RAMBOLL

ENVIRONMENT
& HEALTH

Mr. Gordon Terhune
Georgia Department of Natural Resources
Environmental Protection Division
Response and Remediation Program
2 Martin Luther King Jr. Dr. SE, East Tower, Suite 1054
Atlanta, GA 30334

RE: VRP SEMI-ANNUAL PROGRESS REPORT
BERKELEY LAKE VILLAGE
3351 NORTH BERKELEY LAKE RD., DULUTH, GA

Dear Mr. Terhune:

January 15, 2019

Ramboll
1600 Parkwood Circle,
Suite 310
Atlanta, GA 30339
USA

T 770 874 5010
F 770 874 5011
www.ramboll.com

On behalf of the Berkeley Lake Village Owners Association (BLVOA), Ramboll US Corporation (Ramboll) has prepared this seventh Semi-Annual Progress Report for the property located at 3351 North Berkeley Lake Road NW, in the City of Duluth, Gwinnett County, Georgia, as part of its participation in the Georgia Environmental Protection Division (GA EPD) Voluntary Remediation Program (VRP).

The Berkeley Lake Village Owners Association Property (the property) is part of a larger multi-parcel site designated by the GA EPD as the North Berkeley Lake Road Site, and consists primarily of parcel IDs 6290-231, 6290-232, and 6267-030 (**Figure 1**). Within Parcel ID 6290-232 there are eight sub-parcels that correspond with the footprints of existing and planned future multi-story commercial buildings. Two of the undeveloped sub-parcels (6290-242 and 6290-243) are not owned by BLVOA and will not be part of future assessment activities.

Soil investigation activities for parcels 6290-232 and 6290-231 were completed in April 2018. However, investigation of Parcel 6290-231 was not completed until August of 2018. This progress report summarizes the methods, results, and conclusions of the recent arsenic soil assessment conducted at the 6290-231 parcel.

Soil Screening and Sampling

To further evaluate arsenic impacts in shallow soil at the site, on August 15 and 16, 2018, Ramboll advanced 35 soil borings to a depth of 1 foot below ground surface (ft bgs), and four of those borings to a depth of 3 ft bgs for screening and sample analysis purposes. Each soil boring was advanced with a hand auger. Soil samples were collected from each boring location at a depth of 0.5 to 1.0 ft bgs, and four samples were collected at a depth of 2 to 3 ft bgs. Each soil sample was logged for material composition and screened using a handheld portable X-ray fluorescence (XRF) analyzer to determine the approximate concentration of arsenic. A summary of the soil screening results is provided in **TABLE 1**.

Of the 35 boring locations from the depth of 0.5 to 1.0 ft bgs, the three locations with the highest, median, and lowest arsenic results (SS-27, SS-08, and SS-30, respectively), as screened by the XRF analyzer, were selected to be analyzed by a certified laboratory for arsenic. Additionally, the four shallow boring locations with the highest overall arsenic results, as determined by the XRF analyzer, were selected to be screened at a deeper depth (2 to 3 ft bgs). These four boring locations (SS-18, SS-26, SS-27, and SS-33) were then screened at the deeper depth and the location with the highest XRF reading for arsenic (SS-27) was sent to a certified laboratory for analysis. In total, three soil samples (SS-27, SS-08, and SS-30) from 0.5 to 1.0 ft bgs and one soil sample (SS-27) from 2 to 3 ft bgs were analyzed for total arsenic by the US Environmental Protection Agency (USEPA) Method 6010C and in-vitro bioaccessibility (IVBA) of arsenic by modified USEPA Method 1340.

The four samples to be analyzed by EPA Method 6010C and for IVBA were placed in clean, appropriately preserved, laboratory-supplied containers using new disposable nitrile gloves. After each container was filled, it was labeled and immediately placed on ice in a sample holding cooler. The samples were shipped by overnight delivery to the TestAmerica Laboratory in Tacoma, Washington, under chain-of-custody protocol for analysis of total arsenic and IVBA of arsenic.

Analytical Results

Arsenic was detected at concentrations greater than the Georgia Notification Criteria of 41 milligrams per kilogram (mg/kg) in three of the four samples, with concentrations ranging from 140 - 240 mg/kg. These results are consistent with historical sampling results as well as XRF measurements. The results of the IVBA analysis of samples ranged from 3% to 18%. The soil analytical data is presented in **Table 1** and screening results are shown in **Figure 2**. The complete laboratory analytical reports for the August 2018 sampling event is provided in **Attachment A**.

Conclusion

The arsenic concentrations detected in the four samples collected during this soil assessment are similar to the arsenic concentrations detected during previous investigations. The IVBA results will be applied to the risk reduction standard calculation to develop an adjusted arsenic risk reduction standard for soil at the site.

Should you have any questions regarding this progress report or need further information, please contact us at your convenience.

Sincerely,

Robert Patchett, PG
Managing Consultant
D +1 678 388-1664
M +1 678 491-4230
rpatchett@ramboll.com

Jeff Margolin
Principal
D +1 678 388-1644
M +1 770 235-8183
jmargolin@ramboll.com

cc: Hank Chang, BLVOA

Attachments: Table 1 – Summary of Soil Results – Tax Parcel 6290 231
Figure 1 – BLVOA Site and Parcels
Figure 2 - Average Arsenic Screening Concentrations – Tax Parcel 6290 231
Appendix A – Laboratory Analytical Reports

Table 1 - Summary of Soil Screening Results - Tax Parcel 6290 231
August 2018
Berkeley Lake Village Owners Association

Sample Location	Sample Depth (ft bgs)	Date	Screening/Sampling Time	XRF Arsenic Readings (ppm)				Notes
				Test 1	Test 2	Test 3	Average	
SS-07	0.5-1	08/15/18	7:19	110.0	108.0	-	109.0	Light sandy soil
SS-08	0.5-1	08/15/18	7:22	90.0	75.0	-	82.5	Light sandy soil
SS-09	0.5-1	08/15/18	7:32	112.0	114.0	-	113.0	Light sandy soil
SS-10	0.5-1	08/15/18	7:33	92.0	92.0	-	92.0	Light sandy soil
SS-11	0.5-1	08/15/18	7:40	91.0	95.0	-	93.0	Light sandy soil
SS-12	0.5-1	08/15/18	7:45	73.0	69.0	-	71.0	Light sandy soil
SS-13	0.5-1	08/15/18	7:59	87.0	132.0	-	109.5	Light sandy soil
SS-14	0.5-1	08/15/18	8:05	60.0	62.0	-	61.0	Light sandy soil
SS-15	0.5-1	08/15/18	8:08	66.0	103.0	-	84.5	Light sandy soil
SS-16	0.5-1	08/15/18	8:16	58.0	66.0	-	62.0	Light sandy soil
SS-17	0.5-1	08/15/18	8:22	59.0	65.0	-	62.0	Light sandy soil
SS-18	0.5-1	08/15/18	8:38	148.0	135.0	-	141.5	Light sandy soil
	2-3	08/16/18	8:10	58.0	100.0	-	79.0	Light sandy red soil with some clay
SS-19	0.5-1	08/15/18	8:40	57.0	53.0	-	55.0	Light sandy soil, some clay
SS-20	0.5-1	08/15/18	8:45	55.0	65.0	-	60.0	Light sandy soil
SS-21	0.5-1	08/15/18	8:54	76.0	69.0	-	72.5	Light sandy soil, some clay
SS-22	0.5-1	08/15/18	8:55	56.0	56.0	-	56.0	Light sandy soil
SS-23	0.5-1	08/15/18	9:10	41.0	48.0	-	44.5	Light sandy soil, some clay
SS-24	0.5-1	08/15/18	9:14	44.0	8.0	-	26.0	Light sandy soil, some clay
SS-25	0.5-1	08/15/18	9:20	76.0	87.0	-	81.5	Light sandy soil, some clay
SS-26	0.5-1	08/15/18	9:26	120.0	141.0	-	130.5	Light sandy soil
	2-3	08/16/18	8:45	111.0	113.0	-	112.0	Light sandy soil with some clay
SS-27	0.5-1	08/15/18	9:32	139.0	148.0	-	143.5	Light sandy soil
	2-3	08/16/18	9:15	147.0	197.0	192.0	172.0	Light sandy soil
SS-28	0.5-1	08/15/18	9:45	90.0	108.0	-	99.0	Light sandy soil
SS-29	0.5-1	08/15/18	9:55	113.0	111.0	-	112.0	Light sandy soil

RAMBOLL

Table 1 - Summary of Soil Screening Results - Tax Parcel 6290 231
August 2018
Berkeley Lake Village Owners Association

Sample Location	Sample Depth (ft bgs)	Date	Screening/Sampling Time	XRF Arsenic Readings (ppm)				Notes
				Test 1	Test 2	Test 3	Average	
SS-30	0.5-1	08/15/18	10:08	< 7	< 7	-	7.0	Light sandy soil
SS-31	0.5-1	08/15/18	10:14	< 10	19.0	-	19.0	Light sandy soil
SS-32	0.5-1	08/15/18	10:20	113.0	84.0	-	98.5	Light sandy soil
SS-33	0.5-1	08/15/18	10:25	126.0	129.0	-	127.5	Light sandy soil
	2-3	08/16/18	9:40	168.0	175.0	147.0	163.3	Light sandy soil
SS-34	0.5-1	08/15/18	10:41	65.0	57.0	-	61.0	Light sandy soil, some clay
SS-35	0.5-1	08/15/18	10:49	60.0	41.0	-	50.5	Light sandy soil
SS-36	0.5-1	08/15/18	10:52	88.0	73.0	-	80.5	Light sandy soil
SS-37	0.5-1	08/15/18	10:58	67.0	68.0	-	67.5	Light sandy soil
SS-38	0.5-1	08/15/18	11:03	89.0	87.0	-	88.0	Light sandy soil
SS-39	0.5-1	08/15/18	11:10	116.0	128.0	-	122.0	Light sandy soil
SS-40	0.5-1	08/15/18	11:16	102.0	93.0	-	97.5	Light sandy soil
SS-41	0.5-1	08/15/18	11:22	107.0	64.0	-	85.5	Light sandy soil

Notes:

Highlighted rows indicate a location and depth interval sampled and analyzed for in-vitro bioaccesibility of arsenic.

ft bgs - feet below ground surface

RAMBOLL

Table 2 - Summary of Soil Results - Tax Parcel 6290 231
August 2018
Berkeley Lake Village Owners Association

					Analyte	Arsenic (Total)	Arsenic (Bioaccessible)
					Matrix	Soil	Soil
					Georgia Notification Criteria	41	-
					Unit	mg/kg	%
Sample Location	**Sample ID**	**Date Sampled**	**Start Depth (ft bgs)**	**End Depth (ft bgs)**			
SS-08	SS-08 (0.5-1) 20180815	08/15/2018	0.5	1		**140**	5
SS-27	SS-27 (0.5-1) 20180815	08/15/2018	0.5	1		**200**	4
	SS-27 (2-3) 20180816	08/16/2018	2	3		**240**	3
SS-30	SS-30 (0.5-1) 20180815	08/15/2018	0.5	1		**41**	18

Notes:
"-" - Not applicable or not analyzed.
ft bgs - feet below ground surface
mg/kg - milligrams per kilogram

LEGEND:

SITE BOUNDARY (APPROXIMATE)

THE SITE

0 180

SCALE IN FEET

SOURCE:
Base map source from
Gwinnett County GIS department.

GMILES 6/27/18 F:\GRAEME\1690006349 < NORTH_BERKELEY_LAKE_ROAD_PARCELS >

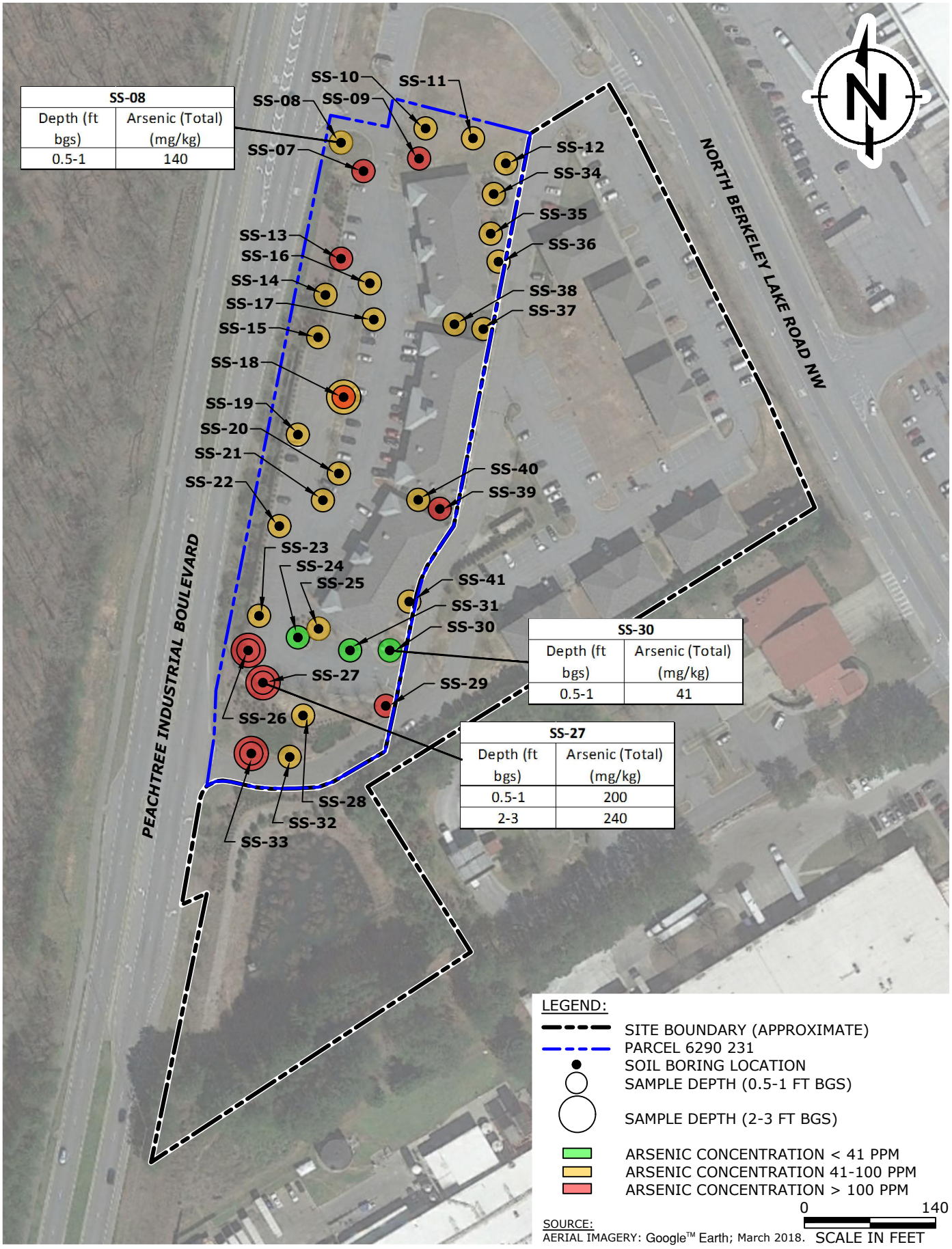
RAMBOLL

BLVOA SITE AND PARCELS

DULUTH, GEORGIA

FIGURE
1

DRAFTED BY: RGM | DATE: 6/19/2018 | PROJECT: 1690006349



RAMBOLL

ARSENIC CONCENTRATIONS
TAX PARCEL 6290 231

BERKELEY LAKE VILLAGE OWNERS ASSOCIATION
DULUTH, GWINNETT COUNTY, GEORGIA

FIGURE
2

DRAFTED BY: RGM | DATE: 8/22/2018 | PROJECT: 1690006349

GMILES 10/16/18 F:\GRAEME\1690006349 < AVERAGE_SAMPLE_RESULTS >

ATTACHMENT A
LABORATORY ANALYTICAL REPORTS

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-79678-1
Client Project/Site: Bioaccessible Arsenic

For:
Ramboll US Corporation
1600 Parkwood Circle, Suite 310
Atlanta, Georgia 30339

Attn: Ms. T. Chang

Kristine D. Allen

Authorized for release by:
9/11/2018 4:25:26 PM
Kristine Allen, Manager of Project Management
(253)248-4970
kristine.allen@testamericainc.com

Designee for

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Case Narrative

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-1

Job ID: 580-79678-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-79678-1

Comments
No additional comments.

Receipt
The samples were received on 8/17/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.8º C.

Metals
Arsenic (Bioaccessible) was detected in the method blank greater than the method detection limit but less than the reporting limit.

No additional analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-1

Qualifiers

Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-1

Client Sample ID: SS-08(0.5-1)20180815
Date Collected: 08/15/18 07:22
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-1
Matrix: Solid

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Bioaccessible)	4.5	J B F1	5.9	0.39	mg/Kg		09/06/18 10:11	09/11/18 10:23	1
Arsenic (Fine)	91	F1	2.9	0.19	mg/Kg		09/06/18 16:30	09/07/18 16:15	1

Method: PBET - Bioaccessible Metals

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Bioaccessible) percent	5.0		0.10	0.10	%			09/11/18 05:10	1

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-1

Client Sample ID: SS-27(0.5-1)20180815
Date Collected: 08/15/18 09:32
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-2
Matrix: Solid

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Bioaccessible)	4.9	J B	5.8	0.39	mg/Kg		09/06/18 10:11	09/11/18 10:49	1
Arsenic (Fine)	130		2.9	0.19	mg/Kg		09/06/18 16:30	09/07/18 16:40	1

Method: PBET - Bioaccessible Metals

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Bioaccessible) percent	4.0		0.10	0.10	%			09/11/18 05:10	1

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-1

Client Sample ID: SS-30(0.5-1)20180815
Date Collected: 08/15/18 10:08
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-3
Matrix: Solid

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Bioaccessible)	3.0	J B	5.8	0.39	mg/Kg		09/06/18 10:11	09/11/18 10:53	1
Arsenic (Fine)	17		3.0	0.20	mg/Kg		09/06/18 16:30	09/07/18 16:43	1

Method: PBET - Bioaccessible Metals

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Bioaccessible) percent	18		0.10	0.10	%			09/11/18 05:10	1

Client Sample Results

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-1

Client Sample ID: SS-27(2-3)20180816
Date Collected: 08/16/18 09:15
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-4
Matrix: Solid

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Bioaccessible)	4.7	J B	5.8	0.38	mg/Kg		09/06/18 10:11	09/11/18 10:56	1
Arsenic (Fine)	150		3.0	0.20	mg/Kg		09/06/18 16:30	09/07/18 16:46	1

Method: PBET - Bioaccessible Metals

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Bioaccessible) percent	3.0		0.10	0.10	%			09/11/18 05:10	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 580-283347/8-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 283693 — **Prep Batch: 283347**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Bioaccessible)	0.570	J	6.0	0.40	mg/Kg		09/06/18 10:11	09/11/18 10:10	1

Lab Sample ID: LCS 580-283347/9-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 283693 — **Prep Batch: 283347**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic (Bioaccessible)	400	417		mg/Kg		104	80 - 120

Lab Sample ID: LCSSRM 580-283347/10-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 283693 — **Prep Batch: 283347**

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic (Bioaccessible)	59.0	61.0		mg/Kg		103	70.4 - 140.3

Lab Sample ID: 580-79678-1 MS — **Client Sample ID: SS-08(0.5-1)20180815**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 283693 — **Prep Batch: 283347**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic (Bioaccessible)	4.5	J B F1	385	235	F1	mg/Kg		60	80 - 120

Lab Sample ID: 580-79678-1 MSD — **Client Sample ID: SS-08(0.5-1)20180815**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 283693 — **Prep Batch: 283347**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic (Bioaccessible)	4.5	J B F1	392	242	F1	mg/Kg		61	80 - 120	3	20

Lab Sample ID: 580-79678-1 DU — **Client Sample ID: SS-08(0.5-1)20180815**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 283693 — **Prep Batch: 283347**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic (Bioaccessible)	4.5	J B F1	4.02	J	mg/Kg		10	20

Lab Sample ID: MB 580-283405/9-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 283596 — **Prep Batch: 283405**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic (Fine)	ND		3.0	0.20	mg/Kg		09/06/18 16:30	09/07/18 16:02	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 580-283405/10-A
Matrix: Solid
Analysis Batch: 283596

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 283405

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic (Fine)			200	198		mg/Kg		99	80 - 120		

Lab Sample ID: LCSD 580-283405/11-A
Matrix: Solid
Analysis Batch: 283596

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 283405

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic (Fine)			200	201		mg/Kg		101	80 - 120	1	20

Lab Sample ID: LCSSRM 580-283405/8-A
Matrix: Solid
Analysis Batch: 283596

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 283405

Analyte			Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic (Fine)			107	101		mg/Kg		94	70.4 - 140.3		

Lab Sample ID: 580-79678-1 MS
Matrix: Solid
Analysis Batch: 283596

Client Sample ID: SS-08(0.5-1)20180815
Prep Type: Total/NA
Prep Batch: 283405

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic (Fine)	91	F1	194	240	F1	mg/Kg		77	80 - 120		

Lab Sample ID: 580-79678-1 MSD
Matrix: Solid
Analysis Batch: 283596

Client Sample ID: SS-08(0.5-1)20180815
Prep Type: Total/NA
Prep Batch: 283405

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic (Fine)	91	F1	199	247	F1	mg/Kg		79	80 - 120	3	20

Lab Sample ID: 580-79678-1 DU
Matrix: Solid
Analysis Batch: 283596

Client Sample ID: SS-08(0.5-1)20180815
Prep Type: Total/NA
Prep Batch: 283405

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic (Fine)	91	F1		89.1		mg/Kg				2	20

Method: PBET - Bioaccessible Metals

Lab Sample ID: 580-79678-1 DU
Matrix: Solid
Analysis Batch: 283670

Client Sample ID: SS-08(0.5-1)20180815
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic (Bioaccessible) percent	5.0			5.00		%				0	

Client Sample ID: SS-08(0.5-1)20180815

Lab Sample ID: 580-79678-1

Date Collected: 08/15/18 07:22

Matrix: Solid

Date Received: 08/17/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Sieved	Sieve			283178	09/04/18 15:49	HJM	TAL SEA
Total/NA	Prep	3050B			283405	09/06/18 16:30	T1H	TAL SEA
Total/NA	Analysis	6010C		1	283596	09/07/18 16:15	HJM	TAL SEA
Total/NA	Sieved	Sieve			283178	09/04/18 15:49	HJM	TAL SEA
Total/NA	Prep	PBET			283347	09/06/18 10:11	HJM	TAL SEA
Total/NA	Analysis	6010C		1	283693	09/11/18 10:23	HJM	TAL SEA
Total/NA	Analysis	PBET		1	283670	09/11/18 05:10	HJM	TAL SEA

Client Sample ID: SS-27(0.5-1)20180815

Lab Sample ID: 580-79678-2

Date Collected: 08/15/18 09:32

Matrix: Solid

Date Received: 08/17/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Sieved	Sieve			283178	09/04/18 15:49	HJM	TAL SEA
Total/NA	Prep	3050B			283405	09/06/18 16:30	T1H	TAL SEA
Total/NA	Analysis	6010C		1	283596	09/07/18 16:40	HJM	TAL SEA
Total/NA	Sieved	Sieve			283178	09/04/18 15:49	HJM	TAL SEA
Total/NA	Prep	PBET			283347	09/06/18 10:11	HJM	TAL SEA
Total/NA	Analysis	6010C		1	283693	09/11/18 10:49	HJM	TAL SEA
Total/NA	Analysis	PBET		1	283670	09/11/18 05:10	HJM	TAL SEA

Client Sample ID: SS-30(0.5-1)20180815

Lab Sample ID: 580-79678-3

Date Collected: 08/15/18 10:08

Matrix: Solid

Date Received: 08/17/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Sieved	Sieve			283178	09/04/18 15:49	HJM	TAL SEA
Total/NA	Prep	3050B			283405	09/06/18 16:30	T1H	TAL SEA
Total/NA	Analysis	6010C		1	283596	09/07/18 16:43	HJM	TAL SEA
Total/NA	Sieved	Sieve			283178	09/04/18 15:49	HJM	TAL SEA
Total/NA	Prep	PBET			283347	09/06/18 10:11	HJM	TAL SEA
Total/NA	Analysis	6010C		1	283693	09/11/18 10:53	HJM	TAL SEA
Total/NA	Analysis	PBET		1	283670	09/11/18 05:10	HJM	TAL SEA

Client Sample ID: SS-27(2-3)20180816

Lab Sample ID: 580-79678-4

Date Collected: 08/16/18 09:15

Matrix: Solid

Date Received: 08/17/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Sieved	Sieve			283178	09/04/18 15:49	HJM	TAL SEA
Total/NA	Prep	3050B			283405	09/06/18 16:30	T1H	TAL SEA
Total/NA	Analysis	6010C		1	283596	09/07/18 16:46	HJM	TAL SEA
Total/NA	Sieved	Sieve			283178	09/04/18 15:49	HJM	TAL SEA

Lab Chronicle

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-1

Client Sample ID: SS-27(2-3)20180816
Date Collected: 08/16/18 09:15
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PBET			283347	09/06/18 10:11	HJM	TAL SEA
Total/NA	Analysis	6010C		1	283693	09/11/18 10:56	HJM	TAL SEA
Total/NA	Analysis	PBET		1	283670	09/11/18 05:10	HJM	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-1

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Nevada	State Program	9	WA000502019-1	07-31-19
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Sample Summary

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79678-1	SS-08(0.5-1)20180815	Solid	08/15/18 07:22	08/17/18 09:30
580-79678-2	SS-27(0.5-1)20180815	Solid	08/15/18 09:32	08/17/18 09:30
580-79678-3	SS-30(0.5-1)20180815	Solid	08/15/18 10:08	08/17/18 09:30
580-79678-4	SS-27(2-3)20180816	Solid	08/16/18 09:15	08/17/18 09:30

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

681-Atlanta

Loc: 580
79678

Chain of Custody Record

TestAmerica

Client Information	Sampler: T. CHANG	Lab PM: Cruz, Sheri L	Carrier Tracking No(s):	COC No: 580-30186-9897.1
Client Contact: Ms. T. Chang	Phone: (404) 957-1026	E-Mail: sheri.cruz@testamericainc.com		Page: Page 1 of 1
Company: Ramboll US Corporation				Job #

Address: 1600 Parkwood Circle, Suite 310	Due Date Requested:	Analysis Requested
City: Atlanta	TAT Requested (days): STANDARD	
State, Zip: GA, 30339		
Phone:	PO #: 1690006349	
Email: Tchang@ramboll.com	WO #:	
Project Name: Bioaccessible Arsenic	Project #: 58012406	
Site:	SSOW#:	

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - (MOD) As (Bioaccessible) / Pb (Bioaccess	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
SS-08 (0.5-1) 20180815	08/15/18	7:22	G	Solid	N		X		
SS-27 (0.5-1) 20180815	08/15/18	9:32	G	Solid	N		X		
SS-30 (0.5-1) 20180815	08/15/18	10:08	G	Solid	N		X		
SS-27 ~~(0.5-1)~~ (2-3) 20180816 TC	08/16/18	9:15	G	Solid	N		X		
				~~Solid~~					
				~~Solid~~					

580-79678 Chain of Custody

Therm. ID: A2 Cor: 1.8 ° Unc: 1.7 °
Cooler Dsc: Med Lnr
Packing: Bubble
Cust. Seal: Yes + No
Cont Packs/Dry Ice/None
FedEx: P.O
UPS:
Lab Cour:
Other:

Possible Hazard Identification
[X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
[ ] Return To Client [X] Disposal By Lab [ ] Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
TIANLIN CHANG	08/16/18 10:43	RAMBOLL		8/16/18 1043	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/16/18 1045	TA	B. Lowell	8/17/18 0930	SRA JA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Ramboll US Corporation

Job Number: 580-79678-1

Login Number: 79678

List Source: TestAmerica Seattle

List Number: 1

Creator: Gall, Brandon A

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-79678-2
Client Project/Site: Bioaccessible Arsenic

For:
Ramboll US Corporation
1600 Parkwood Circle, Suite 310
Atlanta, Georgia 30339

Attn: Ms. T. Chang

Authorized for release by:
9/25/2018 2:41:00 PM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

Table of Contents

Case Narrative

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Job ID: 580-79678-2

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-79678-2

Comments
Client activated total Arsenic by 6010 on 9/17/18.

Receipt
The samples were received on 8/17/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.8º C.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-08(0.5-1)20180815
Date Collected: 08/15/18 07:22
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-1
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	98.6		0.1	0.1	%			09/21/18 15:17	1
Percent Moisture	1.4		0.1	0.1	%			09/21/18 15:17	1

Client Sample Results

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-08(0.5-1)20180815
Date Collected: 08/15/18 07:22
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-1
Matrix: Solid
Percent Solids: 98.6

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	140		28	2.3	mg/Kg	☼	09/24/18 11:49	09/25/18 08:53	10

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-27(0.5-1)20180815
Date Collected: 08/15/18 09:32
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-2
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	98.8		0.1	0.1	%			09/21/18 15:17	1
Percent Moisture	1.2		0.1	0.1	%			09/21/18 15:17	1

Client Sample Results

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-27(0.5-1)20180815
Date Collected: 08/15/18 09:32
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-2
Matrix: Solid
Percent Solids: 98.8

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	200		27	2.3	mg/Kg	☼	09/24/18 11:49	09/25/18 08:56	10

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-30(0.5-1)20180815
Date Collected: 08/15/18 10:08
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-3
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	98.9		0.1	0.1	%			09/21/18 15:17	1
Percent Moisture	1.1		0.1	0.1	%			09/21/18 15:17	1

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-30(0.5-1)20180815
Date Collected: 08/15/18 10:08
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-3
Matrix: Solid
Percent Solids: 98.9

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	41		13	1.1	mg/Kg	☼	09/24/18 11:49	09/25/18 08:59	5

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-27(2-3)20180816
Date Collected: 08/16/18 09:15
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-4
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	98.5		0.1	0.1	%			09/21/18 15:17	1
Percent Moisture	1.5		0.1	0.1	%			09/21/18 15:17	1

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-27(2-3)20180816
Date Collected: 08/16/18 09:15
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-4
Matrix: Solid
Percent Solids: 98.5

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	240		27	2.3	mg/Kg	☼	09/24/18 11:49	09/25/18 09:02	10

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 580-284754/16-A
Matrix: Solid
Analysis Batch: 284823

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 284754

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		3.0	0.25	mg/Kg		09/24/18 11:49	09/24/18 16:48	1

Lab Sample ID: LCS 580-284754/17-A
Matrix: Solid
Analysis Batch: 284823

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 284754

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	206		mg/Kg		103	80 - 120

Lab Sample ID: LCSD 580-284754/18-A
Matrix: Solid
Analysis Batch: 284823

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 284754

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	204		mg/Kg		102	80 - 120	1	20

Method: D 2216 - Percent Moisture

Lab Sample ID: 580-79678-1 DU
Matrix: Solid
Analysis Batch: 284603

Client Sample ID: SS-08(0.5-1)20180815
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Solids	98.6		98.6		%		0	20
Percent Moisture	1.4		1.4		%		0.5	20

Lab Chronicle

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-08(0.5-1)20180815
Lab Sample ID: 580-79678-1
Date Collected: 08/15/18 07:22
Matrix: Solid
Date Received: 08/17/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	284603	09/21/18 15:17	A1K	TAL SEA

Client Sample ID: SS-08(0.5-1)20180815
Lab Sample ID: 580-79678-1
Date Collected: 08/15/18 07:22
Matrix: Solid
Date Received: 08/17/18 09:30
Percent Solids: 98.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			284754	09/24/18 11:49	JKM	TAL SEA
Total/NA	Analysis	6010C		10	284852	09/25/18 08:53	HJM	TAL SEA

Client Sample ID: SS-27(0.5-1)20180815
Lab Sample ID: 580-79678-2
Date Collected: 08/15/18 09:32
Matrix: Solid
Date Received: 08/17/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	284603	09/21/18 15:17	A1K	TAL SEA

Client Sample ID: SS-27(0.5-1)20180815
Lab Sample ID: 580-79678-2
Date Collected: 08/15/18 09:32
Matrix: Solid
Date Received: 08/17/18 09:30
Percent Solids: 98.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			284754	09/24/18 11:49	JKM	TAL SEA
Total/NA	Analysis	6010C		10	284852	09/25/18 08:56	HJM	TAL SEA

Client Sample ID: SS-30(0.5-1)20180815
Lab Sample ID: 580-79678-3
Date Collected: 08/15/18 10:08
Matrix: Solid
Date Received: 08/17/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	284603	09/21/18 15:17	A1K	TAL SEA

Client Sample ID: SS-30(0.5-1)20180815
Lab Sample ID: 580-79678-3
Date Collected: 08/15/18 10:08
Matrix: Solid
Date Received: 08/17/18 09:30
Percent Solids: 98.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			284754	09/24/18 11:49	JKM	TAL SEA
Total/NA	Analysis	6010C		5	284852	09/25/18 08:59	HJM	TAL SEA

Lab Chronicle

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Client Sample ID: SS-27(2-3)20180816
Date Collected: 08/16/18 09:15
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	284603	09/21/18 15:17	A1K	TAL SEA

Client Sample ID: SS-27(2-3)20180816
Date Collected: 08/16/18 09:15
Date Received: 08/17/18 09:30

Lab Sample ID: 580-79678-4
Matrix: Solid
Percent Solids: 98.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			284754	09/24/18 11:49	JKM	TAL SEA
Total/NA	Analysis	6010C		10	284852	09/25/18 09:02	HJM	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Nevada	State Program	9	WA000502019-1	07-31-19
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Sample Summary

Client: Ramboll US Corporation
Project/Site: Bioaccessible Arsenic

TestAmerica Job ID: 580-79678-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79678-1	SS-08(0.5-1)20180815	Solid	08/15/18 07:22	08/17/18 09:30
580-79678-2	SS-27(0.5-1)20180815	Solid	08/15/18 09:32	08/17/18 09:30
580-79678-3	SS-30(0.5-1)20180815	Solid	08/15/18 10:08	08/17/18 09:30
580-79678-4	SS-27(2-3)20180816	Solid	08/16/18 09:15	08/17/18 09:30

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

681-Atlanta

Loc: 580
79678

Chain of Custody Record

TestAmerica

Client Information	Sampler: T. CHANG	Lab PM: Cruz, Sheri L	Carrier Tracking No(s):	COC No: 580-30186-9897.1
Client Contact: Ms. T. Chang	Phone: (404) 957-1026	E-Mail: sheri.cruz@testamericainc.com		Page: Page 1 of 1
Company: Ramboll US Corporation				Job #
Address: 1600 Parkwood Circle, Suite 310	Due Date Requested:			
City: Atlanta	TAT Requested (days): STANDARD			
State, Zip: GA, 30339				
Phone:	PO #: 1690006349			
Email: Tchang@ramboll.com	WO #:			
Project Name: Bioaccessible Arsenic	Project #: 58012406			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - (MOD) As (Bioaccessible) / Pb (Bioaccess	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N		
SS-08 (0.5-1) 20180815	08/15/18	7:22	G	Solid	N		X		
SS-27 (0.5-1) 20180815	08/15/18	9:32	G	Solid	N		X		
SS-30 (0.5-1) 20180815	08/15/18	10:08	G	Solid	N		X		
SS-27 ~~(0.5-1)~~ (2-3) 20180816 TC	08/16/18	9:15	G	Solid	N		X		
				~~Solid~~					
				~~Solid~~					

580-79678 Chain of Custody

Therm. ID: A2 Cor: 1.8 ° Unc: 1.7 °
Cooler Dsc: Med Wht
Packing: Bubble
Cust. Seal: Yes + No
Cont Packs/Dry Ice/None
FedEx: P.O
UPS:
Lab Cour:
Other:

Possible Hazard Identification
[X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
[ ] Return To Client [X] Disposal By Lab [ ] Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	TIANLIN CHANG	08/16/18 10:43	RAMBOLL		8/16/18 1043	
2		8/16/18 1045			8/17/18 0930	SRA JM
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Ramboll US Corporation

Job Number: 580-79678-2

Login Number: 79678
List Number: 1
Creator: Gall, Brandon A

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	