead	76	0.51	0.091		mg/Kg-dry	10	1/24/2017
Percent Moisture		**D2974**			Prep Date: **1/20/2017**		Analyst: **RW**
Percent Moisture	11.7	0.2	0.1	*	wt%	1	1/23/2017

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below reporting limit
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL/MDL - Reporting Limit / Method Detection Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

JC 2/3/17

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations: IEPA ELAP 100445; ORELAP IL300001; AIHA-LAP, LLC 101160; NVLAP LabCode 101202-0

Date Reported: January 25, 2017
Date Printed: January 25, 2017

ANALYTICAL RESULTS

Client: SCST, Inc.
Project: USS Lead
Work Order: 17010576 Revision 1

Lab ID: 17010576-004 **Collection Date:** 1/20/2017 9:20:00 AM
Client Sample ID: EUCL4707-18-24-S **Matrix:** Soil

Analyses	Result	RL	MDL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS		**SW6020A (SW3050B)**			Prep Date: **1/23/2017**		Analyst: **JG**
Arsenic	3.6	1.0	0.35		mg/Kg-dry	10	1/24/2017
Lead	84	0.50	0.09		mg/Kg-dry	10	1/24/2017
Percent Moisture		**D2974**			Prep Date: **1/20/2017**		Analyst: **RW**
Percent Moisture	13.7	0.2	0.1	*	wt%	1	1/23/2017

Lab ID: 17010576-005 **Collection Date:** 1/20/2017 9:20:00 AM
Client Sample ID: EUCL4707-18-24-S-D **Matrix:** Soil

Analyses	Result	RL	MDL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS		**SW6020A (SW3050B)**			Prep Date: **1/23/2017**		Analyst: **JG**
Arsenic	3.7	1.0	0.36		mg/Kg-dry	10	1/24/2017
Lead	59	0.51	0.092		mg/Kg-dry	10	1/24/2017
Percent Moisture		**D2974**			Prep Date: **1/20/2017**		Analyst: **RW**
Percent Moisture	13.5	0.2	0.1	*	wt%	1	1/23/2017

Lab ID: 17010576-006 **Collection Date:** 1/20/2017 9:20:00 AM
Client Sample ID: EUCL4707-24-30-S **Matrix:** Soil

Analyses	Result	RL	MDL	Qualifier	Units	DF	Date Analyzed
Metals by ICP/MS		**SW6020A (SW3050B)**			Prep Date: **1/23/2017**		Analyst: **JG**
Arsenic	4.3	1.0	0.36		mg/Kg-dry	10	1/24/2017
Lead	67	0.51	0.093		mg/Kg-dry	10	1/24/2017
Percent Moisture		**D2974**			Prep Date: **1/20/2017**		Analyst: **RW**
Percent Moisture	14.0	0.2	0.1	*	wt%	1	1/23/2017

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below reporting limit
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL/MDL - Reporting Limit / Method Detection Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

JC 2/3/17

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

SCST
6280 Riverdale Street
San Diego, CA 92120
ATTN: Ms. Jessie Compeau

February 2, 2017

SUBJECT: U.S. Smelter & Lead Refinery, Data Validation

Dear Ms. Compeau,

Enclosed is the final validation report for the fraction listed below. This SDG was received on January 31, 2017. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #38002:

SDG #	**Fraction:**
17010576	Metals

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

- USEPA, National Functional Guidelines for Inorganic Superfund Data Review, August 2014
- 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; update V, July 2014

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

Sincerely,

Christina Rink

Christina Rink
Project Manager/Chemist

365 pages-EM 3 DAY TAT Attachment 1

Level III **EDD**

LDC #38002 (SCST, Inc., San Diego, CA / US Smelter & Lead Refinery, IN)

LDC	SDG#	DATE REC'D	(3) DATE DUE	As,Pb (6020A)																																	
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	17010568	01/31/17	02/03/17	0	30																																
B	17010576	01/31/17	02/03/17	0	11																																
Total	T/CR			0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41

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

L:\SCST\US Smelter\38002ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: U.S. Smelter and Lead Refinery

LDC Report Date: February 1, 2017

Parameters: Metals

Validation Level: Level III

Laboratory: STAT Analysis Corporation

Sample Delivery Group (SDG): 17010576

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EUCL4707-00-06-S	17010576-001	Soil	01/20/17
EUCL4707-06-12-S	17010576-002	Soil	01/20/17
EUCL4707-12-18-S	17010576-003	Soil	01/20/17
EUCL4707-18-24-S	17010576-004	Soil	01/20/17
EUCL4707-18-24-S-D	17010576-005	Soil	01/20/17
EUCL4707-24-30-S	17010576-006	Soil	01/20/17
EUCL4737-00-06-B	17010576-007	Soil	01/20/17
EUCL4737-06-12-B	17010576-008	Soil	01/20/17
EUCL4737-12-18-B	17010576-009	Soil	01/20/17
EUCL4737-18-24-B	17010576-010	Soil	01/20/17
EUCL4737-24-30-B	17010576-011	Soil	01/20/17
EUCL4737-24-30-BMS	17010576-011MS	Soil	01/20/17
EUCL4737-24-30-BMSD	17010576-011MSD	Soil	01/20/17

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Arsenic and Lead by Environmental Protection Agency (EPA) SW 846 Method 6020A

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

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.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

All calibration data were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB	Arsenic	0.00024 mg/L	EUCL4737-24-30-B
ICB/CCB	Arsenic Lead	0.0003 mg/L 0.00032 mg/L	EUCL4707-00-06-S
ICB/CCB	Arsenic Lead	0.00026 mg/L 0.00024 mg/L	EUCL4707-06-12-S EUCL4707-12-18-S EUCL4707-18-24-S EUCL4707-18-24-S-D EUCL4707-24-30-S EUCL4737-00-06-B EUCL4737-06-12-B EUCL4737-12-18-B EUCL4737-18-24-B

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater than the concentrations found in the associated laboratory blanks. Low level detections present in the laboratory blanks had no impact on the associated sample results.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
KENN4814-24-30-QEMS/MSD (EUCL4707-00-06-S EUCL4707-06-12-S EUCL4707-12-18-S EUCL4707-18-24-S EUCL4707-18-24-S-D EUCL4707-24-30-S EUCL4737-00-06-B EUCL4737-06-12-B EUCL4737-12-18-B EUCL4737-18-24-B)	Lead	193 (75-125)	-	J (all detects)	A
EUCL4737-24-30-BMS/MSD (EUCL4737-24-30-B)	Lead	208 (75-125)	-	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

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

VII. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
KENN4814-24-30-QE	Lead	10.7 (≤10)	EUCL4707-00-06-S EUCL4707-06-12-S EUCL4707-12-18-S EUCL4707-18-24-S EUCL4707-18-24-S-D EUCL4707-24-30-S EUCL4737-00-06-B EUCL4737-06-12-B EUCL4737-12-18-B EUCL4737-18-24-B	J (all detects)	A

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples EUCL4707-18-24-S and EUCL4707-18-24-S-D were identified as field duplicates. The results are presented in the tables below.

Analyte	Concentration (mg/Kg)		RPD (Limits)
	EUCL4707-18-24-S	EUCL4707-18-24-S-D	
Arsenic	3.6	3.7	3 (≤35)
Lead	84	59	35 (≤35)

X. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and serial dilution %D, data were qualified as estimated in eleven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

U.S. Smelter and Lead Refinery
Metals - Data Qualification Summary - SDG 17010576

Sample	Analyte	Flag	A or P	Reason
EUCL4707-00-06-S EUCL4707-06-12-S EUCL4707-12-18-S EUCL4707-18-24-S EUCL4707-18-24-S-D EUCL4707-24-30-S EUCL4737-00-06-B EUCL4737-06-12-B EUCL4737-12-18-B EUCL4737-18-24-B EUCL4737-24-30-B	Lead	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
EUCL4707-00-06-S EUCL4707-06-12-S EUCL4707-12-18-S EUCL4707-18-24-S EUCL4707-18-24-S-D EUCL4707-24-30-S EUCL4737-00-06-B EUCL4737-06-12-B EUCL4737-12-18-B EUCL4737-18-24-B	Lead	J (all detects)	A	Serial dilution (%D)

U.S. Smelter and Lead Refinery
Metals - Laboratory Blank Data Qualification Summary - SDG 17010576

No Sample Data Qualified in this SDG

U.S. Smelter and Lead Refinery
Metals - Field Blank Data Qualification Summary - SDG 17010576

No Sample Data Qualified in this SDG

LDC #: 38002B4a

SDG #: 17010576

Laboratory: STAT Analysis Corporation

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/31/17

Page: 1 of 1

Reviewer: SD

2nd Reviewer: [illegible]

METHOD: Metals (EPA SW 846 Method 6020A)

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.	Sample receipt/Technical holding times	A	1/20/17
II.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	N	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS/D = KENN4814-24-30-QEMS/D(SDG: 17010568) *See Below
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	SW	SER = KENN4814-24-30-QE(SDG: 17010568) (11)
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	FD = (4,5)
XII.	Internal Standard (ICP-MS)	A	
XIII.	Sample Result Verification	N	
XIV.	Overall Assessment of Data	A	

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; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	EUCL4707-00-06-S	17010576-001	Soil	01/20/17
2	EUCL4707-06-12-S	17010576-002	Soil	01/20/17
3	EUCL4707-12-18-S	17010576-003	Soil	01/20/17
4	EUCL4707-18-24-S	17010576-004	Soil	01/20/17
5	EUCL4707-18-24-S-D	17010576-005	Soil	01/20/17
6	EUCL4707-24-30-S	17010576-006	Soil	01/20/17
7	EUCL4737-00-06-B	17010576-007	Soil	01/20/17
8	EUCL4737-06-12-B	17010576-008	Soil	01/20/17
9	EUCL4737-12-18-B	17010576-009	Soil	01/20/17
10	EUCL4737-18-24-B	17010576-010	Soil	01/20/17
11	EUCL4737-24-30-B	17010576-011	Soil	01/20/17
12	EUCL4737-24-30-BMS	17010576-011MS	Soil	01/20/17
13	EUCL4737-24-30-BMSD	17010576-011MSD	Soil	01/20/17
14				
15				

*MS/D = (12,13) = PB74X

LDC #: 38002B4c

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

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

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-11		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC-12-13		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Comments: Mercury by CVAA if performed

LDC #: 38002B4a

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: JD
2nd Reviewer: [illegible]

METHOD: Metals (EPA SW 864 Method 6010/6020/7000)
Soil preparation factor applied: ____

Sample Concentration units, unless otherwise noted: mg/kg Associated Samples: 11

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (mg/L)	Blank Action Limit	No Qual.									
As			0.00024											

Sample Concentration units, unless otherwise noted: mg/kg Associated Samples: 1

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (mg/L)	Blank Action Limit	No Qual.									
As			0.0003											
Pb			0.00032											

Sample Concentration units, unless otherwise noted: mg/kg Associated Samples: 2-10

					Sample Identification									
Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (mg/L)	Blank Action Limit	No Qual.									
As			0.00026											
Pb			0.00024											

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

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

LDC #: 38002B4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

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

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

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

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

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

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

LEVEL IV ONLY:

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

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	KENN4814-24-30-QE MS/D (SDG: 17010568)	S	Pb	193 (75-125)			1-10	Jdet/A (det)
	12/13	S	Pb	208 (75-125)			11	Jdet/A (det)

Comments: ~~31/32. Pb > 4X~~ a

38002B4a.wpd

LDC #: 38002B4a

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

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

METHOD: Trace Metals (EPA SW 846 Method 6010C/6020A/7471B)

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

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

LEVEL IV ONLY:

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

#	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
	KENN4814-24-30-QE (SDG: 17010568)	S	Pb	10.7	1-10	J/UJ/A (det)

Comments:

LDC#: 38002B4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Reviewer: JD
2nd Reviewer: [illegible]

METHOD: Metals (EPA Method 6010B/7000)

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

Analyte	Concentration (mg/Kg)		RPD (≤35)
	4	5	
Arsenic	3.6	3.7	3
Lead	84	59	35

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\378002B4a.wpd

CLIENT: SCST, Inc.
Work Order: 17010576
Project: USS Lead

ANALYTICAL QC SUMMARY REPORT
Metals
BatchID: 98003

PREP BATCH SUMMARY

Sample ID	Matrix	pH	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
IMBS3 1/23/17			1.2	0	0	50	41.667	1/23/2017	1/23/2017
ILCSS3 1/23/17			1.2	0	0	50	41.667	1/23/2017	1/23/2017
17010568-021A	Soil		1.119	0	0	50	44.683	1/23/2017	1/23/2017
17010568-022A	Soil		1.136	0	0	50	44.014	1/23/2017	1/23/2017
17010568-023A	Soil		1.153	0	0	50	43.365	1/23/2017	1/23/2017
17010568-024A	Soil		1.117	0	0	50	44.763	1/23/2017	1/23/2017
17010568-025A	Soil		1.13	0	0	50	44.248	1/23/2017	1/23/2017
17010568-026A	Soil		1.136	0	0	50	44.014	1/23/2017	1/23/2017
17010568-027A	Soil		1.133	0	0	50	44.131	1/23/2017	1/23/2017
17010568-028A	Soil		1.171	0	0	50	42.699	1/23/2017	1/23/2017
17010568-029A	Soil		1.144	0	0	50	43.706	1/23/2017	1/23/2017
17010568-030A	Soil		1.151	0	0	50	43.440	1/23/2017	1/23/2017
17010568-030AMS	Soil		1.154	0	0	50	43.328	1/23/2017	1/23/2017
17010568-030AMSD	Soil		1.152	0	0	50	43.403	1/23/2017	1/23/2017
17010576-001A	Soil		1.149	0	0	50	43.516	1/23/2017	1/23/2017
17010576-002A	Soil		1.123	0	0	50	44.524	1/23/2017	1/23/2017
17010576-003A	Soil		1.118	0	0	50	44.723	1/23/2017	1/23/2017
17010576-004A	Soil		1.164	0	0	50	42.955	1/23/2017	1/23/2017
17010576-005A	Soil		1.135	0	0	50	44.053	1/23/2017	1/23/2017
17010576-006A	Soil		1.129	0	0	50	44.287	1/23/2017	1/23/2017
17010576-007A	Soil		1.139	0	0	50	43.898	1/23/2017	1/23/2017
17010576-008A	Soil		1.118	0	0	50	44.723	1/23/2017	1/23/2017
17010576-009A	Soil		1.143	0	0	50	43.745	1/23/2017	1/23/2017
17010576-010A	Soil		1.137	0	0	50	43.975	1/23/2017	1/23/2017

QC SUMMARY

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
IMBS3 1/23/17	**ZZZZZ**	**MBLK**	**mg/Kg**	**SW6020A**	**1/23/2017**	**1/24/2017**	**ICPMS_170124A**	**3541351**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	ND	0.42									
Lead	ND	0.21									

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
ILCSS3 1/23/17	**ZZZZZ**	**LCS**	**mg/Kg**	**SW6020A**	**1/23/2017**	**1/24/2017**	**ICPMS_170124A**	**3541352**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	21.63	0.42	20.83	0	104	80	120	0	0		
Lead	21.92	0.21	20.83	0	105	80	120	0	0		

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
17010568-030AMS	**ZZZZZ**	**MS**	**mg/Kg-dry**	**SW6020A**	**1/23/2017**	**1/24/2017**	**ICPMS_170124A**	**3541357**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	35.28	0.96	24.06	8.824	110	75	125	0	0		
Lead	82.09	0.48	24.06	35.77	193	75	125	0	0		S

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD / %Diff outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: SCST, Inc.
Work Order: 17010576
Project: USS Lead

ANALYTICAL QC SUMMARY REPORT
Metals
BatchID: 98003

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
17010568-030AMSD	**ZZZZZ**	**MSD**	**mg/Kg-dry**	**SW6020A**	**1/23/2017**	**1/24/2017**	**ICPMS_170124A**	**3541358**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	37.15	0.96	24.1	8.824	118	75	125	35.28	5.17	20	
Lead	65.65	0.48	24.1	35.77	124	75	125	82.09	22.3	20	R

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
17010568-030ASD	**ZZZZZ**	**SD**	**mg/Kg-dry**	**SW6020A**	**1/23/2017**	**1/24/2017**	**ICPMS_170124A**	**3541353**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%Diff	Limit	Qual
Arsenic	9.654	4.8	0	0	0	0	0	8.824	9.41	10	
Lead	39.6	2.4	0	0	0	0	0	35.77	10.7	10	R

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD / %Diff outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range

CLIENT: SCST, Inc.
Work Order: 17010576
Project: USS Lead

ANALYTICAL QC SUMMARY REPORT
Metals
BatchID: 98005

PREP BATCH SUMMARY

Sample ID	Matrix	pH	SampAmt	Sol Added	Sol Recov	Fin Vol	factor	PrepStart	PrepEnd
IMBS4 1/23/17			1.2	0	0	50	41.667	1/23/2017	1/23/2017
ILCSS4 1/23/17			1.2	0	0	50	41.667	1/23/2017	1/23/2017
17010576-011A	Soil		1.129	0	0	50	44.287	1/23/2017	1/23/2017
17010576-011AMS	Soil		1.117	0	0	50	44.763	1/23/2017	1/23/2017
17010576-011AMSD	Soil		1.116	0	0	50	44.803	1/23/2017	1/23/2017

QC SUMMARY

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
IMBS4 1/23/17	**ZZZZZ**	**MBLK**	**mg/Kg**	**SW6020A**	**1/23/2017**	**1/23/2017**	**ICPMS_170123A**	**3540866**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	ND	0.42									
Lead	ND	0.21									

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
ILCSS4 1/23/17	**ZZZZZ**	**LCS**	**mg/Kg**	**SW6020A**	**1/23/2017**	**1/23/2017**	**ICPMS_170123A**	**3540867**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	20.56	0.42	20.83	0	98.7	80	120	0	0		
Lead	20.47	0.21	20.83	0	98.3	80	120	0	0		

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
17010576-011AMS	**EUCL4737-24-30-**	**MS**	**mg/Kg-dry**	**SW6020A**	**1/23/2017**	**1/23/2017**	**ICPMS_170123A**	**3540872**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	28.43	0.96	23.97	3.49	104	75	125	0	0		
Lead	120.9	0.48	23.97	71.09	208	75	125	0	0		S

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
17010576-011AMSD	**EUCL4737-24-30-**	**MSD**	**mg/Kg-dry**	**SW6020A**	**1/23/2017**	**1/23/2017**	**ICPMS_170123A**	**3540873**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%RPD	RPD Limit	Qual
Arsenic	28.88	0.96	23.99	3.49	106	75	125	28.43	1.58	20	
Lead	93.61	0.48	23.99	71.09	93.9	75	125	120.9	25.5	20	R

Sample ID:	Customer ID:	SampType:	Units:	TestNo:	Prep Date:	Analysis Date:	Run ID:	SeqNo:
17010576-011ASD	**EUCL4737-24-30-**	**SD**	**mg/Kg-dry**	**SW6020A**	**1/23/2017**	**1/23/2017**	**ICPMS_170123A**	**3540868**

Analyte	Result	PQL	SPK value	SPK Ref Val	% REC	Low Limit	High Limit	RPD Ref Val	%Diff	Limit	Qual
Lead	76.83	2.4	0	0	0	0	0	71.09	8.07	10	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
* - Non Accredited Parameter
S - Spike Recovery outside accepted recovery limits
R - RPD / %Diff outside accepted recovery limits
H/HT - Holding Time Exceeded
B - Analyte detected in the associated Method Blank
E - Value above quantitation range