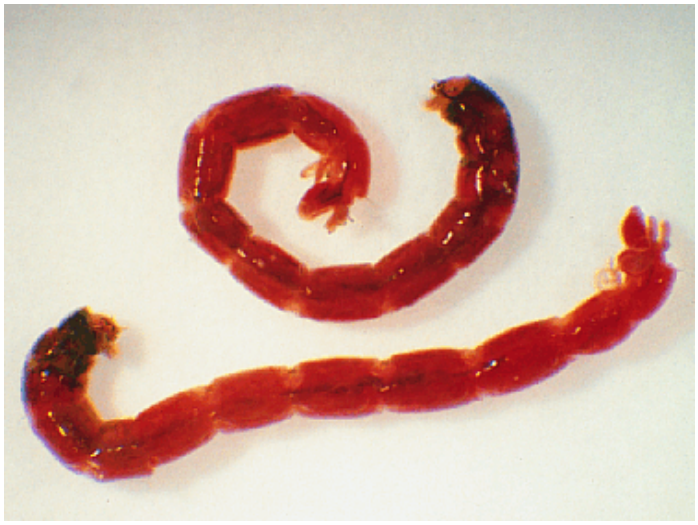
Coeur Alaska, Inc.
Juneau, Alaska

Report of Short-Term Toxicity of Whole Sediment to *Chironomus dilutus*



Prepared by

AECOM Environment
Environmental Toxicology
Fort Collins, CO

60225262-058-(075-080)
November 2011

Report of Short-Term Toxicity of Whole Sediment to Chironomus dilutus

Project IDs: 60225262-058-(075-080)
November 2011

Sponsor and Laboratory Information

Sponsor	Coeur Alaska Inc. Kensington Gold Mine 3031 Clinton Drive Suite 202 Juneau, Alaska 99801
Project Officer	Kevin Eppers (907) 523-3328
Testing Facility	AECOM Environment Fort Collins Environmental Toxicology Laboratory 4303 West LaPorte Ave. Fort Collins, CO 80521 Fax: (970) 490-2963 State of Florida NELAP Laboratory ID: E87972
Study Director	Rami B. Naddy, Ph.D. (970) 416-0916 email: rami.naddy@aecom.com
Report Author	Christina Needham (970) 416-0916 email: christina.needham@aecom.com

Test Information

Test	Short-term chronic screening toxicity test of sediment	
Basis	USEPA (2000) and ASTM (2009)	
Test Period	November 18, 2011 @ 0930-1200 and 1445 to November 28, 2011 @ 0915-1140	
Test Length	10 days	
Species	*Chironomus dilutus*	
Test Material	Whole sediment	
Sediment ID	Sample ID	AECOM Laboratory ID
	Inlet Upper Slate	25192
	Lower Sherman	25193
	Middle Slate	25194
	Lower Slate	25195
	Lower Johnson	25196
	Middle Sherman	25197
Control Sediments	Laboratory Formulated Sediment and Silica Sand	
Overlying water	Moderately hard reconstituted water prepared according to USEPA (2002), augmented with approximately 50 mg/L Cl^- (as NaCl)	
Test Concentrations	0 (control) and 100% of each test sediment	

- *Results described in this report apply only to the samples submitted to the laboratory and analyzed, as listed in the report*
- *Test results comply with NELAC standards. Reports are intended to be considered in their entirety; AECOM is not responsible for consequences arising from use of a partial report*
- *This report contains 8 pages plus 3 appendices*

Sediment Collection and Receipt

Sample ID	Collection Date and Time	AECOM No.	Date of Receipt	Temp. at Arrival (°C)[a]
Inlet Upper Slate	10/06/11 @ 1200	25192	10/11/11	3.4
Lower Sherman	10/04/11 @ 1200	25193	10/11/11	3.4
Middle Slate	10/03/11 @ 1200[b]	25194	10/11/11	3.4
Lower Slate	10/03/11 @ 1200	25195	10/11/11	3.4
Lower Johnson	10/03/11 @ 1200	25196	10/11/11	3.4
Middle Sherman	10/04/11 @ 1200	25197	10/11/11	3.4

[a] Air temperature of cooler
[b] Sample collection was started on 9/26/11 but due to weather constraints had to be completed on 10/03/11.
Note: See Appendix A for copies of chain of custody records

Control Sediment

The primary control sediment was a laboratory formulated sediment with a smaller grain size and higher organic matter content than the secondary control (silica sand, obtained from a local commercial supplier). The composition of the formulated sediment is given in the following table (Kemble et al. 1999).

Composition of Laboratory Formulated Sediment (Control)

Material	Source	Pre-Treatment	Weight (g)
Quartz Sand	Unimin Corporation, Emmett, ID	Rinsed with gentle mixing in deionized water until water ran clear. Dried in oven.	1242
Silt/Clay (ASP400)	Mozel, St. Louis, MO. Distributor = Englehardt	None	219
Dolomite	Grey Rock Clay Center, Ft. Collins, CO.	None	7.5
α-cellulose	Sigma	None	77.3
Humic Acid	Fluka	None	0.15
Total			1545.95

Test Sediment Preparation

Sample ID	Date Homogenized	Time Homogenized
Formulated Sediment (Cont.)	November 17, 2011	0938-0941
Inlet Upper Slate		1012-1016
Lower Sherman		1020-1023
Middle Slate		1000-1003
Lower Slate		1031-1034
Lower Johnson		0955-0959
Middle Sherman		1021-1024
Sand (Cont.)	November 18, 2011	1425-1428

Before, during and after homogenization, debris (including sticks and other plant material) and large stones were removed from the sediment and discarded.

Test Conditions

Test Type	Static sediment with continuous replacement of overlying water
Test Duration	10 days
Overlying Water Delivery System	Continuous renewal (flow-through)[a]
Test Endpoints	Survival, AFDW[b] per original and surviving organism
Test Chambers	500 ml glass beakers
Test Sediment Volume	100 ml
Overlying Water Volume	175 ml
Replicates per Treatment	8[c]
Organisms per Replicate	10
Test Temperature	23 ± 1°C
Lighting	Fluorescent, 16 hours light:8 hours dark
Chamber Placement	Randomized
Test Sediment Renewal	None
Test Overlying Water Renewal	Approximately two volume additions per test chamber per day

[a] Continuous replacement via a drip system
[b] Ash-Free Dry Weight
[c] Due to insufficient sediment volume, the Middle Slate treatment and Sand control had only 6 replicates.

Test Organism

From the lot of *Chironomus dilutus* received for use in the test, 20 were collected, preserved, and used to determine head capsule widths. The mean head capsule width of lot 11-028 was 0.41 mm and the range was 0.35 to 0.56 mm. Some of the organisms were slightly larger than the upper limit for third instar (0.45 mm). However, all organisms were smaller than the lower limit for fourth instars according to the range given in USEPA (2000). All organisms were, therefore, third instars.

Species and Lot Number	*Chironomus dilutus*, Lot 11-028
Age	3rd instar
Source	Aquatic BioSystems (ABS), Fort Collins, CO
Overlying Water	Moderately Hard Reconstituted Water with added chloride (49 mg/L) as NaCl, RW # 10096
Reference Toxicant Testing	Initiated November 17, 2011 using sodium chloride (NaCl)

TEST RESULTS

Biological Data – Survival and Ash Free Dry Weights

Sample ID	Percent Survival	Ash Free Dry Weight (mg)	
		Per original organism	Per surviving organism
Sand	75.0	0.566	0.769
Formulated Sediment	75.0	0.874	1.186
Inlet Upper Slate	61.2	0.644[a]	1.054
Lower Sherman	58.8	0.631[a]	1.120
Middle Slate	78.3	0.718	0.926[a]
Lower Slate	60.0	0.749	1.256
Lower Johnson	75.0	0.836	1.170
Middle Sherman	55.0[b]	0.649	1.167

[a] Statistically significant reduction in AFDW relative to the formulated sediment control using Toxstat Version 3.5 (WEST, Inc. and Gulley 1996)
[b] Statistically significant reduction in survival relative to the formulated sediment control using Toxstat Version 3.5 (WEST, Inc. and Gulley 1996). This treatment was excluded from statistical analysis of AFDW.
Note: See Appendix B for test data sheets.

Analytical Data

Parameter	Sample Identification					
	Inlet Upper Slate	Lower Slate Creek	Middle Slate Creek	Middle Sherman Creek	Lower Sherman	Lower Johnson
Metals (mg/kg-dry)[a]						
Aluminum	22,500	13,600	20,100	19,000	18,200	13,100
Chromium	127	29.4	29.5	43.4	46.2	31.5
Zinc	130	220	1,360	120	110	93.3
Arsenic	17.9	16.2	30.0	55.7	28.9	16.2
Cadmium	0.722	1.46	20.9	0.175	0.389	0.238
Copper	53.4	56.7	88.4	97.1	94.0	73.1
Lead	3.37	7.79	8.50	17.3	6.70	9.76
Nickel	87.5	47.4	143	44.0	45.9	27.3
Selenium	0.809	0.720	1.41	ND	ND	ND
Silver	0.120 J	0.134 J	0.233 J	0.633	0.137 J	0.164 J
Mercury	ND	0.0502 J	0.0692 J	ND	ND	ND
Particle Size (%)[b]						
Clay	4.0	2.0	10.0	2.0	2.0	2.0
Sand	94.0	94.0	86.0	96.0	96.0	96.0
Silt	2.0	4.0	4.0	2.0	2.0	2.0
Texture	Sand	Sand	Loamy Sand	Sand	Sand	Sand
Coarse Material (2 mm)	ND	0.44	1.65	0.22	0.11	ND
TOC (%-dry)[c]	5.46	2.04	11.0	1.17	0.54	0.89
Acid Volatile Sulfide (umoles/g)	1.39	ND	ND	1.01	1.50	ND

[a] Al, As, Cd, Cr, Cu, Pb, Ni, Se, Ag and Zn by SW-846 Method 6020; Hg by SW-846 7471B (USEPA 1986)
[b] Particle size was determined using ASTM Method D422 and Modified ASA 15-5
[c] TOC was determined using the Walkley Black Method
J = The concentration was below the Reporting Limit but above the Method Detection Limit
ND = Not Detected at the Method Detection Limit (MDL)
Note: See Appendix C for a copy of the report from the analytical laboratory (MSE Analytical Laboratory, Butte, MT)

Total and Total Volatile Solids

Sample ID	Percent Total Solids[a]	Percent Total Volatile Solids[b]
Inlet Upper Slate	72.10	4.12
Lower Sherman	73.15	2.75
Middle Slate	60.17	7.81
Lower Slate	78.00	3.38
Lower Johnson	74.28	2.01
Middle Sherman	72.45	2.82

[a] Total solids were determined using Standard Methods 2540B (APHA 1998)
[b] Total volatile solids were determined using Standard Methods 2540E (APHA 1998)
All values are means of duplicate analyses
Note: See Appendix C for data sheets (these parameters were determined at the AECOM/FCETL)

Physical and Chemical Data (Min/Max)

Sample ID	pH (units)	DO (mg/L)	Cond. (µS/cm)	Temp. (°C)[a]	Ammonia as N (mg/L)	Hardness (mg/L as $CaCO_3$)	Alkalinity (mg/L as $CaCO_3$)
Sand	7.8/8.1	5.2/6.7	550	22/23	<1.0	94	69
Formulated Sediment	7.9/8.2	5.0/7.1	550/636	22/23	<1.0	102/128	72/100
Inlet Upper Slate	7.8/8.2	5.2/6.8	506/650	22/23	<1.0/1.5	104/130	65/92
Lower Sherman	7.8/8.2	5.3/6.8	523/587	22/23	<1.0	108/114	75/77
Middle Slate Creek	7.7/8.1	4.6/6.6	613/699	22/24	<1.0/1.3	154/156	113/117
Lower Slate	7.7/8.1	5.0/6.6	504/569	22/23	<1.0	104/108	61/70
Lower Johnson	7.5/8.0	5.0/6.6	498/569	22/24	<1.0	94/106	56/64
Middle Sherman	7.7/8.1	5.2/6.5	512/581	22/24	<1.0	104	68/70

[a] Temperature in test chambers

Reference Toxicant Test Results for *C. dilutus*

Organism Lot Number	Test Dates	96-Hour LC_{50}	AECOM/FCETL Historical 95% Control Limits	
			Low	High
11-028	11/17/11-11/21/11	3,251	3,081	6,568

Note: Values are expressed as mg/L chloride

References

APHA. 1998. Standard Methods for the Examination of Water and Wastewater. Amer. Public Health Assoc., Amer. Water Works Assoc., Water Pollut. Control Fed., APHA, Washington, DC.

ASTM. 2009. Standard Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Fresh Water Invertebrates. Method E 1706-05 In *2009 Annual Book of ASTM Standards, Section 11, Water and Environmental Technology, Volume 11.06, Biological Effects and Environmental Fate; Biotechnology*. American Society of Testing and Materials. West Conshohocken, PA.

Kemble, N.E., F.J. Dwyer, C.G. Ingersoll, T.D. Dawson, and T.J. Norberg-King. 1999. Tolerance of Freshwater Test Organisms to Formulated Sediments for Use as Control Materials in Whole-Sediment Toxicity Test. *Environ. Toxicol. Chem.* 18:222-230.

USEPA. 1986. Test Methods for Evaluating Solid Waste. Third Edition. SW-846.

USEPA. 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. EPA/600/R-99/064.

USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. EPA-821-R-02-012.

WEST, Inc. and D.D. Gulley. 1996. Toxstat Version 3.5. Western EcoSystems Technology, Inc., Cheyenne, WY.

Statement of Procedural Compliance

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge, accurate and complete.

Rami Naddy, Ph.D.
Study Director

February 6, 2012
Date

Statement of Quality Assurance

The test data were reviewed by the Quality Assurance Unit to assure that the study was performed in accordance with standard operating procedures, and that the resulting data and report meet the requirements of the NELAC standards. This report is an accurate reflection of the raw data.

Quality Assurance Unit

February 3, 2012
Date

APPENDIX A

Chain of Custody

Sent 7-26-2011

AECOM

CHAIN OF CUSTODY RECORD

(063-064-065-#Ref 1-066)

Client/Project Name: Coeur Alaska	Project Location: FCEIL
Project Number: 60147217-058	Field Logbook No.:
Sampler (Print Name)/(Affiliation): GORDON WN ADF&G	Chain of Custody Tape Nos.: 41156 *intact*
Signature:	Send Results/Report to: TAT:

Container Type: P – Plastic; A – Amber Glass; C – Clear Glass; V – VOA Vial; O – Other; E – Encore

Preservation: 1 – HCl, 4°; 2 – H2SO4, 4°; 3 – HNO3, 4°; 4 – NaOH, 4°; 5 – NaOH/ZnAc, 4°; 6 – Na2S2O3, 4°; 7 – 4°

Matrix Codes: DW – Drinking Water; WW – Wastewater; GW – Groundwater; SW – Surface Water; ST – Storm Water; W – Water; S – Soil; SL – Sludge; SD – Sediment; SO – Solid; A – Air; L – Liquid; P – Product

Field Sample No./Identification	Date (#)	Time Δ	COMP	GRAB	Sample Container (Size/Mat'l)	Matrix	Preserv.	Field Filtered	Analysis Requested	Lab I.D.	Remarks
INLET UPPER SLATE	10/6	1200	X		1 g jar		ICE		X	25192	
LOWER SHERMAN	10/4	1200	X		1 g jar		ICE		X	25193	
MS (middle slate) *1126 10/3		1200	X		1 g jar		ICE		X	25194	
LOWER SLATE	10/3	1200	X		1 g jar		ICE		X	25195	
JOHNSON	10/3	1200	X		1 g jar		ICE		X	25196	
MIDDLE SHEER	10/4	1200	X		1 g jar		ICE		X	25197	
000388 LOWER JOHNSON	10/3	1200	X		1 4oz jar		ICE		X	25196	
000458 LOWER SH	10/3	1200	X		1 4oz jar		ICE		X	25193	
000389 LS	10/3	1200	X		1 4oz jar		ICE		X	25195	
000383 MS	10/4	1200	X		1 4oz jar		ICE		X	25194	
000463 UPPER SLATE	/	1200	X		1 4oz jar		ICE		X	25192	
000457 MID SHEER		1200	X		1 4oz jar		ICE		X	25197	
											(D53)

Relinquished by: (Print Name)/(Affiliation) GORDON WN ADFG	Date: 10/10	Received by: (Print Name)/(Affiliation) Amber Potts/AECOM	Date: 10/11/11	Analytical Laboratory (Destination): received ice via FedEx @ 3.4°C (cooler temp)	
Signature:	Time: 0730	Signature:	Time: 1020	**AECOM Toxicology Lab** 4303 W. Laporte Avenue Fort Collins, CO 80521 (970) 416-0916 (970) 490-2963 (FAX)	
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:		
Signature:	Time:	Signature:	Time:		
Relinquished by: (Print Name)/(Affiliation) (#) All samples were collected in the year 2011.	Date:	Received by: (Print Name)/(Affiliation)	Date:	Sample Shipped Via: UPS (FedEx) Courier Other	Temp blank: Yes (No)
Signature:	Time:	Signature:	Time:		

Δ All sample times were confirmed with client via phone conversation. 12/18/11 *

Q:\GRAPHICS\FORMS\Chain of Custody (COC)\Chain-of-Custody_Ft. Collins_10_07.doc

Serial No. No 51474

APPENDIX B

Data Sheets

cw 01/30/12
QA: AR 01/31/12

① ~~*H. azteca*~~ *C. dilutus*

10-day Survival and Growth, Testing Cover Page

Project Number: 60225262-058-(~~063-068~~) 075-080 ②
Protocol #: ① ~~CT3AKTIE056.008~~ USEPA (2000) + ASTM (2009)
Test Substance: Sediment
Test Species: *C. dilutus** Lot #: 11-028 Age: 2nd instar Supplier: ABS

Test Type: Chronic, Static Renewal
Overlying Water: Reconstituted Fresh Water (Smith et al., 1997) (RW# 100946) Investigators: cw/KF/mt/Am
Sampling Date(s): 10/3/11-10/6/11 10/20 10/19▲ Sampling Time(s): 1200
FCETL Sample #(s): 25192, 25193, 25194, 25195, 25196, 25197
Test Initiation Date/Time: 11/18/11 @ 0930 - 1200
Test Termination Date/Time: 11/28/11 @ 0915-1140

Renewal Frequency: ⑧ Cont. drip; 2+ vol/day Feeding Freq: daily Food Type/Amount: 1.5 ml of 4 g/L Tetrafin Test Temp: 23 +/- 1 deg C
Test Chamber Capacity: 500 ml Test Soltn. Vol: 100 mL sed/175 mL H2O # Repl's/Trtmnt: 8/6*
Test Duration: 10 days # Org.'s/Repl: 10 Env. Chmbr/Bath:
Water Characterization: Minimum of Hardness, Alkalinity, & Conductivity on days 0 and 10; Ammonia on days 0, 3, 7, and 10; No TRC; pH, temperature & DO daily on overlying water
aerate if dissolved oxygen <2.5 mg/L

Test Sediment (s):

1)	Form Sed (Cont)	2)	Inlet Upper Slate	3)	Lower Sherman
4)	Middle Slate	5)	Lower Slate	6)	Lower Johnson
7)	Middle Sherman	8)	Sand	9)	
10)		11)			

Reference Tox. Dates: 11/17/11 - 11/21/11 LC50: 3251 mg Cl⁻/L Hist. Limits: 3081 - 6568 Method: Probit
Study Director Initials: CW for RBN Date: 11/17/11

Overlying water added at a minimum of 2 volume additions/day; equivalent to >350 ml/day or >0.24 ml/min
* formerly known as *C. tentans*

*Middle Slate and sand control only ~~has~~ ⑥ have 6 replicates due to insufficient amount of sediment.
⑧ Sand controls were renewed manually 2x daily
▲ Started new overlying water on 10/27/11 KF
Ⓐ New overlying water started on 11/21/11 cw

① cw 11/28/11 cf
② cw 02/02/12 cf

CW 01/30/12

QA: AR 01/31/12

SEDIMENT/SOIL PREPARATION

Project Number: 60225262-058 (075-080 ~~068-068~~)

Artificial soil	
Constituent/source	**Amount added (g)**
Coarse Silica Sand	1242
Silt/Clay (ASP 400)	219
Dolomite	7.5
α-cellulose	77.3
Humic Acid	0.15
Total	1545.95

Notes: Container was placed into tumbler for a minimum of an hour to homogenize prior to use

Soil/sediment	FCETL#	Homogenization			
		Date	From	To	Analyst
Form Sed (Cont)Ⓐ	NA	11/17/11	0938	0941	CW
Inlet Upper Slate	25192	11/17/11	1012	1016	AM
Lower Sherman	25193	11/17/11	1020	1023	CW
Middle Slate (MS)▲	25194	11/17/11	1000	1003	CW
Lower Slate	25195	11/17/11	1031	1034	CW
Lower Johnson	25196	11/17/11	0955	0959	AM
Middle Sherman	25197	11/17/11	1021	1024	AM
SandⒶ	NA	11/18/11	1425	1428	CW

Ⓐ added overlying H_2O and homogenized on 11/16/11 and stored overnight @ 4°C. CW

▲ enough sediment for 6 reps only.

Ⓐ Added overlying water during homogenization process.

BIOLOGICAL DATA — *C. dilutus** — Chronic, Static Renewal — Project 60225262-058-~~(063-068)~~ (16) 075-080 — QA: AR 01/11/12

Observations made on 11/28/11 — CW 1/8/12

Sediment	Test Termination	A	B	C	D	E	F	G	H	Remarks: % Survival
Form Sed (Cont)	# Surviving	9	8	6	6	8	6	7	10	75%
	# Observed Dead	0	0	0	0	0	0	1	0	
	# Not Found	1	2	4	4	2	4	2	0	
	Initials	AP	KB	AP	[illegible]	AP	CW	[illegible]	CW	
Inlet Upper Slate	# Surviving	6	5	7	(5) [illegible]	7	6	(6) 8 7	6	~~*emerged~~ (5) 61.2%
	# Observed Dead	0	0	0	(6) 1	0	0	1	0	
	# Not Found	4	5	3	(6) 1 4	(7) 3	4	2	4	
	Initials	KB	KB	AP	(6) [illegible]	F	KB	[illegible]	[illegible]	
Lower Sherman	# Surviving	8	9	4	3	6	(6) 5 5 1	1 6	7	Δpupae° (7) ~~57.5%~~
	# Observed Dead	0	0	0	0	0	(6) 1 0	1	0	58.8%
	# Not Found	2	2	6	7	4	5	3	3	
	Initials	AP	AB	[illegible]	CW	KB	[illegible]	[illegible]	AP	
Middle Slate	# Surviving	8	9	8	5	8	9			78.3%
	# Observed Dead	0	0	0	0	1	0			
	# Not Found	2	1	2	5	1	1			
	Initials	AB	[illegible]	AD	AD	[illegible]	CW			
Lower Slate	# Surviving	6	6	5	3	5	7	7	9	60%
	# Observed Dead	0	0	0	4	0	0	0	0	
	# Not Found	4	4	5	3	5	3	3	1	
	Initials	KB	AP	AD	[illegible]	KB	[illegible]	[illegible]	[illegible]	
Lower Johnson	# Surviving	9	10	5Δ	8	7	7	7Δ	7	Δ1 pupae° 75%
	# Observed Dead	0	0	0	0	0	0	0	0	
	# Not Found	1	0	5	2	3	3	3	3	
	Initials	[illegible]	AP	[illegible]	[illegible]	CW	[illegible]	AP	CW	
Middle Sherman	# Surviving	4	4	7	5° 6	5Δ	5 (8)	7	6	Δ1 pupae° (8) 1 empty casing (n.c) 55%
	# Observed Dead	0	0	0	[illegible] 0	0	0	0	0	
	# Not Found	6	6*	3	5° 4	5	4	3	4	*1 empty casing (N.C)
	Initials	AD	KB	[illegible]	[illegible]	[illegible]	AP	CW	F	
Sand 0	# Surviving	8	8	5	9*	8	7			*1 emerged° 75%
	# Observed Dead	1	0	2	0	0	0 (4)			
	# Not Found	1	2	3	1	2	3			
0	~~# Surviving~~ Initials	[illegible]	CW	[illegible]	CW	CW	[illegible]			
	# Observed Dead									
	# Not Found									
0	# Surviving									
	# Observed Dead									
	# Not Found									
	# Surviving									
	# Observed Dead									
	# Not Found									

(1) CW 11/28/11 cf (3) CW 11/28/11 WP (5) AD 11/28/11 WP (7) CW 1/11/12 E (9) F 1/30/12 E Note: (n.c) = not counted or AFDW

(2) AP 11/28/11 E (4) [illegible] 11/28/11 WP (6) [illegible] 11/28/11 E (8) [illegible] 1/13/12 E (10) CW 02/02/12 cf °Not included in dry weight determination

cw 01/30/12

075-080 QA: AR01/31/12

CHEMICAL DATA (Composite of Overlying Water) *C. dilutus** Chronic, Static Renewal Project 60225262-058-(~~063-068~~)③

Parameter	Sediment	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day	Meter	Date	Time	Initials
Dissolved Oxygen (mg/l)	Form Sed (Cont)	7.1	6.2	6.0	5.4	6.0	5.0	5.2	5.6	6.5	5.7	6.7	0	5	11/18/11	0905	cw
	Inlet Upper Slate	6.8	6.1	6.8	6.0	5.5	5.2	5.3	5.5	5.8	5.6	6.7	1	5	11/19/11	1430	TK
	Lower Sherman	6.8	6.0	6.6	5.6	5.8	6.0	5.3	5.6	6.4	5.6	6.8	2	5	11/20/11	0915	TK
	Middle Slate	6.2	5.6	5.0	4.6	5.1	5.3	4.7*	5.0*	5.1*	5.1*	6.6	3	5	11/21/11	1005	mt
	Lower Slate	6.4	6.0	6.3	5.0	6.1	5.3	5.2	5.2	5.9	5.6	6.6	4	5	11/22/11	0905	AM
	Lower Johnson	6.6	5.8	6.2	5.3	5.7	5.6	5.0	5.2	6.0	5.6	6.5	5	5	11/23/11	1350	mt
	Middle Sherman	6.5	5.7	5.9	6.3	5.8	5.2	6.2	5.3	6.3	5.3	6.4	6	5	11/24/11	1000	TK
	Sand	NM	6.2	6.5	6.1	5.6	5.2	5.9*	5.4*	6.7*	5.9*	6.7	7	5	11/25/11	0930	TK
													8	5	11/26/11	0900	TK
	0												9	5	11/27/11	0900	TK
	0												10	5	11/28/11	1005	mt
	0																
Temp (deg C)	Form Sed (Cont)	①22	22	23	22	23	23	23	22	22	22	22	0	D47	11/18/11	0900	cw
	Inlet Upper Slate	22	22	23	22	23	23	23	22	22	22	22	1	D47	11/19/11	1430	TK
	Lower Sherman	22	23	22	21④	22	23	22	23	22	22	22	2	D47	11/20/11	0915	TK
	Middle Slate	22	22	23	23	23	23	24*	23*	23*	22*	22	3	D54	11/21/11	1005	mt
	Lower Slate	22	22	22	23	23	23	23	22	22	22	22	4	D47	11/22/11	0905	AM
	Lower Johnson	22	22	23	22	22	24	22	22	23	22	22	5	D47	11/23/11	1350	mt
	Middle Sherman	22	22	22	22	23	24	22	22	22	22	22	6	D47	11/24/11	1000	TK
	Sand	NM	23	22	23	23	23	23*	23*	22*	23*	22	7	D47	11/25/11	0930	TK
	0												8	D47	11/26/11	0900	TK
	0												9	D47	11/27/11	0900	TK
	0												10	D47	11/28/11	0905	cw
pH	Form Sed (Cont)	8.2	8.0	8.0	8.1	8.0	7.9	8.0	8.0	8.1	8.0	8.0	0	16	11/18/11	0905	cw
	Inlet Upper Slate	8.2	7.8	8.1	8.0	7.9	7.8	7.8	7.9	7.8	7.9	8.1	1	16	11/19/11	1430	TK
	Lower Sherman	8.2	7.9	8.0	8.0	8.0	8.0	7.8	8.0	8.1	7.9	8.1	2	16	11/20/11	0915	TK
	Middle Slate	8.1	7.9	7.9	8.0	8.0	7.8	7.7*	7.8*	7.7*	7.7*	8.1	3	FM21	11/21/11	1005	mt
	Lower Slate	8.1	7.7	7.9	7.9	7.9	7.9	7.7	7.8	7.8	7.8	8.0	4	16	11/22/11	0905	AM
	Lower Johnson	8.0	7.6	7.7	7.8	7.8	7.9	7.5	7.7	7.8	7.7	8.0	5	16	11/23/11	1350	mt
	Middle Sherman	8.1	7.7	7.8	8.0	7.9	7.8	7.9	7.8	7.9	7.7	8.0	6	16	11/24/11	1000	TK
	Sand 0	NM	7.9	8.0	8.0	8.0	8.0	7.9*	7.8*	8.1*	7.9*	8.0	7	16	11/25/11	0930	TK
	0												8	16	11/26/11	0900	TK
	0												9	16	11/27/11	0900	TK
	Replicate	A	B	C	D	E	F	G/A*	H/B*	A/C*	B/D*	C	10	16	11/28/11	1005	mt

①cw 11/18/11 E ③cw 02/02/12 cf

②TK 11/26/11 E ④mt 2/2/12 cf 22

aw 01/30/12

DA: ARD 1/31/12

OVERLYING WATER CHARACTERIZATION | *C. dilutus** | Chronic, Static Renewal | Project No. 60225262-058-(~~063-068~~)① 075-080

	Conductivity (s/cm)		Hardness (mg/L as CaCO3)		Alkalinity (mg/l as CaCO3)		Ammonia (mg/l)			
Sediment	Day 0	Day 10	Day 0	Day 10	Day 0	Day 10	Day 0	Day 3	Day 7	Day 10
Form Sed (Cont)	550	636	102	128	72	100	<1.0	<1.0	<1.0	<1.0
Inlet Upper Slate	506	650	104	130	65	92	<1.0	<1.0	1.5	<1.0
Lower Sherman	523	587	108	114	75	77	<1.0	<1.0	<1.0	<1.0
Middle Slate	613	699	154	156	117	113	<1.0	1.3	<1.0	<1.0
Lower Slate	504	569	104	108	61	70	<1.0	<1.0	<1.0	<1.0
Lower Johnson	498	569	94	106	56	64	<1.0	<1.0	<1.0	<1.0
Middle Sherman	512	581	104	104	68	70	<1.0	<1.0	<1.0	<1.0
Sand	NM	550	NM	94	NM	69	NM	<1.0	<1.0	<1.0
Overlying water							①~~NM~~ <1.0 A			
(RW 10096) measured 11/17/11	483		90		63		①~~NM~~ <1.0 A			
(RW 10112) measured 11/21/11	442		86		55		<1.0 A			
(RW 10119) measured 11/23/11	513		90		59					
Meter #	15	15	Titr	Titr	Titr	Titr	HA #1	HA #1	~~HA #1~~	HA #1
Date:	11/18/11	11/28/11	11/18/11	11/28/11	11/18/11	11/28/11	11/18/11	11/21/11	11/25/11	11/28/11
Time:	0900	1520	0900	1520	0900	1520	1600	1330	1625	1640
Initials:	TK	AD	TK	AD	TK	AD	TK	MK	BP	AD

Cl⁻ = 49.2 mg/L
Cl⁻ = 49.8 mg/L
Cl⁻ = 52.0 mg/L

Ameasured in source water

①aw 02/02/12 CF

aw 01/30/12
AB: AR 01/31/12

DAILY TESTING LOG | *C. dilutus** | Chronic, Static Renewal | Project No. 60225262-058-(~~063-068~~ 075-080)

Day -1	Sediment Homogenized @ 0945 - 1035 Overlying water added to chambers @ 1130			Initials/Date: aw 11/17/11
Day 0	Test organisms added to chambers @ 0930-1200 added to Sand @ 1445		Feeding: @1530 aw	Initials/Date: aw 11/18/11
Day 1	Bath CT = 24.2 °C	Range = 23.0 - 24.8 °C	Feeding: 1500 F	Initials/Date: F 11/19/11
Day 2	Bath CT = 24.2°C	Range = 23.8 - 24.4 °C	Feeding: 1505 AP	Initials/Date: F 11/20/11
Day 3	Bath CT = 24.0 °C Overlying water switched to RW# 10112 @ ~1000	Range = 23.8 - 24.8 °C	Feeding: 1630 aw	Initials/Date: NT 11/21/11
Day 4	Bath CT = 24.0°C	Range = 23.4 - 24.4 °C	Feeding: 1700 AM	Initials/Date: AM 11/22/11
Day 5	Bath CT = 23.4°C	Range = 23.0 - 24.2 °C	Feeding: 1630 RB	Initials/Date: 11/23/11
Day 6	Bath CT = 23.6°C	Range = 23.0 - 24.8 °C	Feeding: 1720 F	Initials/Date: F 11/24/11
Day 7	Bath CT = 23.4°C	Range = 23.0 - 23.8°C	Feeding: 1600 BP	Initials/Date: F 11/25/11
Day 8	Bath CT = 23.4 °C	Range = 23.0 - 23.8 °C	Feeding: 1530 F	Initials/Date: F 11/26/11
Day 9	Bath CT = 23.4 °C Overlying H2O switched to RW# 10119	Range = 23.0 - 23.8 °C	Feeding: 1550 BP	Initials/Date: F 11/27/11
Day 10	Bath CT = 23.6 °C	Range = 23.0 - 23.8°C	Feeding: None	Initials/Date: aw 11/28/11

aw 02/02/12 cf

CW 01/16/12

QA: AR 01/31/12

Length/Width of Objects Using a Micrometer

Project/Study Number: 60225262-058-(075-080)	**Project Name:** Coeur
Study Initiation Date: 11/18/11	**Species:** C. dilutus
Source of Organisms: ABS	**Organism Batch/Lot #:** 11-028
Collected by: CW	**Date Collected:** 11/18/11
Analyzed by: CW	**Date Analyzed:** 12/02/11

Specimen Number	Magnif.	# of Squares	Length of One Square (mm)	Total (mm)	Remarks
1	100X	5.5	0.07	0.385	
2	100X	6		0.420	
3	100X	5		0.350	
4	100X	5.5		0.385	
5	100X	6		0.420	
6	100X	5		0.350	
7	100X	8		0.560	
8	100X	5		0.350	
9	100X	5.5		0.385	
10	100X	5.5		0.385	
11	100X	6		0.420	
12	100X	5		0.350	
13	100X	6		0.420	
14	100X	6		0.420	
15	100X	5		0.350	
16	100X	7		0.490	
17	100X	5		0.350	
18	100X	8		0.560	
19	100X	5.5		0.385	
20	100X	5.5		0.385	
Total				①~~8.76~~ 8.120	
Mean				①~~0.430~~ 0.406	

3rd Instar = 0.33 - 0.45 mm

①CW 01/16/12 C ②CW 02/02/12 CF

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CW 1/8/12
QA: AL 01/13/12

TEST ORGANISM DRY WEIGHT AND ASH-FREE DRY WEIGHT (AFDW)

Project No: 602253262-058-(063-068) (015-080)
Species: Chironomus dilutus
Lot/Batch No.: 11-028
Analytical Balance ID: Sart #1

TARE: Date/time: 12/08/11 @1130 Analyst: CW
DRY GROSS: Date/time: 12/13/11 @1015 Analyst: CW
ASHED GROSS: Date/time: 12/16/11 @1100-1230 Analyst: CW

Dried in Oven # 3 from Date: 12/8/11 Time: 1500
Oven °C: 60-90 to Date: 12/13/11 Time: 0925
Ashed in Furnace from Date: 12/12/11 Time: 1100
Furnace °C: 550 to Date: 12/13/11 Time: 1630

Indicate mean weight is **Dry Weight** or **AFDW** (Circle one)

Boat No.	Treatment	Rep	Tare Weight (g) A	Dry Gross Weight (g) B	Dry Net Weight (g) (B-A)	Adjusted Dry Net Weight (g)[1]	Ashed Gross Weight (g) (D)	AFDW (g) (B-D)	No. of Original Org.	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Org.	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
1	Sand	A	1.98766	1.991650[A]	0.00884		1.99071	0.00579				8		
2		B	2.20280	2.20967	0.00687		2.20362	0.00605				8		
3		C	1.88503	1.891780 (9)	0.00676		1.88722	0.00457				5		
4		D	2.22825	2.23477	0.00652		2.22928	0.00549	9			8		
5		E	2.21528	2.22220	0.00692		2.21651	0.00569				8		
7		F	2.03168	2.03909	0.00741		2.03333	0.00576				7		
8	Formed	A	2.22211	2.23859[A]	0.01648		2.22839	0.01020				9		
9		B	1.94352	1.95670	0.01318		1.94835	0.00835				8		
10		C	2.21543	2.22970	0.01427		2.22183	0.00787				6		
11		D	2.23168	2.24368	0.01200		2.23491	0.00877				6		
12		E	2.35657	2.37240	0.01583		2.36092	0.01148				8		
13		F	2.17951	2.19107	0.01156		2.18395	0.00712				6		
14		G	2.21717	2.228663	0.01146		2.22166	0.00697				7		
A Blank			2.35273	2.35270	-0.00003		2.35273	+0.00003						

[1] Add in weight loss of blank boat, if appropriate. ① CW 12/13/11 E ② CW 02/02/12 CF

A double checked gross weight

FCETL QA Form No.108
Revision 0
Effective 08/99

cw 1/18/12
QA: AR 01/13/12

TEST ORGANISM DRY WEIGHT AND ASH-FREE DRY WEIGHT (AFDW)

Project No: 60225262-058 - (075-080 ③)
TARE: Date/time: 12/08/11 @ 1130 Analyst: cw
Species: Chironomus dilutus
Lot/Batch No.: 11-028
DRY GROSS: Date/time: 12/13/11 @ 1030 Analyst: cw
Analytical Balance ID: Sart# 1
ASHED GROSS: Date/time: 12/16/11 @ 1100-1230 Analyst: cw

Dried in Oven # 3 from Date: 12/8/11 Time: 1500
Oven °C: 60-90 to Date: 12/13/11 Time: 0925
Ashed in Furnace from Date: 12/13/11 Time: 1100
Furnace °C: 550 to Date: 12/13/11 Time: 1630

Indicate mean weight is **Dry Weight** or **AFDW** (Circle one)

Boat No.	Treatment	Rep	Tare Weight (g) A	Dry Gross Weight (g) B	Dry Net Weight (g) (B-A)	Adjusted Dry Net Weight (g)[1]	Ashed Gross Weight (g) (D)	AFDW (g) (B-D)	No. of Original Org.	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Org.	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
15	Farm Sed	H	2.29082	2.30545	0.01463		2.29628	0.00917				10		
16	Inlet	A	1.96481	1.97584	0.01103		1.96826	0.00758				6		
17	Upper Slide	B	2.29295	2.30115	0.00820		2.29530	0.00585				5		
18		C	2.23689	~~2.26189~~ 2.24801	0.01112		2.24014	0.00787				7		
19		D	2.11460	2.12090	0.00630		2.11621	0.00469				5		
20		E	2.37662	2.38578	0.00916		2.37918	0.00660				7		
21		F	1.87369	1.88161	0.00792		1.87623	0.00538				6		
22		G	1.82777	1.83891	0.01114		1.83176	0.00715				7		
23		H	2.07904	2.08855	0.00951		2.08211	0.00644				6		
24	Lower Sleeman	A	2.32528	2.34056	0.01528		2.33246	0.00810				8		
25		B	2.30195	2.31919	0.01724		2.31053	0.00866				8		
26		C	2.27462	~~2.28044~~ 2.28230	0.00768		2.27802	0.00428				4		
27		D	1.98082	1.98804	0.00722		1.98358	0.00446				3		
B Blank			2.26189	2.26189	0.00000		2.26192	to.00003						

[1] Add in weight loss of blank boat, if appropriate.

①cw 12/13/11 wp
②cw 12/16/11 E
③cw 02/02/12 cf

°use blank A °~~use blank B~~ ②re-ashed on 12/15/11 from 1100 to 1645 to ensure complete ashing. weights didn't change. cw

FCETL QA Form No.108
Revision 0
Effective 08/99

CW 1/18/12
QA: AR 01/13/12

TEST ORGANISM DRY WEIGHT AND ASH-FREE DRY WEIGHT (AFDW)

Project No: 60223262-0558-(075-080) TARE: Date/time: 12/08/11 @1130 Analyst: CW
Species: Chironomus dilutus DRY GROSS: Date/time: 12/13/11 @1110 Analyst: CW
Lot/Batch No.: 11-028
Analytical Balance ID: Sart# 1 ASHED GROSS: Date/time: 12/16/11 @1100-1230 Analyst: CW

Dried in Oven # 3 from Date: 12/8/11 Time: 1500
Oven °C: 60-90 to Date: 12/13/11 Time: 0925
Ashed in Furnace from Date: 12/13/11 Time: 1100
Furnace °C: 550 to Date: 12/15/11 Time: 1645

Indicate mean weight is **Dry Weight** or **(AFDW)** (Circle one)

	Boat No.	Treatment	Rep	Tare Weight (g) A	Dry Gross Weight (g) B	Dry Net Weight (g) (B-A)	Adjusted Dry Net Weight (g)[1]	Ashed Gross Weight (g) (D)	AFDW (g) (B-D)	No. of Original Org.	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Org.	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
⑧	28	Lower Sherman	E	2.20960	2.22129	0.01169		2.21489	0.00640				6		
⑧	29		F	2.24436	2.25490	0.01054		2.24980	0.00510	9			4		
⑧	30		G	2.05894	2.06611 [A]	0.00717		2.06105	0.00506				6		
⑧	31		H	2.23133	2.24627	0.01494		2.23840	0.00787				7		
Ⓐ	33	Middle Slate	A	2.24651	2.25712	0.01061		2.24907	0.00805				8		
Ⓐ	34		B	1.82243	1.83289	0.01046		1.82566	0.00723				9		
⑧	35		C	2.08135	2.09123	0.00988		2.08350	0.00773				8		
Ⓐ	36		D	1.95061	1.95682	0.00621		1.95177	0.00505				5		
⑧	37		E	1.87730	1.88663	0.00933		1.87948	0.00715				8		
Ⓐ	39		F	1.94708	1.95799	0.01091		1.95013	0.00786				9		
Ⓐ	40	Lower Slate	A	1.75882	1.77355	0.01473		1.76533	0.00822				6		
Ⓐ	41		B	1.88183	1.89632	0.01449		1.88831	0.00801				6		
⑧	42		C	1.93580	1.94627	0.01047		1.93998	0.00629				5		
⑤	A2 Blank			2.20598	2.20598	0.00000		NM							

[1] Add in weight loss of blank boat, if appropriate.

⑧ CW 12/13/11 E
⑧ CW 12/15/11 E
⑧ CW 12/20/11 Not used

A double checked gross weight

⑧ use blank C
Ⓐ CW 02/02/12 CF

Ⓐ use blank B

FCETL QA Form No.108
Revision 0
Effective 08/99
CW 1/8/12
QA: AR 01/13/12

TEST ORGANISM DRY WEIGHT AND ASH-FREE DRY WEIGHT (AFDW)

Project No: 60225260-058 (075-080) TARE: Date/time: 12/08/11 @1130 Analyst: CW
Species: Chironomus dilutus DRY GROSS: Date/time: 12/13/11 @1130 Analyst: CW
Lot/Batch No.: 11-028 ASHED GROSS: Date/time: 12/16/11 @1100-1230 Analyst: CW
Analytical Balance ID: Sart #1

Dried in Oven # 3 from Date: 12/8/11 Time: 1500
Oven °C: 60-90 to Date: 12/13/11 Time: 0925
Ashed in Furnace from Date: 12/15/11 Time: 1100
Furnace °C: 550 to Date: 12/16/11 Time: 1645

Indicate mean weight is **Dry Weight** or **AFDW** (Circle one)

	Boat No.	Treatment	Rep	Tare Weight (g) A	Dry Gross Weight (g) B	Dry Net Weight (g) (B-A)	Adjusted Dry Net Weight (g)[1]	Ashed Gross Weight (g) (D)	AFDW (g) (B-D)	No. of Original Org.	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Org.	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
④	43	Lower Slate	D	2.21729	2.22306	0.00577		2.21963 ~~2.12978~~ ⑨	0.00343					3	
⑧	44		E	2.24508	2.25596	0.01088		2.24895	0.00701					5	
⑧	45		F	2.24060	2.25535	0.01475		2.24657	0.00878					7	
⑧	46		G	1.87060	1.88377	0.01317		1.87582	0.00795					7	
④	47		H	1.87603	1.89229	0.016216		1.88308	0.00921	9				8 ⑪	
⑧	48	Lower Johnson	A	1.98055	1.99478	0.01423		1.98716	0.00762					9	
⑧	49		B	2.12133	2.13940	0.01807		2.12978	0.00962					10	
⑧	50		C	2.12985	2.13779	0.00794		2.13274	0.00505	9				~~05~~ 4 ①	
④	52		D	2.03561	2.05231	0.01670		2.043169	0.00862					8	
⑧	55		E	1.85798	1.87240	0.01442		1.86408	0.00832					7	
⑧	60		F	2.060066	2.07189	0.01123		2.066623	0.005666					7	
⑤	64		G	2.15883	2.17404	0.01521		2.166607	0.00797	9				0716	
	C Blank			1.97054	1.97054	0.00000		1.97055	+0.00001						
③	• Bz Blank			2.33449	2.33451	+0.00002		2.33450	-0.00001						

[1] Add in weight loss of blank boat, if appropriate.

• Note: Blank Bz ashed 12/13/11 from 1100 to 1630 and again on 12/15/11 from 1100 to 1645. CW

① CW 12/8/11 E ④ use Blank C ⑤ use blank B ⑪ Lowerslate H had 9 survivors, but one was lost during drying process
② CW 12/16/11 WP ⑨ CW 02/02/12 CF
③ CW 12/20/11 Not used

FCETL QA Form No.108
Revision 0
Effective 08/99
CW 1/18/12
QA: AR 01/13/12

TEST ORGANISM DRY WEIGHT AND ASH-FREE DRY WEIGHT (AFDW)

Project No: 60225262-058 (075-080) (063-068) ②
TARE: Date/time: 12/8/11 @1630 Analyst: CW
Species: Chironomus dilutus
Lot/Batch No.: 11-028
DRY GROSS: Date/time: 12/13/11@1000 Analyst: CW
Analytical Balance ID:
ASHED GROSS: Date/time: 12/16/11@1100-1230 Analyst: CW
Dried in Oven # 3 from Date: 12/8/11 Time: 1645
Oven °C: 60-90 to Date: 12/13/11 Time: 0925
Ashed in Furnace from Date: 12/13/11 Time: 1100
Furnace °C: 550 to Date: 12/13/11 Time: 1630

Indicate mean weight is **Dry Weight** or **(AFDW)** (Circle one)

Boat No.	Treatment	Rep	Tare Weight (g) A	Dry Gross Weight (g) B	Dry Net Weight (g) (B-A)	Adjusted Dry Net Weight (g)[1]	Ashed Gross Weight (g) (D)	AFDW (g) (B-D)	No. of Original Org.	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Org.	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
• 3B	L.Johnson	H	2.24642	2.25918	0.01276		2.24789	0.01129	9			6 ▲		
• 6	Middle Sherman	A	2.14744	2.15585	0.00841		2.15085	0.00500				4		
④ B7		B	2.56437	2.57087	0.00650		2.56647	0.00440				4		
• 9B		C	2.19549	2.20919	0.01370		2.20150	0.00769				7		
• 10B		D	1.93442	1.94977	0.01535		1.94197	0.00780				6		
• 28B		E	2.06910	2.07927	0.01017		2.07343	0.00584	9			5 ☒ ①	note: one of the 5 orgs was partially pupated	
• 29B		F	2.03751	2.04808	0.01057		2.04244	0.00564				5		
⑧ 36B		G	2.02155	2.03523	0.01368		2.02736	0.00787				7		
④ 41B		H	2.26881	2.28204	0.01323		2.27503	0.00701				6		
D Blank			1.97082	1.97080			NM							
E Blank			2.35711	2.35712			NM							

[1] Add in weight loss of blank boat, if appropriate.
① AR 01/13/12 E ② CW 02/02/12 CF

• Use blank A ⑧ Use blank C and the corresponding times in furnace ④ Use blank B and the corresponding times in furnace

① ☒ ~~Middle Sherman E had 6 survivors but I was lost in drying process~~

▲ Lower Johnson H had 7 survivors, but I was lost during drying process

CW 01/13/12
QA: AR 01/13/12

Chironomus dilutus Ash-Free Dry Weight (AFDW) Determination

Test Start Date:	11/18/2011	**Test End Date:**	11/28/2011
Test Number(s):	60225262-058-(~~060-066~~ 055-060)	**Test Material:**	Sediment
Species:	*C. dilutus*	**Entered by:**	Christina Needham

Boat #	Treatment	Rep	Tare wt (dry) (g)	Gross wt (dry) (g)	Dry net wt (g)	Dry adjusted net wt (g)	Ashed gross wt (g)	AFDW (g)	Adjusted AFDW (g)	Number original organisms	Mean wt per orig (mg) AFDW	Mean wt per treatment (orig) (mg) AFDW	Number surviving	Mean wt per surviving AFDW	Mean wt per treatment (surv) (mg) AFDW
1	Sand cont	A	1.98766	1.99650	0.00884	0.00887	1.99071	0.00579	0.00579	10	0.5790	0.5660	8	0.7237	0.7691
2		B	2.20280	2.20967	0.00687	0.00690	2.20362	0.00605	0.00605	10	0.6050		8	0.7563	
3		C	1.88503	1.89179	0.00676	0.00679	1.88722	0.00457	0.00457	10	0.4570		5	0.9140	
4		D	2.22825	2.23477	0.00652	0.00655	2.22928	0.00549	0.00549	9	0.6100		8	0.6862	
5		E	2.21528	2.22220	0.00692	0.00695	2.21651	0.00569	0.00569	10	0.5690		8	0.7112	
7		F	2.03168	2.03909	0.00741	0.00744	2.03333	0.00576	0.00576	10	0.5760		7	0.8229	
8	Form sed	A	2.22211	2.23859	0.01648	0.01651	2.22839	0.01020	0.01020	10	1.0200	0.8741	9	1.1333	1.1856
9		B	1.94352	1.95670	0.01318	0.01321	1.94835	0.00835	0.00835	10	0.8350		8	1.0438	
10		C	2.21543	2.22970	0.01427	0.01430	2.22183	0.00787	0.00787	10	0.7870		6	1.3117	
11		D	2.23168	2.24368	0.01200	0.01203	2.23491	0.00877	0.00877	10	0.8770		6	1.4617	
12		E	2.35657	2.37240	0.01583	0.01586	2.36092	0.01148	0.01148	10	1.1480		8	1.4350	
13		F	2.17951	2.19107	0.01156	0.01159	2.18395	0.00712	0.00712	10	0.7120		6	1.1867	
14		G	2.21717	2.22863	0.01146	0.01149	2.22166	0.00697	0.00697	10	0.6970		7	0.9957	
15		H	2.29082	2.30545	0.01463	0.01466	2.29628	0.00917	0.00917	10	0.9170		10	0.9170	
16	nlet Upper Slate	A	1.96481	1.97584	0.01103	0.01106	1.96826	0.00758	0.00758	10	0.7580	0.6445	6	1.2633	1.0537
17		B	2.29295	2.30115	0.00820	0.00823	2.29530	0.00585	0.00585	10	0.5850		5	1.1700	
18		C	2.23689	2.24801	0.01112	0.01115	2.24014	0.00787	0.00787	10	0.7870		7	1.1243	
19		D	2.11460	2.12090	0.00630	0.00633	2.11621	0.00469	0.00469	10	0.4690		5	0.9380	
20		E	2.37662	2.38578	0.00916	0.00919	2.37918	0.00660	0.00660	10	0.6600		7	0.9429	
21		F	1.87369	1.88161	0.00792	0.00795	1.87623	0.00538	0.00538	10	0.5380		6	0.8967	
22		G	1.82777	1.83891	0.01114	0.01117	1.83176	0.00715	0.00715	10	0.7150		7	1.0214	
23		H	2.07904	2.08855	0.00951	0.00954	2.08211	0.00644	0.00644	10	0.6440		6	1.0733	
24	Lower Sherman	A	2.32528	2.34056	0.01528	0.01531	2.33246	0.00810	0.00810	10	0.8100	0.6312	8	1.0125	1.1201
25		B	2.30195	2.31919	0.01724	0.01727	2.31053	0.00866	0.00866	10	0.8660		8	1.0825	
26		C	2.27462	2.28230	0.00768	0.00771	2.27802	0.00428	0.00428	10	0.4280		4	1.0700	
27		D	1.98082	1.98804	0.00722	0.00725	1.98358	0.00446	0.00446	10	0.4460		3	1.4867	
28		E	2.20960	2.22129	0.01169	0.01169	2.21489	0.00640	0.00640	10	0.6400		6	1.0667	
29		F	2.24436	2.25490	0.01054	0.01054	2.24980	0.00510	0.00510	9	0.5667		4	1.2750	
30		G	2.05894	2.06611	0.00717	0.00717	2.06105	0.00506	0.00506	10	0.5060		6	0.8433	
31		H	2.23133	2.24627	0.01494	0.01494	2.23840	0.00787	0.00787	10	0.7870		7	1.1243	

CW 02/02/12 CT

CW 01/13/12

QA: AR 01/13/12

Chironomus dilutus Ash-Free Dry Weight (AFDW) Determination

Test Start Date:	11/18/2011 ~~075-080~~	**Test End Date:**	11/28/2011
Test Number(s):	60225262-058-(~~063-068~~)①	**Test Material:**	Sediment
Species:	*C. dilutus*	**Entered by:**	Christina Needham

Boat #	Treatment	Rep	Tare wt (dry) (g)	Gross wt (dry) (g)	Dry net wt (g)	Dry adjusted net wt (g)	Ashed gross wt (g)	AFDW (g)	Adjusted AFDW (g)	Number original organisms	Mean wt per orig (mg) AFDW	Mean wt per treatment (orig) (mg) AFDW	Number surviving	Mean wt per surviving AFDW	Mean wt per treatment (surv) (mg) AFDW
33	Middle Slate	A	2.24651	2.25712	0.01061	0.01061	2.24907	0.00805	0.00805	10	0.8050	0.7178	8	1.0062	0.9255
34		B	1.82243	1.83289	0.01046	0.01046	1.82566	0.00723	0.00723	10	0.7230		9	0.8033	
35		C	2.08135	2.09123	0.00988	0.00988	2.08350	0.00773	0.00773	10	0.7730		8	0.9663	
36		D	1.95061	1.95682	0.00621	0.00621	1.95177	0.00505	0.00505	10	0.5050		5	1.0100	
37		E	1.87730	1.88663	0.00933	0.00933	1.87948	0.00715	0.00715	10	0.7150		8	0.8937	
39		F	1.94708	1.95799	0.01091	0.01091	1.95013	0.00786	0.00786	10	0.7860		9	0.8733	
40	Lower Slate	A	1.75882	1.77355	0.01473	0.01473	1.76533	0.00822	0.00822	10	0.8220	0.7490	6	1.3700	1.2562
41		B	1.88183	1.89632	0.01449	0.01449	1.88831	0.00801	0.00801	10	0.8010		6	1.3350	
42		C	1.93580	1.94627	0.01047	0.01047	1.93998	0.00629	0.00629	10	0.6290		5	1.2580	
43		D	2.21729	2.22306	0.00577	0.00577	2.21963	0.00343	0.00343	10	0.3430		3	1.1433	
44		E	2.24508	2.25596	0.01088	0.01088	2.24895	0.00701	0.00701	10	0.7010		5	1.4020	
45		F	2.24060	2.25535	0.01475	0.01475	2.24657	0.00878	0.00878	10	0.8780		7	1.2543	
46		G	1.87060	1.88377	0.01317	0.01317	1.87582	0.00795	0.00795	10	0.7950		7	1.1357	
47		H	1.87603	1.89229	0.01626	0.01626	1.88308	0.00921	0.00921	9	1.0233		8	1.1512	
48	Lower Johnson	A	1.98055	1.99478	0.01423	0.01423	1.98716	0.00762	0.00762	10	0.7620	0.8356	9	0.8467	1.1695
49		B	2.12133	2.13940	0.01807	0.01807	2.12978	0.00962	0.00962	10	0.9620		10	0.9620	
50		C	2.12985	2.13779	0.00794	0.00794	2.13274	0.00505	0.00505	9	0.5611		4	1.2625	
52		D	2.03561	2.05231	0.01670	0.01670	2.04369	0.00862	0.00862	10	0.8620		8	1.0775	
55		E	1.85798	1.87240	0.01442	0.01442	1.86408	0.00832	0.00832	10	0.8320		7	1.1886	
60		F	2.06066	2.07189	0.01123	0.01123	2.06623	0.00566	0.00566	10	0.5660		7	0.8086	
64		G	2.15883	2.17404	0.01521	0.01521	2.16607	0.00797	0.00797	9	0.8856		6	1.3283	
33		H	2.24642	2.25918	0.01276	0.01279	2.24789	0.01129	0.01129	9	1.2544		6	1.8817	
6	Middle Sherman	A	2.14744	2.15585	0.00841	0.00844	2.15085	0.00500	0.00500	10	0.5000	0.6487	4	1.2500	1.1671
B7		B	2.56437	2.57087	0.00650	0.00650	2.56647	0.00440	0.00440	10	0.4400		4	1.1000	
9B		C	2.19549	2.20919	0.01370	0.01373	2.20150	0.00769	0.00769	10	0.7690		7	1.0986	
10B		D	1.93442	1.94977	0.01535	0.01538	1.94197	0.00780	0.00780	10	0.7800		6	1.3000	
28B		E	2.06910	2.07927	0.01017	0.01020	2.07343	0.00584	0.00584	9	0.6489		5	1.1680	
29B		F	2.03751	2.04808	0.01057	0.01060	2.04244	0.00564	0.00564	10	0.5640		5	1.1280	
36B		G	2.02155	2.03523	0.01368	0.01368	2.02736	0.00787	0.00787	10	0.7870		7	1.1243	
41B		H	2.26881	2.28204	0.01323	0.01323	2.27503	0.00701	0.00701	10	0.7010		6	1.1683	
Blank	A		2.35273	2.35270	-0.00003		2.35273	0.00003	0.00003						
Blank	B		2.26189	2.26189	0.00000		2.26192	0.00003	0.00003						
Blank	C		1.97054	1.97054	0.00000		1.97055	0.00001	0.00001						

①CW 02/02/12 CF

cw 1/9/12
aA: AR 01/13/12

File: 058063s.dat Transform: NO TRANSFORMATION
Number of Groups: 8

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	Form Sed	1	0.9000	0.9000
1	Form Sed	2	0.8000	0.8000
1	Form Sed	3	0.6000	0.6000
1	Form Sed	4	0.6000	0.6000
1	Form Sed	5	0.8000	0.8000
1	Form Sed	6	0.6000	0.6000
1	Form Sed	7	0.7000	0.7000
1	Form Sed	8	1.0000	1.0000
2	In. Upper Slate	1	0.6000	0.6000
2	In. Upper Slate	2	0.5000	0.5000
2	In. Upper Slate	3	0.7000	0.7000
2	In. Upper Slate	4	0.5000	0.5000
2	In. Upper Slate	5	0.7000	0.7000
2	In. Upper Slate	6	0.6000	0.6000
2	In. Upper Slate	7	0.7000	0.7000
2	In. Upper Slate	8	0.6000	0.6000
3	Lower Sherman	1	0.8000	0.8000
3	Lower Sherman	2	0.8000	0.8000
3	Lower Sherman	3	0.4000	0.4000
3	Lower Sherman	4	0.3000	0.3000
3	Lower Sherman	5	0.6000	0.6000
3	Lower Sherman	6	0.5000	0.5000
3	Lower Sherman	7	0.6000	0.6000
3	Lower Sherman	8	0.7000	0.7000
4	Middle Slate	1	0.8000	0.8000
4	Middle Slate	2	0.9000	0.9000
4	Middle Slate	3	0.8000	0.8000
4	Middle Slate	4	0.5000	0.5000
4	Middle Slate	5	0.8000	0.8000
4	Middle Slate	6	0.9000	0.9000
5	Lower Slate	1	0.6000	0.6000
5	Lower Slate	2	0.6000	0.6000
5	Lower Slate	3	0.5000	0.5000
5	Lower Slate	4	0.3000	0.3000
5	Lower Slate	5	0.5000	0.5000
5	Lower Slate	6	0.7000	0.7000
5	Lower Slate	7	0.7000	0.7000
5	Lower Slate	8	0.9000	0.9000
6	Lower Johnson	1	0.9000	0.9000
6	Lower Johnson	2	1.0000	1.0000
6	Lower Johnson	3	0.5000	0.5000
6	Lower Johnson	4	0.8000	0.8000
6	Lower Johnson	5	0.7000	0.7000
6	Lower Johnson	6	0.7000	0.7000
6	Lower Johnson	7	0.7000	0.7000
6	Lower Johnson	8	0.7000	0.7000
7	Middle Sherman	1	0.4000	0.4000
7	Middle Sherman	2	0.4000	0.4000
7	Middle Sherman	3	0.7000	0.7000
7	Middle Sherman	4	0.6000	0.6000
7	Middle Sherman	5	0.5000	0.5000
7	Middle Sherman	6	0.5000	0.5000
7	Middle Sherman	7	0.7000	0.7000
7	Middle Sherman	8	0.6000	0.6000
8	Sand	1	0.8000	0.8000
8	Sand	2	0.8000	0.8000
8	Sand	3	0.5000	0.5000
8	Sand	4	0.9000	0.9000
8	Sand	5	0.8000	0.8000
8	Sand	6	0.7000	0.7000

①cw 02/02/12 cf

Title: 60225262-058-(063-068) C. dilutus survival
File: 058063s.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Form Sed	8	0.6000	1.0000	0.7500
2	In. Upper Slate	8	0.5000	0.7000	0.6125
3	Lower Sherman	8	0.3000	0.8000	0.5875
4	Middle Slate	6	0.5000	0.9000	0.7833
5	Lower Slate	8	0.3000	0.9000	0.6000
6	Lower Johnson	8	0.5000	1.0000	0.7500
7	Middle Sherman	8	0.4000	0.7000	0.5500
8	Sand	6	0.5000	0.9000	0.7500

Title: 60225262-058-(063-068) C. dilutus survival
File: 058063s.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Form Sed	0.0229	0.1512	0.0535	20.1581
2	In. Upper Slate	0.0070	0.0835	0.0295	13.6249
3	Lower Sherman	0.0327	0.1808	0.0639	30.7697
4	Middle Slate	0.0217	0.1472	0.0601	18.7910
5	Lower Slate	0.0314	0.1773	0.0627	29.5468
6	Lower Johnson	0.0229	0.1512	0.0535	20.1581
7	Middle Sherman	0.0143	0.1195	0.0423	21.7314
8	Sand	0.0190	0.1378	0.0563	18.3787

Title: 60225262-058-(063-068) C. dilutus survival
File: 058063cs.dat Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's Test for Normality

******** Shapiro - Wilk's Test is aborted ********

This test can not be performed because total number of replicates is greater than 50.

Total number of replicates = 54

Title: 60225262-058-(063-068) C. dilutus survival
File: 058063cs.dat Transform: ARC SINE(SQUARE ROOT(Y))

Chi-Square Test for Normality

Actual and Expected Frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	3.6180	13.0680	20.6280	13.0680	3.6180
OBSERVED	3	11	25	12	3

Chi-Square = 1.5523 (p-value = 0.8173)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: 60225262-058-(063-068) C. dilutus survival
File: 058063cs.dat Transform: ARC SINE(SQUARE ROOT(Y))

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 6.1586 (p-value = 0.4057)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 16.8119 (alpha = 0.01, df = 6)
= 12.5916 (alpha = 0.05, df = 6)

Using Average Degrees of Freedom
(Based on average replicate size of 7.71)

Calculated B2 statistic = 5.2494 (p-value = 0.5122)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

CW 02/02/12 CF

w 1/9/12

QA: AR 01/13/12

Title: 60225262-058-(063-068) C. dilutus survival
File: 058063cs.dat Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA Table

SOURCE	DF	SS	MS	F
Between	6	0.5335	0.0889	3.1298
Within (Error)	47	1.3352	0.0284	
Total	53	1.8686		

(p-value = 0.0116)

Critical F = 3.2128 (alpha = 0.01, df = 6,47)
= 2.2990 (alpha = 0.05, df = 6,47)

Since F > Critical F REJECT Ho: All equal (alpha = 0.05)

Title: 60225262-058-(063-068) C. dilutus survival
File: 058063cs.dat Transform: ARC SINE(SQUARE ROOT(Y))

Bonferroni t-Test - TABLE 1 OF 2 Ho: Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	TRANS t STAT	SIG 0.05
1	Form Sed	1.0656	0.7500		
2	In. Upper Slate	0.9003	0.6125	1.9613	
3	Lower Sherman	0.8784	0.5875	2.2210	
4	Middle Slate	1.1008	0.7833	-0.3870	
5	Lower Slate	0.8942	0.6000	2.0333	
6	Lower Johnson	1.0648	0.7500	0.0097	
7	Middle Sherman	0.8368	0.5500	2.7145	*

Bonferroni t critical value = 2.4827 (1 Tailed, alpha = 0.05, df = 6,47)

Title: 60225262-058-(063-068) C. dilutus survival
File: 058063cs.dat Transform: ARC SINE(SQUARE ROOT(Y))

Bonferroni t-Test - TABLE 2 OF 2 Ho: Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	MIN SIG DIFF (IN ORIG. UNITS)	% OF CONTROL	DIFFERENCE FROM CONTROL
1	Form Sed	8			
2	In. Upper Slate	8	0.1950	25.5	0.1375
3	Lower Sherman	8	0.1950	25.5	0.1625
4	Middle Slate	6	0.2117	27.6	-0.0333
5	Lower Slate	8	0.1950	25.5	0.1500
6	Lower Johnson	8	0.1950	25.5	0.0000
7	Middle Sherman	8	0.1950	25.5	0.2000

Dcw 02/02/12 cf

CW 1/9/12
QA: AR 01/13/12

File: 058063g.dat Transform: NO TRANSFORMATION
Number of Groups: 8

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	Form Sed	1	1.0200	1.0200
1	Form Sed	2	0.8350	0.8350
1	Form Sed	3	0.7870	0.7870
1	Form Sed	4	0.8770	0.8770
1	Form Sed	5	1.1480	1.1480
1	Form Sed	6	0.7120	0.7120
1	Form Sed	7	0.6970	0.6970
1	Form Sed	8	0.9170	0.9170
2	In. Upper Slate	1	0.7580	0.7580
2	In. Upper Slate	2	0.5850	0.5850
2	In. Upper Slate	3	0.7870	0.7870
2	In. Upper Slate	4	0.4690	0.4690
2	In. Upper Slate	5	0.6600	0.6600
2	In. Upper Slate	6	0.5380	0.5380
2	In. Upper Slate	7	0.7150	0.7150
2	In. Upper Slate	8	0.6440	0.6440
3	Lower Sherman	1	0.8100	0.8100
3	Lower Sherman	2	0.8660	0.8660
3	Lower Sherman	3	0.4280	0.4280
3	Lower Sherman	4	0.4460	0.4460
3	Lower Sherman	5	0.6400	0.6400
3	Lower Sherman	6	0.5667	0.5667
3	Lower Sherman	7	0.5060	0.5060
3	Lower Sherman	8	0.7870	0.7870
4	Middle Slate	1	0.8050	0.8050
4	Middle Slate	2	0.7230	0.7230
4	Middle Slate	3	0.7730	0.7730
4	Middle Slate	4	0.5050	0.5050
4	Middle Slate	5	0.7150	0.7150
4	Middle Slate	6	0.7860	0.7860
5	Lower Slate	1	0.8220	0.8220
5	Lower Slate	2	0.8010	0.8010
5	Lower Slate	3	0.6290	0.6290
5	Lower Slate	4	0.3430	0.3430
5	Lower Slate	5	0.7010	0.7010
5	Lower Slate	6	0.8780	0.8780
5	Lower Slate	7	0.7950	0.7950
5	Lower Slate	8	1.0233	1.0233
6	Lower Johnson	1	0.7620	0.7620
6	Lower Johnson	2	0.9620	0.9620
6	Lower Johnson	3	0.5611	0.5611
6	Lower Johnson	4	0.8620	0.8620
6	Lower Johnson	5	0.8320	0.8320
6	Lower Johnson	6	0.5660	0.5660
6	Lower Johnson	7	0.8856	0.8856
6	Lower Johnson	8	1.2544	1.2544
7	Middle Sherman	1	0.5000	0.5000
7	Middle Sherman	2	0.4400	0.4400
7	Middle Sherman	3	0.7690	0.7690
7	Middle Sherman	4	0.7800	0.7800
7	Middle Sherman	5	0.6489	0.6489
7	Middle Sherman	6	0.5640	0.5640
7	Middle Sherman	7	0.7870	0.7870
7	Middle Sherman	8	0.7010	0.7010
8	Sand	1	0.5790	0.5790
8	Sand	2	0.6050	0.6050
8	Sand	3	0.4570	0.4570
8	Sand	4	0.6100	0.6100
8	Sand	5	0.5690	0.5690
8	Sand	6	0.5760	0.5760

Title: 60225262-058-(063-068) C. dilutus AFDW
File: 058063g.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Form Sed	8	0.6970	1.1480	0.8741
2	In. Upper Slate	8	0.4690	0.7870	0.6445
3	Lower Sherman	8	0.4280	0.8660	0.6312
4	Middle Slate	6	0.5050	0.8050	0.7178
5	Lower Slate	8	0.3430	1.0233	0.7490
6	Lower Johnson	8	0.5611	1.2544	0.8356
7	Middle Sherman	8	0.4400	0.7870	0.6487
8	Sand	6	0.4570	0.6100	0.5660

Title: 60225262-058-(063-068) C. dilutus AFDW
File: 058063g.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Form Sed	0.0236	0.1535	0.0543	17.5592
2	In. Upper Slate	0.0120	0.1096	0.0387	17.0051
3	Lower Sherman	0.0296	0.1719	0.0608	27.2352
4	Middle Slate	0.0121	0.1101	0.0450	15.3392
5	Lower Slate	0.0405	0.2013	0.0712	26.8706
6	Lower Johnson	0.0497	0.2230	0.0788	26.6835
7	Middle Sherman	0.0181	0.1344	0.0475	20.7149
8	Sand	0.0031	0.0559	0.0228	9.8738

Title: 60225262-058-(063-068) C. dilutus AFDW
File: 058063.dat Transform: NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

D = 1.1481
W = 0.9920

Critical W = 0.9270 (alpha = 0.01 , N = 46)
W = 0.9450 (alpha = 0.05 , N = 46)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: 60225262-058-(063-068) C. dilutus AFDW
File: 058063.dat Transform: NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 5.0283 (p-value = 0.4124)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Critical B = 15.0863 (alpha = 0.01, df = 5)
= 11.0705 (alpha = 0.05, df = 5)

Using Average Degrees of Freedom
(Based on average replicate size of 7.67)

Calculated B2 statistic = 4.7321 (p-value = 0.4494)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

cw 1/9/12
AA: AR 2/13/12

Title: 60225262-058-(063-068) C. dilutus AFDW
File: 058063.dat Transform: NO TRANSFORMATION

ANOVA Table

SOURCE	DF	SS	MS	F
Between	5	0.3879	0.0776	2.7028
Within (Error)	40	1.1481	0.0287	
Total	45	1.5360		

(p-value = 0.0339)

Critical F = 3.5138 (alpha = 0.01, df = 5,40)
= 2.4495 (alpha = 0.05, df = 5,40)

Since F > Critical F REJECT Ho: All equal (alpha = 0.05)

Title: 60225262-058-(063-068) C. dilutus AFDW
File: 058063.dat Transform: NO TRANSFORMATION

Bonferroni t-Test - TABLE 1 OF 2 Ho: Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	t STAT	SIG 0.05
1	Form Sed	0.8741	0.8741		
2	In. Upper Slate	0.6445	0.6445	2.7108	*
3	Lower Sherman	0.6312	0.6312	2.8676	*
4	Middle Slate	0.7178	0.7178	1.7082	
5	Lower Slate	0.7490	0.7490	1.4767	
6	Lower Johnson	0.8356	0.8356	0.4544	

Bonferroni t critical value = 2.4233 (1 Tailed, alpha = 0.05, df = 5,40)

Title: 60225262-058-(063-068) C. dilutus AFDW
File: 058063.dat Transform: NO TRANSFORMATION

Bonferroni t-Test - TABLE 2 OF 2 Ho: Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	MIN SIG DIFF (IN ORIG. UNITS)	% OF CONTROL	DIFFERENCE FROM CONTROL
1	Form Sed	8			
2	In. Upper Slate	8	0.2053	23.5	0.2296
3	Lower Sherman	8	0.2053	23.5	0.2429
4	Middle Slate	6	0.2217	25.4	0.1563
5	Lower Slate	8	0.2053	23.5	0.1251
6	Lower Johnson	8	0.2053	23.5	0.0385

Dw 02/08/12 cf

CW 01/13/12
QA: AR 02/01/12

File: 058063gs.dat Transform: NO TRANSFORMATION
Number of Groups: 8

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	Form Sed	1	1.1333	1.1333
1	Form Sed	2	1.0438	1.0438
1	Form Sed	3	1.3117	1.3117
1	Form Sed	4	1.4617	1.4617
1	Form Sed	5	1.4350	1.4350
1	Form Sed	6	1.1867	1.1867
1	Form Sed	7	0.9957	0.9957
1	Form Sed	8	0.9170	0.9170
2	In. Upper Slate	1	1.2633	1.2633
2	In. Upper Slate	2	1.1700	1.1700
2	In. Upper Slate	3	1.1243	1.1243
2	In. Upper Slate	4	0.9380	0.9380
2	In. Upper Slate	5	0.9429	0.9429
2	In. Upper Slate	6	0.8967	0.8967
2	In. Upper Slate	7	1.0214	1.0214
2	In. Upper Slate	8	1.0733	1.0733
3	Lower Sherman	1	1.0125	1.0125
3	Lower Sherman	2	1.0825	1.0825
3	Lower Sherman	3	1.0700	1.0700
3	Lower Sherman	4	1.4867	1.4867
3	Lower Sherman	5	1.0667	1.0667
3	Lower Sherman	6	1.2750	1.2750
3	Lower Sherman	7	0.8433	0.8433
3	Lower Sherman	8	1.1243	1.1243
4	Middle Slate	1	1.0062	1.0062
4	Middle Slate	2	0.8033	0.8033
4	Middle Slate	3	0.9663	0.9663
4	Middle Slate	4	1.0100	1.0100
4	Middle Slate	5	0.8937	0.8937
4	Middle Slate	6	0.8733	0.8733
5	Lower Slate	1	1.3700	1.3700
5	Lower Slate	2	1.3350	1.3350
5	Lower Slate	3	1.2580	1.2580
5	Lower Slate	4	1.1433	1.1433
5	Lower Slate	5	1.4020	1.4020
5	Lower Slate	6	1.2543	1.2543
5	Lower Slate	7	1.1357	1.1357
5	Lower Slate	8	1.1512	1.1512
6	Lower Johnson	1	0.8467	0.8467
6	Lower Johnson	2	0.9620	0.9620
6	Lower Johnson	3	1.2625	1.2625
6	Lower Johnson	4	1.0775	1.0775
6	Lower Johnson	5	1.1886	1.1886
6	Lower Johnson	6	0.8086	0.8086
6	Lower Johnson	7	1.3283	1.3283
6	Lower Johnson	8	1.8817	1.8817
7	Middle Sherman	1	1.2500	1.2500
7	Middle Sherman	2	1.1000	1.1000
7	Middle Sherman	3	1.0986	1.0986
7	Middle Sherman	4	1.3000	1.3000
7	Middle Sherman	5	1.1680	1.1680
7	Middle Sherman	6	1.1280	1.1280
7	Middle Sherman	7	1.1243	1.1243
7	Middle Sherman	8	1.1683	1.1683
8	Sand	1	0.7237	0.7237
8	Sand	2	0.7563	0.7563
8	Sand	3	0.9140	0.9140
8	Sand	4	0.6862	0.6862
8	Sand	5	0.7112	0.7112
8	Sand	6	0.8229	0.8229

CW 02/02/12 cf

ew 01/13/12
QA: AR02/01/12

File: 058063gs.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Form Sed	8	0.9170	1.4617	1.1856
2	In. Upper Slate	8	0.8967	1.2633	1.0537
3	Lower Sherman	8	0.8433	1.4867	1.1201
4	Middle Slate	6	0.8033	1.0100	0.9255
5	Lower Slate	8	1.1357	1.4020	1.2562
6	Lower Johnson	8	0.8086	1.8817	1.1695
7	Middle Sherman	8	1.0986	1.3000	1.1672
8	Sand	6	0.6862	0.9140	0.7690

File: 058063gs.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Form Sed	0.0408	0.2019	0.0714	17.0303
2	In. Upper Slate	0.0163	0.1277	0.0452	12.1204
3	Lower Sherman	0.0362	0.1903	0.0673	16.9852
4	Middle Slate	0.0068	0.0824	0.0337	8.9085
5	Lower Slate	0.0112	0.1060	0.0375	8.4417
6	Lower Johnson	0.1182	0.3438	0.1216	29.3982
7	Middle Sherman	0.0053	0.0728	0.0257	6.2369
8	Sand	0.0073	0.0853	0.0348	11.0855

CW 01/13/12
QA: KRO 2/01/12

File: 058063so.dat Transform: NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

D = 1.5931
W = 0.9417

Critical W = 0.9270 (alpha = 0.01 , N = 46)
W = 0.9450 (alpha = 0.05 , N = 46)

Data PASS normality test (alpha = 0.01). Continue analysis.

File: 058063so.dat Transform: NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 15.8892 (p-value = 0.0072)

Data FAIL B1 homogeneity test at 0.01 level. Try another transformation.

Critical B = 15.0863 (alpha = 0.01, df = 5)
= 11.0705 (alpha = 0.05, df = 5)

Using Average Degrees of Freedom
(Based on average replicate size of 7.67)

Calculated B2 statistic = 15.0327 (p-value = 0.0102)

Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

File: 058063so.dat Transform: NO TRANSFORMATION

Wilcoxon's Rank Sum Test w/ Bonferroni Adjustment Ho: Control<Treatment

GROUP	IDENTIFICATION	MEAN IN ORIGINAL UNITS	RANK SUM	CRIT. VALUE	REPS	SIG 0.05
1	Form Sed	1.1856				
2	In. Upper Slate	1.0537	55.00	45	8	
3	Lower Sherman	1.1201	63.00	45	8	
4	Middle Slate	0.9255	26.00	27	6	*
5	Lower Slate	1.2562	76.00	45	8	
6	Lower Johnson	1.1695	64.00	45	8	

Critical values are 1 tailed (k = 5)

CW 02/02/12 cf

File: 058063so.dat Transform: NO TRANSFORMATION

ANOVA Table

SOURCE	DF	SS	MS	F
Between	5	0.4625	0.0925	2.3223
Within (Error)	40	1.5931	0.0398	
Total	45	2.0555		

(p-value = 0.0608)

Critical F = 3.5138 (alpha = 0.01, df = 5,40)
= 2.4495 (alpha = 0.05, df = 5,40)

Since F < Critical F FAIL TO REJECT Ho: All equal (alpha = 0.05)

Title: 60225262-058-(063-068) C. dilutus AFDW (Per Surviving)
File: 058063so.dat Transform: NO TRANSFORMATION

Bonferroni t-Test - TABLE 1 OF 2 Ho: Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	t STAT	SIG 0.05
1	Form Sed	1.1856	1.1856		
2	In. Upper Slate	1.0537	1.0537	1.3216	
3	Lower Sherman	1.1201	1.1201	0.6563	
4	Middle Slate	0.9255	0.9255	2.4137	
5	Lower Slate	1.2562	1.2562	-0.7073	
6	Lower Johnson	1.1695	1.1695	0.1616	

Bonferroni t critical value = 2.4233 (1 Tailed, alpha = 0.05, df = 5,40)

Title: 60225262-058-(063-068) C. dilutus AFDW (Per Surviving)
File: 058063so.dat Transform: NO TRANSFORMATION

Bonferroni t-Test - TABLE 2 OF 2 Ho: Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	MIN SIG DIFF (IN ORIG. UNITS)	% OF CONTROL	DIFFERENCE FROM CONTROL
1	Form Sed	8			
2	In. Upper Slate	8	0.2418	20.4	0.1319
3	Lower Sherman	8	0.2418	20.4	0.0655
4	Middle Slate	6	0.2612	22.0	0.2601
5	Lower Slate	8	0.2418	20.4	-0.0706
6	Lower Johnson	8	0.2418	20.4	0.0161

APPENDIX C

Analytical Data

FCETL QA Form No.131
Revision 0
Effective 10/06

AR: AR 01/11/12

PERCENT TOTAL SOLIDS AND PERCENT TOTAL VOLATILE SOLIDS (TVS)

Project No: 60225262-058-C15-080 (C63-066) ③

TARE: Date/time: 12/8/11 @ 1515 Analyst: AB/CW

DRY GROSS: Date/time: 12/9/11 @1250 Analyst: CW

ASHED GROSS: Date/time: 12/13/11 @ 1025 Analyst: CW

Analytical Balance ID: A+D #2

Dried in Oven # 1 from Date: 12/8/11 Time: 1540
Oven °C: 104 to Date: 12/9/11 Time: 1220

Ashed in Furnace from Date: 12/9/11 Time: 1300
Furnace °C: 550 to Date: 12/9/11 Time: 1635

	Dish No.	Treatment	Rep	Tare Weight of Dish (g) A	Dish + Wet Sample (g) B	Dry Gross Weight (g) (dish + dry sample) C	% Total Solids (g) [(C-A)(100)]/(B-A)	Ashed Gross Weight (dish + sample)(g) D	% Total Volatile Solids (g) [(C-D)(100)]/(C-A)
▲	6	inlet Upper Side		17.4731	38.1931	32.5184		31.9334	
▲	5(side)	"		28.2594	57.4630	49.3248		48.4312	
▲	54B	Lower Side		26.4402	55.5349	49.1594		48.3934	
▲	52	"		25.7186	46.9934	42.2961		41.7338	
	7	Middle Side		19.9943	39.9894	32.0925		31.1624	
	19	"		18.0636	38.3900	30.2261		29.2623	
	26	Lower Sherman		19.0541	42.1467	35.8163		35.3507	
	15	"		18.3875	39.9342	34.2720		33.8392	
	16	Middle Sherman		19.1703	43.2400	36.4068		35.8727	
▲	21	"		19.9266	40.4985	35.0048		34.6220	
	28	Lower Johnson		18.1432	39.7009	34.1146		33.7975	
	10	"		18.0139 ① 45	41.6577	35.6213		35.2623	
▲	Blank	(53)		26.6048	~~26.6035~~ ②	~~26.6048~~ 26.6035		26.6043	
	Blank	(1)		20.2117	~~20.2105~~ ②	20.2105		20.2114	

[1] Add in weight loss of blank boat, if appropriate.

① AB 12/8/11 C
② CW 12/9/11 WP
③ CW 01/02/12 CF

▲ Ashed in Furnace from 12/12/11 @ 1030 to 12/12/11 @ 1640
Ashed gross weight 12/13/11 @ 0950 CW

cw 12/20/11
QA: AR 01/11/12

Percent Total Solids and Percent Total Volatile Solids

Project Number: 60225262-058-(~~063-068~~ 075-080 ①)

Treatment	Rep		Tare Weight (g) A	Dish + Wet Sample (g) B	Dry Gross Weight (g) (dish + dry sample) C	% Total Solids [(C-A)(100)]/(B-A)	Treatment Mean % Total Solids	Ashed Gross Weight (g) (dish + sample) D	% Total Volatile Solids [(C-D)(100)]/(C-A)	Treatment Mean % Total Volatile Solids
Inlet Upper Slate	A		17.8731	38.1931	32.5184	72.0733	72.1029	31.9334	3.9945	4.1183
	B		28.2599	57.4630	49.3248	72.1324		48.4312	4.2421	
Lower Slate	A		26.4402	55.5349	49.1594	78.0871	78.0040	48.3934	3.3716	3.3818
	B		25.7186	46.9934	42.2961	77.9208		41.7338	3.3919	
Middle Slate	A		19.9943	39.9894	32.0925	60.5058	60.1709	31.1624	7.6879	7.8061
	B		18.0636	38.3900	30.2261	59.8360		29.2623	7.9244	
Lower Sherman	A		19.0541	42.1467	35.8163	72.5869	73.1541	35.3507	2.7777	2.7512
	B		18.3875	39.9342	34.2720	73.7213		33.8392	2.7247	
Middle Sherman	A		19.1703	43.2400	36.4068	71.6108	72.4530	35.8727	3.0987	2.8187
	B		19.9266	40.4985	35.0048	73.2951		34.6220	2.5388	
Lower Johnson	A		18.1432	39.7009	34.1146	74.0868	74.2778	33.7975	1.9854	2.0122
	B		18.0145	41.6577	35.6213	74.4688		35.2623	2.0390	
Blank 1			26.6048		26.6035			26.6043		
Blank 2			20.2117		20.2105			20.2114		

① cw calculate cf

Friday, December 02, 2011

Analytical Laboratory

Rami Naddy
AECOM
4303 W Laporte Ave
Fort Collins, CO 80521

RE: FCETL/AECOM

Work Order: 1111062

Dear Rami Naddy:

MSE Lab Services received 7 sample(s) on 11/15/2011 for the analyses presented in the following report.

Please find enclosed analytical results for the sample(s) received at the MSE Laboratory.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Sara Ward

Sara Ward
Laboratory Manager
406-494-7334

Enclosure

12/2/11

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	FORM SED
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-001A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	1050	4.45	14.2		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	ND	0.103	0.354		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.061	0.006	0.024		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	7.31	0.130	0.472		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	0.940	0.097	0.295		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	0.390	0.011	0.047		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	0.986	0.068	0.236		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	ND	0.160	0.472		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	ND	0.087	0.236		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	3.92	0.216	0.708		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0366	0.126		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	25.3	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	8.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	86.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	6.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	LOAMYSAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	15.2	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-002A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	13600	5.04	16.0		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	16.2	0.116	0.401		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	1.46	0.007	0.027		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	29.4	0.147	0.535		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	56.7	0.110	0.334		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	7.79	0.012	0.054		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	47.4	0.077	0.267		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	0.720	0.182	0.535		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.134	0.098	0.267	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	220	0.244	0.802		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	0.0502	0.0393	0.136	J	mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	2.04	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	0.44	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	94.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	4.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	25.2	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/3/2011
Lab ID:	1111062-002B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS		**AVS-SEM**		**AVS-SEM**			Analyst: **kgw**
Sulfide	ND	0.55	1.50		µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT: AECOM
Lab Order: 1111062
Project: FCETL/AECOM
Lab ID: 1111062-003A

Client Sample ID: INLET UPPER SLATE
Tag Number:
Collection Date: 11/10/2011 11:00:00 AM
Matrix: SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	22500	5.25	16.7		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	17.9	0.121	0.418		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.722	0.007	0.028		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	127	0.153	0.557		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	53.4	0.114	0.348		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	3.37	0.012	0.056		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	87.5	0.080	0.278		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	0.809	0.189	0.557		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.120	0.103	0.278	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	130	0.254	0.835		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0489	0.169		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	5.46	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	4.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	94.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	28.2	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	INLET UPPER SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/4/2011
Lab ID:	1111062-003B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS		**AVS-SEM**		**AVS-SEM**			Analyst: kgw
Sulfide	1.39	0.55	1.50	J	µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	MIDDLE SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-004A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES		**SW6020**		**SW3050B**			Analyst: **kgw**
Aluminum	20100	6.31	20.1		mg/Kg-dry	4	11/23/2011 8:10:21 PM
Arsenic	30.0	0.146	0.502		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	20.9	0.009	0.034		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	29.5	0.184	0.669		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	88.4	0.137	0.418		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	8.50	0.015	0.067		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	143	0.096	0.335		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	1.41	0.227	0.669		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.233	0.123	0.335	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	1360	0.306	1.00		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B		**E245.5**		**SW7471A**			Analyst: **tr**
Mercury	0.0692	0.0545	0.188	J	mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK		**OM_WALKLEYBLACK**					Analyst: **dk**
Organic Matter - Walkley Black	11.0	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL		**ASTMD422**					Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	1.65	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5		**MSA15-5**					Analyst: **dk**
% Clay	10.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	86.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	4.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	LOAMYSAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE		**D2216**					Analyst: **BO**
Percent Moisture	40.2	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	MIDDLE SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/4/2011
Lab ID:	1111062-004B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS		**AVS-SEM**	**AVS-SEM**				Analyst: kgv
Sulfide	ND	0.55	1.50		µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	MIDDLE SHERMAN
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-005A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	19000	5.06	16.1		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	55.7	0.117	0.402		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.175	0.007	0.027		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	43.4	0.147	0.536		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	97.1	0.110	0.335		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	17.3	0.012	0.054		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	44.0	0.077	0.268		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	ND	0.182	0.536		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.633	0.099	0.268		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	120	0.245	0.804		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0412	0.142		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	1.17	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	0.22	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	96.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	25.4	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	MIDDLE SHERMAN
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/4/2011
Lab ID:	1111062-005B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS		**AVS-SEM**	**AVS-SEM**				Analyst: kgw
Sulfide	1.01	0.55	1.50	J	µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER SHERMAN
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-006A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	18200	4.88	15.5		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	28.9	0.112	0.388		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.389	0.007	0.026		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	46.2	0.142	0.517		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	94.0	0.106	0.323		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	6.70	0.012	0.052		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	45.9	0.074	0.259		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	ND	0.176	0.517		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.137	0.095	0.259	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	110	0.236	0.776		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0455	0.157		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	0.54	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	0.11	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	96.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	22.7	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit	
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)	

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER SHERMAN
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/3/2011
Lab ID:	1111062-006B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS		**AVS-SEM**	**AVS-SEM**				Analyst: kgw
Sulfide	1.50	0.55	1.50		µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER JOHNSON
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-007A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	13100	5.02	16.0		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	16.2	0.116	0.399		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.238	0.007	0.027		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	31.5	0.146	0.533		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	73.1	0.109	0.333		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	9.76	0.012	0.053		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	27.3	0.076	0.266		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	ND	0.181	0.533		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.164	0.098	0.266	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	93.3	0.243	0.799		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0386	0.133		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	0.89	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	96.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	24.9	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER JOHNSON
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/3/2011
Lab ID:	1111062-007B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS			**AVS-SEM**	**AVS-SEM**			Analyst: **kgw**
Sulfide	ND	0.55	1.50		µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Analytical Laboratory
P.O. Box 4078
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Butte, MT 59701
Lab: 406-494-7334
Fax: 406-494-7230
labinfo@mse-ta.com

Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: 5060

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
*Sample ID: **5060-PB FILTERED***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 6:39:56 PM*		
Arsenic	0.070	0.150	mg/Kg							J
Cadmium	0.012	0.010	mg/Kg							
Lead	0.020	0.020	mg/Kg							
Selenium	ND	0.200	mg/Kg							
Silver	0.078	0.100	mg/Kg							J
*Sample ID: **5060-PB UNFILTERED***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	0.150	0.150	mg/Kg							
Cadmium	0.004	0.010	mg/Kg							J
Lead	0.022	0.020	mg/Kg							
Selenium	ND	0.200	mg/Kg							
Silver	ND	0.100	mg/Kg							
*Sample ID: **5060-LCS***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	85.9	0.300	mg/Kg	85.30	101	80	120			
Cadmium	153	0.020	mg/Kg	159.0	96.4	80	120			
Lead	44.4	0.040	mg/Kg	46.30	96.0	80	120			
Selenium	39.3	0.400	mg/Kg	45.20	87.0	80	120			
Silver	24.7	0.200	mg/Kg	24.30	102	80	120			
*Sample ID: **1111062-007A MS***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	146	0.399	mg/Kg-dry	113.6	114	75	125			
Cadmium	202	0.027	mg/Kg-dry	211.7	95.2	75	125			
Lead	67.2	0.053	mg/Kg-dry	61.65	93.1	75	125			
Selenium	56.8	0.533	mg/Kg-dry	60.19	94.3	75	125			
Silver	33.1	0.266	mg/Kg-dry	32.36	102	75	125			
*Sample ID: **1111062-007A MSD***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	141	0.399	mg/Kg-dry	113.6	110	75	125	3.23	20	
Cadmium	201	0.027	mg/Kg-dry	211.7	94.7	75	125	0.527	20	
Lead	68.1	0.053	mg/Kg-dry	61.65	94.5	75	125	1.31	20	
Selenium	58.3	0.533	mg/Kg-dry	60.19	96.9	75	125	2.70	20	
Silver	32.8	0.266	mg/Kg-dry	32.36	101	75	125	0.878	20	
*Sample ID: **1111062-007A MST***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	129	0.399	mg/Kg-dry	113.6	99.2	75	125	12.4	20	
Cadmium	198	0.027	mg/Kg-dry	211.7	93.4	75	125	1.84	20	
Lead	66.1	0.053	mg/Kg-dry	61.65	91.4	75	125	1.56	20	
Selenium	55.3	0.533	mg/Kg-dry	60.19	91.9	75	125	2.53	20	
Silver	33.3	0.266	mg/Kg-dry	32.36	102	75	125	0.576	20	
*Sample ID: **5060-PB FILTERED***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/23/2011 3:10:21 PM*		
Aluminum	ND	3.00	mg/Kg							

Qualifiers: NA Sample conc. is > 4*spike level S Spike Recovery outside accepted recovery limits

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labinfo@mse-ta.com

Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM
Work Order: 1111062
BatchID: 5060

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
*Sample ID: **5060-PB UNFILTERED***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/23/2011 3:10:21 PM*			
Aluminum	ND	3.00	mg/Kg							
*Sample ID: **5060-LCS***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/23/2011 3:10:21 PM*			
Aluminum	9920	6.00	mg/Kg	11250	88.2	80	120			
*Sample ID: **1111062-007A MS***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/23/2011 3:10:21 PM*			
Aluminum	28100	16.0	mg/Kg-dry	14980	100	75	125			
*Sample ID: **1111062-007A MSD***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/23/2011 3:10:21 PM*			
Aluminum	29500	16.0	mg/Kg-dry	14980	109	75	125	4.57	20	
*Sample ID: **1111062-007A MST***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/23/2011 3:10:21 PM*			
Aluminum	30100	16.0	mg/Kg-dry	14980	113	75	125	6.57	20	
*Sample ID: **5060-PB FILTERED***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/30/2011 2:00:59 PM*			
Chromium	3.03	0.200	mg/Kg							
Copper	0.141	0.125	mg/Kg							
Nickel	0.103	0.100	mg/Kg							
Zinc	0.352	0.300	mg/Kg							
*Sample ID: **5060-PB UNFILTERED***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/30/2011 2:00:59 PM*			
Chromium	2.79	0.200	mg/Kg							
Copper	0.175	0.125	mg/Kg							
Nickel	0.068	0.100	mg/Kg							J
Zinc	0.332	0.300	mg/Kg							
*Sample ID: **5060-LCS***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/30/2011 2:00:59 PM*			
Chromium	337	0.400	mg/Kg	294.0	115	80	120			
Copper	71.9	0.250	mg/Kg	63.20	114	80	120			
Nickel	186	0.200	mg/Kg	163.0	114	80	120			
Zinc	270	0.600	mg/Kg	262.0	103	80	120			
*Sample ID: **1111062-007A MS***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/30/2011 2:00:59 PM*			
Chromium	489	0.533	mg/Kg-dry	391.5	117	75	125			
Copper	171	0.333	mg/Kg-dry	84.16	117	75	125			
Nickel	271	0.266	mg/Kg-dry	217.1	112	75	125			
Zinc	441	0.799	mg/Kg-dry	348.9	99.7	75	125			
*Sample ID: **1111062-007A MSD***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/30/2011 2:00:59 PM*			
Chromium	515	0.533	mg/Kg-dry	391.5	124	75	125	5.16	20	
Copper	168	0.333	mg/Kg-dry	84.16	113	75	125	1.72	20	
Nickel	276	0.266	mg/Kg-dry	217.1	115	75	125	2.03	20	
Zinc	449	0.799	mg/Kg-dry	348.9	102	75	125	1.69	20	
*Sample ID: **1111062-007A MST***			*Method: **SW6020***		*Batch ID: **5060***		*Analysis Date: 11/30/2011 2:00:59 PM*			
Chromium	486	0.533	mg/Kg-dry	391.5	116	75	125	0.795	20	

Qualifiers: NA Sample conc. is > 4*spike level S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: 5060

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
*Sample ID: **1111062-007A MST***			*Method: **SW6020***	*Batch ID: **5060***				*Analysis Date: 11/30/2011 2:00:59 PM*		
Copper	159	0.333	mg/Kg-dry	84.16	103	75	125	7.18	20	
Nickel	265	0.266	mg/Kg-dry	217.1	110	75	125	2.05	20	
Zinc	436	0.799	mg/Kg-dry	348.9	98.2	75	125	1.24	20	

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: 5064

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
Sample ID: ***5064-PB***			*Method:* ***E245.5***		*Batch ID:* ***5064***				*Analysis Date: 11/18/2011 9:32:00 AM*	
Mercury	ND	0.100	mg/Kg							
Sample ID: ***LCS-5064***			*Method:* ***E245.5***		*Batch ID:* ***5064***				*Analysis Date: 11/18/2011 9:32:00 AM*	
Mercury	14.0	0.553	mg/Kg	16.00	87.8	80	120			
Sample ID: ***1111062-002A-MS***			*Method:* ***E245.5***		*Batch ID:* ***5064***				*Analysis Date: 11/18/2011 9:32:00 AM*	
Mercury	18.2	1.66	mg/Kg-dry	21.40	84.9	75	125			
Sample ID: ***1111062-002A-MSD***			*Method:* ***E245.5***		*Batch ID:* ***5064***				*Analysis Date: 11/18/2011 9:32:00 AM*	
Mercury	21.3	1.66	mg/Kg-dry	21.40	99.2	75	125	15.5	20	

Qualifiers: NA Sample conc. is > 4*spike level

S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: 5079

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
Sample ID: ***1111062-002B-D***			*Method:* ***AVS-SEM***		*Batch ID:* ***5079***			*Analysis Date: 11/18/2011 9:32:00 AM*		
Sulfide	ND	1.50	µmoles/g					0	35	
Sample ID: ***1111062-002B-S***			*Method:* ***AVS-SEM***		*Batch ID:* ***5079***			*Analysis Date: 11/18/2011 9:32:00 AM*		
Sulfide	11.1	1.50	µmoles/g	10.59	105	80	120			
Sample ID: ***LCS-5079***			*Method:* ***AVS-SEM***		*Batch ID:* ***5079***			*Analysis Date: 11/18/2011 9:32:00 AM*		
Sulfide	13.7	1.50	µmoles/g	12.58	109	85	115			
Sample ID: ***5079-PB***			*Method:* ***AVS-SEM***		*Batch ID:* ***5079***			*Analysis Date: 11/18/2011 9:32:00 AM*		
Sulfide	0.89	1.50	µmoles/g							J

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: R18192

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
Sample ID: ***1111062-006A-D***			*Method:* ***ASTMD422***		*Batch ID:* ***R18192***			*Analysis Date: 11/17/2011 4:55:00 PM*		
1" Gradation	ND	0.10	%					0	35	
2mm Gradation	0.13	0.10	%					12.9	35	

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: R18203

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
*Sample ID: **1111062-004A-D***			*Method: **MSA15-5***		*Batch ID: **R18203***			*Analysis Date: 11/17/2011 6:50:00 PM*		
% Clay	10.0	0.1	%					0	35	
% Sand	86.0	0.1	%					0	35	
% Silt	4.0	0.1	%					0	35	
Soil Class	LOAMYSAND									

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: R18208

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
Sample ID: ***1111062-002A-D***			*Method:* ***OM_WALKLE*** *Batch ID:* ***R18208***					*Analysis Date: 11/18/2011 2:19:00 PM*		
Organic Matter - Walkl	2.29	0.20	%					11.9	35	
Sample ID: ***LCSQ5771***			*Method:* ***OM_WALKLE*** *Batch ID:* ***R18208***					*Analysis Date: 11/18/2011 2:19:00 PM*		
Organic Matter - Walkl	0.55	0.20	%	0.5965	92.9	70.7	109			
Sample ID: ***PB***			*Method:* ***OM_WALKLE*** *Batch ID:* ***R18208***					*Analysis Date: 11/18/2011 2:19:00 PM*		
Organic Matter - Walkl	ND	0.20	%							

Qualifiers: NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: R18241

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
Sample ID: ***1111062-001A-D***			*Method:* ***D2216***		*Batch ID:* ***R18241***			*Analysis Date: 11/16/2011 3:00:00 PM*		
Percent Moisture	14.9	0.05	wt%					2.14	35	
Sample ID: ***1111062-007A-D***			*Method:* ***D2216***		*Batch ID:* ***R18241***			*Analysis Date: 11/16/2011 3:00:00 PM*		
Percent Moisture	25.8	0.05	wt%					3.45	35	

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

AECOM

CHAIN OF CUSTODY RECORD

1111062-

7.4°C Received in cooler w/ice custody seal on cooler

Page 1 of 1

Client/Project Name: 058	Project Location: FCETL/AECOM
Project Number: 60225262-058	Field Logbook No.:
Sampler (Print Name)/(Affiliation): Gordon Wilson / AECOM; Christina Needham / AECOM	Chain of Custody Tape Nos.: 42986
Signature: Christina Needham	Send Results/Report to: Rami.Naddy@aecom.com; TAT: Std

Container Type: P – Plastic; A – Amber Glass; G – Clear Glass; V – VOA Vial; O – Other; E – Encore

Preservation: 1 – HCl, 4°; 2 – H2SO4, 4°; 3 – HNO3, 4°; 4 – NaOH, 4°; 5 – NaOH/ZnAc, 4°; 6 – Na2S2O3, 4°; 7 – 4°

Matrix Codes: DW – Drinking Water; WW – Wastewater; GW – Groundwater; SW – Surface Water; ST – Storm Water; W – Water; S – Soil; SL – Sludge; SD – Sediment; SO – Solid; A – Air; L – Liquid; P – Product

Field Sample No./Identification	Date	Time	COMP	GRAB	Sample Container (Size/Mat'l)	Matrix	Preserv.	Field Filtered	Analysis Requested: TOC (Loi on Ignition, Black); Total Metals (Al, Cr, Ni, Ag, Zn, As, Cd, Cu, Pb, Se); Mercury; % coarse Material; Rapid Hydro. (% clay, sand, silt); AVS	Lab I.D.	Remarks
Farm Sed	11/10/11	1100		X	8oz P Jar	Sed	cool		X X X X X	001A	
Lower Slate	11/10/11	1100			8oz P Jar				X X X X X	002A	
Lower Slate	10/3/11	unk			40z glass				X	002B	
Inlet upper slate	11/10/11	1100			8oz P				X X X X X	003A	
Inlet upper slate	10/4/11	unk			4oz glass				X	003B	
Middle Slate	11/10/11	1100			8oz P				X X X X X	004A	
Middle Slate	10/4/11	unk			4oz glass				X	004B	
Middle Sherman	11/10/11	1100			8oz P				X X X X X	005A	
Middle Sherman	10/4/11	unk			4oz glass				X	005B	
Lower Sherman	11/10/11	1100			8oz P				X X X X X	006A	
Lower Sherman	10/3/11	unk			4oz glass				X	006B	
Lower Johnson	11/10/11	1100			8oz P				X X X X X	007A	
Lower Johnson	10/3/11	unk		↓	4oz glass	↓	↓		X	007B	

Relinquished by: (Print Name)/(Affiliation): Christina Needham / AECOM Signature: Christina Needham	Date: 11/14/11 Time: 1300	Received by: (Print Name)/(Affiliation): Katrina Wilkins Signature: Katrina Wilkins	Date: 11/15/11 Time: 11:00
Relinquished by: (Print Name)/(Affiliation) Signature:	Date: Time:	Received by: (Print Name)/(Affiliation) Signature:	Date: Time:
Relinquished by: (Print Name)/(Affiliation) Signature:	Date: Time:	Received by: (Print Name)/(Affiliation) Signature:	Date: Time:

Analytical Laboratory (Destination):

AECOM Toxicology Lab
4303 W. Laporte Avenue
Fort Collins, CO 80521
(970) 416-0916
(970) 490-2963 (FAX)

MSE

Sample Shipped Via: UPS FedEx Courier Other

Temp blank: Yes No

Q:\GRAPHICS\FORMS\Chain of Custody (COC)\Chain-of-Custody_Ft. Collins_10_07.doc

Serial No. № 51788

MSE Lab Services

Sample Receipt Checklist

Client Name AECOM_INC

Date and Time Received: 11/15/2011 11:32:02 AM

Work Order Number 1111062 RcptNo: 1

Received by kgw

COC_ID: CoolerID:

Checklist completed by [signature] 11/15/11 (Signature / Date)

Reviewed by SW 11/16/11 (Initials / Date)

Matrix: Carrier name FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☐	No ☑	
Water - VOA vials have zero headspace?	No VOA vials submitted ☑	Yes ☐	No ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Blank ☐

Adjusted? Na Checked by BO 11/15/11

Sediments

Any No and/or NA (not applicable) response must be detailed in the comments section be

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: TEMP = 7.4 - SEDIMENT SAMPLES

Corrective Action _____

AECOM
Environmental Toxicology
4303 West LaPorte Avenue, Fort Collins, Colorado 80521-2154
T 970.416.0916 F 970.490.2963 www.aecom.com

AECOM

January 27, 2012

Kevin Eppers
Coeur Alaska Inc.
Kensington Gold Mine
3031 Clinton Drive
Suite 202
Juneau AK 99801

Subject: Result of sediment toxicity test

Dear Mr. Eppers:

Enclosed is a copy of the report for the sediment toxicity test conducted with *Hyalella azteca.* While there were no significant survival effects, there were significant growth effects in several of the sediments. All analytical data are included in the report.

We greatly appreciate the opportunity to complete this study for Coeur Alaska Inc.. Please do not hesitate to call us if you have any questions.

Sincerely,

Amber Potts (Roberts)
Data Analyst
amber.roberts@aecom.com

Rami B. Naddy, Ph.D.
Study Director / Environmental Toxicologist
rami.naddy@aecom.com

Attachment

60225262-058-(069-074)

Coeur Alaska, Inc.
Juneau, Alaska

Report of Short-Term Toxicity of Whole Sediment to *Hyalella azteca*

Prepared by

AECOM Environment
Environmental Toxicology
Fort Collins, CO

60225262-058-(069-074)
December 2011

Report of Short-Term Toxicity of Whole Sediment to Hyalella azteca

Project IDs: 60225262-058-(069-074)
November 2011

Sponsor and Laboratory Information

Sponsor	Coeur Alaska Inc. Kensington Mine 3031 Clinton Drive Suite 202 Juneau, Alaska 99801
Project Officer	Kevin Eppers (907) 523-3328
Testing Facility	AECOM Environment Fort Collins Environmental Toxicology Laboratory 4303 West LaPorte Ave. Fort Collins, CO 80521 Fax: (970) 490-2963 State of Florida NELAP Laboratory ID: E87972
Study Director	Rami B. Naddy, Ph.D (970) 416-0916 email: rami.naddy@aecom.com
Report Author	Amber Potts (Roberts) (970) 416-0916 email: amber.roberts@aecom.com

Test Information

Test	Short-term chronic screening toxicity test of sediment	
Basis	USEPA (2000) and ASTM (2009)	
Test Protocol	HA3AK.TIE058.007	
Test Period	November 4, 2011 @ 1100 to November 14, 2011 @ 0900-1120	
Test Length	10 days	
Species	*Hyalella azteca*	
Test Material	Whole sediment	
Sediment ID	Sample ID	AECOM Laboratory ID
	Inlet Upper Slate	25192
	Lower Sherman	25193
	Middle Slate	25194
	Lower Slate	25195
	Lower Johnson	25196
	Middle Sherman	25197
Control Sediments	Silica Sand	
Overlying water	Moderately hard reconstituted water prepared according to USEPA (2002), augmented with approximately 50 mg/L Cl^- (as NaCl)	
Test Concentrations	0 (control) and 100% of each test sediment	

- *Results described in this report apply only to the samples submitted to the laboratory and analyzed, as listed in the report*
- *Test results comply with NELAC standards. Reports are intended to be considered in their entirety; AECOM is not responsible for consequences arising from use of a partial report*
- *This report contains 7 pages plus 3 appendices*

Sediment Collection and Receipt

Sample ID	Collection Date and Time	AECOM No.	Date of Receipt	Temp. at Arrival (°C)[a]
Inlet Upper Slate	10/06/11 @ 1200	25192	10/11/11	3.4
Lower Sherman	10/04/11 @ 1200	25193	10/11/11	3.4
Middle Slate	10/03/11 @ 1200[b]	25194	10/11/11	3.4
Lower Slate	10/03/11 @ 1200	25195	10/11/11	3.4
Lower Johnson	10/03/11 @ 1200	25196	10/11/11	3.4
Middle Sherman	10/04/11 @ 1200	25197	10/11/11	3.4

[a] Air temperature of cooler
[b] Sample collection was started on 9/26/11 but due to weather constraints had to be completed on 10/03/11.
Note: See Appendix A for copies of chain of custody records

Control Sediment

The primary control sediment was silica sand, obtained from a local commercial supplier.

Test Sediment Preparation

Sample ID	Date Homogenized	Time Homogenized
Inlet Upper Slate	November 3, 2011	1030-1033
Lower Sherman		1015-1018
Middle Slate		1045-1048
Lower Slate		1040-1043
Lower Johnson		1042-1045
Middle Sherman		1028-1031

Before, during, and after homogenization, any noticeable debris (including sticks and other plant material) and large stones were removed from the sediment and discarded.

Test Conditions

Test Type	Static sediment with continuous replacement of overlying water
Test Duration	10 days
Overlying Water Delivery System	Continuous renewal (flow-through)[a]
Test Endpoints	Survival, dry weight per original and surviving organism
Test Chambers	500 ml glass beakers
Test Sediment Volume	100 ml
Overlying Water Volume	175 ml
Replicates per Treatment	8
Organisms per Replicate	10
Test Temperature	23 ± 1°C
Lighting	Fluorescent, 16 hours light:8 hours dark
Chamber Placement	Randomized
Test Sediment Renewal	None
Test Overlying Water Renewal	Approximately two volume additions per test chamber per day

[a] Continuous replacement via a drip system

Test Organism

Species and Lot Number	*Hyalella azteca*, FCETL Lot 11-025
Age	8 – 10 days
Size (pre-test wt.)	0.018 mg/organism (mean)
Source	Aquatic BioSystems (ABS), Fort Collins, CO
Overlying Water	Moderately Hard Reconstituted Water with added chloride (49 mg/L) as NaCl, RW # 10089
Reference Toxicant Testing	Initiated November 4, 2011 using sodium chloride (NaCl)

TEST RESULTS

Biological Data – Survival and Dry Weight

Sample ID	Percent Survival	Dry Weight (mg)	
		Per original organism	Per surviving organism
Sand Control	98.8	0.081	0.082
Inlet Upper Slate	96.2	0.070	0.073
Lower Sherman	96.2	0.071	0.074
Middle Slate	93.8	0.058[a]	0.062[a]
Lower Slate	95.0	0.072	0.076
Lower Johnson	96.2	0.074[a]	0.077
Middle Sherman	98.8	0.068[a]	0.069[a]

[a] Statistically significant reduction in weight relative to the control using Toxstat Version 3.5 (WEST, Inc. and Gulley 1996)
Note: See Appendix B for test data sheets

Analytical Data

Parameter	Sample Identification					
	Inlet Upper Slate	Lower Slate Creek	Middle Slate Creek	Middle Sherman Creek	Lower Sherman	Lower Johnson
Metals (mg/kg-dry)[a]						
Aluminum	22,500	13,600	20,100	19,000	18,200	13,100
Chromium	127	29.4	29.5	43.4	46.2	31.5
Zinc	130	220	1,360	120	110	93.3
Arsenic	17.9	16.2	30.0	55.7	28.9	16.2
Cadmium	0.722	1.46	20.9	0.175	0.389	0.238
Copper	53.4	56.7	88.4	97.1	94.0	73.1
Lead	3.37	7.79	8.50	17.3	6.70	9.76
Nickel	87.5	47.4	143	44.0	45.9	27.3
Selenium	0.809	0.720	1.41	ND	ND	ND
Silver	0.120 J	0.134 J	0.233 J	0.633	0.137 J	0.164 J
Mercury	ND	0.0502 J	0.0692 J	ND	ND	ND
Particle Size (%)[b]						
Clay	4.0	2.0	10.0	2.0	2.0	2.0
Sand	94.0	94.0	86.0	96.0	96.0	96.0
Silt	2.0	4.0	4.0	2.0	2.0	2.0
Texture	Sand	Sand	Loamy Sand	Sand	Sand	Sand
Coarse Material (2 mm)	ND	0.44	1.65	0.22	0.11	ND
TOC (%-dry)[c]	5.46	2.04	11.0	1.17	0.54	0.89
Acid Volatile Sulfide (umoles/g)	1.39	ND	ND	1.01	1.50	ND

[a] Al, As, Cd, Cr, Cu, Pb, Ni, Se, Ag and Zn by SW-846 Method 6020; Hg by SW-846 7471B (USEPA 1986)
[b] Particle size was determined using ASTM Method D422 and Modified ASA 15-5
[c] TOC was determined using the Walkley Black Method
J = The concentration was below the Reporting Limit but above the Method Detection Limit
ND = Not Detected at the Method Detection Limit (MDL)
Note: See Appendix C for a copy of the report from the analytical laboratory (MSE Analytical Laboratory, Butte, MT)

Total and Total Volatile Solids

Sample ID	Percent Total Solids[a]	Percent Total Volatile Solids[b]
Inlet Upper Slate	72.10	4.12
Lower Sherman	73.15	2.75
Middle Slate	60.17	7.81
Lower Slate	78.00	3.38
Lower Johnson	74.28	2.01
Middle Sherman	72.45	2.82

[a] Total solids were determined using Standard Methods 2540B (APHA 1998)
[b] Total volatile solids were determined using Standard Methods 2540E (APHA 1998)
All values are means of duplicate analyses
Note: See Appendix B for data sheets (these parameters were determined at the AECOM/FCETL)

Physical and Chemical Data (Min/Max)

Sample ID	pH (units)	DO (mg/L)	Cond. (µS/cm)	Temp. (°C)[a]	Ammonia as N (mg/L)	Hardness (mg/L as $CaCO_3$)	Alkalinity (mg/L as $CaCO_3$)
Sand Control	8.0/8.5	6.7/7.2	510/661	22/24	<1.0	88/124	67/89
Inlet Upper Slate	8.0/8.3	6.1/7.2	488/675	22/24	<1.0	116/140	78/93
Lower Sherman	8.1/8.3	6.3/7.1	499/620	22/24	<1.0	104/130	79/92
Middle Slate Creek	8.0/8.2	5.6/6.7	602/811	22/24	<1.0	156/156	112/121
Lower Slate	7.9/8.1	6.0/6.7	479/628	22/24	<1.0	96/126	65/85
Lower Johnson	7.8/8.1	5.9/7.0	484/677	22/24	<1.0	90/130	68/87
Middle Sherman	8.0/8.3	5.9/7.0	494/686	22/24	<1.0	88/136	70/93

[a] Temperature in test chambers

Reference Toxicant Test Results for *H. azteca*

Organism Lot Number	Test Dates	96-Hour LC_{50}	AECOM/FCETL Historical 95% Control Limits	
			Low	High
11-025	11/04/11 to 11/08/11	2,943	1,030	3,306

Note: Values are expressed as mg/L chloride

References

APHA. 1998. Standard Methods for the Examination of Water and Wastewater. Amer. Public Health Assoc., Amer. Water Works Assoc., Water Pollut. Control Fed., APHA, Washington, DC.

ASTM. 2009. Standard Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Fresh Water Invertebrates. Method E 1706-05 In *2009 Annual Book of ASTM Standards, Section 11, Water and Environmental Technology, Volume 11.06, Biological Effects and Environmental Fate; Biotechnology*. American Society of Testing and Materials. West Conshohocken, PA.

USEPA. 1986. Test Methods for Evaluating Solid Waste. Third Edition. SW-846.

USEPA. 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates. EPA/600/R-99/064.

USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. EPA-821-R-02-012.

WEST, Inc. and D.D. Gulley. 1996. Toxstat Version 3.5. Western EcoSystems Technology, Inc., Cheyenne, WY.

Statement of Procedural Compliance

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge, accurate and complete.

Rami Naddy, Ph.D. — Date: January 26, 2012
Study Director

Statement of Quality Assurance

The test data were reviewed by the Quality Assurance Unit to assure that the study was performed in accordance with standard operating procedures, and that the resulting data and report meet the requirements of the NELAC standards. This report is an accurate reflection of the raw data.

Quality Assurance Unit — Date: January 26, 2012

APPENDIX A

Chain of Custody

Sent 7-26-2011

AECOM

CHAIN OF CUSTODY RECORD

(063-064-065-#Ref!-0666)

Page 1 of 1

Client/Project Name: Coeur Alaska	Project Location: FCEIL
Project Number: 60147217-058	Field Logbook No.:
Sampler (Print Name)/(Affiliation): GORDON WN ADF+G	Chain of Custody Tape Nos.: 41156 *intact*
Signature:	Send Results/Report to: TAT:

Container Type: P – Plastic; A – Amber Glass; G – Clear Glass; V – VOA Vial; O – Other; E – Encore

Preservation: 1 – HCl, 4°; 2 – H2SO4, 4°; 3 – HNO3, 4°; 4 – NaOH, 4°; 5 – NaOH/ZnAc, 4°; 6 – Na2S2O3, 4°; 7 – 4°

Matrix Codes: DW – Drinking Water; WW – Wastewater; GW – Groundwater; SW – Surface Water; ST – Storm Water; W – Water; S – Soil; SL – Sludge; SD – Sediment; SO – Solid; A – Air; L – Liquid; P – Product

Field Sample No./Identification	Date (#)	Time Δ	COMP	GRAB	Sample Container (Size/Mat'l)	Matrix	Preserv.	Field Filtered	Analysis Requested	Lab I.D.	Remarks
INLET UPPER SLATE	10/6	1200	X		1 g jar		ICE		X	25192	
LOWER SHERMAN	10/4	1200	X		1 g jar		ICE		X	25193	
MS (Middle slate) 9/26 10/3		1200	X		1 g jar		ICE		X	25194	
LOWER SLATE	10/3	1200	X		1 g jar		ICE		X	25195	
JOHNSON	10/3	1200	X		1 g jar		ICE		X	25196	
MIDDLE SHERM	10/4	1200	X		1 g jar		ICE		X	25197	
000388 LOWER JOHNSON	10/3	1200	X		1 4oz jar		ICE		X	25196	
000458 LOWER SH	10/3	1200	X		1 4oz jar		ICE		X	25193	
000389 LS	10/3	1200	X		1 4oz jar		ICE		X	25195	
000385 MS	10/4	1200	X		1 4oz jar		ICE		X	25194	
000463 UPPER SLATE		1200	X		1 4oz jar		ICE		X	25192	
000457 MID SHERM		1200	X		1 4oz jar		ICE		X	25197	
											(D53)

Relinquished by: (Print Name)/(Affiliation) GORDON WN ADFG	Date: 10/10	Received by: (Print Name)/(Affiliation) Amber Potts/AECOM	Date: 10/11/11
Signature:	Time: 0730	Signature:	Time: 1030
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:
Signature:	Time:	Signature:	Time:
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:
Signature:	Time:	Signature:	Time:

Analytical Laboratory (Destination): recd on ice via FedEx @ 3.4 °C (cooler temp)

AECOM Toxicology Lab
4303 W. Laporte Avenue
Fort Collins, CO 80521
(970) 416-0916
(970) 490-2963 (FAX)

Sample Shipped Via: UPS (FedEx) Courier Other

Temp blank: Yes (No)

(#) All samples were collected in the year 2011.

Δ All sample times were confirmed with client via phone conversation. 12/13/11 JS

Q:\GRAPHICS\FORMS\Chain of Custody (COC)\Chain-of-Custody_Ft. Collins_10_07.doc

Serial No. NO 51474

APPENDIX B

Data Sheets

H. azteca 10-day Survival and Growth, Testing Cover Page

Project Number:	60225262-058-(069-074)			Protocol #:	#A3AK.TIE058.007		1/5/11 CAS: AR01: 1/9/12
Test Substance:	Sediment						
Test Species:	*H. azteca*	Lot #:	11-025	Age:	8-10 days (7-14 days)	Supplier:	ABS
Test Type:	Chronic, Static Renewal						
Overlying Water:	Reconstituted Fresh Water (Smith et al., 1997) - (RW 10089)			Investigators:	CW/AM/BP/LK/AB/MT/TK/MP/GM/AS/AD		
Sampling Date(s):	10/3/11-10/6/11; Middle Sherman was sampled on 9/26 but completed on 10/3 due to weather.			Sampling Time(s):	12.00		
FCETL Sample #(s):	25192, 25193, 25194, 25195, 25196, 25197						
Test Initiation Date/Time:	11/4/11 @1100						
Test Termination Date/Time:	11/4/11 @0900-1120						

Renewal Frequency:	Cont. drip, 2+ vol/da	Feeding Freq:	daily	Food Type/Amount:	1 ml YTC daily	Test Temp:	23 +/- 1 deg C
Test Chamber Capacity:	500-ML	Test Soltn. Vol:	100 mL sed/175 mL H2O	# Repl's/Trtmnt:	8		
Test Duration:	10 days	# Org.'s/Repl:	10	Env. Chmbr/(Bath)	3		

Water Characterization: Minimum of Hardness, Alkalinity, & Conductivity on days 0 and 10; Ammonia on days 0, 3, 7, and 10; No TRC; pH, temperature & DO daily on overlying water
aerate if dissolved oxygen <2.5 mg/L

Test Sediment (s):							
1)	Sand (cont)	2)	Inlet Upper Slate	3)	Lower Sherman		
4)	Middle Slate	5)	Lower Slate	6)	Lower Johnson		
7)	Middle Sherman	8)		9)			
10)		11)					

Reference Tox. Dates:	11/4/11 - 11/8/11	LC50:	2943 mg/L Cl⁻	Hist. Limits:	1030-3306	Method:	T-S-K
Study Director Initials:	CW for RBN	Date:	11/9/11				

Overlying water added at a minimum of 2 volume additions/day; equivalent to >350 ml/day or >0.24 ml/min

SEDIMENT/SOIL PREPARATION

Project Number: 60225262.058 - (069 - 074)

*1/5/12
QA: AR01/19/12

Artificial soil	
Constituent/source	**Amount added (g)**
Coarse Silica Sand	1242
Silt/Clay (ASP 400)	219
Dolomite	7.5
α-cellulose	77.3
Humic Acid	0.15
Total	1545.95

Notes: Container was placed into tumbler for a minimum of an hour to homogenize prior to use ②

Soil/sediment	FCETL#	Homogenization			
		Date	From	To	Analyst
Sand Cont. ⊛	NA	11/3/11	1007	1010	CW
Inlet Upper Slate	25192	11/3/11	1030	① 1040 1033	MT
Lower Sherman	25193	11/3/11	1015	1018	AB
Middle Slate (MS)	25194	11/3/11	1045	1048	CW
Lower Slate	25195	11/3/11	1040	1043	MT
Lower Johnson	25196	11/3/11	1042	1045	AB
Middle Sherman	25197	11/3/11	1028	1031	CW

⊛added overlying water during homogenization process
① MT 11/3/11 E
② CW 11/3/11 NA

BIOLOGICAL DATA — *H. azteca* — Chronic, Static Renewal — Project 60225262-058-(069-074) QA: AP 11/9/12 CW 11/14/11

Test termination date 11/14/11

Sediment	Test Termination	A	B	C	D	E	F	G	H	Remarks: % Survival
Sand (cont)	# Surviving	10	10	10	9	10	10	10	10	98.8%
	# Observed Dead	0	0	0	0	0	0	0	0	
	# Not Found	0	0	0	1	0	0	0	0	
	Initials	TK	AP	AP	CW	AP	CW	AD	AD	
Inlet Upper Slate	# Surviving	9	10	10	9	9	10	10	10	96.2%
	# Observed Dead	0	0	0	0	0	0	0	0	
	# Not Found	1	0	0	1	1	0	0	0	
	Initials	TK	AP	AP	CW	AP	AD	AD	TK	
Lower Sherman	# Surviving	10	9	10	8	10	10	10	10	96.2%
	# Observed Dead	0	0	0	0	0	0	0	0	
	# Not Found	0	1	0	2	0	0	0	0	
	Initials	MK	AD	AP	MK	AD	CW	CW	AD	
Middle Slate	# Surviving	9	10	10	10	7	10	10	9	Note: Rep B had no surviving H2O on Day 8
	# Observed Dead	0	0	0	0	0	0	0	0	
	# Not Found	1 ①	0	0	0	3	0	0	1	93.8%
	Initials	AD	AP	AP	AD	TK	MK	GMM	CW	
Lower Slate	# Surviving	10	8	10	9	9	10	10	10	95%
	# Observed Dead	0	0	0	0	0	0	0	0	
	# Not Found	0	2	0	1	1	0	0	0	
	Initials	AD	AP	AP	MK	AD	GMM	CW	GMM	
Lower Johnson	# Surviving	9	10	10	10	10	9	10	9	96.2%
	# Observed Dead	0	0	0	0	0	0	0	0	
	# Not Found	1	0	0	0	0	1	0	1	
	Initials	AP	AD	AP	CW	TK	GMM	AD	CW	
Middle Sherman	# Surviving	10	10	10	10	10	9	10	10	98.8%
	# Observed Dead	0	0	0	0	0	0	0	0	
	# Not Found	0	0	0	0	0	1	0	0	
	Initials	AD	AD	② TK AP	TK	AD	CW	GMM	TK	
0	# Surviving									
	# Observed Dead									
	# Not Found									
0	# Surviving									
	# Observed Dead									
	# Not Found									
0	# Surviving									
	# Observed Dead									
	# Not Found									
	# Surviving									
	# Observed Dead									
	# Not Found									

① AD 11/14/11 E

② TK 11/14/11 WP

Note: when transferring organisms to dosing pans, the Lower Sherman organisms were inadvertently placed on the pans labeled "Lower Johnson", and vice versa. (AR 11/9/12, transcribed from temporary note)

QA: ARD 11/9/12 ✱ 11/5/12

CHEMICAL DATA (Composite of Overlying Water) — *H. azteca* — Chronic, Static Renewal — Project 60225262-058-(069-074)

Parameter	Sediment	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day	Meter	Date	Time	Initials
Dissolved Oxygen (mg/l)	Sand (cont)	6.9	6.8	6.8	7.0	6.9	7.2	6.6	6.7	6.9	6.8	6.8	0	5	11/04/11	0935	CW
	Inlet Upper Slate	6.9	6.5	6.6	6.8	6.7	7.2	6.1	6.1	6.7	6.7	6.6	1	5	11/5/11	1750	BP
	Lower Sherman	6.8	6.7	6.5	6.7	6.8	7.1	6.4	6.3	6.6	6.3	6.5	2	5	11/6/11	1610	BP
	Middle Slate	6.5	6.6	6.8	6.7	6.4	6.3	~~5.7~~ ①	6.6	6.6	5.6	6.1	3	5	11/7/11	1115	①
	Lower Slate	6.5	6.5	6.0	6.7	6.6	6.4	6.4	6.3	6.5	6.0	6.5	4	5	11/8/11	0915	TR
	Lower Johnson	6.6	6.3	6.2	6.3	7.0	6.4	6.4	6.2	6.5	5.9	6.6	5	5	11/9/11	1115	AG
	Middle Sherman	6.6	6.3	6.8	6.6	7.0	6.7	6.4	6.2	6.5	5.9	6.7	6	5	11/10/11	1500	mt
													7	5	11/11/11	UNK	AG
													8	5	11/12/11	1110	TR
													9	5	11/13/11	1045	BP
													10	5	11/14/11	0935	mt
Temp (deg C)	Sand (cont)	23	24	23	23	23	23	24	23	23	23	22	0	D47	11/04/11	0935	CW
	Inlet Upper Slate	23	24	22	23	23	23	24	23	23	22	22	1	D47	11/5/11	1750	BP
	Lower Sherman	23	24	23	22	23	23	23	23	23	23	22	2	D47	11/6/11	1610	BP
	Middle Slate	23	24	23	23	23	22	23	23	23	23	22	3	D47	11/7/11	1110	①
	Lower Slate	23	24	22	24	23	22	23	23	23	23	22	4	D47	11/8/11	0915	TR
	Lower Johnson	23	24	23	24	23	23 ②	24	23	23	23	22	5	D47	11/9/11	1115	AG
	Middle Sherman	23	24	22	24	23	~~23~~ ②	23	23	23	23	22	6	D47	11/10/11	1500	mt
													7	D47	11/11/11	UNK	AG
													8	D47	11/12/11	1030	TR
													9	D47	11/13/11	1045	BP
													10	D47	11/14/11	0845	CW
pH	Sand (cont)	8.2	8.0	8.1	8.3	8.3	8.3	8.2	8.2	8.4	8.1	8.5	0	12	11/04/11	0935	CW
	Inlet Upper Slate	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.0	8.2	8.1	8.3	1	12	11/5/11	1845	TR
	Lower Sherman	8.1	8.2	8.2	8.1	8.2	8.2	8.1	8.1	8.3	8.1	8.2	2	12	11/6/11	1610	BP
	Middle Slate	8.0	8.1	8.0	8.0	8.1	8.1	8.0	8.0	8.2	8.1	8.1	3	16	11/7/11	1115	①
	Lower Slate	8.0	7.9	8.0	7.9	8.0	8.0	8.0	7.9	8.1	8.0	8.0	4	16	11/8/11	0915	TR
	Lower Johnson	8.0	7.8	7.9	7.8	8.0	7.9	8.0	7.9	8.1	7.9	8.1	5	16	11/9/11	1115	AG
	Middle Sherman	8.0	8.0	8.0	8.0	8.1	8.2	8.0	8.0	8.3	8.0	8.0	6	16	11/10/11	1500	mt
													7	16	11/11/11	UNK	AG
													8	16	11/12/11	1050	TR
													9	16	11/13/11	1045	BP
	Replicate	A	B	C	D	E	F	G	H	A	B	C	10	16	11/14/11	0935	mt

① 11/7/11 E

② mt 11/10/11 E, CF DO = 6.1

③ AG, 11/23/12 E

OVERLYING WATER CHARACTERIZATION | *H. azteca* | Chronic, Static Renewal | Project No. 60225262-058-(069-074)

QA: AYO 1/19/12
A 1/5/12

	Conductivity (s/cm)		Hardness (mg/L as CaCO3)		Alkalinity (mg/l as CaCO3)		Ammonia (mg/l)			
Sediment	Day 0	Day 10	Day 0	Day 10	Day 0	Day 10	Day 0	Day 3	Day 7	Day 10
Sand (cont)	510	6061	88	124	67	89	<1.0	<1.0	<1.0	<1.0
Inlet Upper Slate	488	6075	116	140	78	93	<1.0	<1.0	<1.0	<1.0
Lower Sherman	499	6020	104	130	79	92	<1.0	<1.0	<1.0	<1.0
Middle Slate	602	811	156	156	121	112	<1.0	<1.0	<1.0	<1.0
Lower Slate	479	6028	96	126	65	85	<1.0	<1.0	<1.0	<1.0
Lower Johnson	484	6071	90	130	68	87	<1.0	<1.0	<1.0	<1.0
Middle Sherman	494	6086	88	136	70	13	<1.0	<1.0	<1.0	<1.0
							K ①			
Overlying H2O (Rw# 10829)	469	NM	86	NM	62	NM	<1.0 ②			
Cl- = 493 mg/L										
Meter #	15	15	Titr #1	Titr #1	Titr #1	Titr #1	HA #1	HA #1	HA #1	HA #1
Date:	11/4/11	11/14/11	11/4/11	11/14/11	11/4/11	11/14/11	11/4/11	11/7/11	11/11/11	11/14/11
Time:	1100	1010	1100	1010	1106	1016	1650	1130	1600	1600
Initials:	cw for TK	cw for AMP	cw for TK	cw for AMP	cw for TK	cw for AMP	cw for NLT		cw for AB	cw for TK

②measured in source water

①cw for AMP 11/30/11 NAL

DAILY TESTING LOG | *H. azteca* | Chronic, Static Renewal | Project No. 60225262-058-(069-074)

Day -1	Sediment Homogenized @ 1010 - 1048 Overlying water added to chambers @ 1100			CW 11/03/11 QA: AKE01/19/12
Day 0	Test organisms added to chambers @ 1100		Feeding: @1525 CW	Initials/Date: CW 11/04/11
Day 1	Bath CT = 25.8 °C	Range = 23.8 - 26.6°C	Feeding: @1755 BP	Initials/Date: BP 11/5/11
Day 2	Bath CT = 25.0°C	Range = 23.8 - 26.6°C	Feeding: 1620 BP	Initials/Date: BP 11/6/11
Day 3	Bath CT = 24.2°C	Range = 24.2 - 24.8°C	Feeding: 1045 AB	Initials/Date: 11/7/11
Day 4	Bath CT = 24.4 °C	Range = 24.2 - 24.4°C	Feeding: 1630 CW	Initials/Date: F 11/8/11
Day 5	Bath CT = ~~24.2~~ (2) 24.2 °C	Range = 23.6 - 24.4 °C	Feeding: 1700 AB / AD	Initials/Date: AB 11/9/11
Day 6	Bath CT = 23.2°C	Range = 23.0 - 24.4 °C	Feeding: 1700 AD / AB	Initials/Date: mt 11/10/11
Day 7	Bath CT = 24.2°C	Range = 22.0 - 25.2 °C	Feeding: 1630 AB	Initials/Date: AB 11/11/11
Day 8	Bath CT = 24.8°C	Range = 24.2 - 25.8°C	Feeding: 1700 AM	Initials/Date: AM 11/12/11
Day 9	Bath CT = 24.6°C	Range = 24.2 - 25.2°C	Feeding: 1545 AM	Initials/Date: AM 11/13/11
Day 10	Bath CT = 24.4°C	Range = 24.2 - 24.8°C	Feeding: None	Initials/Date: CW 11/14/11

At 0900 on 11-~~07~~ 06-11, the lab clocks were set back one hour to 0800 to adjust time to Mountain Standard Time. All times recorded for data on this day are Mountain Standard times. Initials: BP.

DBP 1/24/12 E

DBP 11/6/11 E

FCETL QA Form No.010
Revision 5
Effective 08/99

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

QA: cw 11/29/11 ✱ 11/27/11

Project Number: 00225262-058-(069-074) Test Substance: Sediment (Pre-weights)

Species: H. azteca Analyst Tare: JA Analyst Gross: mt/ bs

Date/Time of Tare Wt.: 11/4/11 @ 1120 Date/Time of Gross Wt.: 11/7/11 @ 1020

Comments:
Analytical Balance ID: Sartorius #1
Dried in Oven # 3 from Date: 11/4/11 Time: 1215
to Date: 11/7/11 Time: 0945

Weight Type (Circle): Wet Blot Dry (Dry (60-90°C) ~~(>100°C)~~) AFDW (>500°C)

Lot or Batch Number: 11-025

Boat No.	Treatment	Rep.	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)[1]	No. of Orig. Organisms	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Organisms	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
	1			0.956018	0.95633	0.00015					15		
	2			0.949360	0.94945	0.00009					15		
	3			0.948700	0.94887	0.00017					14		
	4			0.948090	0.94835	0.00026					15		
	5			0.950490	0.95079	0.00030					15		
Blank				0.957190	0.95716	-0.00003							
Range													
Mean													

Test Solution Volume: Loading Rate:

[1] Add in weight loss of blank boat, if appropriate.

Dcw 11/28/11 QA

FCETL QA Form No.010
Revision 5
Effective 08/99

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

QA: cw 11/29/11 * 11/21/11

Project Number: 60225262-058
Species: Hyalella azteca
Date/Time of Tare Wt.: NA

Test Substance: Hyalella azteca Pre-weights
Analyst Tare: NA Analyst Gross: NA
Date/Time of Gross Wt.: 11/7/11 @ 1045

Comments:
Analytical Balance ID: Sartorius #1
Dried in Oven # 3 from Date: 11/4/11 Time: 1215
to Date: 11/7/11 Time: 0945

Weight Type (Circle): Wet Blot Dry Dry (60-90 °C) ~~(100°C)~~ AFDW (>500°C)

Lot or Batch Number: 11-025

Boat No.	Treatment	Rep.	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)[1]	No. of Orig. Organisms	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Organisms	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
	1					0.00023					15		
	2					0.00028					15		
	3					0.00021					14		
	4					0.00028					15		
	5					0.00030					15		
Blank													
Range													
Mean													

Test Solution Volume:

Loading Rate:

[1] Add in weight loss of blank boat, if appropriate.

① cw 11/22/11 cc ② AR for CN 01/19/12E

Note: weights on this page were obtained by taring a new pan to zero removing organisms from old pan and placing on newly tared pan, and obtaining ~~gross~~ net weight.

FCETL QA Form No. 010a
Revision 0
Effective 10/06

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

QA: CW 11/29/11
11/27/11

Project Number: 60225262-058-(069-074) Species: *H. azteca*

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Org. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Initial wts	A				0.00023	0.00023	15	0.015	0.0175	15	0.015	0.0175
	B				0.00028	0.00028	15	0.019		15	0.019	
	C				0.00021	0.00021	14	0.015		14	0.015	
	D				0.00028	0.00028	15	0.019		15	0.019	
					0.00030	0.00030	15	0.020		15	0.020	
Blank					0.00000							

Summary Statistics for Growth Data (dry wt per original)

Treatment	N	Min	Max	Mean	SD	C.V.
Initial wts	4	0.015	0.019	0.0175	0.0020	11.551%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Initial wts	4	0.015	0.019	0.0175	0.0020	11.551%

FCETL QA Form No.010
Revision 5
Effective 08/99

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

*11/22/11

Project Number: 60225262-058-(069-074) | Test Substance: Sediment | Comments: QA: CW 11/22/11 QA: AR 01/19/12

Species: Hyalella azteca | Analyst Tare: KB | Analyst Gross: AP | Analytical Balance ID: Sartorius #1

Date/Time of Tare Wt.: 11/14/11 @ 1040 | Date/Time of Gross Wt.: 11/18/11 @ 1600 | Dried in Oven # 3 from Date: 11/14/11 Time: 1500 to Date: 11/18/11 Time: 1230

Weight Type (Circle): Wet Blot Dry (Dry (60-90°C) ~~>100°C~~) AFDW (>500°C) | Lot or Batch Number: 11-025

Boat No.	Treatment	Rep.	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)[1]	No. of Orig. Organisms	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Organisms	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
	Sand	A		0.93738	0.93812	0.00074		③~~10~~ 9			9 (A)		
		B		0.93648	0.93723	0.00075		10			10		
		C		0.93850	0.93935	0.00085		10			10		
		D		0.94034	0.94115	0.00081		10			9		
		E		0.93682	0.93764	0.00082		10			10		
		F		0.93901	0.93979	0.00078		10			10		
		G		0.93822	0.93901	0.00079		10			10		
		H		0.93809	0.93894	0.00085		10			10		
	Inlet	A		0.93961	0.94009	0.00048		③~~10~~ 9			8 (A)		
	Upper	B		0.94125	0.94190	0.00065		10			10		
	Slope	C		0.93915	0.93985	0.00070		10			10		
		D		0.93873	0.93934	0.00061		10			9		
Blank				0.93894	0.93896	~~0.00002~~ 0.00002 (+)							
Range													
Mean													

Test Solution Volume: | Loading Rate:

[1] Add in weight loss of blank boat, if appropriate.

① ~~*~~ for AP 11/22/11 E
② CW 11/22/11 cf
③ CW for AND 11/22/11 E

(A) one organism lost during drying process.

FCETL QA Form No.010
Revision 5
Effective 08/99

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

11/22/11
QA: cw 11/22/11
QA: AR 01/19/12

Project Number: 60225262-058-(069-074) | Test Substance: Sediment | Comments:
Species: Hyalella azteca | Analyst Tare: KB | Analyst Gross: AP | Analytical Balance ID: Sartorius #1
Date/Time of Tare Wt.: 11/14/11 @1040 | Date/Time of Gross Wt.: 11/18/11 @ 1600 | Dried in Oven # 3 from Date: 11/14/11 Time: 1500 to Date: 11/18/11 Time: 1230

Weight Type (Circle): Wet Blot Dry (60-90°C) ~~Dry (100°C)~~ AFDW (>500°C) | Lot or Batch Number: 11-025

Boat No.	Treatment	Rep.	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)[1]	No. of Orig. Organisms	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Organisms	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
	Inlet	E		0.93976	0.94049	0.00073		10			9		
	Upper	F		0.93703	0.93776	0.00073		③10 9			9 Ⓐ		
	Slate	G		0.93744	0.93832	0.00088		10			10		
	(cont.)	H		0.93818 89	0.93891	0.00073		10			10		
	Lower**	A		0.93978	0.94054	0.00076		10			9		
	Sherman	B		0.92878	0.92950	0.00072		10			10		
	(Lower Johnson)	C		0.92680	0.92754	0.00074		10			10		
		D		0.93186	0.93268	0.00082		10			10		
		E		0.93886	0.93963	0.00077		10			10		
		F		0.93633	0.93701	0.00068		10			9		
		G		0.94047	0.94125	0.00078		10			10		
		H		0.94185	0.94253	0.00068		10			9		
Blank													
Range													
Mean													

Test Solution Volume: | Loading Rate:

[1] Add in weight loss of blank boat, if appropriate.

① KB 11/14/11 E
② cw 11/22/11 CF
③ cw for ANP 11/22/11 E

Ⓐ one organism lost during drying process.
** organisms on pans labeled "Lower Sherman" are actually organisms from "Lower Johnson"

FCETL QA Form No.010
Revision 5
Effective 08/99

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

KB 11/22/11

Project Number: 60225262-058-(069-074) | Test Substance: Sediment

Species: Hyalella azteca | Analyst Tare: KB | Analyst Gross: AP

Date/Time of Tare Wt.: 11/14/11 @ 1040 | Date/Time of Gross Wt.: 11/18/11 @ 1600

Comments: QA: CW 11/22/11 QA: AKO 1/19/12
Analytical Balance ID: Sartorius #1
Dried in Oven # 3 from Date: 11/14/11 Time: 1500
to Date: 11/18/11 Time: 1230

Weight Type (Circle): Wet Blot Dry Dry (~~>100°C~~ 60-90°C) AFDW (>500°C) | Lot or Batch Number: 11-025

Boat No.	Treatment	Rep.	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)[1]	No. of Orig. Organisms	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Organisms	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
	Middle	A		0.94351	0.94407	0.00056		10			9		
	Slide	B		0.94600	0.94717	0.00057		10			10		
		C		0.94937	0.95006	0.00069		10			10		
		D		0.94942	0.95008	0.00066		10			10		
		E		0.95253	0.95299	0.00046		10			7		
		F		0.95226	0.95293	0.00067		10			10		
		G		0.94895	0.94949	0.00054		10			10		
		H		0.94130	0.94177	0.00047		10			9		
	Lower	A		0.94488	0.94558	0.00070		10			10		
	Slide	B		0.94660	0.94716	0.00056		10			8		
		C		0.94505	0.94597	0.00092*		10			10		
		D		0.94402	0.94457	0.00055		10			9		
Blank													
Range													
Mean													

Test Solution Volume: | Loading Rate:

[1] Add in weight loss of blank boat, if appropriate. * large orgs ① CW 11/22/11 CF

FCETL QA Form No.010
Revision 5
Effective 08/99

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

AP 11/22/11

Project Number: 60225262-058-(069-074) | Test Substance: Sediment | Comments: QA: aw 11/22/11 AP: AP 01/19/12

Species: Hyalella azteca | Analyst Tare: KB | Analyst Gross: AP | Analytical Balance ID: Sartorius #1

Date/Time of Tare Wt.: 11/14/11 @ 1040 | Date/Time of Gross Wt.: 11/18/11 @ 1600 | Dried in Oven # 3 from Date: 11/14/11 Time: 1500 to Date: 11/18/11 Time: 1230

Weight Type (Circle): Wet Blot Dry (Dry ~~@ 100°C~~ @ 60-90°C) AFDW (>500°C) | Lot or Batch Number: 11-025

Boat No.	Treatment	Rep.	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)[1]	No. of Orig. Organisms	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Organisms	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
	Lower	E		0.94320	0.94408°	0.00088		10			9		
	State	F		0.94318	0.94384	0.00066		10			10		
	(cont.)	G		0.94218	0.94311	0.00093*		10			10		
		H		0.94151	0.94211	0.00060		10			10		
	Lower**	A		0.93873	0.93954	0.00081		10			10		
	Johnson	B		0.93443	0.93512	0.00069		10			9		
	(Lower)	C		0.93645	0.93706	0.00061		10			10		
	Sherman	D		0.94011	0.94061	0.00050		10			8		
		E		0.94177	0.94249	0.00072		10			10		
		F		0.93882	0.93958	0.00076		10			10		
		G		0.93953	0.94025	0.00072		10			10		
		H		0.94142	0.94231	0.00089		10			10		
Blank													
Range													
Mean													

Test Solution Volume: | Loading Rate:

[1] Add in weight loss of blank boat, if appropriate.

°AP 11/18/11 @ 0.94408

*Large orgs @aw 11/22/11 cf

**organisms on "Lower Johnson" pans are actually "Lower Sherman" organisms

FCETL QA Form No.010
Revision 5
Effective 08/99

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

~~AE~~ 11/22/11

Project Number: 60225262-058-(069-074) | Test Substance: Sediment | Comments: QA:CW 11/22/11 am-AE 11/22/11

Species: Hyalella azteca | Analyst Tare: KB | Analyst Gross: AP | Analytical Balance ID: Sartorius #1

Date/Time of Tare Wt.: 11/4/11 @ 1040 | Date/Time of Gross Wt.: 11/18/11 @ 1600 | Dried in Oven # 3 from Date: 11/4/11 Time: 1500 to Date: 11/18/11 Time: 1230

Weight Type (Circle): Wet Blot Dry Dry (60-90°C) ~~(>100°C)~~ AFDW (>500°C) | Lot or Batch Number: 11-025

Boat No.	Treatment	Rep.	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)[1]	No. of Orig. Organisms	Mean Wt. per Original Organism (mg)	Mean Wt. per Treatment (mg) (Original)	No. of Surv. Organisms	Mean Wt. per Surviving Organism (mg)	Mean Wt. per Treatment (mg) (Surviving)
	Middle	A		0.94070	0.94145	0.00075		10			10		
	Sherman	B		0.94150	0.94218	0.00068		10			10		
		C		0.94311	0.94372	0.00061		10			10		
		D		0.93768	0.93833	0.00065		10			10		
		E		0.93505	0.93565	0.00060		10			10		
		F		0.93303	0.93363	0.00060		②~~10~~ 9			8 ④		
		G		0.93176	0.93245	0.00069		10			10		
		H		0.92924	0.93001	0.00077		10			10		
Blank													
Range													
Mean													

Test Solution Volume: | Loading Rate:

[1] Add in weight loss of blank boat, if appropriate.

④ one organism lost during drying process.

①CW 11/22/11 CC
②CW for ANP 11/22/11 E

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

QA: acn 11/29/11
11/23/11

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Orig. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Sand Control	A		0.93738	0.93812	0.00074	0.00074	9	0.082		9	0.082	
	B		0.93648	0.93723	0.00075	0.00075	10	0.075		10	0.075	
	C		0.93850	0.93935	0.00085	0.00085	10	0.085		10	0.085	
	D		0.94034	0.94115	0.00081	0.00081	10	0.081		9	0.090	
	E		0.93682	0.93764	0.00082	0.00082	10	0.082		10	0.082	
	F		0.93901	0.93979	0.00078	0.00078	10	0.078		10	0.078	
	G		0.93822	0.93901	0.00079	0.00079	10	0.079		10	0.079	
	H		0.93809	0.93894	0.00085	0.00085	10	0.085	0.0809	10	0.085	0.0820
Blank			0.93894	0.93896	0.00002							

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Summary Statistics for Growth Data (dry wt per original organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Sand Control	8	0.075	0.085	0.0809	0.0035	4.267%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Sand Control	8	0.075	0.090	0.0820	0.0047	5.756%

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

QA: ARO 11/9/12
QA: CW 11/29/12
JK 11/23/12

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Orig. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Inlet Upper Slate	A		0.93961	0.94009	0.00048	0.00048	9	0.053		8	0.060	
	B		0.94125	0.94190	0.00065	0.00065	10	0.065		10	0.065	
	C		0.93915	0.93985	0.00070	0.00070	10	0.070		10	0.070	
	D		0.93873	0.93934	0.00061	0.00061	10	0.061		9	0.068	
	E		0.93976	0.94049	0.00073	0.00073	10	0.073		9	0.081	
	F		0.93703	0.93776	0.00073	0.00073	9	0.081		9	0.081	
	G		0.93744	0.93832	0.00088	0.00088	10	0.088		10	0.088	
	H		0.93818	0.93891	0.00073	0.00073	10	0.073	0.0706	10	0.073	0.0732
Blank			0.93894	0.93896	0.00002							

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Summary Statistics for Growth Data (dry wt per original organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Inlet Upper Slate	8	0.053	0.088	0.0706	0.0110	15.588%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Inlet Upper Slate	8	0.060	0.088	0.0732	0.0095	12.903%

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

QA: NR 07/19/12
QA: CW 11/29/11
DF 11/23/11

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Orig. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Lower Johnson	A		0.93978	0.94054	0.00076	0.00076	10	0.076		9	0.084	
	B		0.92878	0.92950	0.00072	0.00072	10	0.072		10	0.072	
	C		0.92680	0.92754	0.00074	0.00074	10	0.074		10	0.074	
	D		0.93186	0.93268	0.00082	0.00082	10	0.082		10	0.082	
	E		0.93886	0.93963	0.00077	0.00077	10	0.077		10	0.077	
	F		0.93633	0.93701	0.00068	0.00068	10	0.068		9	0.076	
	G		0.94047	0.94125	0.00078	0.00078	10	0.078		10	0.078	
	H		0.94185	0.94253	0.00068	0.00068	10	0.068	0.0744	9	0.076	0.0773
Blank			0.93894	0.93896	0.00002							

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Summary Statistics for Growth Data (dry wt per original organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Lower Johnson	8	0.068	0.082	0.0744	0.0049	6.584%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Lower Johnson	8	0.072	0.084	0.0773	0.0041	5.328%

QA: ARO 1/19/12
QA: CW 11/29/11
#11/23/11

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Orig. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Middle Slate	A		0.94351	0.94407	0.00056	0.00056	10	0.056		9	0.062	
	B		0.94660	0.94717	0.00057	0.00057	10	0.057		10	0.057	
	C		0.94937	0.95006	0.00069	0.00069	10	0.069		10	0.069	
	D		0.94942	0.95008	0.00066	0.00066	10	0.066		10	0.066	
	E		0.95253	0.95299	0.00046	0.00046	10	0.046		7	0.066	
	F		0.95226	0.95293	0.00067	0.00067	10	0.067		10	0.067	
	G		0.94895	0.94949	0.00054	0.00054	10	0.054		10	0.054	
	H		0.94130	0.94177	0.00047	0.00047	10	0.047	0.0577	9	0.052	0.0616
Blank			0.93894	0.93896	0.00002							

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Summary Statistics for Growth Data (dry wt per original organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Middle Slate	8	0.046	0.069	0.0577	0.0089	15.370%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Middle Slate	8	0.052	0.069	0.0616	0.0064	10.395%

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

QA: AR 11/29/11
QA: CW 11/29/11
JK 11/23/11

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Orig. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Lower Slate	A		0.94488	0.94558	0.00070	0.00070	10	0.070		10	0.070	
	B		0.94660	0.94716	0.00056	0.00056	10	0.056		8	0.070	
	C		0.94505	0.94597	0.00092	0.00092	10	0.092		10	0.092	
	D		0.94402	0.94457	0.00055	0.00055	10	0.055		9	0.061	
	E		0.94320	0.94408	0.00088	0.00088	10	0.088		9	0.098	
	F		0.94318	0.94384	0.00066	0.00066	10	0.066		10	0.066	
	G		0.94218	0.94311	0.00093	0.00093	10	0.093		10	0.093	
	H		0.94151	0.94211	0.00060	0.00060	10	0.060	0.0725	10	0.060	0.0762
Blank			0.93894	0.93896	0.00002							

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Summary Statistics for Growth Data (dry wt per original organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Lower Slate	8	0.055	0.093	0.0725	0.0161	22.265%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Lower Slate	8	0.060	0.098	0.0762	0.0154	20.251%

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

QA: AR 01/19/12
QA: EW 11/29/11
AR 11/23/11

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Orig. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Lower Sherman	A		0.93073	0.93154	0.00081	0.00081	10	0.081		10	0.081	
	B		0.93443	0.93512	0.00069	0.00069	10	0.069		9	0.077	
	C		0.93645	0.93706	0.00061	0.00061	10	0.061		10	0.061	
	D		0.94011	0.94061	0.00050	0.00050	10	0.050		8	0.062	
	E		0.94177	0.94249	0.00072	0.00072	10	0.072		10	0.072	
	F		0.93882	0.93958	0.00076	0.00076	10	0.076		10	0.076	
	G		0.93953	0.94025	0.00072	0.00072	10	0.072		10	0.072	
	H		0.94142	0.94231	0.00089	0.00089	10	0.089	0.0713	10	0.089	0.0738
Blank			0.93894	0.93896	0.00002							

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Summary Statistics for Growth Data (dry wt per original organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Lower Sherman	8	0.050	0.089	0.0713	0.0119	16.737%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Lower Sherman	8	0.061	0.089	0.0738	0.0092	12.486%

TEST ORGANISM LENGTHS, WEIGHTS, AND LOADING

QA: MRO 1/19/12
QA: CW 11/29/11
RT 11/23/11

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Treatment	Rep	Length Units:	Tare Weight (g)	Gross Weight (g)	Net Weight (g)	Adjusted Net Weight (g)	No of Orig. Organisms	Mean Wt./ Original Organism (mg)	Mean Wt./ Treatment (mg) (Original)	Number of Surv. Organisms	Mean Wt./ Surviving Organism (mg)	Mean Wt./ Treatment (mg) (Surviving)
Middle Sherman	A		0.94070	0.94145	0.00075	0.00075	10	0.075		10	0.075	
	B		0.94150	0.94218	0.00068	0.00068	10	0.068		10	0.068	
	C		0.94311	0.94372	0.00061	0.00061	10	0.061		10	0.061	
	D		0.93768	0.93833	0.00065	0.00065	10	0.065		10	0.065	
	E		0.93505	0.93565	0.00060	0.00060	10	0.060		10	0.060	
	F		0.93303	0.93363	0.00060	0.00060	9	0.067		8	0.075	
	G		0.93176	0.93245	0.00069	0.00069	10	0.069		10	0.069	
	H		0.92924	0.93001	0.00077	0.00077	10	0.077	0.0677	10	0.077	0.0687
Blank			0.93894	0.93896	0.00002							

Project Number: 60225262-058-(069-074) Species: *Hyalella azteca*

Summary Statistics for Growth Data (dry wt per original organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Middle Sherman	8	0.060	0.077	0.0677	0.0060	8.898%

Summary Statistics for Growth Data (dry wt per surviving organism)

Treatment	N	Min	Max	Mean	SD	C.V.
Middle Sherman	8	0.060	0.077	0.0687	0.0065	9.482%

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Summary Statistics for Survival

QA: MRO 1/19/12
dk 11/29/11
QA: CW 11/29/11

Title: 60225262-058-(069-074)
File: 058069s.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Control	8	0.9000	1.0000	0.9875
2	In. Upper Slate	8	0.9000	1.0000	0.9625
3	Lower Sherman	8	0.8000	1.0000	0.9625
4	Middle Slate	8	0.7000	1.0000	0.9375
5	Lower Slate	8	0.8000	1.0000	0.9500
6	Lower Johnson	8	0.9000	1.0000	0.9625
7	Middle Sherman	8	0.9000	1.0000	0.9875

Title: 60225262-058-(069-074)
File: 058069s.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Control	0.0013	0.0354	0.0125	3.5803
2	In. Upper Slate	0.0027	0.0518	0.0183	5.3771
3	Lower Sherman	0.0055	0.0744	0.0263	7.7301
4	Middle Slate	0.0113	0.1061	0.0375	11.3137
5	Lower Slate	0.0057	0.0756	0.0267	7.9571
6	Lower Johnson	0.0027	0.0518	0.0183	5.3771
7	Middle Sherman	0.0013	0.0354	0.0125	3.5803

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Summary Statistics for Growth per Original

* 11/29/11
QA:CW 11/29/11
ar: 4/20 01/19/12

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION
Number of Groups: 7

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	Control	1	0.0820	0.0820
1	Control	2	0.0750	0.0750
1	Control	3	0.0850	0.0850
1	Control	4	0.0810	0.0810
1	Control	5	0.0820	0.0820
1	Control	6	0.0780	0.0780
1	Control	7	0.0790	0.0790
1	Control	8	0.0850	0.0850
2	In. Upper Slate	1	0.0530	0.0530
2	In. Upper Slate	2	0.0650	0.0650
2	In. Upper Slate	3	0.0700	0.0700
2	In. Upper Slate	4	0.0610	0.0610
2	In. Upper Slate	5	0.0730	0.0730
2	In. Upper Slate	6	0.0810	0.0810
2	In. Upper Slate	7	0.0880	0.0880
2	In. Upper Slate	8	0.0730	0.0730
3	Lower Johnson	1	0.0760	0.0760
3	Lower Johnson	2	0.0720	0.0720
3	Lower Johnson	3	0.0740	0.0740
3	Lower Johnson	4	0.0820	0.0820
3	Lower Johnson	5	0.0770	0.0770
3	Lower Johnson	6	0.0680	0.0680
3	Lower Johnson	7	0.0780	0.0780
3	Lower Johnson	8	0.0680	0.0680
4	Middle Slate	1	0.0560	0.0560
4	Middle Slate	2	0.0570	0.0570
4	Middle Slate	3	0.0690	0.0690
4	Middle Slate	4	0.0660	0.0660
4	Middle Slate	5	0.0460	0.0460
4	Middle Slate	6	0.0670	0.0670
4	Middle Slate	7	0.0540	0.0540
4	Middle Slate	8	0.0470	0.0470
5	Lower Slate	1	0.0700	0.0700
5	Lower Slate	2	0.0560	0.0560
5	Lower Slate	3	0.0920	0.0920
5	Lower Slate	4	0.0550	0.0550
5	Lower Slate	5	0.0880	0.0880
5	Lower Slate	6	0.0660	0.0660
5	Lower Slate	7	0.0930	0.0930
5	Lower Slate	8	0.0600	0.0600
6	Lower Sherman	1	0.0810	0.0810
6	Lower Sherman	2	0.0690	0.0690
6	Lower Sherman	3	0.0610	0.0610
6	Lower Sherman	4	0.0500	0.0500
6	Lower Sherman	5	0.0720	0.0720
6	Lower Sherman	6	0.0760	0.0760
6	Lower Sherman	7	0.0720	0.0720
6	Lower Sherman	8	0.0890	0.0890
7	Middle Sherman	1	0.0750	0.0750
7	Middle Sherman	2	0.0680	0.0680
7	Middle Sherman	3	0.0610	0.0610

Toxstat version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.

JR 11/29/11
QA: CW 11/29/11
QA: MM 01/19/12

7	Middle Sherman	4	0.0650	0.0650	
7	Middle Sherman	5	0.0600	0.0600	
7	Middle Sherman	6	0.0670	0.0670	
7	Middle Sherman	7	0.0690	0.0690	
7	Middle Sherman	8	0.0770	0.0770	

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Summary Statistics for Growth per Original

* 11/29/11
QA: CW 11/29/11
QA: MR 01/19/12

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Control	8	0.0750	0.0850	0.0809
2	In. Upper Slate	8	0.0530	0.0880	0.0705
3	Lower Johnson	8	0.0680	0.0820	0.0744
4	Middle Slate	8	0.0460	0.0690	0.0577
5	Lower Slate	8	0.0550	0.0930	0.0725
6	Lower Sherman	8	0.0500	0.0890	0.0713
7	Middle Sherman	8	0.0600	0.0770	0.0678

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Control	0.0000	0.0034	0.0012	4.2545
2	In. Upper Slate	0.0001	0.0111	0.0039	15.6855
3	Lower Johnson	0.0000	0.0049	0.0017	6.5844
4	Middle Slate	0.0001	0.0089	0.0031	15.3699
5	Lower Slate	0.0003	0.0161	0.0057	22.2651
6	Lower Sherman	0.0001	0.0119	0.0042	16.7374
7	Middle Sherman	0.0000	0.0060	0.0021	8.8824

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Determination of NOEC and LOEC for Growth per Original

11/29/11
QA: cw 11/29/11
AR: AR 01/19/12

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION

Chi-Square Test for Normality

Actual and Expected Frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	3.7520	13.5520	21.3920	13.5520	3.7520
OBSERVED	3	13	23	14	3

Chi-Square = 0.4596 (p-value = 0.9773)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data (PASS) normality test (alpha = 0.01). Continue analysis.

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

******** Shapiro - Wilk's Test is aborted ********

This test can not be performed because total number of replicates is greater than 50.

Total number of replicates = 56

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 20.3103 (p-value = 0.0024)

Data (FAIL) B1 homogeneity test at 0.01 level. Try another transformation.

Critical B = 16.8119 (alpha = 0.01, df = 6)
= 12.5916 (alpha = 0.05, df = 6)

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Determination of NOEC and LOEC for Growth per Original

AK 11/29/11
QA: CW 11/29/11
AM: AM 11/29/11

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION

Steel's Many-One Rank Test - Ho: Control<Treatment

GROUP	IDENTIFICATION	MEAN IN ORIGINAL UNITS	RANK SUM	CRIT. VALUE	DF	SIG 0.05
1	Control	0.0809				
2	In. Upper Slate	0.0705	47.50	46.00	8.00	
3	Lower Johnson	0.0744	44.50	46.00	8.00	*
4	Middle Slate	0.0577	36.00	46.00	8.00	*
5	Lower Slate	0.0725	60.00	46.00	8.00	
6	Lower Sherman	0.0713	48.50	46.00	8.00	
7	Middle Sherman	0.0678	37.50	46.00	8.00	*

Critical values are 1 tailed (k = 6)

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Determination of **PMSD ONLY** for Growth per Original

ak 11/29/11
QA:cw 11/29/11
QA: mc 01/19/12

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION

ANOVA Table

SOURCE	DF	SS	MS	F
Between	6	0.0024	0.0004	4.1015
Within (Error)	49	0.0047	0.0001	
Total	55	0.0071		

(p-value = 0.0021)

Critical F = 3.1948 (alpha = 0.01, df = 6,49)
= 2.2904 (alpha = 0.05, df = 6,49)

Since F > Critical F REJECT Ho: All equal (alpha = 0.05)

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION

Dunnett's Test - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG 0.05
1	Control	0.0809	0.0809		
2	In. Upper Slate	0.0705	0.0705	2.1117	
3	Lower Johnson	0.0744	0.0744	1.3230	
4	Middle Slate	0.0577	0.0577	4.7068	*
5	Lower Slate	0.0725	0.0725	1.7046	
6	Lower Sherman	0.0713	0.0713	1.9590	
7	Middle Sherman	0.0678	0.0678	2.6714	*

Dunnett critical value = 2.3700 (1 Tailed, alpha = 0.05, df [used] = 6,40)
(Actual df = 6,49)

Title: 60225262-058-(069-074)
File: 058069g.dat Transform: NO TRANSFORMATION

Dunnett's Test - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	MIN SIG DIFF (IN ORIG. UNITS)	% OF CONTROL	DIFFERENCE FROM CONTROL
1	Control	8			
2	In. Upper Slate	8	0.0116	14.4	0.0104
3	Lower Johnson	8	0.0116	14.4	0.0065
4	Middle Slate	8	0.0116	14.4	0.0231
5	Lower Slate	8	0.0116	14.4	0.0084
6	Lower Sherman	8	0.0116	14.4	0.0096
7	Middle Sherman	8	0.0116	14.4	0.0131

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
List Data for Growth per Surviving

QA: ARev 1/9/12
11/29/11
QA: CW 11/30/11

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION
Number of Groups: 7

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	Control	1	0.0820	0.0820
1	Control	2	0.0750	0.0750
1	Control	3	0.0850	0.0850
1	Control	4	0.0900	0.0900
1	Control	5	0.0820	0.0820
1	Control	6	0.0780	0.0780
1	Control	7	0.0790	0.0790
1	Control	8	0.0850	0.0850
2	In. Upper Slate	1	0.0600	0.0600
2	In. Upper Slate	2	0.0650	0.0650
2	In. Upper Slate	3	0.0700	0.0700
2	In. Upper Slate	4	0.0680	0.0680
2	In. Upper Slate	5	0.0810	0.0810
2	In. Upper Slate	6	0.0810	0.0810
2	In. Upper Slate	7	0.0880	0.0880
2	In. Upper Slate	8	0.0730	0.0730
3	Lower Johnson	1	0.0840	0.0840
3	Lower Johnson	2	0.0720	0.0720
3	Lower Johnson	3	0.0740	0.0740
3	Lower Johnson	4	0.0820	0.0820
3	Lower Johnson	5	0.0770	0.0770
3	Lower Johnson	6	0.0760	0.0760
3	Lower Johnson	7	0.0780	0.0780
3	Lower Johnson	8	0.0760	0.0760
4	Middle Slate	1	0.0620	0.0620
4	Middle Slate	2	0.0570	0.0570
4	Middle Slate	3	0.0690	0.0690
4	Middle Slate	4	0.0660	0.0660
4	Middle Slate	5	0.0660	0.0660
4	Middle Slate	6	0.0670	0.0670
4	Middle Slate	7	0.0540	0.0540
4	Middle Slate	8	0.0520	0.0520
5	Lower Slate	1	0.0700	0.0700
5	Lower Slate	2	0.0700	0.0700
5	Lower Slate	3	0.0920	0.0920
5	Lower Slate	4	0.0610	0.0610
5	Lower Slate	5	0.0980	0.0980
5	Lower Slate	6	0.0660	0.0660
5	Lower Slate	7	0.0930	0.0930
5	Lower Slate	8	0.0600	0.0600
6	Lower Sherman	1	0.0810	0.0810
6	Lower Sherman	2	0.0770	0.0770
6	Lower Sherman	3	0.0610	0.0610
6	Lower Sherman	4	0.0620	0.0620
6	Lower Sherman	5	0.0720	0.0720
6	Lower Sherman	6	0.0760	0.0760
6	Lower Sherman	7	0.0720	0.0720
6	Lower Sherman	8	0.0890	0.0890
7	Middle Sherman	1	0.0750	0.0750
7	Middle Sherman	2	0.0680	0.0680
7	Middle Sherman	3	0.0610	0.0610

AK 11/29/11
QA: cw 11/30/11
An: AEO 1/09/12

7	Middle Sherman	4	0.0650	0.0650
7	Middle Sherman	5	0.0600	0.0600
7	Middle Sherman	6	0.0750	0.0750
7	Middle Sherman	7	0.0690	0.0690
7	Middle Sherman	8	0.0770	0.0770

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Summary Statistics for Growth per Surviving

dk 11/29/11
QA: cw 11/30/11
QA: AR 01/9/12

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Control	8	0.0750	0.0900	0.0820
2	In. Upper Slate	8	0.0600	0.0880	0.0733
3	Lower Johnson	8	0.0720	0.0840	0.0774
4	Middle Slate	8	0.0520	0.0690	0.0616
5	Lower Slate	8	0.0600	0.0980	0.0763
6	Lower Sherman	8	0.0610	0.0890	0.0738
7	Middle Sherman	8	0.0600	0.0770	0.0688

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION

Summary Statistics on Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Control	0.0000	0.0047	0.0017	5.7570
2	In. Upper Slate	0.0001	0.0094	0.0033	12.8429
3	Lower Johnson	0.0000	0.0040	0.0014	5.1204
4	Middle Slate	0.0000	0.0065	0.0023	10.5142
5	Lower Slate	0.0002	0.0155	0.0055	20.3264
6	Lower Sherman	0.0001	0.0093	0.0033	12.6317
7	Middle Sherman	0.0000	0.0065	0.0023	9.4825

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Determination of NOEC and LOEC for Growth per Surviving

11/29/11
QA: aw 11/30/11
QA: AEO 11/9/12

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION

Chi-Square Test for Normality

Actual and Expected Frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	3.7520	13.5520	21.3920	13.5520	3.7520
OBSERVED	0	19	17	16	4

Chi-Square = 7.3025 (p-value = 0.1207)

Critical Chi-Square = 13.277 (alpha = 0.01 , df = 4)
= 9.488 (alpha = 0.05 , df = 4)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION

Shapiro - Wilk's Test for Normality

******** Shapiro - Wilk's Test is aborted ********

This test can not be performed because total number of replicates is greater than 50.

Total number of replicates = 56

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION

Bartlett's Test for Homogeneity of Variance

Calculated B1 statistic = 17.4005 (p-value = 0.0079)

Data FAIL B1 homogeneity test at 0.01 level. Try another transformation.

Critical B = 16.8119 (alpha = 0.01, df = 6)
= 12.5916 (alpha = 0.05, df = 6)

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Determination of NOEC and LOEC for Growth per Surviving

*11/29/11
QA: cw 11/30/11
QA: AG 01/19/12

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION

Steel's Many-One Rank Test - Ho: Control<Treatment

GROUP	IDENTIFICATION	MEAN IN ORIGINAL UNITS	RANK SUM	CRIT. VALUE	DF	SIG 0.05
1	Control	0.0820				
2	In. Upper Slate	0.0733	49.00	46.00	8.00	
3	Lower Johnson	0.0774	49.50	46.00	8.00	
4	Middle Slate	0.0616	36.00	46.00	8.00	*
5	Lower Slate	0.0763	60.00	46.00	8.00	
6	Lower Sherman	0.0738	48.00	46.00	8.00	
7	Middle Sherman	0.0688	38.00	46.00	8.00	*

Critical values are 1 tailed (k = 6)

Toxstat Version 3.5
Study # 60225262-058-(069-074)
Coeur Alaska Inc.
Determination of **PMSD ONLY** for Growth per Surviving

11/29/11
QA: CW 11/30/11
QA: AR 01/19/12

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION

ANOVA Table

SOURCE	DF	SS	MS	F
Between	6	0.0021	0.0003	4.4798
Within (Error)	49	0.0038	0.0001	
Total	55	0.0058		

(p-value = 0.0011)

Critical F = 3.1948 (alpha = 0.01, df = 6,49)
= 2.2904 (alpha = 0.05, df = 6,49)

Since F > Critical F REJECT Ho: All equal (alpha = 0.05)

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION

Dunnett's Test - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG 0.05
1	Control	0.0820	0.0820		
2	In. Upper Slate	0.0733	0.0733	1.9962	
3	Lower Johnson	0.0774	0.0774	1.0551	
4	Middle Slate	0.0616	0.0616	4.6484	*
5	Lower Slate	0.0763	0.0763	1.3118	
6	Lower Sherman	0.0738	0.0738	1.8822	
7	Middle Sherman	0.0688	0.0688	3.0229	*

Dunnett critical value = 2.3700 (1 Tailed, alpha = 0.05, df [used] = 6,40)
(Actual df = 6,49)

Title: 60225262-058-(069-074)
File: 058069gs.dat Transform: NO TRANSFORMATION

Dunnett's Test - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	MIN SIG DIFF (IN ORIG. UNITS)	% OF CONTROL	DIFFERENCE FROM CONTROL
1	Control	8			
2	In. Upper Slate	8	0.0104	12.7	0.0087
3	Lower Johnson	8	0.0104	12.7	0.0046
4	Middle Slate	8	0.0104	12.7	0.0204
5	Lower Slate	8	0.0104	12.7	0.0057
6	Lower Sherman	8	0.0104	12.7	0.0082
7	Middle Sherman	8	0.0104	12.7	0.0132

APPENDIX C

Analytical Data

FCETL QA Form No.131
Revision 0
Effective 10/06

AR: AR 01/11/12

PERCENT TOTAL SOLIDS AND PERCENT TOTAL VOLATILE SOLIDS (TVS)

Project No: 60225262-058-(063-068)

TARE: Date/time: 12/8/11 @ 1515 Analyst: AS / CW

DRY GROSS: Date/time: 12/9/11 @ 1250 Analyst: CW

ASHED GROSS: Date/time: 12/13/11 @ 1025 Analyst: CW

Analytical Balance ID: A+D #2

Dried in Oven # 1 from Date: 12/8/11 Time: 1540
Oven °C: 104 to Date: 12/9/11 Time: 1220

Ashed in Furnace from Date: 12/9/11 Time: 1300
Furnace °C: 550 to Date: 12/9/11 Time: 1635

	Dish No.	Treatment	Rep	Tare Weight of Dish (g) A	Dish + Wet Sample (g) B	Dry Gross Weight (g) (dish + dry sample) C	% Total Solids (g) [(C-A)(100)]/(B-A)	Ashed Gross Weight (dish + sample)(g) D	% Total Volatile Solids (g) [(C-D)(100)]/(C-A)
▲	6	Inlet Upper Side		17.8731	38.1931	32.5184		31.9334	
▲	5(side)	"		28.2599	57.4630	49.3248		48.4312	
▲	54B	Lower Side		26.4402	55.5349	49.1594		48.3934	
▲	52	"		25.7186	46.9934	42.2961		41.7338	
	7	Middle Side		19.9943	39.9894	32.0925		31.1624	
	19	"		18.0636	38.3900	30.2261		29.2623	
	26	Lower Sherman		19.0541	42.1467	35.8163		35.3507	
	15	"		18.3875	39.9342	34.2720		33.8392	
	16	Middle Sherman		19.1703	43.2400	36.4068		35.8727	
▲	21	"		19.9266	40.4985	35.0048		34.6220	
	28	Lower Johnson		18.1432	39.7009	34.1146		33.7975	
	10	"		18.0139 ① 45	41.6577	35.6213		35.2623	
▲	Blank	(53)		26.6048	~~26.6025~~ ②	~~26.6048~~ 26.6035		26.6043	
	Blank	(1)		20.2117	~~20.2105~~ ②	20.2105		20.2114	

[1] Add in weight loss of blank boat, if appropriate.

① AS 12/8/11 C

② CW 12/9/11 WP

▲ Ashed in furnace from 12/12/11 @ 1030 to 12/12/11 @ 1640
Ashed gross weight 12/13/11 @ 0950 CW

EW 12/20/11
QA: AR01/11/12

Percent Total Solids and Percent Total Volatile Solids

Project Number: 60225262-058-(063-068)

Treatment	Rep		Tare Weight (g) A	Dish + Wet Sample (g) B	Dry Gross Weight (g) (dish + dry sample) C	% Total Solids [(C-A)(100)]/(B-A)	Treatment Mean % Total Solids	Ashed Gross Weight (g) (dish + sample) D	% Total Volatile Solids [(C-D)(100)]/(C-A)	Treatment Mean % Total Volatile Solids
Inlet Upper Slate	A		17.8731	38.1931	32.5184	72.0733	72.1029	31.9334	3.9945	4.1183
	B		28.2599	57.4630	49.3246	72.1324		48.4312	4.2421	
Lower Slate	A		26.4402	55.5349	49.1594	78.0871	78.0040	48.3934	3.3716	3.3818
	B		25.7186	46.9934	42.2961	77.9208		41.7338	3.3919	
Middle Slate	A		19.9943	39.9894	32.0926	60.5058	60.1709	31.1624	7.6879	7.8061
	B		18.0636	38.3900	30.2261	59.8360		29.2623	7.9244	
Lower Sherman	A		19.0541	42.1467	35.8163	72.5869	73.1541	35.3507	2.7777	2.7512
	B		18.3875	39.9342	34.2720	73.7213		33.8392	2.7247	
Middle Sherman	A		19.1703	43.2400	36.4068	71.6108	72.4530	35.8727	3.0987	2.8187
	B		19.9266	40.4985	35.0048	73.2951		34.6220	2.5388	
Lower Johnson	A		18.1432	39.7009	34.1146	74.0868	74.2778	33.7975	1.9854	2.0122
	B		18.0145	41.6577	35.6213	74.4688		35.2623	2.0390	
Blank 1			26.6048		26.6035			26.6043		
Blank 2			20.2117		20.2105			20.2114		

Friday, December 02, 2011

Analytical Laboratory

Rami Naddy
AECOM
4303 W Laporte Ave
Fort Collins, CO 80521

RE: FCETL/AECOM Work Order: 1111062

Dear Rami Naddy:

MSE Lab Services received 7 sample(s) on 11/15/2011 for the analyses presented in the following report.

Please find enclosed analytical results for the sample(s) received at the MSE Laboratory.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Sara Ward

Sara Ward
Laboratory Manager
406-494-7334

Enclosure

MSE Analytical Laboratory
P.O. Box 4078
200 Technology Way
Butte, MT 59701
Lab: 406-494-7334
Fax: 406-494-7230
labinfo@mse-ta.com

12/2/11 SW

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	FORM SED
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-001A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgv**
Aluminum	1050	4.45	14.2		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	ND	0.103	0.354		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.061	0.006	0.024		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	7.31	0.130	0.472		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	0.940	0.097	0.295		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	0.390	0.011	0.047		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	0.986	0.068	0.236		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	ND	0.160	0.472		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	ND	0.087	0.236		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	3.92	0.216	0.708		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0366	0.126		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	25.3	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	8.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	86.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	6.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	LOAMYSAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	15.2	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-002A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	13600	5.04	16.0		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	16.2	0.116	0.401		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	1.46	0.007	0.027		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	29.4	0.147	0.535		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	56.7	0.110	0.334		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	7.79	0.012	0.054		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	47.4	0.077	0.267		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	0.720	0.182	0.535		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.134	0.098	0.267	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	220	0.244	0.802		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	0.0502	0.0393	0.136	J	mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	2.04	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	0.44	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	94.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	4.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	25.2	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/3/2011
Lab ID:	1111062-002B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS		**AVS-SEM**	**AVS-SEM**				Analyst: **kgw**
Sulfide	ND	0.55	1.50		µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	INLET UPPER SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-003A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	22500	5.25	16.7		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	17.9	0.121	0.418		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.722	0.007	0.028		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	127	0.153	0.557		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	53.4	0.114	0.348		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	3.37	0.012	0.056		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	87.5	0.080	0.278		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	0.809	0.189	0.557		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.120	0.103	0.278	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	130	0.254	0.835		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0489	0.169		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	5.46	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	4.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	94.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	28.2	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	INLET UPPER SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/4/2011
Lab ID:	1111062-003B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS			**AVS-SEM**	**AVS-SEM**			Analyst: **kgw**
Sulfide	1.39	0.55	1.50	J	µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	MIDDLE SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-004A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	20100	6.31	20.1		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	30.0	0.146	0.502		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	20.9	0.009	0.034		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	29.5	0.184	0.669		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	88.4	0.137	0.418		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	8.50	0.015	0.067		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	143	0.096	0.335		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	1.41	0.227	0.669		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.233	0.123	0.335	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	1360	0.306	1.00		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	0.0692	0.0545	0.188	J	mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	11.0	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	1.65	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	10.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	86.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	4.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	LOAMYSAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	40.2	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	MIDDLE SLATE
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/4/2011
Lab ID:	1111062-004B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS			**AVS-SEM**	**AVS-SEM**			Analyst: **kgw**
Sulfide	ND	0.55	1.50		µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	MIDDLE SHERMAN
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-005A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	19000	5.06	16.1		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	55.7	0.117	0.402		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.175	0.007	0.027		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	43.4	0.147	0.536		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	97.1	0.110	0.335		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	17.3	0.012	0.054		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	44.0	0.077	0.268		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	ND	0.182	0.536		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.633	0.099	0.268		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	120	0.245	0.804		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0412	0.142		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	1.17	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	0.22	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	96.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	25.4	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	MIDDLE SHERMAN
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/4/2011
Lab ID:	1111062-005B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS			**AVS-SEM**	**AVS-SEM**			Analyst: kgw
Sulfide	1.01	0.55	1.50	J	µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER SHERMAN
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	11/10/2011 11:00:00 AM
Lab ID:	1111062-006A	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	18200	4.88	15.5		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	28.9	0.112	0.388		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.389	0.007	0.026		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	46.2	0.142	0.517		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	94.0	0.106	0.323		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	6.70	0.012	0.052		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	45.9	0.074	0.259		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	ND	0.176	0.517		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.137	0.095	0.259	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	110	0.236	0.776		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0455	0.157		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	0.54	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	0.11	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	96.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	22.7	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER SHERMAN
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/3/2011
Lab ID:	1111062-006B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS		**AVS-SEM**	**AVS-SEM**				Analyst: kgw
Sulfide	1.50	0.55	1.50		µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT: AECOM
Lab Order: 1111062
Project: FCETL/AECOM
Lab ID: 1111062-007A

Client Sample ID: LOWER JOHNSON
Tag Number:
Collection Date: 11/10/2011 11:00:00 AM
Matrix: SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ICP-MS METALS, SOLID SAMPLES			**SW6020**	**SW3050B**			Analyst: **kgw**
Aluminum	13100	5.02	16.0		mg/Kg-dry	4	11/23/2011 3:10:21 PM
Arsenic	16.2	0.116	0.399		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Cadmium	0.238	0.007	0.027		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Chromium	31.5	0.146	0.533		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Copper	73.1	0.109	0.333		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Lead	9.76	0.012	0.053		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Nickel	27.3	0.076	0.266		mg/Kg-dry	2	11/30/2011 2:00:59 PM
Selenium	ND	0.181	0.533		mg/Kg-dry	2	11/21/2011 5:39:56 PM
Silver	0.164	0.098	0.266	J	mg/Kg-dry	2	11/21/2011 5:39:56 PM
Zinc	93.3	0.243	0.799		mg/Kg-dry	2	11/30/2011 2:00:59 PM
MERCURY IN SOIL/SEDIMENT - SW846 7471B			**E245.5**	**SW7471A**			Analyst: **tr**
Mercury	ND	0.0386	0.133		mg/Kg-dry	1	11/18/2011 9:32:00 AM
ORGANIC MATTER-WALKLEY BLACK			**OM_WALKLEYBLACK**				Analyst: **dk**
Organic Matter - Walkley Black	0.89	0.09	0.20		%	1	11/18/2011 2:19:00 PM
PERCENT COARSE MATERIAL			**ASTMD422**				Analyst: **dk**
1" Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
2mm Gradation	ND	0.05	0.10		%	1	11/17/2011 4:55:00 PM
RAPID HYDROMETER (2 HOUR) MOD ASA 15-5			**MSA15-5**				Analyst: **dk**
% Clay	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Sand	96.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
% Silt	2.0	0.1	0.1		%	1	11/17/2011 5:50:00 PM
Soil Class	SAND					1	11/17/2011 5:50:00 PM
PERCENT MOISTURE			**D2216**				Analyst: **BO**
Percent Moisture	24.9	0.01	0.05		wt%	1	11/16/2011 3:00:00 PM

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

MSE Lab Services

Date: *02-Dec-11*

CLIENT:	AECOM	**Client Sample ID:**	LOWER JOHNSON
Lab Order:	1111062	**Tag Number:**	
Project:	FCETL/AECOM	**Collection Date:**	10/3/2011
Lab ID:	1111062-007B	**Matrix:**	SEDIMENT

Analyses	Result	MDL	Rpt. Limit	Qual	Units	DF	Date Analyzed
ACID VOLATILE SULFIDE-SIM. EXT. METALS			**AVS-SEM**	**AVS-SEM**			Analyst: **kgw**
Sulfide	ND	0.55	1.50		µmoles/g	1	11/18/2011 9:32:00 AM

Qualifiers:				
	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
	J	Analyte detected below the Reporting Limit	Limit	Reporting Limit
	MDL	Method Detection Limit	ND	Not Detected at the Method Detection Limit (MDL)

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM
Work Order: 1111062
BatchID: 5060

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
*Sample ID: **5060-PB FILTERED***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	0.070	0.150	mg/Kg							J
Cadmium	0.012	0.010	mg/Kg							
Lead	0.020	0.020	mg/Kg							
Selenium	ND	0.200	mg/Kg							
Silver	0.078	0.100	mg/Kg							J
*Sample ID: **5060-PB UNFILTERED***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	0.150	0.150	mg/Kg							
Cadmium	0.004	0.010	mg/Kg							J
Lead	0.022	0.020	mg/Kg							
Selenium	ND	0.200	mg/Kg							
Silver	ND	0.100	mg/Kg							
*Sample ID: **5060-LCS***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	85.9	0.300	mg/Kg	85.30	101	80	120			
Cadmium	153	0.020	mg/Kg	159.0	96.4	80	120			
Lead	44.4	0.040	mg/Kg	46.30	96.0	80	120			
Selenium	39.3	0.400	mg/Kg	45.20	87.0	80	120			
Silver	24.7	0.200	mg/Kg	24.30	102	80	120			
*Sample ID: **1111062-007A MS***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	146	0.399	mg/Kg-dry	113.6	114	75	125			
Cadmium	202	0.027	mg/Kg-dry	211.7	95.2	75	125			
Lead	67.2	0.053	mg/Kg-dry	61.65	93.1	75	125			
Selenium	56.8	0.533	mg/Kg-dry	60.19	94.3	75	125			
Silver	33.1	0.266	mg/Kg-dry	32.36	102	75	125			
*Sample ID: **1111062-007A MSD***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	141	0.399	mg/Kg-dry	113.6	110	75	125	3.23	20	
Cadmium	201	0.027	mg/Kg-dry	211.7	94.7	75	125	0.527	20	
Lead	68.1	0.053	mg/Kg-dry	61.65	94.5	75	125	1.31	20	
Selenium	58.3	0.533	mg/Kg-dry	60.19	96.9	75	125	2.70	20	
Silver	32.8	0.266	mg/Kg-dry	32.36	101	75	125	0.878	20	
*Sample ID: **1111062-007A MST***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/21/2011 5:39:56 PM*		
Arsenic	129	0.399	mg/Kg-dry	113.6	99.2	75	125	12.4	20	
Cadmium	198	0.027	mg/Kg-dry	211.7	93.4	75	125	1.84	20	
Lead	66.1	0.053	mg/Kg-dry	61.65	91.4	75	125	1.56	20	
Selenium	55.3	0.533	mg/Kg-dry	60.19	91.9	75	125	2.53	20	
Silver	33.3	0.266	mg/Kg-dry	32.36	102	75	125	0.576	20	
*Sample ID: **5060-PB FILTERED***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/23/2011 3:10:21 PM*		
Aluminum	ND	3.00	mg/Kg							

Qualifiers: NA Sample conc. is > 4*spike level S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM
Work Order: 1111062
BatchID: 5060

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
*Sample ID: **5060-PB UNFILTERED***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/23/2011 3:10:21 PM*		
Aluminum	ND	3.00	mg/Kg							
*Sample ID: **5060-LCS***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/23/2011 3:10:21 PM*		
Aluminum	9920	6.00	mg/Kg	11250	88.2	80	120			
*Sample ID: **1111062-007A MS***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/23/2011 3:10:21 PM*		
Aluminum	28100	16.0	mg/Kg-dry	14980	100	75	125			
*Sample ID: **1111062-007A MSD***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/23/2011 3:10:21 PM*		
Aluminum	29500	16.0	mg/Kg-dry	14980	109	75	125	4.57	20	
*Sample ID: **1111062-007A MST***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/23/2011 3:10:21 PM*		
Aluminum	30100	16.0	mg/Kg-dry	14980	113	75	125	6.57	20	
*Sample ID: **5060-PB FILTERED***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/30/2011 2:00:59 PM*		
Chromium	3.03	0.200	mg/Kg							
Copper	0.141	0.125	mg/Kg							
Nickel	0.103	0.100	mg/Kg							
Zinc	0.352	0.300	mg/Kg							
*Sample ID: **5060-PB UNFILTERED***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/30/2011 2:00:59 PM*		
Chromium	2.79	0.200	mg/Kg							
Copper	0.175	0.125	mg/Kg							
Nickel	0.068	0.100	mg/Kg							J
Zinc	0.332	0.300	mg/Kg							
*Sample ID: **5060-LCS***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/30/2011 2:00:59 PM*		
Chromium	337	0.400	mg/Kg	294.0	115	80	120			
Copper	71.9	0.250	mg/Kg	63.20	114	80	120			
Nickel	186	0.200	mg/Kg	163.0	114	80	120			
Zinc	270	0.600	mg/Kg	262.0	103	80	120			
*Sample ID: **1111062-007A MS***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/30/2011 2:00:59 PM*		
Chromium	489	0.533	mg/Kg-dry	391.5	117	75	125			
Copper	171	0.333	mg/Kg-dry	84.16	117	75	125			
Nickel	271	0.266	mg/Kg-dry	217.1	112	75	125			
Zinc	441	0.799	mg/Kg-dry	348.9	99.7	75	125			
*Sample ID: **1111062-007A MSD***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/30/2011 2:00:59 PM*		
Chromium	515	0.533	mg/Kg-dry	391.5	124	75	125	5.16	20	
Copper	168	0.333	mg/Kg-dry	84.16	113	75	125	1.72	20	
Nickel	276	0.266	mg/Kg-dry	217.1	115	75	125	2.03	20	
Zinc	449	0.799	mg/Kg-dry	348.9	102	75	125	1.69	20	
*Sample ID: **1111062-007A MST***			*Method: **SW6020***		*Batch ID: **5060***			*Analysis Date: 11/30/2011 2:00:59 PM*		
Chromium	486	0.533	mg/Kg-dry	391.5	116	75	125	0.795	20	

Qualifiers: NA Sample conc. is > 4*spike level S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: 5060

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
*Sample ID: **1111062-007A MST***			*Method: **SW6020***	*Batch ID: **5060***				*Analysis Date: 11/30/2011 2:00:59 PM*		
Copper	159	0.333	mg/Kg-dry	84.16	103	75	125	7.18	20	
Nickel	265	0.266	mg/Kg-dry	217.1	110	75	125	2.05	20	
Zinc	436	0.799	mg/Kg-dry	348.9	98.2	75	125	1.24	20	

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: 5064

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
Sample ID: ***5064-PB***			*Method:* ***E245.5***		*Batch ID:* ***5064***				*Analysis Date: 11/18/2011 9:32:00 AM*	
Mercury	ND	0.100	mg/Kg							
Sample ID: ***LCS-5064***			*Method:* ***E245.5***		*Batch ID:* ***5064***				*Analysis Date: 11/18/2011 9:32:00 AM*	
Mercury	14.0	0.553	mg/Kg	16.00	87.8	80	120			
Sample ID: ***1111062-002A-MS***			*Method:* ***E245.5***		*Batch ID:* ***5064***				*Analysis Date: 11/18/2011 9:32:00 AM*	
Mercury	18.2	1.66	mg/Kg-dry	21.40	84.9	75	125			
Sample ID: ***1111062-002A-MSD***			*Method:* ***E245.5***		*Batch ID:* ***5064***				*Analysis Date: 11/18/2011 9:32:00 AM*	
Mercury	21.3	1.66	mg/Kg-dry	21.40	99.2	75	125	15.5	20	

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: 5079

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
Sample ID: ***1111062-002B-D***			*Method:* ***AVS-SEM***		*Batch ID:* ***5079***			*Analysis Date: 11/18/2011 9:32:00 AM*		
Sulfide	ND	1.50	µmoles/g					0	35	
Sample ID: ***1111062-002B-S***			*Method:* ***AVS-SEM***		*Batch ID:* ***5079***			*Analysis Date: 11/18/2011 9:32:00 AM*		
Sulfide	11.1	1.50	µmoles/g	10.59	105	80	120			
Sample ID: ***LCS-5079***			*Method:* ***AVS-SEM***		*Batch ID:* ***5079***			*Analysis Date: 11/18/2011 9:32:00 AM*		
Sulfide	13.7	1.50	µmoles/g	12.58	109	85	115			
Sample ID: ***5079-PB***			*Method:* ***AVS-SEM***		*Batch ID:* ***5079***			*Analysis Date: 11/18/2011 9:32:00 AM*		
Sulfide	0.89	1.50	µmoles/g							J

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

MSE Analytical Laboratory
P.O. Box 4078
200 Technology Way
Butte, MT 59701
Lab: 406-494-7334
Fax: 406-494-7230
labinfo@mse-ta.com

Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: R18192

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
*Sample ID: **1111062-006A-D***			*Method: **ASTMD422***		*Batch ID: **R18192***			*Analysis Date: 11/17/2011 4:55:00 PM*		
1" Gradation	ND	0.10	%					0	35	
2mm Gradation	0.13	0.10	%					12.9	35	

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: R18203

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
*Sample ID: **1111062-004A-D***			*Method: **MSA15-5***		*Batch ID: **R18203***			*Analysis Date: 11/17/2011 5:50:00 PM*		
% Clay	10.0	0.1	%					0	35	
% Sand	86.0	0.1	%					0	35	
% Silt	4.0	0.1	%					0	35	
Soil Class	LOAMYSAND									

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: R18208

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
Sample ID: ***1111062-002A-D***			*Method:* ***OM_WALKLE*** *Batch ID:* ***R18208***						*Analysis Date: 11/18/2011 2:19:00 PM*	
Organic Matter - Walkl	2.29	0.20	%					11.9	35	
Sample ID: ***LCSQ5771***			*Method:* ***OM_WALKLE*** *Batch ID:* ***R18208***						*Analysis Date: 11/18/2011 2:19:00 PM*	
Organic Matter - Walkl	0.55	0.20	%	0.5965	92.9	70.7	109			
Sample ID: ***PB***			*Method:* ***OM_WALKLE*** *Batch ID:* ***R18208***						*Analysis Date: 11/18/2011 2:19:00 PM*	
Organic Matter - Walkl	ND	0.20	%							

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

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Date: 02-Dec-11
Report Date: 02-Dec-11

QA/QC SUMMARY REPORT

Client: AECOM
Project: FCETL/AECOM

Work Order: 1111062
BatchID: R18241

Analyte	Result	RL	Units	Spike Lvl	% Rec	Low Limit	High Limit	RPD	RPD Limit	Qualifier
Sample ID: ***1111062-001A-D***			*Method:* ***D2216***		*Batch ID:* ***R18241***			*Analysis Date: 11/16/2011 3:00:00 PM*		
Percent Moisture	14.9	0.05	wt%					2.14	35	
Sample ID: ***1111062-007A-D***			*Method:* ***D2216***		*Batch ID:* ***R18241***			*Analysis Date: 11/16/2011 3:00:00 PM*		
Percent Moisture	25.8	0.05	wt%					3.45	35	

Qualifiers:
NA Sample conc. is > 4*spike level
S Spike Recovery outside accepted recovery limits

AECOM

CHAIN OF CUSTODY RECORD

1111062-

7.4°C Received in cooler w/ice custody seal on cooler

Page 1 of 1

Client/Project Name: 058	Project Location: FCETL/AECOM
Project Number: 60225202-058	Field Logbook No.:
Sampler (Print Name)/(Affiliation): Gordon Wilcoxen / AECOM; Christina Needham / AECOM	Chain of Custody Tape Nos.: 42986
Signature: Christina Needham	Send Results/Report to: Rami.Naddy@aecom.com; TAT: Std

Analysis Requested

Container Type	Preservation
P – Plastic	1 – HCl, 4°
A – Amber Glass	2 – H2SO4, 4°
G – Clear Glass	3 – HNO3, 4°
V – VOA Vial	4 – NaOH, 4°
O – Other	5 – NaOH/ZnAc, 4°
E – Encore	6 – Na2S2O3, 4°
	7 – 4°

Matrix Codes:

DW – Drinking Water	S – Soil
WW – Wastewater	SL – Sludge
GW – Groundwater	SD – Sediment
SW – Surface Water	SO – Solid
ST – Storm Water	A – Air
W – Water	L – Liquid
	P – Product

Field Sample No./Identification	Date	Time	COMP	GRAB	Sample Container (Size/Mat'l)	Matrix	Preserv.	Field Filtered	TOC (Lumley Black)	Total Metals (Al, Cr, Ni, Ag, Zn, As, Cd, Cu, Pb, Se)	Mercury	% coarse Material	Rapid Hydro (% clay, sand, silt)	AVS					Lab I.D.	Remarks
Farm Sed	11/10/11	1100		X	8oz P Jar	Sed	4°C		X	X	X	X	X						001A	
Lower Slate	11/10/11	1100			8oz P Jar				X	X	X	X	X						002A	
Lower Slate	10/3/11	unk			4oz glass									X					002B	
Inlet upper slate	11/10/11	1100			8oz P				X	X	X	X	X						003A	
Inlet upper slate	10/4/11	unk			4oz glass									X					003B	
Middle Slate	11/10/11	1100			8oz P				X	X	X	X	X						004A	
Middle Slate	10/4/11	unk			4oz glass									X					004B	
Middle Sherman	11/10/11	1100			8oz P				X	X	X	X	X						005A	
Middle Sherman	10/4/11	unk			4oz glass									X					005B	
Lower Sherman	11/10/11	1100			8oz P				X	X	X	X	X						006A	
Lower Sherman	10/3/11	unk			4oz glass									X					006B	
Lower Johnson	11/10/11	1100			8oz P				X	X	X	X	X						007A	
Lower Johnson	10/3/11	unk			4oz glass									X					007B	

Relinquished by: (Print Name)/(Affiliation) Christina Needham / AECOM	Date: 11/14/11	Received by: (Print Name)/(Affiliation) Kitrina Wilkins	Date: 11/15/11
Signature: Christina Needham	Time: 1300	Signature: Kitrina Wilkins	Time: 11:00
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:
Signature:	Time:	Signature:	Time:
Relinquished by: (Print Name)/(Affiliation)	Date:	Received by: (Print Name)/(Affiliation)	Date:
Signature:	Time:	Signature:	Time:

Analytical Laboratory (Destination):

AECOM Toxicology Lab
4303 W. Laporte Avenue
Fort Collins, CO 80521
(970) 416-0916
(970) 490-2963 (FAX)

MSE

Sample Shipped Via: UPS FedEx Courier Other

Temp blank: Yes No

Serial No. № 51788

MSE Lab Services

Sample Receipt Checklist

Client Name AECOM_INC

Date and Time Received: 11/15/2011 11:32:02 AM

Work Order Number 1111062 RcptNo: 1

Received by kgw

COC_ID: CoolerID:

Checklist completed by B. O'Donnell 11/15/11 (Signature / Date)

Reviewed by SW 11/16/11 (Initials / Date)

Matrix: Carrier name FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☐	No ☑	
Water - VOA vials have zero headspace?	No VOA vials submitted ☑	Yes ☐	No ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Blank ☐

Adjusted? NA Checked by B.O 11/15/11

Sediments

Any No and/or NA (not applicable) response must be detailed in the comments section be

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: TEMP = 7.4 - SEDIMENT SAMPLES

Corrective Action _____