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Residential Metals Abatement Program Investigation Summary Report (Non-Residential Parcels – Indoor Soil) - Silver Bow Montessori

Environmental Resource Management (ERM)

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Atlantic Richfield Company

317 Anaconda Road
Butte MT 59701

Mike McAnulty

Liability Manager

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February 6, 2024

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**RE: Residential Metals Abatement Program – Interior School Dust – Investigation
Summary Report – Silver Bow Montessori – Indoor Soil**

Agency Representatives:

I am writing to you on behalf of Atlantic Richfield Company to submit the approved final 2023 *Residential Metals Abatement Program Investigation Summary Report (Non-Residential Parcels – Indoor Soil) – Silver Bow Montessori – Indoor Soil*.

The report may be downloaded at the following link: https://theermgroupnam-my.sharepoint.com/:f:/g/personal/thomas_beckman_erm_com/EmmZ84MW8UhFsV7Jc_yhxukBExv5YhVVfJJPs72yDjuX_A?e=zdi3xf

If you have any questions or comments, please call me at (907) 355-3914.

Sincerely,



Mike McAnulty
Liability Manager
Remediation Management Services Company
An Affiliate of **Atlantic Richfield Company**



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE**

FEDERAL BUILDING, 10 West 15TH Street, Suite 3200
Helena, MT 59626-0096
Phone 866-457-2690
www.epa.gov/region8

Ref: 8MO

February 6, 2024

Mr. Mike McAnulty
Liability Manager
Atlantic Richfield Company
317 Anaconda Road
Butte, Montana 59701

Re: Approval letter for the Butte Priority Soils Operable Unit (BPSOU) Residential Metals Abatement Program (RMAP) – Indoor Soil – Investigation Summary Report – Silver Bow Montessori (November 29, 2023)

Dear Mike:

The U. S. Environmental Protection Agency (EPA), in consultation with the Montana Department of Environmental Quality (DEQ), is approving the *Residential Metals Abatement Program (RMAP) – Indoor Soil – Investigation Summary Report – Silver Bow Montessori (dated November 29, 2023)*. Please distribute this Investigation Summary Report submittal as final.

If you have any questions or concerns, please call me at (406) 457-5019.

Sincerely,

**NIKIA
GREENE**

Digitally signed by
NIKIA GREENE
Date: 2024.02.06
10:02:27 -07'00'

Nikia Greene
Remedial Project Manager

Butte File
Chris Greco / Atlantic Richfield
Josh Bryson / Atlantic Richfield
Mike Mc Anulty / Atlantic Richfield
Loren Burmeister / Atlantic Richfield

Dave Griffis / Atlantic Richfield
Jean Martin / Atlantic Richfield
Irene Montero / Atlantic Richfield
David A. Gratson / Environmental Standards
Mave Gasaway / DGS
Adam Cohen / DGS
Brienne McClafferty / Holland & Hart
Daryl Reed / DEQ
Kevin Stone / DEQ
Logan Dudding / DEQ
Amy Steinmetz / DEQ
Dave Bowers / DEQ
Katie Garcin-Forba / DEQ
Doug Martin / NRDP
Jim Ford / NRDP
Pat Cunneen / NRDP
Katherine Hausrath / NRDP
Ted Duaine / MBMG
Gary Icopini / MBMG
Becky Summerville / MR
John DeJong / UP
Robert Bylsma / UP
John Gilmour / Kelley Drye
Leo Berry / BNSF
Robert Lowry / BNSF
Brooke Kuhl / BNSF
Lauren Knickrehm / BNSF
Doug Brannan / Kennedy Jenks
Matthew Mavrinc / RARUS
Harrison Roughton / RARUS
Brad Gordon / RARUS
Mark Neary / BSB
Eric Hassler / BSB
Brandon Warner / BSB
Abigail Peltomaa / BSB
Eileen Joyce / BSB
Sean Peterson/BSB
Josh Vincent / WET
Scott Bradshaw / W&C
Emily Evans / W&C
Pat Sampson / Pioneer
Andy Dare / Pioneer
Karen Helfrich / Pioneer
Randa Colling / Pioneer
Scott Sampson / Pioneer
Jesse Schwarzrock / Pioneer
Ian Magruder/ CTEC

CTEC of Butte
Scott Juskiewicz / Montana Tech
David Shanight / CDM Smith
Curt Coover / CDM Smith
Chapin Storrar / CDM Smith
Erin Agee / EPA
Will Lindsey / EPA
Jamie Miller / EPA
Carolina Balliew / EPA
Molly Roby / EPA
Emma Rott / EPA
Chris Wardell / EPA
Dana Barnicoat / EPA
Charles Van-Otten / EPA
Charlie Partridge / EPA
Scott Juskiewicz / Montana Tech Library



Residential Metals Abatement Program Investigation Summary Report (Non-Residential Parcels – Indoor Soil)

Silver Bow Montessori

29 November 2023

Project No.: 0701985

Signature Page

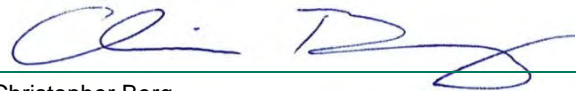
29 November 2023

Residential Metals Abatement Program Data Summary Report (Non-Residential Parcels – Indoor Soil)

Silver Bow Montessori



Elsie King
Quality Manager



Christopher Berg
Project Manager



Thomas J. Beckman
Partner

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Acronyms and Abbreviations

Name	Description
ARCO	Atlantic Richfield Company
BPSOU	Butte Priority Soils Operable Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EDD	electronic data deliverable
Environmental Standards	Environmental Standards, Inc.
ERM	Environmental Resources Management, Inc.
FSP	Field Sampling Plan
MDL	method detection limit
mg/kg	milligrams per kilogram
QAPP	Quality Assurance Project Plan
RL	reporting limit
RMAP	Residential Metals Abatement Program
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

This investigation summary report provides a summary of indoor soil field sampling activities and presents the results of the 2023 Residential Metals Abatement Program (RMAP) school indoor soil sampling for Silver Bow Montessori.

1.1 Background

The Butte-Silver Bow County Multi-Pathway RMAP (BSB and ARCO 2020) is designed to mitigate exposure of residents of the Butte Priority Soils Operable Unit (BPSOU), the larger Butte community, and rural residential development within the Silver Bow Creek/Butte Area Superfund Site to sources of arsenic, lead, and mercury contamination.

The United States Environmental Protection Agency (USEPA) has included schools (public and private schools, daycares, and preschools) in the RMAP in the First Amendment to the Administrative Order (USEPA Docket No. Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA]-08-2011-0011; USEPA 2020). Contamination of schools may originate from both mining-related (waste rock, tailings, aerial emissions) and non-mining-related sources (e.g., lead paint or broken mercury thermometers). The BPSOU residential action levels are 250 milligrams per kilogram (mg/kg) for arsenic, 1,200 mg/kg for lead, and 147 mg/kg for mercury (see Table 1). This component of the RMAP evaluates arsenic, lead, and mercury present in interior soils.

Environmental Resources Management, Inc. (ERM) performed sampling and assessment to determine whether remediation or abatement was required. Remediation/abatement is required for buildings constructed in or before 1980, indoor soils contain arsenic, lead, or mercury at concentrations in crawlspaces in excess of solid media action levels where there is an exposure pathway to an interior occupied space.

1.2 Site Description

Silver Bow Montessori School is located at 1800 Sunset Road, Butte, Montana (Figure 1). It was constructed in 1947 and has not been remodeled. Exposure pathways from building attics to interior spaces are not complete. There are no crawlspaces present. The results of a July 2021 exterior surface soil investigation performed by Atlantic Richfield Company (ARCO) and Pioneer Technical Services, Inc., found exterior surface soils did not contain metals at concentrations above action levels requiring soil remediation. The results of the June 2022 interior dust investigation by ARCO and ERM found lead concentrations detected in exceedance of the Butte Priority Soils Site-Specific Residential Action Levels for indoor soil and dust in a floor surface dust sample.

ERM collected indoor soil samples in accordance with the *Residential Metals Abatement Program Quality Assurance Project Plan (Non-Residential Parcels – Indoor Soil)* (QAPP; ARCO 2022) and *2023 Residential Metals Abatement Program (RMAP) Field Sampling Plan – Interior Soils – Silver Bow Montessori* (FSP; ERM 2023). Table 1 summarizes the sample location, dates, times, location description. Appendix A includes site photographs and Appendix B includes field notes and sample data sheets.

2. FIELD SAMPLING ACTIVITIES

On 26 July 2023, one composite soil sample and a field duplicate were collected from an exposed earthen area located in the basement furnace room at Silver Bow Montessori, as shown on Figure 2. The soil composite was comprised of three sampling points from the exposed earthen area.

No deviations to the QAPP or FSP occurred during field sampling.

3. INVESTIGATION RESULTS

Analytical results and corrective action requirement areas are depicted on Figure 3. Table 1 summarizes the analytical sample results and applicable laboratory and data validation qualifiers. The laboratory analytical reports from Pace Analytical Services, LLC are provided in Appendix C.

3.1 Indoor Soil Sampling Results

Arsenic, lead, and mercury were detected at concentrations below the residential action levels in the soil sample. (See Figure 3 and Table 1).

4. DATA QUALITY AND USABILITY REVIEW

Environmental Standards, Inc. (Environmental Standards) reviewed field documentation and laboratory data in accordance with the QAPP. Environmental Standards provided field documentation review in the form of a Level A/B Field Documentation Screening Review and validated laboratory data in the form of a Stage 4 Quality Assurance Reviews (Appendix D). Environmental Standards assigned applicable validation qualifiers and usability qualifiers in an electronic data deliverable (EDD) format.

Data that met the Level A and Level B criteria in the field documentation quality assessment as detailed in the QAPP, and not qualified as estimated or rejected during the data validation process, are considered enforcement-quality data and can be used for all Superfund purposes and activities. Data that meet only the Level A criteria and are not rejected during the data validation process can be considered screening-quality data in accordance with the QAPP. All results met Level A and Level B criteria. All quality control criteria were met; no results required qualification.

Reported positive results between the method detection limit (MDL) and the reporting limit (RL) are considered estimated and have been flagged “J” in the qualified EDD. It is appropriate to note that sample results qualified as estimated “J” by the laboratory because the reported result is between the MDL and RL, values are considered enforcement-quality data if no other qualifiers were required during data review and validation.

All data meet enforcement quality and are considered usable for project objectives. The analytical data completeness (defined as the percentage of usable data) for the samples included in the quality assurance review is 100 percent.

5. CONCLUSIONS AND REMEDIAL RECOMMENDATION

The reported indoor soil concentrations of arsenic, lead, and mercury are below the residential action levels. However, lead concentrations were detected in exceedance of the Butte Priority Soils Site-Specific Residential Action Levels for indoor soil and dust in a floor surface dust sample collected in June 2022. Remedial action or dust containment is needed to prevent exposure and the migration of particulates and dust from the storage room to the occupied areas of the school.

6. REFERENCES

- ARCO (Atlantic Richfield Company). 2022. *Residential Metals Abatement Program Quality Assurance Project Plan (Non-Residential Parcels – Indoor Soil)*. October.
- BSB and ARCO (Butte-Silver Bow County and Atlantic Richfield Company). 2020. *Revised Final Multi-Pathway Residential Metals Abatement Program (RMAP) Plan*. Priority Soils Operable Unit Silver Bow Creek/Butte Area, National Priorities List.
- ERM (Environmental Resources Management, Inc.). 2023. *Draft Residential Metals Abatement Program (RMAP) Investigation Summary Report (Non-Residential Parcels – Indoor Dust) – Silver Bow Montessori School*. June.
- ERM. 2023. *2023 Residential Metals Abatement Program (RMAP) Field Sampling Plan (FSP) – Interior Soils – Silver Bow Montessori*. July.
- USEPA (United States Environmental Protection Agency). 2020. U.S. Environmental Protection Agency (EPA) Unilateral Administrative Order Amendment (UAO Amendment) for “Partial Remedial Design/Remedial Action Implementation and Certain Operation and Maintenance at the Butte Priority Soils Operable Unit/Butte Site” (EPA Docket No. CERCLA-08-2011-0011).

TABLES

Table 1
Summary of Analytical Sampling Results
Silver Bow Montessori
Butte RMAP Indoor Soil
Butte, Montana

Location Type	Location ID	Sample ID	Sample Type	Date	Matrix	Location Desc	Chemical Name					Lead					Mercury				
							Butte Priority Soils Residential Action Level					250 (mg/kg)					1200 (mg/kg)				
							Result	MDL	RL	Interp Qual	E / S	Result	MDL	RL	Interp Qual	E / S	Result	MDL	RL	Interp Qual	E / S
Crawlspce	S-0015-C-01	S-0015-S-C-01-20230726	N	7/26/2023	Surface Soil	Basement exposed soil in boiler room.	5.5	0.67	2.4		E	32.2	0.44	2.4		E	0.018	0.0087	0.020	J	E
Crawlspce	S-0015-C-01	S-0015-S-C-01D-20230726	FD	7/26/2023	Surface Soil	Field duplicate, basement exposed soil in boiler room.	5.6	0.67	2.4		E	44.4	0.44	2.4		E	0.018	0.0085	0.020	J	E

Notes:

Bold text indicates detection.
 All reported values in mg/kg.

Acronyms:

- FD Field Duplicate
- MDL Method Detection Limit
- mg/kg milligrams per kilogram
- N Normal / Primary
- RL Reporting Limit

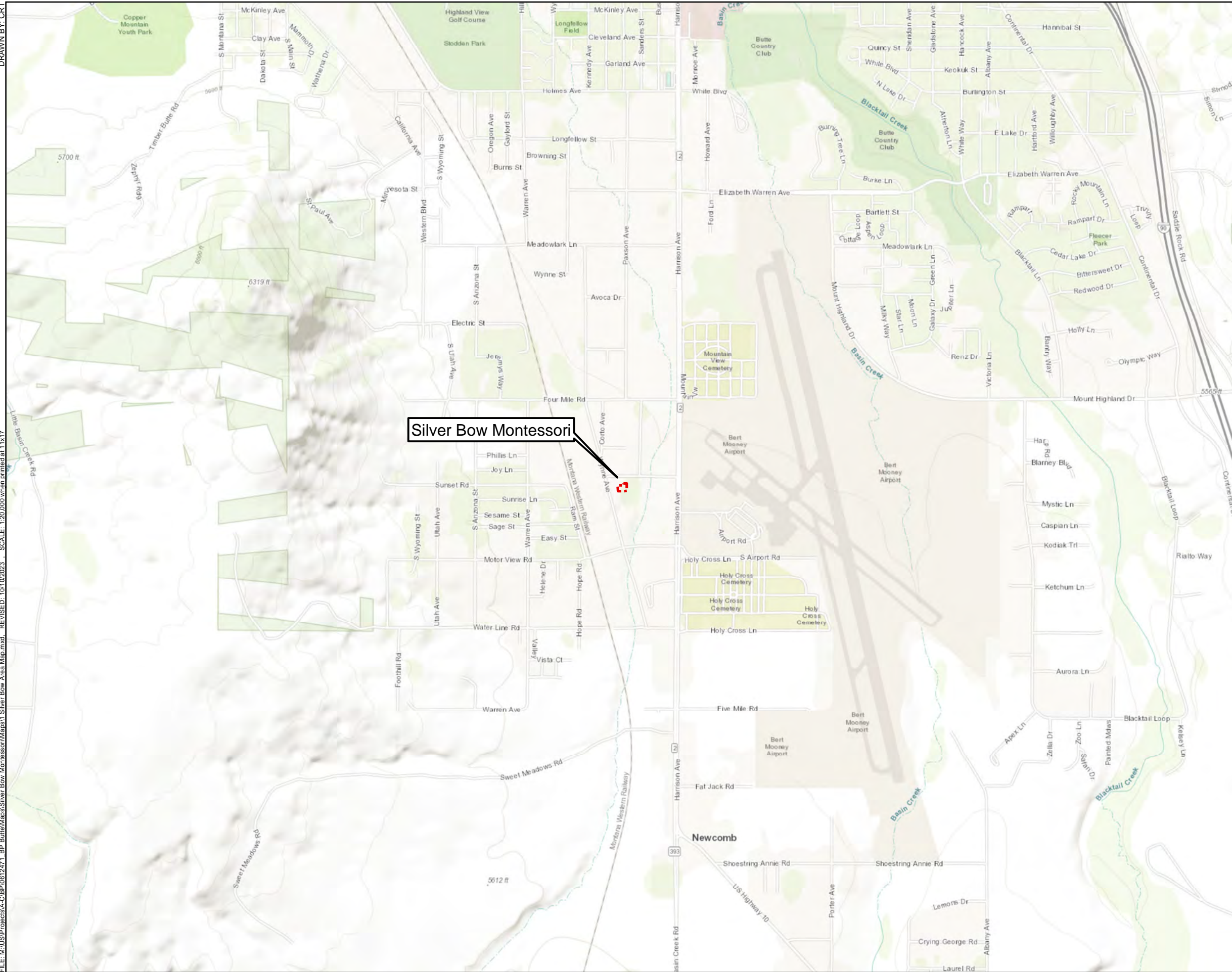
Interpreted Qualifiers:

J The analyte was positively identified; the associated numerical value is an estimate of the concentration of the analyte in the sample. This will also include results reported between the MDL and RL.

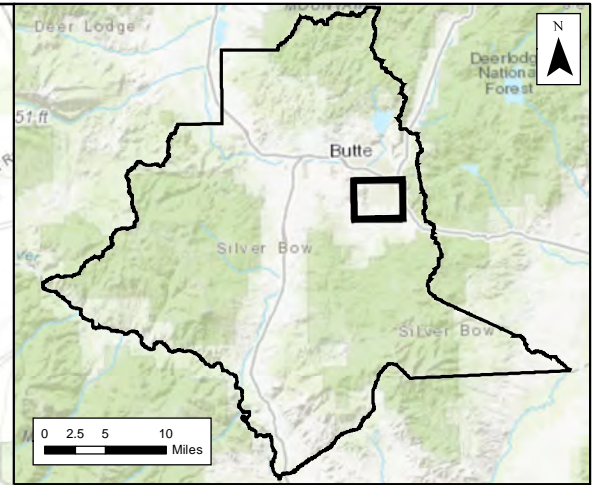
E / S:

E Enforcement quality. No qualifiers, U qualifier, or J qualifier and meets Level A and B criteria.

FIGURES



Silver Bow Montessori



Legend
 Site Area

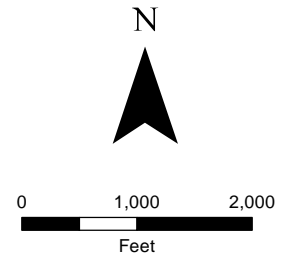
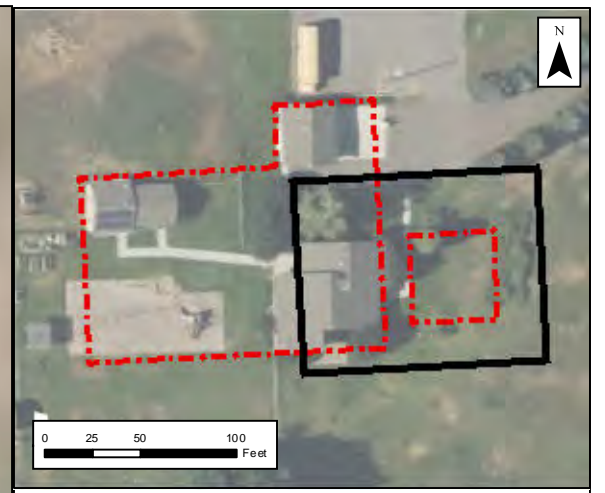


Figure 1
Silver Bow Montessori Location
 1800 Sunset Rd
 Butte, MT 59701



Legend

- Three-Point Composite Soil Sample
- Inaccessible Area

Notes:
 -Room IDs reflect verbiage used on site maps provided by Butte School District.

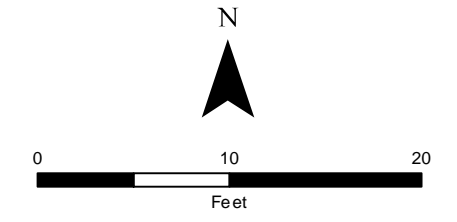
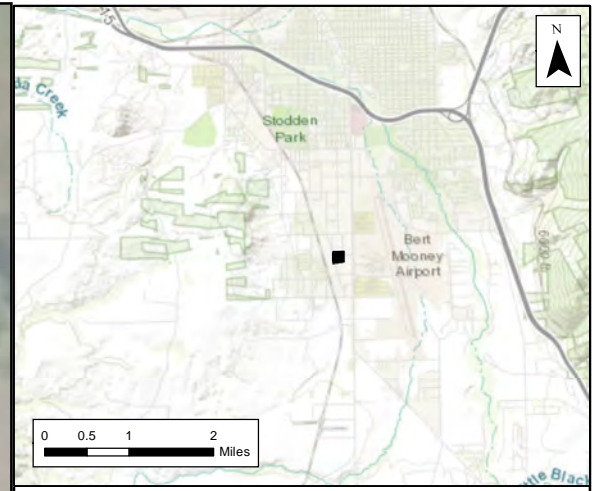
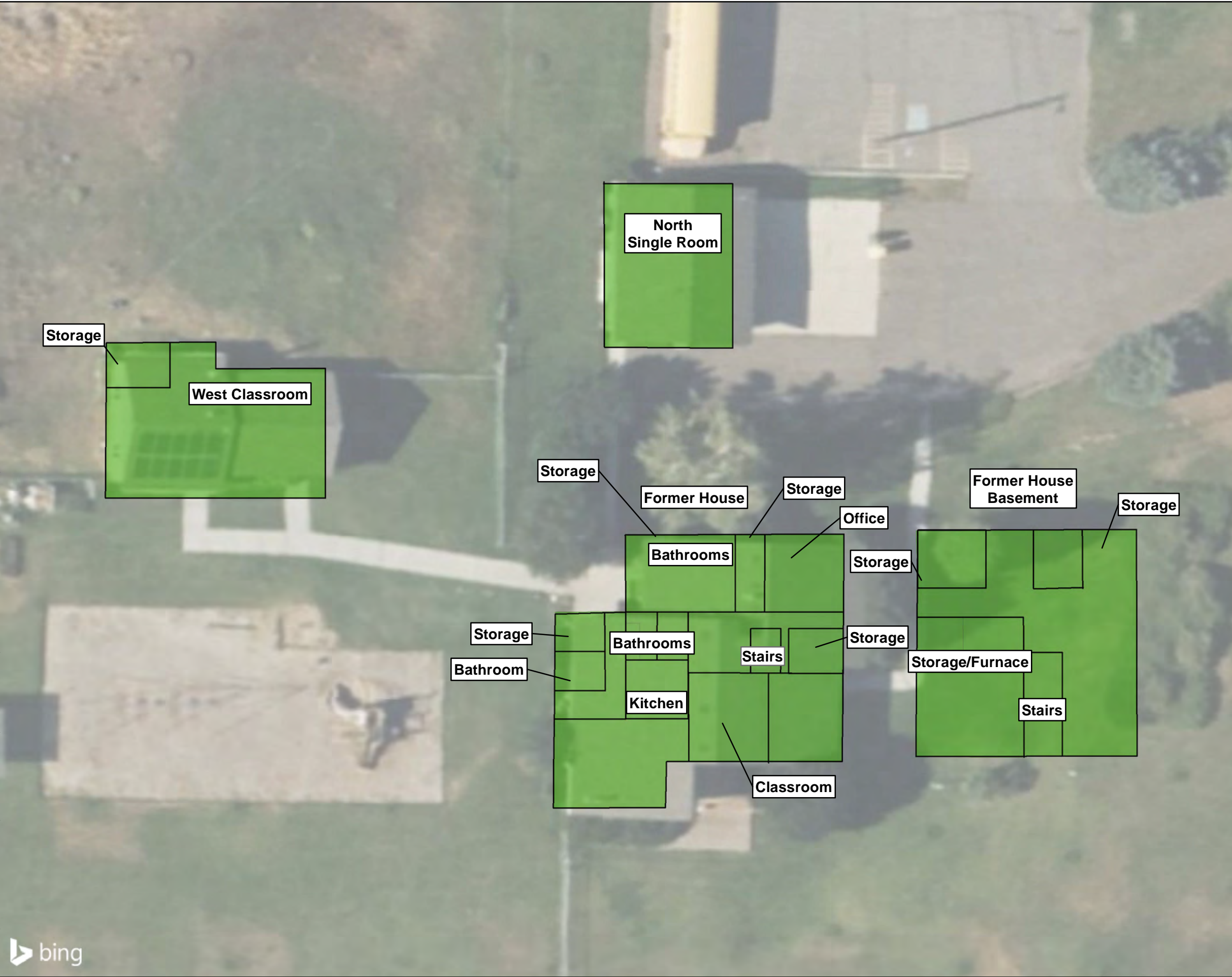


Figure 2
Silver Bow Montessori
Soil Sample Location
 1800 Sunset Rd
 Butte, MT 59701



Legend

- No Action Required
- Action Required

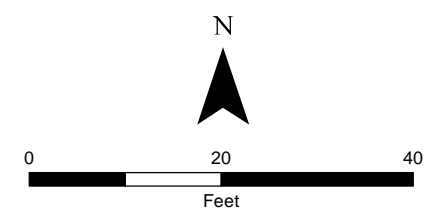
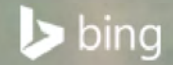


Figure 3
Silver Bow Montessori Action Areas
 1800 Sunset Rd
 Butte, MT 59701



APPENDIX A SITE PHOTOGRAPHS



Photograph: 1726 View of furnace room entrance, facing south. Exposed earthen area is at the base of the boiler. 7/26/2023 12:45



Photograph: 1729 Exposed earthen area at base of furnace room. 7/26/2023 12:45



2023. 07.26 12:45
(TW 20230911)

Photograph: 1731	View from west wall of furnace room, behind boiler, looking at exposed earthen area, facing north. 7/26/2023 12:45
----------------------------	--



APPENDIX B FIELD NOTES AND SAMPLE DATA SHEETS

Butte RMAP

15

7/26/23

T. Wilcox

Gold Hill, Silver-Bow Montessori

Arrive

11:30 Arrive at Gold Hill, check-in

11:50 Unpack equipment

12:00 Place FM-01 down at main entrance by office (photo 1720)
Place FM-02 down at North entrance (Photo 1721)

Place FM-03 at Daycare entrance (photo 1725)

Place FM-04 at Sanctuary entrance (photo 1724)

12:25 Inspect open rooms for potential micro-vial sampling

12:30 Check-out, leave Gold Hill

12:45 Arrive at Silver Bow Mont. check in with admin

13:00 Go down to basement, collect two 3-point composite soil samples from top 2" of exposed soil (4 Jan)

collected

① 13:10 photos 1726, ~~1728~~, 1729, 1731
TW 7/27/23
* note one of two samples was a duplicate

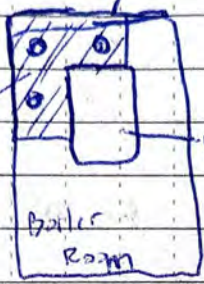
Scale: 1 square = 1 = Not on original
ERA. FM-04 was added in field *note in explanation*

(16) TW 7/27/23

sample IDs: S-0015-S-C-01-20230726

S. Ketch:

Exposed soil



Entrance S-0015-S-C-01-20230726

Composite point

(3)

Boiler

Boiler Room

North

1330 off-site

1345 Pick up HUS3 vacuum from BSB

1400 off-site



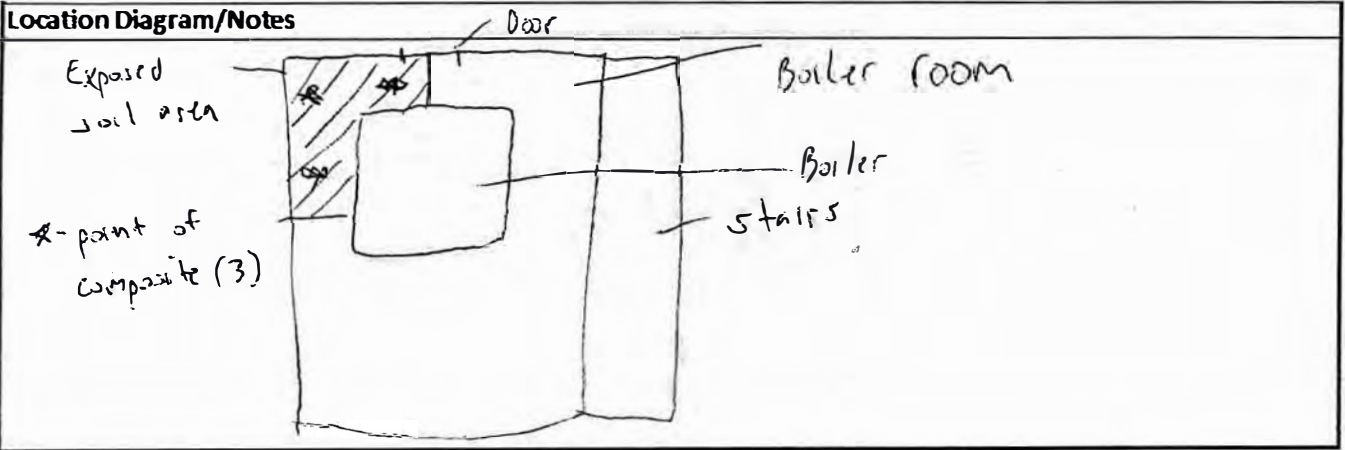
Tu Tu

7/26/23

Soil Sampling Worksheet

Project #: 0643586	Location: Silver Bow Montessori School
Project Name: Butte RMAP Sampling	Date: 7/26/2023
Field Team: Tim Wilson	Start Time: 1300
Sample ID: S-015-5-2-01-20250726	End Time: 1310
Sample ID: S-015-5-6-015-20230726	Time: 1310
Weather Conditions: Sunny, 75 degrees	split: ms/msd emk 08/04/23

Notable Observations (circle all that apply)	PID Readings
Description: Sandy Gravel , Organic Material, Tundra Mat, Other: emk 08/04/23	1
Odor: None , Low, Medium, High, Very Strong, H2S, Fuel like, Chemical ?, Unknown emk 08/04/23	2
Organic Matter: Yes, No emk 08/04/23	3
Collection Method: Grab, Composite , Multi-Incremental emk 08/04/23	4
Other: Two 3-point composite samples (1 parent sample, 1 duplicate) Two 4 oz jars per 3-point composite (for 2 separate analyses) Four jars total	5
	6
	7



General Information			
Sample Method	Sample Depth(ft)	Sample Collection Equipment	Extraction Method
Composite	0-2"	Stainless steel spoon, nitrile gloves, plastic bags, sample jars	Stainless steel spoon

Analyses	# of Bottles Collected	Bottle Type (preservative)	Comments:
Lead and Arsenic	Two 4-ounce amber jars	None	One parent sample (2 jars) One duplicate sample (2 jars)
Mercury	Two 4-ounce amber jars	None	

Signed: <u>Tim Wilson</u>	Date: <u>7/26/2023</u>
Signed/reviewer: <u>Elsie King</u>	Date: <u>08/04/23</u>

APPENDIX C LABORATORY REPORTS



August 10, 2023

Christopher Berg
ERM
1 Ninth St. Island Drive
Livingston, MT 59047

RE: Project: 0643586 RMAP Interior School
Pace Project No.: 10663488

Dear Christopher Berg:

Enclosed are the analytical results for sample(s) received by the laboratory on August 01, 2023. The results relate only to the samples included in this report. Results contained within this report conform to the most current version of the TNI standards, BP LaMP Technical Requirements Revision 12.1, and any applicable Quality Assurance Project Plan (QAPP), or Work Plan unless otherwise narrated in the body of this report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Anderson
jennifer.anderson@pacelabs.com
(612)607-6436
Project Manager

Enclosures

cc: Tom Beckman, ERM Alaska, Inc
AR Deliverables ESI, Environmental Standards, Inc.
Elsie King, ERM AK
BPEquis UploadEmail, BP EQUIS
Emmy Zartman, ERM



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014

Arkansas DW Certification #: MN00064

Arkansas WW Certification #: 88-0680

California Certification #: 2929

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Tribal Water Systems+Wyoming DW

Certification #: via MN 027-053-137

Florida Certification #: E87605

Georgia Certification #: 959

GMP+ Certification #: GMP050884

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: AI-03086

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137

Minnesota Dept of Ag Approval: via MN 027-053-137

Minnesota Petrofund Registration #: 1240

Mississippi Certification #: MN00064

Missouri Certification #: 10100

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081

New Jersey Certification #: MN002

New York Certification #: 11647

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification (A2LA) #: R-036

North Dakota Certification (MN) #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification (1700) #: CL101

Oklahoma Certification #: 9507

Oregon Primary Certification #: MN300001

Oregon Secondary Certification #: MN200001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification #: MN00064

South Carolina Certification #:74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Vermont Certification #: VT-027053137

Virginia Certification #: 460163

Washington Certification #: C486

West Virginia DEP Certification #: 382

West Virginia DW Certification #: 9952 C

Wisconsin Certification #: 999407970

Wyoming UST Certification #: via A2LA 2926.01

USDA Permit #: P330-19-00208

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 0643586 RMAP Interior School
Pace Project No.: 10663488

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10663488001	S-0015-S-C-01-20230726	Solid	07/26/23 13:10	08/01/23 08:50
10663488002	S-0015-S-C-01D-20230726	Solid	07/26/23 13:10	08/01/23 08:50
10663488003	S-0015-S-C-01-20230726	Solid	07/23/23 13:10	08/01/23 08:50
10663488004	S-0015-S-C-01D-20230726	Solid	07/23/23 13:10	08/01/23 08:50

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10663488001	S-0015-S-C-01-20230726	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	IMB	1	PASI-M
10663488002	S-0015-S-C-01D-20230726	EPA 7471B	LMW	1	PASI-M
		ASTM D2974	IMB	1	PASI-M
10663488003	S-0015-S-C-01-20230726	EPA 6020B	NN2	2	PASI-M
10663488004	S-0015-S-C-01D-20230726	EPA 6020B	NN2	2	PASI-M

PASI-M = Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

Method: EPA 6020B

Description: 6020B MET ICPMS

Client: BP-ERM-MT

Date: August 10, 2023

General Information:

2 samples were analyzed for EPA 6020B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

Method: EPA 7471B

Description: 7471B Mercury

Client: BP-ERM-MT

Date: August 10, 2023

General Information:

2 samples were analyzed for EPA 7471B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

Sample: S-0015-S-C-01-20230726 Lab ID: 10663488001 Collected: 07/26/23 13:10 Received: 08/01/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	0.018J	mg/kg	0.020	0.0087	1	08/07/23 12:22	08/08/23 15:49	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	2.1	%	0.10	0.10	1		08/09/23 10:28		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

Sample: S-0015-S-C-01D-20230726 Lab ID: 10663488002 Collected: 07/26/23 13:10 Received: 08/01/23 08:50 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	0.018J	mg/kg	0.020	0.0085	1	08/07/23 12:22	08/08/23 15:56	7439-97-6	
Dry Weight / %M by ASTM D2974	Analytical Method: ASTM D2974 Pace Analytical Services - Minneapolis								
Percent Moisture	2.1	%	0.10	0.10	1		08/09/23 10:33		N2

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

Sample: S-0015-S-C-01-20230726 Lab ID: 10663488003 Collected: 07/23/23 13:10 Received: 08/01/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS		Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis							
Arsenic	5.5	mg/kg	2.4	0.67	5	08/09/23 13:40	08/10/23 11:43	7440-38-2	
Lead	32.2	mg/kg	2.4	0.44	5	08/09/23 13:40	08/10/23 11:43	7439-92-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

Sample: S-0015-S-C-01D-20230726 Lab ID: 10663488004 Collected: 07/23/23 13:10 Received: 08/01/23 08:50 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS		Analytical Method: EPA 6020B Preparation Method: EPA 3050B Pace Analytical Services - Minneapolis							
Arsenic	5.6	mg/kg	2.4	0.67	5	08/09/23 13:40	08/10/23 12:01	7440-38-2	
Lead	44.4	mg/kg	2.4	0.44	5	08/09/23 13:40	08/10/23 12:01	7439-92-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

QC Batch: 898457	Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B	Analysis Description: 7471B Mercury Solids
	Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 10663488001, 10663488002

METHOD BLANK: 4732970 Matrix: Solid

Associated Lab Samples: 10663488001, 10663488002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0082	0.019	0.0082	08/08/23 15:45	

LABORATORY CONTROL SAMPLE: 4732971

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.48	0.46	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4732973 4732974

Parameter	Units	10663488001		4732974		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Mercury	mg/kg	0.018J	0.5	0.51	0.49	0.48	94	92	80-120	1	20

SAMPLE DUPLICATE: 4732972

Parameter	Units	10663488001 Result	Dup Result	RPD	Max RPD	Qualifiers
Mercury	mg/kg	0.018J	0.019J		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

QC Batch: 898982	Analysis Method: EPA 6020B
QC Batch Method: EPA 3050B	Analysis Description: 6020B Solids UPD5
	Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 10663488003, 10663488004

METHOD BLANK: 4734977 Matrix: Solid

Associated Lab Samples: 10663488003, 10663488004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.13	0.47	0.13	08/10/23 11:37	
Lead	mg/kg	<0.088	0.47	0.088	08/10/23 11:37	

LABORATORY CONTROL SAMPLE: 4734978

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	46.9	44.1	94	80-120	
Lead	mg/kg	46.9	47.8	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4734979 4734980

Parameter	Units	10663488003		4734980		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Arsenic	mg/kg	5.5	47.6	46.6	52.2	53.5	98	103	75-125	2	20
Lead	mg/kg	32.2	47.6	46.6	74.7	81.4	89	106	75-125	9	20

SAMPLE DUPLICATE: 4734981

Parameter	Units	10663488003 Result	Dup Result	RPD	Max RPD	Qualifiers
Arsenic	mg/kg	5.5	5.9	7	20	
Lead	mg/kg	32.2	35.2	9	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

QC Batch: 899036

Analysis Method: ASTM D2974

QC Batch Method: ASTM D2974

Analysis Description: Dry Weight / %M by ASTM D2974

Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 10663488001, 10663488002

SAMPLE DUPLICATE: 4735205

Parameter	Units	10663488001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	2.1	2.0	3	30	N2

SAMPLE DUPLICATE: 4735206

Parameter	Units	10663167003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	9.3	9.5	2	30	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 0643586 RMAP Interior School

Pace Project No.: 10663488

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10663488003	S-0015-S-C-01-20230726	EPA 3050B	898982	EPA 6020B	899384
10663488004	S-0015-S-C-01D-20230726	EPA 3050B	898982	EPA 6020B	899384
10663488001	S-0015-S-C-01-20230726	EPA 7471B	898457	EPA 7471B	898897
10663488002	S-0015-S-C-01D-20230726	EPA 7471B	898457	EPA 7471B	898897
10663488001	S-0015-S-C-01-20230726	ASTM D2974	899036		
10663488002	S-0015-S-C-01D-20230726	ASTM D2974	899036		

REPORT OF LABORATORY ANALYSIS

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Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

Turn Around Time (Days): 5

Lab Work Order Number:

BP/IRM Facility No: MT_Butte Priority Soils

Chain of Custody: 20230726-0115-PACE MPLS-S-0015

Lab Name: PACE, INC., MINNEAPOLIS, MN
 Lab Address: 1700 Elm Street SE
 Lab PM:
 Lab Phone: 612-607-6398
 Lab Shipping Acct:
 Lab Bottle Order No:
 Other Info:
 BP/IRM PM: Mike McAnulty/mcanumc@bp.com

BP/ARC Facility Address:
 City, State, ZIP Code: Butte, MT, 59701
 Lead Regulatory Agency:
 California Global ID No:
 Accounting information:

Consultant/Contractor: ERM
 Consultant/Contractor Project No: 0643586
 Address: 1 9th St Island Dr, Livingston, MT 59047
 Consultant/Contractor P.M.: Christopher Berg
 Phone: 9167699050
 Email: Christopher.Berg@erm.com
 Send/Submit EDD to: mcanumc@bp.com; Christopher.Berg@erm.com
 Invoice To: mcanumc@bp.com; Christopher.Berg@erm.com

PM Phone: PM Email:
Report Type & QC Level:

Lab No.	Sample Description	Date	Time	Sample Details				Requested Analyses				Comments	
				Field Matrix	Start Depth	End Depth	Depth Unit	Grab (G) or Composite (C)	Total # of Containers	Pres	File		N
1	S-0015-S-C-01-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2	X	X	X	001
2	S-0015-S-C-01D-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2	X	X	X	002

Sampler's Name: Tim Wilson
 Sampler's Company: ERM
 Ship Method:
 Shipment Tracking No: 592371483209
 Ship Date: 7/31/2023 4:00:00 PM

Relinquished By/Affiliation: *Tim Wilson/ERM*
 Date / Time: 7/31/2023 3:30:00 PM

Accepted By / Affiliation: *CCC/Peer*
 Date / Time: 8-1-23 08:00

Special Instructions:
 THIS LINE - LAB USE ONLY: Custody Seals in Place Yes / No | Temp Blank Yes / No | Cooler Temp on Receipt: *17* °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

WO#: 10663488

10663488



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Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

Sample Condition Upon Receipt - ESI Tech Specs
 Client Name: ERM

Project #: **WO# : 10663488**
 PM: JMA Due Date: 08/08/23
 CLIENT: BP-ERM-MT

Courier: FedEx UPS USPS Client
 Pace Speedee Commercial
 Tracking Number: 592371483209 See Exceptions ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other
 Thermometer: T1 (0461) T2 (0436) T3 (0459) T4 (0402) T5 (0178)
 T6 (0235) T7 (0042) T8 (0775) T9 (0727) 01339252/1710
 Biological Tissue Frozen? Yes No N/A
 Temp Blank? Yes No
 Type of Ice: Wet Blue Dry None
 Melted

Temp should be above freezing to 6 °C Cooler temp Read w/Temp Blank: 1.7 °C
 Correction Factor: True Cooler Temp Corrected w/temp blank: 1.7 °C
 Average Corrected Temp (no temp blank only): _____ °C
 See Exceptions ENV-FRM-MIN4-0142 1 Container

USDA Regulated Soil: N/A, water sample/other: _____
 Date/Initials of Person Examining Contents: ARC 8-1-23
 Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one):	Chain of Custody Present and Filled Out?	Chain of Custody Relinquished?	Sampler Name and/or Signature on COC?	Samples Arrived within Hold Time?	Short Hold Time Analysis (<72 hr)?	Rush Turn Around Time Requested?	Sufficient Sample Volume?	Triple Volume Provided for MS/MSD (if more than 10 samples)?	Correct Containers Used?	-Pace Containers Used?	Containers Intact?	Field Filtered Volume Received for Dissolved Tests?	Is sufficient information available to reconcile the samples to the COC?	Matrix:	All containers needing acid/base preservation have been checked?	All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH >10 Cyanide)	Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.)	Extra labels present on soil VOA or WIDRO containers? :	Headspace in VOA Vials (greater than 6mm)?	3 Trip Blanks Present?	Trip Blank Custody Seals Present?	COMMENTS
<input type="checkbox"/> Duluth <input checked="" type="checkbox"/> Minneapolis <input type="checkbox"/> Virginia	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input checked="" type="checkbox"/> Other	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	1. JMA 8/2/23
																						2. Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E.coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrom <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
																						3. 10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
																						11. If no, write ID/Date/Time of container below: <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142
																						12. Sample # <input type="checkbox"/> NaOH <input type="checkbox"/> HNO3 <input type="checkbox"/> H2SO4 <input type="checkbox"/> Zinc Acetate
																						Positive for Residual Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142
																						pH Paper Lot # Residual Chlorine 0-6 Roll 0-6 Strip 0-14 Strip
																						13. <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142
																						14. Pace Trip Blank Lot # (if purchased):

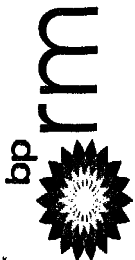
Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins

Opened Time: <u>1:30</u>	Temp: <u>1.7</u>	Corrected Temp: <u>True</u>
Time: <u>1:50</u>	put in cooler	
Time:	Temp:	Corrected Temp:

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: Confirmed that air dry & sieve required. Sample volume forwarded to Pace GB.
 Date: 08/02/2023

Project Manager Review: [Signature]

NOTE: Whenever there is a discrepancy among North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, put of temp, incorrect containers).



Laboratory Management Program (LAMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

Rev_01
 emk 08/03/23
 Page 1 of 2

Revised COC received 8/3/23 JMA

Turn Around Time (Days): 5

Lab Work Order Number:

BP/IRM Facility No: MT_Butte Priority Soils

Chain of Custody: 20230726-0115-PACE MPLS-S-0015_Rev_01

Lab Name: PACE, INC., MINNEAPOLIS, MN
 Lab Address: 1700 Elm Street SE
 Lab PM:
 Lab Phone: 612-607-6398
 Lab Shipping Acct:
 Lab Bottle Order No: -
 Other Info:
 BP/IRM PM: Mike Mc Anulty/mcanumc@bp.com

BP/ARC Facility Address:
 City, State, ZIP Code: Butte, MT, 59701
 Lead Regulatory Agency:
 California Global ID No.:
 Accounting Information:

Consultant/Contractor: ERM
 Consultant/Contractor Project No: 0643586
 Address: 1 9th St Island Dr, Livingston, MT 59047
 Consultant/Contractor PM: Christopher Berg
 Phone: 9167699050
 Email: Christopher.Berg@erm.com
 Send/Submit EDD to: mcanumc@bp.com; Christopher.Berg@erm.com
 Invoice To: mcanumc@bp.com; Christopher.Berg@erm.com

PM Phone: PM Email:
Report Type & QC Level:

Lab No.	Sample Description	Date	Time	Sample Details										Requested Analyses	Comments		
				Field Mark	Start Depth	End Depth	Depth Unit	Grab (g) or Composite (c)	Total # of Containers	Pres	Filt	Ambient C	SW620B (arsenic and lead)			SW7471B (mercury)	Degrees C
1	S-0015-S-C-01-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2	X	X	X	X	X	X	MS/MSD	061 emk 08/03/23
2	S-0015-S-C-01D-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2	X	X	X	X	X	X	002	002

Relinquished By / Affiliation: *Tim Wilson/ELM* Date / Time: 7/31/2023 3:30:00 PM
 Accepted By / Affiliation: *CRC/ERM* Date / Time: 8-1-23 08:40

Sampler's Name: Tim Wilson
 Sampler's Company: ERM
 Ship Method: FedEx emk 08/03/23 Ship Date: 7/31/2023 4:00:00 PM
 Shipment Tracking No: 592371483209

Special Instructions:
 THIS LINE - LAB USE ONLY: Custody Seals In Place Yes / No | Temp Blank Yes / No | Cooler Temp on Receipt: *12.7* °F / °C | Trip Blank Yes / No | MS/MSD Sample Submitted Yes / No

WO#: 10663488

10663488

Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

Revised COC received 8/3/23 JMA



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From: [Tim Wilson](#)
To: [Jennifer Anderson](#)
Cc: [Elsie King](#)
Subject: Butte RMAP Analysis Notes
Date: Monday, July 31, 2023 6:10:10 PM
Attachments: [image001.png](#)

CAUTION: This email originated from outside Pace Analytical. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Jennifer,

I just sent a shipment to Pace for the Butte RMAP project, it has samples from 3 schools (3 separate COCs). I was in a bit of a rush to get the samples in before the FedEx shipped for the day, and forgot a few things:

- Samples from S-0021 and S-0023 both have cassette filter blanks and field blanks, I forgot to add notes to the COC, however samples S-0021-D-O-01-20230729 (filter blank), S-0021-D-O-02-20230729 (field blank), S-0023-D-O-01-20230728 (filter blank), S-0023-D-O-02-20230728 (field blank) will not have sufficient mass, but please analyze for lead/arsenic and mercury as they are blanks
- Please do a MS/MSD on S-0015-S-C-01-20230726. These are soil samples and the 4 ounce soil jars are full, so I believe there should be enough.
- We used a new type of cassette for Gold Hill, there are 10 blank cassettes in the cooler in two bags labeled "blanks" (possibly "filter blanks")
- Just a reminder that per the EPA, the Gold Hill samples (S-0021) need to be rushed and are first priority.

The tracking number is: 592371483209

My apologies on not getting this information on the COC. Please reach out if you have any questions. Thank you.

Tim Wilson
Consultant II, Data Analytics and Visualization

ERM

1 Ninth St. Island Drive | Livingston, MT | 59047

T (215) 287-2063

E tim.wilson@erm.com | W www.erm.com



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From: [Elsie King](#)
To: [Jennifer Anderson](#); [Tim Wilson](#)
Subject: RE: Butte RMAP Analysis Notes
Date: Tuesday, August 1, 2023 2:54:16 PM
Attachments: [image002.png](#)

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The sieve step is needed for the composite soils, but we could not split the shipment on our end.

Thanks,

Elsie

From: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Sent: Tuesday, August 1, 2023 11:52 AM
To: Tim Wilson <Tim.Wilson@erm.com>
Cc: Elsie King <Elsie.King@erm.com>
Subject: RE: Butte RMAP Analysis Notes

EXTERNAL MESSAGE

Thank you Tim!

One more quick question, you mentioned that the S-0015 samples are soils, do these need to be air dried and sieved prior to the 6020 arsenic and lead analysis? I did not see a note on the COC that sieving was needed but wanted to double check.

Thanks again!

Jennifer Anderson, PMP
Project Manager
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
D: 612.607.6436 | pacelabs.com



From: Tim Wilson <Tim.Wilson@erm.com>
Sent: Tuesday, August 1, 2023 12:38 PM
To: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Cc: Elsie King <Elsie.King@erm.com>
Subject: RE: Butte RMAP Analysis Notes

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Hi Jennifer,

Sure thing, they are attached. Please reach out if anything else comes up.

Tim

From: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Sent: Monday, July 31, 2023 6:32 PM
To: Tim Wilson <Tim.Wilson@erm.com>
Cc: Elsie King <Elsie.King@erm.com>
Subject: RE: Butte RMAP Analysis Notes

EXTERNAL MESSAGE

Hi Tim,

Thank you for letting me know! Would it please be possible to email me copies of the COCs? (Just for me to work on getting them into our system before they arrive to help expedite the processing).

Thanks again!

Jennifer

Jennifer Anderson, PMP
Project Manager
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
D: 612.607.6436 | pacelabs.com



From: Tim Wilson <Tim.Wilson@erm.com>
Sent: Monday, July 31, 2023 6:10 PM
To: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Cc: Elsie King <Elsie.King@erm.com>
Subject: Butte RMAP Analysis Notes

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Hi Jennifer,

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(field blank) will not have sufficient mass, but please analyze for lead/arsenic and mercury as they are blanks

- Please do a MS/MSD on S-0015-S-C-01-20230726. These are soil samples and the 4 ounce soil jars are full, so I believe there should be enough.
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The tracking number is: 592371483209

My apologies on not getting this information on the COC. Please reach out if you have any questions. Thank you.

Tim Wilson
Consultant II, Data Analytics and Visualization

ERM

1 Ninth St. Island Drive | Livingston, MT | 59047

T (215) 287-2063

E tim.wilson@erm.com | W www.erm.com



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From: [Elsie King](#)
To: [Amanda Whitney](#); [Jennifer Anderson](#); [Emmy Zartman](#); [Thomas Beckman](#); [Christopher Berg](#)
Cc: [AR_Deliverables](#); [Lester Dupes](#)
Subject: RE: Samples Received, "0643586 RMAP Interior School" Pace® Project #10663488
Date: Thursday, August 3, 2023 1:29:23 PM
Attachments: [image001.png](#)
[10663488_coc_Rev01.pdf](#)

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Hi Amanda,

See Attached for the revised COC for the Silver Bow Indoor Soil samples collected 7/26/2023.

Regards.

Elsie King
Senior Consultant
ERM
900 E. Benson Blvd. | Suite 480 | Anchorage, AK 99508
T +1 925 482 3792 | M +1 907 201 6785
E Elsie.King@erm.com | W www.erm.com



ERM *The business of sustainability*

From: Amanda Whitney <awhitney@envstd.com>
Sent: Thursday, August 3, 2023 3:20 AM
To: jennifer.anderson@pacelabs.com; [Emmy Zartman <emmy.zartman@erm.com>](mailto:emmy.zartman@erm.com); [Elsie King <elsie.king@erm.com>](mailto:elsie.king@erm.com); [Thomas Beckman <thomas.beckman@erm.com>](mailto:thomas.beckman@erm.com); [Christopher Berg <christopher.berg@erm.com>](mailto:christopher.berg@erm.com)
Cc: [AR_Deliverables <AR_Deliverables@envstd.com>](#); [Lester Dupes <ldupes@envstd.com>](#)
Subject: RE: Samples Received, "0643586 RMAP Interior School" Pace® Project #10663488

EXTERNAL MESSAGE

Good morning ERM,

On the attached COC, please revise the following:

- Update to include Ship Method
- Update line item 1 to include a comment stating "MS/MSD"
- Under "Requested Analyses", please add a "Air dry & sieve" as a separate line item, preservative "Ambient", Filtered "N" and add an "X" to each sample for this analysis. Typically it's included with the metals analysis field but since there is no room, I would just make it a separate line item.

For all revisions, please strike through the error and write the revision next to the error. In addition, please initial and date next to all revisions. In the top right corner of each page of the COC, please add "Rev_01" with initials and the date.

Thanks!

Amanda Whitney

Project Quality Assurance Chemist

Environmental Standards, Inc.

Valley Forge, PA | US Eastern Time

Office: +1-610-935-5577 x110247

awhitney@envstd.com | www.envstd.com

From: jennifer.anderson@pacelabs.com <jennifer.anderson@pacelabs.com>

Sent: Wednesday, August 2, 2023 9:30 PM

To: emmy.zartman@erm.com; elsie.king@erm.com; thomas.beckman@erm.com; AR_Deliverables <AR_Deliverables@envstd.com>; christopher.berg@erm.com

Subject: Samples Received, "0643586 RMAP Interior School" Pace® Project #10663488

Hello,

Thank you for submitting your samples to Pace® Analytical Services! We appreciate your business.

Samples were received and logged-in at Pace® Analytical in Minneapolis, MN.

Please review the attached Sample Acknowledgement Form (SAF) for a summary description of the project as received and logged.

If you notice any discrepancies, please contact your project manager as soon as possible.

Sincerely,

Jennifer Anderson

jennifer.anderson@pacelabs.com

[emmy.zartman@erm.com, elsie.king@erm.com, thomas.beckman@erm.com, ar_deliverables@envstd.com, christopher.berg@erm.com]

[emmy.zartman@erm.com, elsie.king@erm.com, thomas.beckman@erm.com, ar_deliverables@envstd.com, christopher.berg@erm.com]

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Internal Transfer Chain of Custody

40266011



Samples Pre-Logged into eCOC.

State Of Origin: MT

Cert. Needed: Yes No

Workorder Name: 0643586 RMAP Interior School

Results Requested By: 8/8/2023

Owner Received Date: 8/1/2023



Report To		Subcontract To		Requested Analysis			
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436		Air Dry & Sieve			
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	LAB USE ONLY
1	S-0015-S-C-01-20230726	RQS	7/23/2023 13:10	10663488003	Solid	1	NOI
2	S-0015-S-C-01D-20230726	PS	7/23/2023 13:10	10663488004	Solid	1	NOI
3							
4							
5							

Transfers	Released By	Date/Time	Received By	Date/Time
1	Jane Pace	8/23 1500		
2	Walter	8/23 23 0230	Summit High Pace	08/23 0730
3				

Cooler Temperature on Receipt -0.5°C	Custody Seal (Y) or N	Received on Ice (Y) or N	Samples Intact (Y) or N
--------------------------------------	-----------------------	--------------------------	-------------------------

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Client Name: **Pace M**
 All containers needing preservation have been checked and noted below:
 Lab Lot# of pH paper: Yes No

Sample Preservation Receipt Form
 Project # **402066071**
 No Yes

Lab Std #ID of preservation (if pH adjusted): N/A

Initial when completed:

Date/Time:

Pace Lab #	Glass					Plastic					Vials					Jars		General		VOA Vials (>6mm)	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≤12	HNO3 pH ≤2	pH after adjusted	Volume (mL)		
	AG1U	BG1U	AG1H	AG4S	AG5U	BG3U	BP1U	BP3U	BP3B	BP3N	BP2Z	BG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U								WGFU	WPFU
001																												
002																												2.5/5
003																												2.5/5
004																												2.5/5
005																												2.5/5
006																												2.5/5
007																												2.5/5
008																												2.5/5
009																												2.5/5
010																												2.5/5
011																												2.5/5
012																												2.5/5
013																												2.5/5
014																												2.5/5
015																												2.5/5
016																												2.5/5
017																												2.5/5
018																												2.5/5
019																												2.5/5
020																												2.5/5


Exceptions to preservation check. VOA, Coliform, TOC, TOX, O&G, WI DRO, Phenolics, Other:

Headspace in VOA Vials (>6mm): Yes No N/A *If yes look in headspace column

AG1U	BG1U	AG1H	AG4S	AG5U	BG3U	BP1U	BP3U	BP3B	BP3N	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN1	GN2	
1 liter amber glass	1 liter clear glass	1 liter amber glass HCL	125 mL amber glass H2SO4	100 mL amber glass unpres	500 mL amber glass H2SO4	250 mL clear-glass unpres	1 liter plastic unpres	250 mL plastic unpres	250 mL plastic NaOH	250 mL plastic HNO3	250 mL plastic H2SO4	500 mL plastic NaOH + Zn	40 mL clear ascorbic w/ HCl	40 mL amber Na Thio	40 mL clear vial unpres	40 mL clear vial HCL	40 mL clear vial MeOH	40 mL clear vial DI	4 oz amber jar unpres	9 oz amber jar unpres	4 oz clear jar unpres	4 oz plastic jar unpres	120 mL plastic Na Thiosulfate	ziploc bag	

Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, Minneapolis, MN
 Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____
 Tracking #: 3639794

Project #: _____
WO#: 40266011

 40266011

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No
 Custody Seal on Samples Present: Yes No Seals intact: Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other
 Thermometer Used SR - 117 Type of Ice: Wet Blue Dry None Meltwater Only
 Cooler Temperature Uncorr: 0.0 / Corr: -0.5
 Temp Blank Present: Yes No Biological Tissue is Frozen: Yes No
 Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Person examining contents:
 Date: 08/02/23 Initials: SLW
 Labeled By Initials: mt

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>FRWO</u>
Samples Arrived within Hold Time: - DI VOA Samples frozen upon receipt	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	5. <u>08/02/23</u> <u>80</u>
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume: For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		8.
Correct Containers Used: Correct Type: Pace Green Bay, <u>Pace IB</u> , Non-Pace	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: <u>S</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
Trip Blank Present: Trip Blank Custody Seals Present Pace Trip Blank Lot # (if purchased):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ If checked, see attached form for additional comments
 Comments/ Resolution: _____

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample log in

40266011



Internal Transfer Chain of Custody

Samples Pre-Logged into eCOC.

State Of Origin: MT
Cert. Needed: Yes No

Workorder: 10663488 Workorder Name: 0643586 RMAP Interior School Results Requested By: 8/8/2023



Report to:		Subcontract To:		Requested Analysis:			
Jennifer Anderson Pace Analytical Minnesota 1700 Elm Street Minneapolis, MN 55414 Phone (612)607-6436		Pace Analytical Green Bay 1241 Bellevue Street Suite 9 Green Bay, WI 54302 Phone (920)469-2436					
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	LAB USE ONLY
1	S-0015-S-C-01-20230726	RQS	7/23/2023 13:10	10663488003	Solid	Unpreserved	
2	S-0015-S-C-01D-20230728	PS	7/23/2023 13:10	10663488004	Solid	Unpreserved	
3							
4							
5							

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	Jane Pace	8/23/23 13:00			
2	W.A. G. COO	8/23/23 0730	Sumant Nigam Pace	08/23/23 0730	
3	W.A. G. COO	8-23-23 1600	Sumant Nigam Pace	8-23-23 0809	

Cooler Temperature on Receipt	-2.5°C	Custody Seal	(Y) or N	Received on Ice	(Y) or N	Samples Intact	(Y) or N
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***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.

Forwarding for analysis 8/3/23

WO#: 10663488

10663488

Effective Date: 4/14/2023

Sample Condition Upon Receipt
 Client Name: Pace Greenbay

Project #: **WO#: 10663488**
 PM: JMA Due Date: 08/10/23
 CLIENT: BP-ERM-MT

Courier: FedEx UPS USPS Client
 Pace Speedee Commercial

See Exceptions
 ENV-FRM-MIN4-0142

Tracking Number: _____
 Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other
 Thermometer: T1 (0461) T2 (0436) T3 (0459) T4 (0402) T5 (0178)
 T6 (0235) T7 (0042) T8 (0775) T9(0727) 01339252/1710
 Biological Tissue Frozen? Yes No N/A
 Temp Blank? Yes No
 Type of Ice: Wet Blue Dry None
 Melted

Did Samples Originate in West Virginia? Yes No Were All Container Temps Taken? Yes No N/A
 Temp should be above freezing to 6 °C Cooler temp Read w/Temp Blank: _____ °C
 Average Corrected Temp (no temp blank only): 2.1 °C
 Correction Factor: True Cooler Temp Corrected w/temp blank: _____ °C
 See Exceptions ENV-FRM-MIN4-0142 1 Container

USDA Regulated Soil: N/A, water sample/other: _____ Date/Initials of Person Examining Contents: APC 8-4-23
 Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one):	Duluth	<input checked="" type="checkbox"/> Minneapolis	Virginia	COMMENTS
Chain of Custody Present and Filled Out?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	4. If fecal: <input type="checkbox"/> <8 hrs <input type="checkbox"/> >8 hr, <24 <input type="checkbox"/> No
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E.coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrom <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other _____
Rush Turn Around Time Requested?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	6.
Sufficient Sample Volume?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	7.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	9.
Containers Intact?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? Matrix: <input type="checkbox"/> Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	11. If no, write ID/Date/Time of container below: <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH >10 Cyanide)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> NaOH <input type="checkbox"/> HNO3 <input type="checkbox"/> H2SO4 <input type="checkbox"/> Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Positive for Residual Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142 pH Paper Lot # Residual Chlorine 0-6 Roll 0-6 Strip 0-14 Strip
Headspace in Methyl Mercury Container?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	13.
Extra labels present on soil VOA or WIDRO containers?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	14. <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
3 Trip Blanks Present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____
 Project Manager Review: [Signature] Date: 08/07/2023

NOTE: Whenever there is a discrepancy among North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers):

Labeled By: APC Line: 2



DC#_Title: ENV-FRM-MIN4-0142 v02_Sample Condition Upon Receipt
(SCUR) Exception Form

Effective Date: 09/22/2022

Workorder #: _____

No Temp Blank		
Read Temp	Corrected Temp	Average temp
21.0	True	21.1
21.1		

PM Notified of Out of Temp Cooler? Yes No

If yes, indicate who was contacted, date and time.
If no, indicate reason why.

Multiple Cooler Project? Yes No

If anything is OVER 6.0° C, you **MUST** document containers in this section **HERE**



Tracking Number	Temperature



Out of Temp Sample ID	Container Type	# of Containers

pH Adjustment Log for Preserved Samples

Sample ID	Type Of Preserve	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance After Addition?		Initials
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Comments:

APPENDIX D VALIDATION REPORTS



LEVEL A/B FIELD DOCUMENTATION SCREENING REVIEW

**SILVER BOW CREEK/BUTTE AREA NATIONAL PRIORITIES LIST SITE,
BUTTE PRIORITY SOILS OPERABLE UNIT,
RESIDENTIAL METALS ABATEMENT PROGRAM PROJECT**

SOIL SAMPLES COLLECTED ON

JULY 26, 2023

RESIDENT IDENTIFICATION: S-0015

SAMPLE DELIVERY GROUPS: 10663488

August 15, 2023

Prepared for:

ATLANTIC RICHFIELD COMPANY

317 Anaconda Road
Butte, MT 59701

Prepared by:

ENVIRONMENTAL STANDARDS, INC.

1140 Valley Forge Road
P.O. Box 810
Valley Forge, PA 19482-0810

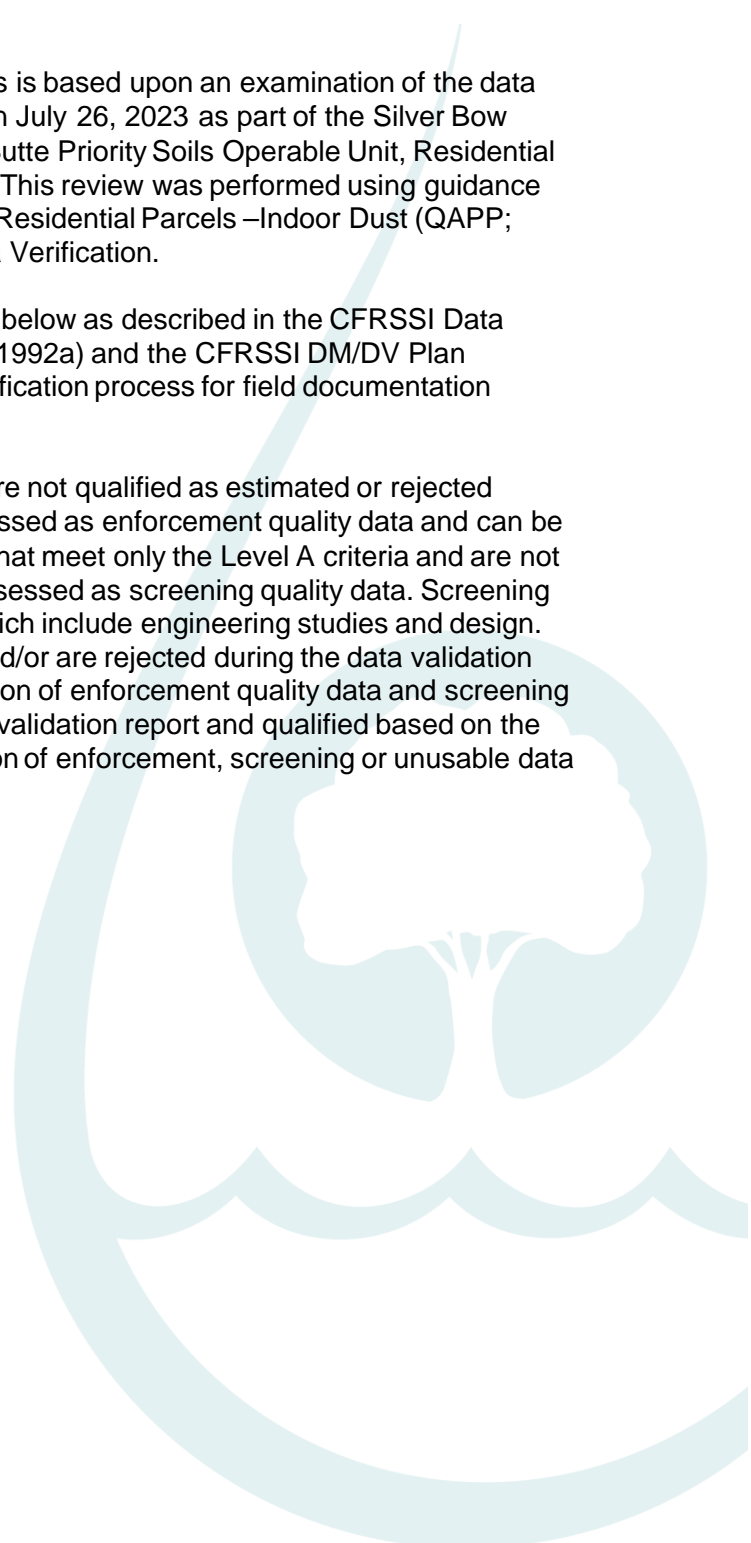
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INTRODUCTION

This quality assurance (QA) review of field documents is based upon an examination of the data generated during the collection of the field samples on July 26, 2023 as part of the Silver Bow Creek/Butte Area National Priorities List (NPL) Site, Butte Priority Soils Operable Unit, Residential Metals Abatement Program (RMAP) sampling event. This review was performed using guidance from the RMAP Quality Assurance Project Plan Non-Residential Parcels –Indoor Dust (QAPP; Revision 2, October 2022), Section 5.1.2.1 Field Data Verification.

The Level A/B review is documented on the checklist below as described in the CFRSSI Data Management/Data Validation (DV/DM) Plan (ARCO, 1992a) and the CFRSSI DM/DV Plan Addendum (AERL, 2000), and will be used in the verification process for field documentation related to samples collected for laboratory analyses.

Data that meet the Level A and Level B criteria and are not qualified as estimated or rejected during the analytical data validation process are assessed as enforcement quality data and can be used for all Superfund purposes and activities. Data that meet only the Level A criteria and are not rejected during the data validation process can be assessed as screening quality data. Screening quality data can be used only for certain activities, which include engineering studies and design. Data that do not meet the Level A and/or B criteria and/or are rejected during the data validation process are designated as unusable. The determination of enforcement quality data and screening quality data will be made in conjunction with the data validation report and qualified based on the requirements of Section 5.3 of the QAPP. Identification of enforcement, screening or unusable data will be added to the electronic data deliverables.



SECTION 1 LEVEL A/B FIELD DOCUMENTATION SCREENING REVIEW**1. General Information**

Site: Silver Bow Montessori (S-0015)
 Project: Residential Metals Abatement Program
 Client: Atlantic Richfield Company
 Sample Matrix: Soil

2. Screening Result

Data are:

Unusable

Level A

Level B

3. Level A Criteria: The following must be fully documented

Criteria		Comments
Sampling date	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recorded in Logbook <input checked="" type="checkbox"/> COC <input checked="" type="checkbox"/> Bottle Labels <input checked="" type="checkbox"/>
Sampling team or leader name	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recorded in Logbook <input checked="" type="checkbox"/> COC <input checked="" type="checkbox"/>
Physical description of sampling location	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recorded in Logbook <input type="checkbox"/> Field Forms <input type="checkbox"/> Photo Log <input type="checkbox"/>
Sample collection depth (soils)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Recorded in Logbook <input checked="" type="checkbox"/> Field Forms <input checked="" type="checkbox"/>
Sample collection technique	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Collected in accordance with the SOPs in Appendix B of QAPP Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Field preparation technique	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Collected in accordance with the SOPs in Appendix B of QAPP Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample preservation technique	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Dust samples for arsenic, lead and mercury analyses submitted on ice? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample shipping records	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Did sample arrive at < 6°C but not frozen (mercury analysis)? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>1.7°C</u> Reported (corrected) temperature

4. Level B Criteria – The following must be fully documented.

Criteria		Comments
Field instrumentation methods and standardization complete.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Field equipment calibrated if used? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample container preparation	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Unpreserved bottles provided by laboratory and lot number tracked? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Collection of field duplicates (1/20 minimum)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Sampling equipment decontamination	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Dedicated sampling equipment decontaminated per QAPP Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Field custody documentation	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	COC complete and signed (performed during SCUR review) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Shipping custody documentation	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Custody Seals applied to sample shipment cooler (performed during SCUR review) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Custody Seals intact (performed during SCUR review) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Traceable sample designation number	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Sample IDs in Logbook match COC? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Field logbook(s), custody records in secure repository	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	All notes are complete in a PDF Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Secure repository under RMAP protocols
Completed field forms	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Are field forms, complete, legible, and signed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

5. Authorization of Field Documentation Screening Review

Report prepared by: Brett Dunphy, Staff Geoscientist
 Report reviewed by: Joseph Kraycik, Senior Quality Assurance Chemist
 Report approved by: Lester J. Dupes, CEAC, Senior Quality Assurance Chemist
 Report approved by: Rock J. Vitale, CEAC, Technical Director of Chemistry/Principal
 Date: 8/15/2023

SECTION 2 ENFORCEMENT/SCREENING DEFINITIONS

- E Enforcement quality. No qualifiers, U qualifier or J qualifier (see note below) and meets Level A and B criteria.
- S Screening quality. J or UJ qualifier and/or meets only Level A criteria.
- R Unusable. R qualifier and/or does not meet Level A or B requirements.

Enforcement/Screening Designation

	Meets Level A and B	Meets Level A	Does not meet Level A or B
No qualifier, A, U, or laboratory results reported between the MDL and RL with a J qualifier	E	S	R
J, J+, J-, or UJ	S	S	R
R	R	R	R

Note: It is appropriate to note that sample results qualified as estimated "J" by the laboratory because the reported result is between the MDL and RL, values are considered enforcement data if no other qualifiers were required during validation.



SECTION 3

ERM FIELD DATA SUPPORT DOCUMENTATION

Butte RMAP

15

7/26/23

T. Wilcox

Gold Hill, Silver-Bow Montessori

Arrive

11:30 Arrive at Gold Hill, check-in

11:50 Unpack equipment

12:00 Place FM-01 down at main entrance by office (photo 1720)
Place FM-02 down at North entrance (Photo 1721)

Place FM-03 at Daycare entrance (photo 1725)

Place FM-04 at Sanctuary entrance (photo 1724)

12:25 Inspect open rooms for potential micro-vial sampling

12:30 Check-out, leave Gold Hill

12:45 Arrive at Silver Bow Mont. check in with admin

13:00 Go down to basement, collect two 3-part composite soil samples from top 2" of exposed soil (4 Jan)

collected

① 13:10 photos 1726, ~~1728~~, 1729, 1731
TW 7/27/23
* note one of two samples was a duplicate

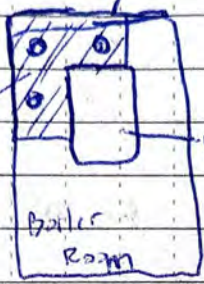
Scale: 1 square = 1 = Not on original
ERA. FM-04 was added in field *note in explanation*

(16) TW 7/27/23

sample IDs: S-0015-S-C-01-20230726

S. Ketch:

Exposed soil



● = Composite point.

(3)

1330

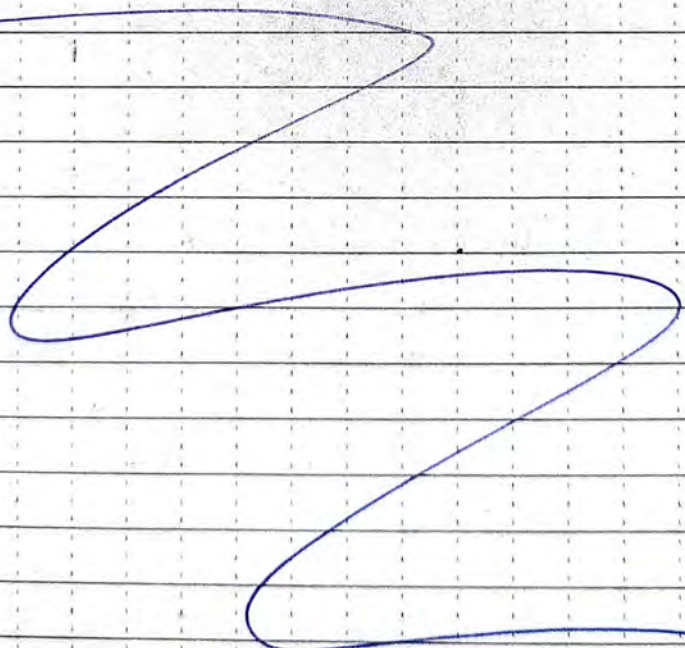
off-site

1345

Pick up HUS3 vacuum from BSB

1400

off-site



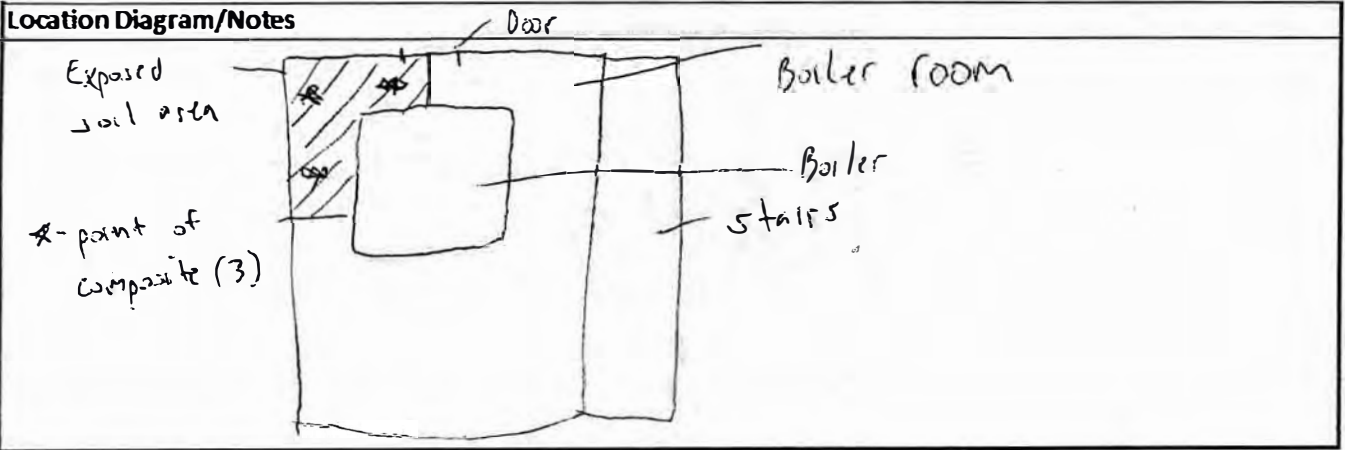
Tu Tu

7/26/23

Soil Sampling Worksheet

Project #: 0643586	Location: Silver Bow Montessori School
Project Name: Butte RMAP Sampling	Date: 7/26/2023
Field Team: Tim Wilson	Start Time: 1300
Sample ID: S-015-5-6-015-20250726	End Time: 1310
Sample ID: S-015-5-6-015-20250726	Time: 1310
Weather Conditions: Sunny, 75 degrees	split: ms/msd emk 08/04/23
	split: ms/msd

Notable Observations (circle all that apply)	PID Readings
Description: Sandy Gravel , Organic Material, Tundra Mat, Other: emk 08/04/23	1
Odor: None , Low, Medium, High, Very Strong, H2S, Fuel like, Chemical ?, Unknown emk 08/04/23	2
Organic Matter: Yes, No emk 08/04/23	3
Collection Method: Grab, Composite , Multi-Incremental emk 08/04/23	4
Other: Two 3-point composite samples (1 parent sample, 1 duplicate) Two 4 oz jars per 3-point composite (for 2 separate analyses) Four jars total	5
	6
	7



General Information			
Sample Method	Sample Depth(ft)	Sample Collection Equipment	Extraction Method
Composite	0-2"	Stainless steel spoon, nitrile gloves, plastic bags, sample jars	Stainless steel spoon

Analyses	# of Bottles Collected	Bottle Type (preservative)	Comments:
Lead and Arsenic	Two 4-ounce amber jars	None	One parent sample (2 jars) One duplicate sample (2 jars)
Mercury	Two 4-ounce amber jars	None	

Signed: <u>Tim Wilson</u>	Date: <u>7/26/2023</u>
Signed/reviewer: <u>Elsie King</u>	Date: <u>08/04/23</u>



Photograph:
1726

View of furnace room entrance, facing south. Exposed earthen area is at the base of the boiler. 7/26/2023 12:45



Photograph:
1729

Exposed earthen area at base of furnace room. 7/26/2023 12:45





Photograph:
1731

View from west wall of furnace room, behind boiler, looking at exposed earthen area, facing north. 7/26/2023 12:45



Butte RMAP
Silver Bow Montessori Soil Sampling
ERM Project Number 0643586



Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

Rev_01
 emk 08/03/23
 Page 1 of 2

BP/RM Facility No: MT_Butte Priority Soils

Lab Work Order Number:

Turn Around Time (Days): 5

Chain of Custody: 20230726-0115-PACE MPLS-S-0015_Rev_01

Lab Name: PACE, INC., MINNEAPOLIS, MN	BP/ARC Facility Address:	Consultant/Contractor: ERM
Lab Address: 1700 Elm Street SE	City, State, ZIP Code: Butte, MT, 59701	Consultant/Contractor Project No: 0643586
Lab PM:	Lead Regulatory Agency:	Address: 1 9th St Island Dr, Livingston, MT 59047
Lab Phone: 612-607-6398	California Global ID No.:	Consultant/Contractor PM: Christopher Berg
Lab Shipping Accnt:	Accounting Information:	Phone: 9167699050 Email: Christopher.Berg@erm.com
Lab Bottle Order No: -		Send/Submit EDD to: mcanumc@bp.com; Christopher.Berg@erm.com
Other Info:		Invoice To: mcanumc@bp.com; Christopher.Berg@erm.com
BP/RM PM: Mike Mc Anulty@mcanumc@bp.com	PM Phone: PM Email:	Report Type & QC Level:

Lab No.	Sample Description	Date	Time	Field Matrix	Start Depth	End Depth	Depth Unit	Grab (G) or Composite (C)	Total # of Containers	Requested Analyses				Comments
										Pres	N	N	N	
1	S-0015-S-C-01-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2	X	X	X		MS/MSD 001 emk 08/03/23
2	S-0015-S-C-01D-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2	X	X	X		002

Sampler's Name: Tim Wilson	Relinquished By / Affiliation	Date / Time	Accepted By / Affiliation	Date / Time
Sampler's Company: ERM	Tim Wilson / ERM	7/31/2023 3:30:00 PM	<i>Christopher Berg</i>	8-1-23 08:40
Ship Method: FedEx emk 08/03/23	Ship Date: 7/31/2023 4:00:00 PM			
Shipment Tracking No: 592371483209				

Special Instructions:
 THIS LINE - LAB USE ONLY: Custody Seals In Place Yes / No | Temp Blank Yes / No | Cooler Temp on Receipt: 16.7 °F/C | Trip Blank Yes / No | MS/MSD Sample Submitted: Yes / No

WO#: 10663488





Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples



STAGE 4 QUALITY ASSURANCE REVIEW

**SILVER BOW CREEK/BUTTE AREA NATIONAL PRIORITIES LIST SITE,
BUTTE PRIORITY SOILS OPERABLE UNIT,
RESIDENTIAL METALS ABATEMENT PROGRAM PROJECT**

SOIL SAMPLES COLLECTED ON

JULY 26, 2023

RESIDENT IDENTIFICATION: S-0015

SAMPLE DELIVERY GROUP: 10663488

AUGUST 25, 2023

Prepared for:

ATLANTIC RICHFIELD COMPANY

317 Anaconda Road
Butte, MT 59701

Prepared by:

ENVIRONMENTAL STANDARDS, INC.

1140 Valley Forge Road
P.O. Box 810
Valley Forge, PA 19482-0810

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Section 1 Quality Assurance Review

Section 2 Data Validation Checklist for Metals Sample Analysis

Section 3 Data Validation Qualifier Definitions

Section 4 Inorganic Data Support Documentation

Section 5 Project Case Narrative and Chain-of-Custody Record

Section 6 Project Correspondence



INTRODUCTION

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the samples collected on July 26, 2023, as part of the Silver Bow Creek/Butte Area National Priorities List (NPL) Site, Butte Priority Soils Operable Unit, Residential Metals Abatement Program (RMAP) sampling event. The samples that have undergone a rigorous QA review are listed on Table 1. Table 1 also presents the laboratory sample number, collection date, parameter(s) examined, and the review level for each sample. Stage 2B review includes an evaluation of data package completeness and review of the summary forms provided (raw data are not reviewed). In addition to all the elements included in a Stage 2B review, a Stage 4 review includes the evaluation of raw data and the verification of calculated results.

This review was performed with guidance from the RMAP Quality Assurance Project Plan Non-Residential Parcels –Indoor Dust (QAPP; Revision 2, October 2022); Clark Fork River Superfund Site Investigation (CFRSSI) Data Management/Data Validation Plan (CFRSSI DM/DV Plan) (ARCO 1992a); the “Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use,” (US EPA, January 2009); and the “National Functional Guidelines for Inorganic Superfund Methods Data Review,” (US EPA, November 2020). The National Functional Guidelines validation guidance documents specifically address analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods and are not completely applicable to the type of analyses and analytical protocols performed for the SW-846 methods utilized by the laboratory for these samples. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the usability of the analytical results and compliance relative to the methods utilized by the laboratory.

The reported analytical results are presented as qualified electronic data deliverables (EDDs). Any required data validation qualifications have been annotated on the associated EDDs. Data were examined to determine the usability of the analytical results and compliance relative to the method requirements specified in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846” (SW-846) Methods 6020B and 7471B. This report was prepared to provide a critical review of the laboratory analyses and reported analytical results. Rigorous QA reviews of laboratory-generated data routinely identify problems associated with analytical measurements, even from the most experienced and capable laboratories. The data qualifications allow the data end-user to best understand the usability of the analytical results. Data not qualified in this report should be considered valid based on the quality control (QC) criteria that have been reviewed and be considered enforcement quality if the data also passed Level A and Level B field documentation quality assessment as detailed in the QAPP (October 2022). Details of this QA review are presented in Section 1 of this report.

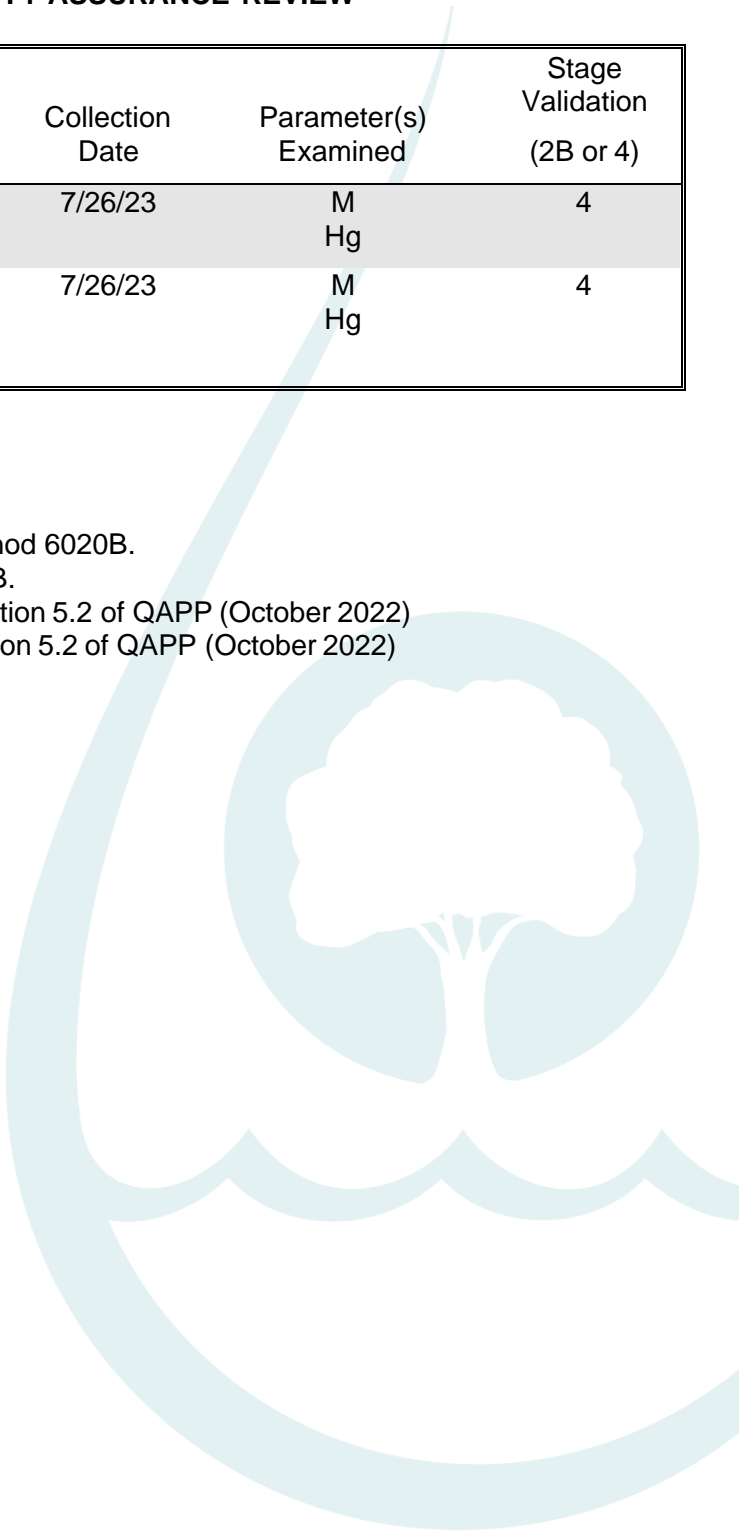
TABLE 1

SAMPLES INCLUDED IN THIS QUALITY ASSURANCE REVIEW

Field Sample Name	Laboratory Sample Numbers	Sample Delivery Group	Collection Date	Parameter(s) Examined	Stage Validation (2B or 4)
S-0015-S-C-01-20230726	10663488001 10663488003	10663488	7/26/23	M Hg	4
S-0015-S-C-01D-20230726 (Field Duplicate of S-0015-S-C-01-20230726)	10663488002 10663488004	10663488	7/26/23	M Hg	4

NOTES:

- M - Total Lead and Arsenic by SW-846 Method 6020B.
- Hg - Total Mercury by SW-846 Method 7471B.
- 2B - Data Verification in accordance with Section 5.2 of QAPP (October 2022)
- 4 - Data Validation in accordance with Section 5.2 of QAPP (October 2022)



SECTION 1 QUALITY ASSURANCE REVIEW

The soil samples were collected on July 26, 2023, as part of the Silver Bow Creek/Butte Area NPL Site, Butte Priority Soils Operable Unit, RMAP sampling event. The soil samples were collectively shipped in iced coolers to Pace Analytical Services, LLC (Pace) of Minneapolis, Minnesota. The samples for the analysis of lead and arsenic by inductively coupled plasma/mass spectrometry (ICP/MS) were shipped from Pace of Minneapolis, Minnesota to Pace of Green Bay, Wisconsin, for drying and sieving prior to transferring back to Pace of Minneapolis, Minnesota, for digestion and analysis by SW-846 Method 6020B. The soil samples were analyzed for mercury by Cold Vapor Atomic Absorption (CVAA) by SW-846 Method 7471B and reported on a dry-weight basis. The specific samples and analyses reviewed are identified on Table 1.

The findings in this QA review are based upon a review of sample holding times, condition of samples upon laboratory receipt, blank analysis results, laboratory matrix spike sample (LMS) results, laboratory control sample (LCS) results, laboratory and field duplicate results, initial and continuing calibrations, sample preparation, reporting limit (RL) standard results, interference check sample results, serial dilution results, internal standard performance, instrument sensitivity, analytical sequence, the quantitation of positive results, and a critical evaluation of instrumental raw data. Any required data validation qualifications are annotated in the qualified EDD as defined in Section 3.

Issues are typically presented in two categories – deliverable issues and procedural issues. Deliverable issues are data issues that can easily be corrected and that may or may not impact the usability of the reported results. Procedural issues are issues that cannot be corrected and address method compliance issues; these issues may or may not impact the usability of the reported results. Comments address issues for which the data reviewer has provided information in order to clarify issues relating to the data; comments do not typically impact the usability of the reported results. The data reviewer has edited the laboratory-reported data and QC summary forms based on the issues and comments in this QA review. Furthermore, the data reviewer has included copies of all relevant raw data, QC forms, and other documentation needed to support these edits in the Inorganic Data Support Documentation (Section 4) of this report.

Deliverable Review

- Deliverable issues were not observed for the data in this QA review.

Procedural Review

- Procedural issues were not observed for the data in this QA review.

Comments

- Due to a Laboratory Information Management System (LIMS) limitation, the results reported for arsenic and lead were described as being reported on a “wet-weight basis” in the data package. As described in the Case Narrative (see Laboratory Case Narrative and Chain-Of-Custody Record [Section 5]), the samples for arsenic and lead were dried

and sieved prior to preparation and analysis; therefore, the distinction of being reported on a “wet-weight basis” for these results does not indicate that the percent moisture associated with the sample can be applied to the arsenic and lead results. Qualification of data due to this issue was not warranted.

- The qualified EDD reports the arsenic and lead results with a basis of “WET” based upon the reporting requirements of BP America, Inc. (BP) and DDMS, Inc. (DDMS). The basis of “WET” is misleading as wetness is the ability of a liquid to adhere to the surface of a solid and the samples for arsenic and lead were dried and sieved prior to preparation and analysis as described in the Case Narrative (see Section 5). The distinction of “WET” does not indicate that the percent moisture associated with the sample can be applied to the arsenic and lead results. Qualification of data due to this issue was not warranted.
- The data reviewer noted that the sample collection times for samples S-0015-S-C-01-20230726 and S-0015-S-C-01D-20230726 were incorrectly recorded on the Internal Chain-of-Custody (COC) Record and Sample Summary Form. In addition, the Project Narrative referencing the SW-846 Method 6020B samples undergoing drying and sieving was not included in the data package. Upon Environmental Standards’ request, the laboratory personnel provided revisions to update the Internal COC Record and Sample Summary and to include the missing Project Narrative (see Project Correspondence [Section 6]).

With regard to data usability, the principal area of concern is results reported below the sample-specific RL. Based upon a complete review of the data package provided, the following qualifiers are offered. The following data usability issues represent an interpretation of the QC results obtained for the project samples. Quite often, data qualifications address issues relating to sample matrix problems. Similarly, the data validation guidelines routinely specify areas of the data that require qualification, yet the methods used for analysis may not require corrective action by the laboratory. Accordingly, the following data usability issues should not be construed as an indication of laboratory performance.

SECTION 2 DATA VALIDATION CHECKLIST FOR METALS SAMPLE ANALYSIS

1. Holding Times

Analyte	Laboratory	Matrix	Method	Holding Times*	Collection Date	Batch	Analysis Date	Holding Time Met (Y/N)	Affected Data Flagged (Y/N)
Lead and Arsenic	Pace – Minneapolis, MN	Dust	SW-846 Method 6020B	6 months from sample collection	7/26/23	899384	8/10/23	Y	N/A
Mercury	Pace – Minneapolis, MN	Dust	SW-846 Method 7471B	28 days from sample collection	7/26/23	898897	8/8/23	Y	N/A

*Reference for Holding Times – Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition” (SW-846) Methods 6020B and 7471B and Chapter 3

Were any data flagged because of holding time? Yes No

Were any data flagged because of preservation problems? Yes No

Describe Any Actions Taken:

No actions were required.

Comments:

Qualification of data was not warranted.

2. Instrument Calibration

Was the Tune analysis performed? Yes No

Were the peak widths and resolution of the masses within the required control limits?

Yes No

Was the percent relative standard deviation $\leq 5\%$ for all analytes in the Tune solutions?

Yes No

Was the Instrument successfully calibrated at the correct frequency? Yes No

Was the Instrument calibrated with appropriate standards and blanks? Yes No

Were Initial Calibration Verification (ICV) and Continuing Calibration Verification (CCV) samples analyzed? Yes No

Were ICV and CCV results within the control window? Yes No

Were any data flagged because of calibration problems? Yes No

Describe Any Actions Taken:

No actions were required.

Comments:

Qualification of data was not warranted. Calibrations were within method acceptance criteria of 90% - 110% for metals and 85% - 115% for mercury.

3. Blanks

Were Initial and Continuing Calibration Blanks (ICB and CCBs) analyzed? Yes No

Were ICBs and CCBs within the control window? Yes No

Were Method Blanks (MBs) analyzed at the frequency of 1 per analytical batch? Yes No

Were MBs within the control window? Yes No

Were any data flagged because of blank problems? Yes No

Describe Any Actions Taken:

No actions were required.

Comments:

The absolute value of the blank results were within the NFG (November 2020) acceptance criteria of less than the method detection limit (MDL). Qualification of data was not warranted.

4. Interference Check Samples

Were ICP/MS Interference Check Samples (ICS) within the control limits? Yes No

Were any data flagged because of ICS problems? Yes No

Describe Any Actions Taken:

No actions were required.

Comments:

Information provided in the data package(s) was insufficient to permit assessment of the potential for molecular or other interferences or the adequacy of corrections for such interferences. The fact that the analysis was performed with an instrument that includes collision cell technology reduces the likelihood of significant interference if one or more of the potentially interfering elements were present. The data user should consider this information when determining the ultimate use of the reported results.

5. Laboratory Control Samples

Were Laboratory Control Samples (LCS) analyzed at the frequency of 1 per batch?

Yes No

What was the LCS prepared from a second source? Yes No

Were LCS results within the control window (70-130%)? Yes No

Were any data flagged because of LCS problems? Yes No

Describe Any Actions Taken:

No actions were required.

Comments:

Qualification of data was not warranted.

6. Laboratory Reporting Limit Standards

Were RL standards analyzed at the beginning and end of each analytical batch?

Yes No

Were RL standard results within the control window (70-130%)? Yes No

Were any data flagged because of RL standard results problems? Yes No

Describe Any Actions Taken:

No actions were required.

Comments:

Qualification of data was not warranted.

7. Laboratory Duplicate Sample Results

Were Laboratory Duplicate Samples (LDS) analyzed at the frequency of 1 per batch?

Yes No

Were LDS results within the control window (relative percent difference [RPD]< 20%)?

Yes No

Were any data flagged because of LDS problems? Yes No

Describe Any Actions Taken:

No actions were required.

Comments:

Qualification of data was not warranted.

8. Matrix Spike/Matrix Spike Duplicate/Post Digestion Spike Sample Results

Were LMS analyzed at the frequency of 1 per batch? Yes No

Were LMS percent recovery (%R) results within the control window (75-125%)? Yes No

Were any data flagged because of LMS problems? Yes No N/A

Was a Post Digestion Spike (PDS) performed? Yes No N/A

Were PDS percent recovery (%R) results within the control window (75-125%)?

Yes No N/A

Were any data flagged because of PDS problems? Yes No N/A

Describe Any Actions Taken:

No actions were required.

Comments:

The laboratory did not perform PDS analysis for preparation batch 898982. As stated in SW-846 Method 6020B, Section 9.13, the PDS is only required if less than acceptable bias and precision data are generated for the LMS/LMSD. Qualification of data was not warranted.

9. ICP/MS Serial Dilutions

Were ICP/MS Serial Dilutions (SD) analyzed at the frequency of 1 per batch? Yes No

Were SD percent differences (%D) results within the control window? Yes No

Were any data flagged because of SD problems? Yes No

Describe Any Actions Taken:

No actions were required.

Comments:

The SD analysis was within the method acceptance criteria; the percent difference was $\leq 25\%$ when the original undiluted concentration was greater than 50x MDL. The SD analysis was not evaluated when the original undiluted concentrations was less than or equal to 50x MDL. Qualification of data was not warranted.

10. Internal Standards

Were internal standards added to each sample in the analytical batch? Yes No

Were the percent relative recoveries (%RI) within the control window (60-125%)? Yes No

Were any data flagged because of internal standard problems? Yes No

Describe Any Actions Taken:

No actions were required.

Comments:

Qualification of data was not warranted.

11. Field Blanks (Equipment Blank, Filter Blank, Field Blank, Floor Mat Blank)

Were field blanks submitted as specified in the Field Sampling Plan (FSP)?

Yes No N/A

Were field blanks within the control window? Yes No N/A

Were any data qualified because of field blank problems? Yes No N/A

Describe Any Actions Taken:

No actions were required.

Comments:

As referred to in the QAPP (October 2022), Section 3.11, sampling equipment for soils are anticipated to be “one time use”; there, no external contamination blank/cross-contamination blank samples will be submitted. Qualification of data was not warranted.

12. Field Duplicates

Were field duplicates submitted as specified in the FSP?

Yes No N/A

Were the field duplicates within the control window (RPD > 35%)? Yes No N/A

Were any data qualified because of field duplicate problems? Yes No N/A

Describe Any Actions Taken:

No actions were required.

Comments:

Qualification of data was not warranted.

13. Overall Assessment

Are there analytical limitations of the data that users should be aware of? Yes No

Comments:

- Data that meet the Level A and Level B criteria in the field documentation quality assessment as detailed in the QAPP (October 2022) and not qualified as estimated or rejected during the data validation process, are considered enforcement-quality data and can be used for all Superfund purposes and activities. Data that meet only the Level A criteria and are not rejected during the data validation process can be considered screening-quality data in accordance with Section 5.3 of the QAPP (October 2022). Level A and Level B acceptance of these data are documented in a separate report.
- Reported positive results between the method detection limit (MDL) and the reporting limit (RL) should be considered estimated and have been flagged “J” in the qualified EDD. It is appropriate to note that sample results qualified as estimated “J” by the laboratory because the reported result is between the MDL and RL, values are considered enforcement-quality data if no other qualifiers were required during validation.

Complete support documentation for this inorganic QA review is presented in Section 4 of this report. The cover sheet for this section is a checklist of all QA procedures required by the protocol and examined in this data review.

The analytical data completeness (defined as the percentage of usable data) for the samples included in this QA review is 100%.



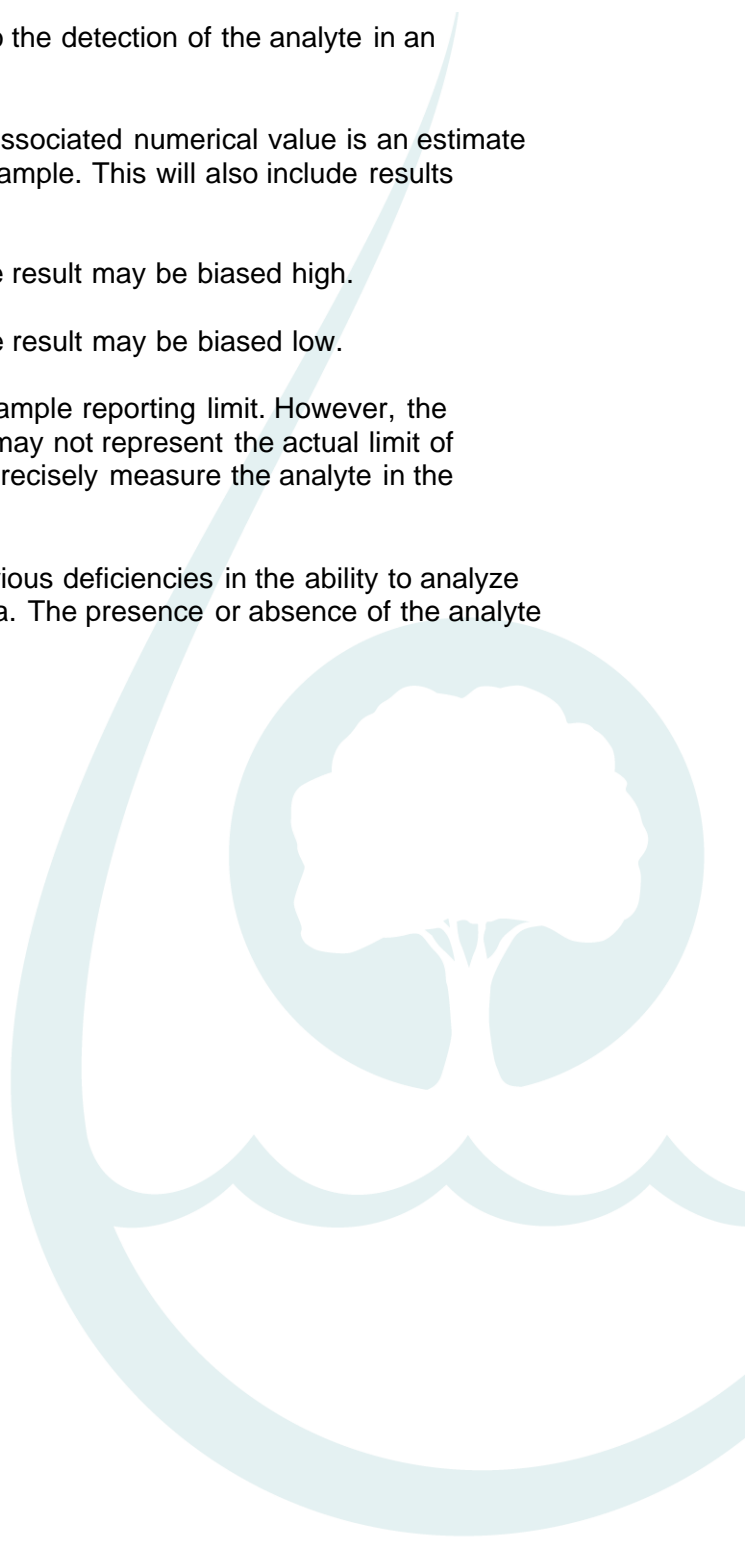
14. Authorization of Data Validation

Report prepared by: Katelyn Kelly, Quality Assurance Chemist
Report reviewed and approved by: Amanda e. Whitney, Project Quality Assurance Chemist
Report approved by: Lester J. Dupes, CEAC, Senior Quality Assurance Chemist
Report approved by: Rock J. Vitale, CEAC, Technical Director of Chemistry/Senior Principal
Date: 8/25/2023



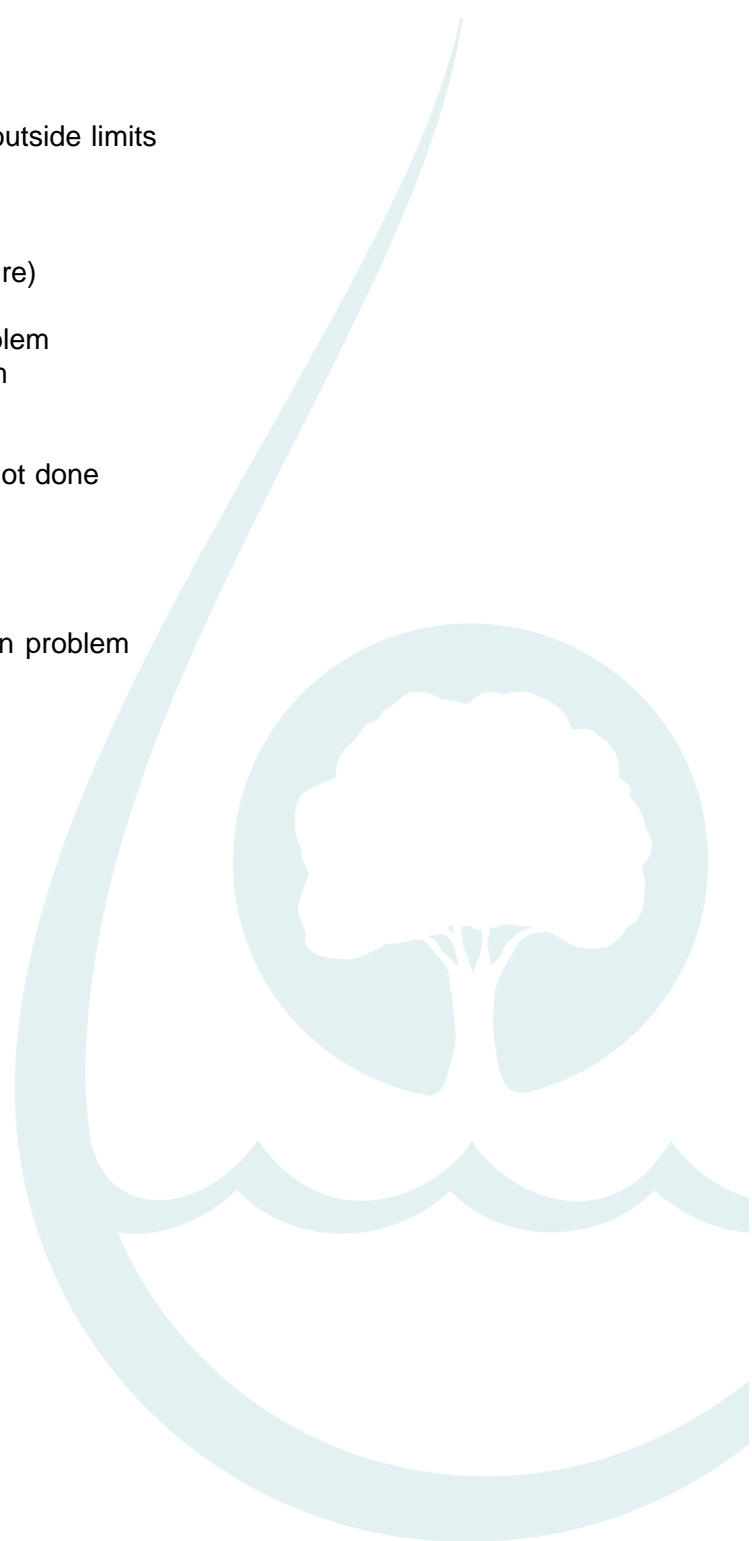
SECTION 3 DATA VALIDATION QUALIFIER DEFINITIONS

- U The result is qualified as non-detect due to the detection of the analyte in an associated QC blank.
- J The analyte was positively identified; the associated numerical value is an estimate of the concentration of the analyte in the sample. This will also include results reported between the MDL and RL.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was not detected above the sample reporting limit. However, the reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- No Flag Result accepted without qualification.



RMAP REASON CODES

1	Holding time violation
2	Method blank contamination
3	Surrogate recovery
4	Matrix spike/matrix spike duplicate recovery
5	Matrix spike/matrix spike duplicate precision outside limits
6	Laboratory control sample recovery
7	Field blank contamination
8	Field duplicate precision outside limits
9	Other deficiencies (including cooler temperature)
A	Absence of supporting QC
S	ICV, CCV, or column performance check problem
Y	Initial and continuing calibration blank problem
M	Interference check samples problem
O	Post-digestion spike outside of 75-125%
F	MSA correlation coefficient < 0.995, or MSA not done
G	Serial dilution problem
K	DFTPP or BFB tuning problem
Q	Initial calibration problem
X	Internal standard recovery problem
V	Second-source standard calibration verification problem
L	Low bias
Z	Retention time problem
N	Counting time error (radionuclide chemistry)
W	Detector instability (radionuclide chemistry)
C	Co-elution of compounds
E	Value exceeds linear calibration range
I	Interferences present during analysis
T	Trace-level compound, poor quantitation
P	1C/2C precision outside of limits
B	LCS/LCSD precision outside limits
D	Lab Dup/Rep precision outside limits
H	High Bias



SECTION 4

INORGANIC DATA SUPPORT DOCUMENTATION

INORGANIC ANALYSIS SUPPORT DOCUMENTATION

Client Name: Atlantic Richfield
 2023 Parks and Playgrounds Quality Assurance
 Site/Project Name: Atlantic Richfield - 2023 Parks and Playgrounds Quality Assurance (CHEM-P) > Professional Services > Task 2B : Stage 4 Analytical Data Validation/ Qualification of EDD
 Project Number/Task: EDD
 Laboratory/Location: Pace Minneapolis
 SDG: 10663488
 Sample Collection Dates: 7/26/23

EnvStd Project Manager: Lester Dupes
 Reviewed by: Katelyn Kelly
 Approved by: Amanda E. Whitney
 Completion Date: 8/15/23
 Validation Level: 4

The following table indicates criteria that were examined, the identified problems, and support documentation attachments.

	Criteria Examined in Detail						Problems Identified					
	Note: All items examined have been included in the Support Document unless otherwise noted.											
	Check (√) if Yes or Footnote Letter for Comments Below											
Parameter/Method	Metals	Mercury					Metals	Mercury				
Condition upon Receipt	√	√										
Sample Preservation	√	√										
Holding Times	√	√										
Blank Analysis Results	√	√										
Laboratory Control Sample	√	√										
Matrix Spike (Pre-Digestion Spike)	√	√										
Laboratory Duplicate	√	√										
Field Duplicate	√	√										
Total vs. Dissolved Results Comparison												
Sample Preparation	√	√										
Mass Tuning	√											
Initial Calibrations	√	√										
Continuing Calibrations	√	√										
Detection Limit/Reporting Limit Standards	√	√										
Negative Bias												
Interference Checks	√											
Post-Digestion Spike												
Serial Dilution	√											
Analytical Sequence	√	√										
Linear Range Analysis												
Interelement Correction Factors												
Detection Limit/Sensitivity	√	√										
Dilutions	√	√										
Internal Standard Performance	√											
Quantitation of Results	√	√										
Multiple Exposures %RSD	√	√										
Percent Solids		√										
Deliverable was Complete	√	√										
Other:												

Comments: Quantitation of Results and Multiple Exposures are not included in the Support Documentation unless a problem was identified.

BLANK ANALYSIS RESULTS

Fraction ¹	Matrix ²	Blank Type ³	Blank Sample Number	Contaminant	Concentration	Units ⁴	Qualification limit	
							(5x)	(10x)
			All	None				

1 - M = Metal; G = General Chemistry; V = Volatile; S = Semivolatile; P = Pesticide/PCB; O = Other:

2 - Aq = Aqueous; S = Solid

3 - MB = Method Blank; TB = Trip Blank; EB = Equipment Blank; FB = Field Blank;

IB = Instrument Blank; CCB = Continuing Calibration Blank; ICB = Initial Calibration Blank

4 - µg/L, mg/L, µg/kg, mg/kg

Notes:

ENVIRONMENTAL STANDARDS, INC.
EVALUATION OF DUPLICATE RESULTS

Matrix: <input type="radio"/> Aqueous <input checked="" type="radio"/> Non-aq. Reporting Level: <input checked="" type="radio"/> MDL <input type="radio"/> QL Units: mg/kg		PRECISION OBJECTIVES: If Both Results $\geq 5 \times$ Their QL, RPD ≤ 35 If Either Result $< 5 \times$ Its QL, Dif. $\leq 2 \times$ Highest QL									
Sample ID: S-0015-S-C-01-20230726		Duplicate Sample ID: S-0015-S-C-01D-20230726									
Analyte	Sample Concentration	Qual	QL	MDL	Duplicate Concentration	Qual	QL	MDL	Difference	RPD	Flag
Arsenic	5.5		2.4	0.67	5.6		2.4	0.67	0.1	NA	
Lead	32.2		2.4	0.44	44.4		2.4	0.44	NA	32%	
Mercury	0.018	J	0.02	0.0087	0.018	J	0.02	0.0085	NA	NA	

NOTES:

- Qual:** Qualifier(s) based on evaluation(s) other than Total/ vs. Dissolved comparison, if applicable (J, U, U* or B)
- RPD:** Relative Percent Difference
- QL:** Quantitation Limit
- MDL:** Method Detection Limit
- RL:** Reporting Limit. RL = QL for QL reporting and MDL for MDL reporting
- J:** The analyte concentration should be considered estimated
- U:** The analyte was not detected in the sample at or above the RL indicated. The RL will be used for comparison purposes.
- UJ:** The analyte was not detected in the sample at or above the Reporting Limit Indicated. The RL is approximate.
- R:** The analyte was analyzed for and detected, but sample results are unreliable. The presence or absence of the analyte cannot be verified.
- UR:** The analyte was analyzed for and not detected, but the determination that the analyte was not present in the sample is unreliable. The presence or absence of the analyte cannot be verified.
- U*** The result was blank qualified. The RL will be used for comparison purposes.
- NA:** The MDL (for QL reporting), RPD or Difference is not applicable

Comments:

FORM I INORGANIC-1
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

S-0015-S-C-01-20230726

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior
Lab Sample ID: 10663488003 Percent Moisture: _____

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7440-38-2	Arsenic	✓ 5.5		mg/kg	5	08/10/2023 11:43
7439-92-1	Lead	✓ 32.2		mg/kg	5	08/10/2023 11:43

FORM I INORGANIC-1
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.
S-0015-S-C-01D-20230726

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior
 Lab Sample ID: 10663488004 Percent Moisture: _____

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7440-38-2	Arsenic	✓ 5.6		mg/kg	5	08/10/2023 12:01
7439-92-1	Lead	✓ 44.4		mg/kg	5	08/10/2023 12:01

FORM II INORGANIC-1
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source: 431747

Continuing Calibration Verification Source: 431747

Concentration Units: ug/L Instrument ID: 10ICMB

Analyte	Initial Calibration Verification				Continuing Calibration Verification						
	08/10/2023 09:32				08/10/2023 09:47			08/10/2023 10:29			Control Limit
	True	Found	%R	Control Limit	True	Found	%R	True	Found	%R	
Arsenic	80	80.2	100.2	90-110	80	79.9	99.9	80	80.1	100.1	90-110
Lead	80	84.6	105.7	90-110	80	84.3	105.4	80	84.3	105.3	90-110

✓

No Eval

No Eval

FORM II INORGANIC-2
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source: _____

Continuing Calibration Verification Source: 431747

Concentration Units: ug/L Instrument ID: 10ICMB

Analyte	Continuing Calibration Verification									Control Limit
	08/10/2023 11:31			08/10/2023 12:04			08/10/2023 12:33			
	True	Found	%R	True	Found	%R	True	Found	%R	
Arsenic	80	79.8	99.8	80	80.1 ✓	100.1 ✓	80	79.9	99.8	90-110
Lead	80	83.0 ✓	103.8 ✓	80	81.9	102.4 ✓	80	83.2	104.1	90-110

No Eval

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 431480 Analysis Date/Time: 08/10/2023 09:53

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Arsenic	0.5	0.48	96.6	80-120
Lead	0.5	0.51	✓ 101.2	80-120



70-130

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 431480 Analysis Date/Time: 08/10/2023 12:09

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Arsenic	0.5	0.51	✓ 101.1	80-120
Lead	0.5	0.52	103.8	80-120

✓ 70-130

FORM III INORGANIC-1
BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract : 0643586 RMAP Interior School

Method Blank Matrix: Solid Instrument ID: 10ICMB

Method Blank Concentration Units: mg/kg

Analyte	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Method Blank	
	08/10/2023 09:38	C	08/10/2023 09:50	C	08/10/2023 10:32	C	08/10/2023 11:34	C	4734977	C
Arsenic	0.14	U	0.14	U	0.14	U	0.14	U	<0.13	U
Lead	0.093	U	0.093	U	0.093	U	0.093	U	<0.088	U

No Eval

No Eval

Clean Blank

Clean Blank

FORM III INORGANIC-2

BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract : 0643586 RMAP Interior School

Method Blank Matrix: _____ Instrument ID: 10ICMB

Method Blank Concentration Units: _____

Analyte	Initial Calibration Blank		Continuing Calibration Blank (ug/L)					
		C	08/10/2023 12:06	C	08/10/2023 12:36	C		C
Arsenic			0.14	U	0.14	U		
Lead			0.093	U	0.093	U		

Clean Blank

No Eval

FORM IV INORGANIC-1
INTERFERENCE CHECK SAMPLE

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Instrument ID: 10ICMB

Solution A Run Date: 08/10/2023 09:41

ICS Source: 431145,431144

Solution AB Run Date: 08/10/2023 09:44

Concentration Units: ug/L

Analyte	True		Found				Limits
	Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R	
Aluminum	25000	27500	25460.218	101.8	27000.678	98.2	80-120
Arsenic		100	0.0141		97.0958	97.1	80-120
Calcium	25000	27500	24401.014	97.6	26637.960	96.9	80-120
Iron	25000	26250	26428.852	105.7	27127.089	103.3	80-120
Lead		100	0.0165		102.6246	102.6	80-120
Magnesium	25000	27500	24688.964	98.8	26542.058	96.5	80-120
Molybdenum	500	600	511.904	102.4	602.1685	100.4	80-120
Potassium	25000	27500	25186.198	100.7	27302.263	99.3	80-120
Sodium	25000	27500	26396.625	105.6	27913.938	101.5	80-120
Titanium	500	600	500.2859	100.1	593.9342	99	80-120

85-115

✓

✓

✓

✓

FORM V INORGANIC-1
MATRIX SPIKE SAMPLE RECOVERY

SAMPLE NO.

4734979MS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Basis: Wet Parent Sample ID: S-0015-S-C-01-20230726

Percent Moisture: _____

Analyte	Units	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R
Arsenic	mg/kg	75-125	52.2	5.5	47.6	98 ✓
Lead	mg/kg	75-125	74.7	32.2	47.6	89 ✓

FORM V INORGANIC-2
MATRIX SPIKE SAMPLE RECOVERY

SAMPLE NO.

4734980MSD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Basis: Wet Parent Sample ID: S-0015-S-C-01-20230726

Percent Moisture: _____

Analyte	Units	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R
Arsenic	mg/kg	75-125	53.5	5.5	46.6	103
Lead	mg/kg	75-125	81.4	32.2	46.6	106



FORM VI INORGANIC-1
DUPLICATES

SAMPLE NO.

4734980MSD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: mg/kg

Percent Moisture: _____ Basis: Wet

S3

Analyte	RPD Control Limit	Sample	Duplicate	RPD
Arsenic	20	52.2	53.5	✓ 2
Lead	20	74.7	81.4	✓ 9

✓

FORM VI INORGANIC-2
DUPLICATES

SAMPLE NO.

4734981DUP

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: mg/kg

Percent Moisture: _____ Basis: Wet

S3

Analyte	RPD Control Limit	Sample	Duplicate	RPD
Arsenic	20	5.5	5.9	7
Lead	20	32.2	35.2	9

✓
✓
✓

FORM VII INORGANIC-1
LABORATORY CONTROL SAMPLE

SAMPLE NO.

4734978LCS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid

Analyte	Units	True	Found	%R	Limits	
Arsenic	mg/kg	46.9	44.1	94 ✓	80	120
Lead	mg/kg	46.9	47.8	102 ✓	80	120

FORM VIII INORGANIC-1
SERIAL DILUTIONS

4737230SD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Matrix: Solid Parent Sample ID: S-0015-S-C-01-20230726

Analyte	Units	Initial Sample Result	Serial Dilution Result	% Difference	Control Limit %D
Arsenic	ug/L	2.9U	14.3U	✓	10
Lead	ug/L	6.8J	9.3U		10

25

both < 50x MDL

* Indicates that the % Difference exceeds the control limit.
No difference is calculated if either result is a non-detect.

FORM IX INORGANIC-1
INSTRUMENT DETECTION LIMITS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Preparation Method: None Instrument ID: 10ICMB

Concentration Units: ug/L

Analyte	PQL	IDL	IDL Date
Arsenic	0.50	0.14	07/25/2022
Lead	0.50	0.093	07/25/2022

FORM IX INORGANIC-2
METHOD DETECTION LIMITS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Preparation Method: EPA 3050B Instrument ID: 10ICMB

Concentration Units: mg/kg

Analyte	PQL	MDL	MDL Date
Arsenic	0.50	0.14	07/25/2022
Lead	0.50	0.093	07/25/2022

FORM XI - INORGANIC-1
LINEAR DYNAMIC RANGES

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract : 0643586 RMAP Interior
Instrument ID: 10ICMB Effective Date:05/25/2023

Analyte	Concentration (ug/L)
Arsenic	450
Lead	450

FORM XII INORGANIC-1
PREPARATION LOG

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Preparation Method: EPA 3050B Batch: MPRP 136899

Lab Sample ID	Sample Name	✓ Preparation Date	Initial Weight (g)	Final Volume (mL)
4734977	4734977	08/09/2023	1.064	50
4734978	4734978	08/09/2023	1.067	50
4734979	4734979	08/09/2023	1.05	50
4734980	4734980	08/09/2023	1.073	50
4734981	4734981	08/09/2023	1.061	50
10663488003	S-0015-S-C-01-20230726	08/09/2023	1.061	50
10663488004	S-0015-S-C-01D-20230726	08/09/2023	1.062	50

FORM XIII INORGANIC-1
ANALYSIS RUN LOG

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Instrument ID: 10ICMB Analysis Method: EPA 6020B

Start Date: 08/10/2023 09:05 End Date: 08/10/2023 12:36

Sample Name	Lab Sample ID	D/F	Date	Time	As	Pb
33262690CAL0	33262690CAL0	1	08/10/2023	09:05	X	X
33262691CAL1	33262691CAL1	1	08/10/2023	09:08	X	X
33262692CAL2	33262692CAL2	1	08/10/2023	09:12	X	X
33262693CAL3	33262693CAL3	1	08/10/2023	09:15	X	X
33262694CAL4	33262694CAL4	1	08/10/2023	09:18	X	X
33262695CAL5	33262695CAL5	1	08/10/2023	09:21	X	X
33262696CAL6	33262696CAL6	1	08/10/2023	09:24	X	X
33262697CAL7	33262697CAL7	1	08/10/2023	09:27	X	X
33262698ICV	33262698ICV	1	08/10/2023	09:32	X	X
33262699ICB	33262699ICB	1	08/10/2023	09:38	X	X
33262700ICSA	33262700ICSA	1	08/10/2023	09:41	X	X
33262701ICSAB	33262701ICSAB	1	08/10/2023	09:44	X	X
33262702CCV	33262702CCV	1	08/10/2023	09:47	X	X
33262703CCB	33262703CCB	1	08/10/2023	09:50	X	X
33262704CRDL	33262704CRDL	1	08/10/2023	09:53	X	X
33262705CCV	33262705CCV	1	08/10/2023	10:29	X	X
33262706CCB	33262706CCB	1	08/10/2023	10:32	X	X
33262727CCV	33262727CCV	1	08/10/2023	11:31	X	X
33262728CCB	33262728CCB	1	08/10/2023	11:34	X	X
4734977BLANK	4734977	1	08/10/2023	11:37	X	X
4734978LCS	4734978	1	08/10/2023	11:40	X	X
S-0015-S-C-01-20230726	10663488003	5	08/10/2023	11:43	X	X
4737230SD	4737230	25	08/10/2023	11:49	X	X
4734981DUP	4734981	5	08/10/2023	11:52	X	X
4734979MS	4734979	5	08/10/2023	11:55	X	X
4734980MSD	4734980	5	08/10/2023	11:58	X	X
S-0015-S-C-01D-20230726	10663488004	5	08/10/2023	12:01	X	X
33262735CCV	33262735CCV	1	08/10/2023	12:04	X	X
33262736CCB	33262736CCB	1	08/10/2023	12:06	X	X
33262737CRDL	33262737CRDL	1	08/10/2023	12:09	X	X
33262743CCV	33262743CCV	1	08/10/2023	12:33	X	X
33262744CCB	33262744CCB	1	08/10/2023	12:36	X	X

US EPA 200.8/6020 Tune Check Report

Acq/Data Batch
Report Comment
Instrument Name

C:\Agilent\ICPMH1\DATA\081023.b
10ICMB NN2
G8421A JP16120262

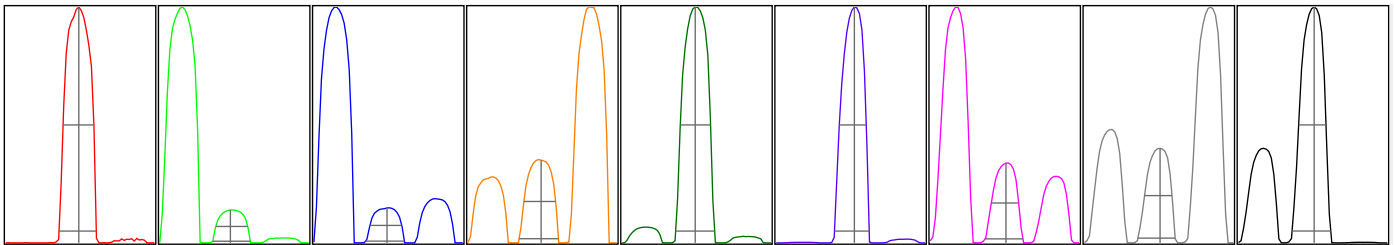
[He]

Sensitivity

Mass	Count	RSD%	RSD%(Rqd)	RSD%(Flag)	Rep#1 Count	Rep#2 Count	Rep#3 Count	Rep#4 Count	Rep#5 Count
9	152	1.752 ✓	5.000		154	155	149	152	150
24	1293	0.559	5.000		1295	1282	1300	1298	1290
25	192	0.682	5.000		193	191	192	194	192
26	242	1.398 ✓	5.000		236	245	243	241	244
59	16197	0.624	5.000		16139	16239	16325	16221	16060
115	15929	0.754	5.000		16072	16002	15909	15911	15752
206	6371	1.337	5.000		6490	6400	6385	6299	6279
207	5360	0.721	5.000		5398	5378	5333	5385	5306
208	13342	1.353	5.000		13485	13488	13395	13286	13055

Integration Time [sec] ✓ 0.1

Resolution/Axis



Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)	W-5%	W-5% (Required)	W-5% (Flag)
9	263.13	9.00	8.90 - 9.10		0.739	0.900	
24	2140.76	23.95	23.90 - 24.10		0.744	0.900	
25	317.49	25.00	24.90 - 25.10		0.772	0.900	
26	399.46	26.00	25.90 - 26.10		0.781	0.900	
59	28276.92	59.00	58.90 - 59.10		0.774	0.900	
115	31044.78	115.10	114.90 - 115.10		0.689	0.900	
206	12034.03	206.05	205.90 - 206.10		0.751	0.900	
207	10043.00	207.05	206.90 - 207.10		0.739	0.900	
208	25066.31	208.05	207.90 - 208.10		0.768	0.900	

Integration Time [sec] 0.1 ✓ Acquisition Time [sec] 212.5 ✓ Y Axis Linear

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.75 L/min	Dilution Gas	0.35 L/min
RF Power	1550 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.50 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	7.7 V	Deflect	-1.0 V
Extract 2	-200.0 V	Cell Entrance	-50 V	Plate Bias	-60 V
Omega Bias	-75 V	Cell Exit	-70 V		

Cell Parameters

Use Gas	Yes	3rd Gas Flow	---	Energy Discrimination	4.0 V
He Flow	4.5 mL/min	OctP Bias	-20.0 V		
H2 Flow	0.0 mL/min	OctP RF	200 V		

US EPA 200.8/6020 Tune Check Report

Acq/Data Batch
Report Comment
Instrument Name

C:\Agilent\ICPMH1\DATA\081023.b
10ICMB NN2
G8421A JP16120262

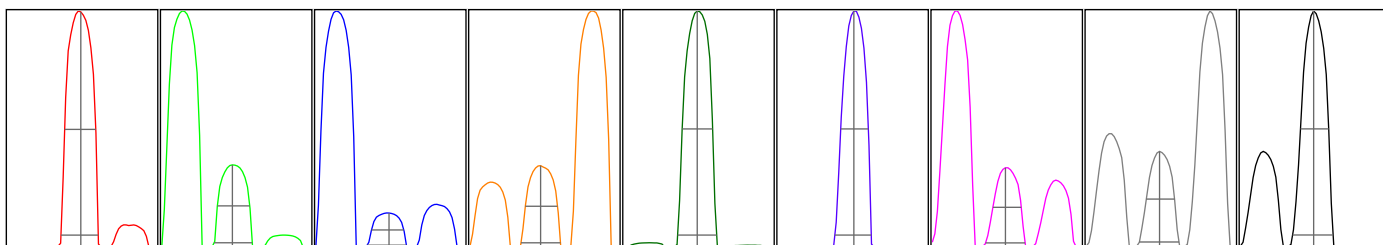
[H2]

Sensitivity

Mass	Count	RSD%	RSD%(Rqd)	RSD%(Flag)	Rep#1 Count	Rep#2 Count	Rep#3 Count	Rep#4 Count	Rep#5 Count
9	1003	0.558	5.000		996	999	1005	1007	1009
24	11305	1.360 ✓	5.000		11053	11275	11359	11401	11439
25	1633	0.889	5.000		1615	1629	1631	1633	1655
26	2026	1.069 ✓	5.000		2001	2005	2043	2046	2035
59	17784	1.357	5.000		17475	17578	17888	18001	17978
115	49757	1.313	5.000		48953	49299	49900	49996	50637
206	7915	1.268	5.000		7748	7894	7971	7990	7973
207	6640	1.132	5.000		6550	6608	6680	6616	6746
208	16400	1.149	5.000		16179	16222	16475	16521	16602

Integration Time [sec] ✓ 0.1

Resolution/Axis



Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)	W-5%	W-5% (Required)	W-5% (Flag)
9	1703.67	9.00	8.90 - 9.10		0.740	0.900	
24	18553.52	23.95	23.90 - 24.10		0.758	0.900	
25	2661.38	25.00	24.90 - 25.10		0.779	0.900	
26	3345.52	25.95	25.90 - 26.10		0.783	0.900	
59	30931.31	59.00	58.90 - 59.10		0.776	0.900	
115	94945.08	115.05	114.90 - 115.10		0.723	0.900	
206	14542.58	206.00	205.90 - 206.10		0.785	0.900	
207	12269.24	207.00	206.90 - 207.10		0.786	0.900	
208	30311.42	208.00	207.90 - 208.10		0.805	0.900	

Integration Time [sec] 0.1 ✓ Acquisition Time [sec] 212.5 ✓ Y Axis Linear

Tune Parameters

Plasma Parameters

Plasma Mode	---	Nebulizer Gas	0.75 L/min	Dilution Gas	0.35 L/min
RF Power	1550 W	Option Gas	---	Auxiliary Gas	0.90 L/min
RF Matching	1.50 V	Nebulizer Pump	0.10 rps	Plasma Gas	15.0 L/min
Sample Depth	8.0 mm	S/C Temp	2 °C		

Lens Parameters

Extract 1	0.0 V	Omega Lens	7.7 V	Deflect	2.4 V
Extract 2	-200.0 V	Cell Entrance	-50 V	Plate Bias	-60 V
Omega Bias	-75 V	Cell Exit	-70 V		

Cell Parameters

Use Gas	Yes	3rd Gas Flow	---	Energy Discrimination	4.0 V
He Flow	0.0 mL/min	OctP Bias	-18.0 V		
H2 Flow	3.5 mL/min	OctP RF	200 V		

FORM XV INORGANIC-1
INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

60-125

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

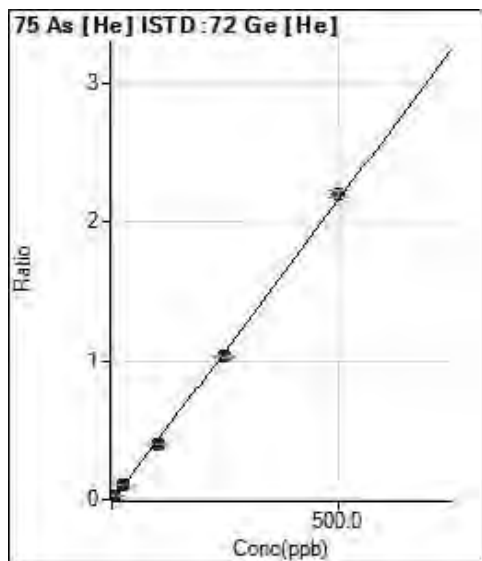
Instrument ID: 10ICMB Start Date: 08/10/2023 09:05 End Date: 08/10/2023 12:36

Sample Name	Time	GE-72	Ge-72-IS1	In-115	Ir-193-IS	Sc-45-IS	Sc-45-IS1	Tb-159
33262690CAL0	09:05	100.0	100.0	100.0	100.0	100.0	100.0	100.0
33262691CAL1	09:08	99.2	99.9	99.0	96.3	99.1	100.7	99.0
33262692CAL2	09:12	99.9	101.6	99.8	97.7	100.3	102.9	100.0
33262693CAL3	09:15	100.2	100.9	99.2	97.6	101.4	100.8	100.0
33262694CAL4	09:18	99.6	101.7	98.2	97.6	99.8	101.5	100.8
33262695CAL5	09:21	97.8	99.0	96.7	92.9	98.9	99.2	98.3
33262696CAL6	09:24	95.6	92.7	94.5	93.0	99.7	94.1	98.9
33262697CAL7	09:27	90.3	86.0	88.6	87.1	90.5	89.0	94.0
33262698ICV	09:32	97.2	98.0	96.8	96.1	94.5	93.5	98.3
33262699ICB	09:38	97.0	99.5	98.8	98.4	95.0	97.6	99.6
33262700ICSA	09:41	94.1	94.5	93.5	93.9	95.5	95.5	97.5
33262701ICSAB	09:44	94.0	94.0	92.6	91.9	95.3	95.6	96.4
33262702CCV	09:47	100.6	99.9	99.0	98.6	98.1	96.8	100.8
33262703CCB	09:50	90.9	101.5	91.1	92.2	88.3	98.4	93.2
33262704CRDL	09:53	98.7	101.7	97.4	99.6	97.9	100.3	100.8
33262705CCV	10:29	103.2	105.6	101.3	101.0	101.9	104.4	102.9
33262706CCB	10:32	100.5	103.9	100.5	102.8	103.1	105.1	102.9
33262727CCV	11:31	101.8	104.8	100.3	101.6	100.7	102.9	102.2
33262728CCB	11:34	99.3	105.8	100.7	102.5	97.4	102.5	102.3
4734977	11:37	98.9	104.0	99.3	103.3	101.6	102.0	101.5
4734978	11:40	100.6	104.5	100.3	99.6	98.8	103.0	103.0
S-0015-S-C-01-	11:43	✓ 100.4	104.4	98.6	101.6	99.9	104.6	103.3 ✓
4737230	11:49	100.9	104.2	101.8	102.4	100.2	103.8	103.2
4734981	11:52	100.8	105.0	99.7	99.3	103.6	105.7	102.8
4734979	11:55	102.4	105.2	100.0	99.6	102.9	105.0	104.1
4734980	11:58	101.6	104.6	100.0	99.7	102.7	106.9	103.1
S-0015-S-C-01D-	12:01	✓ 101.7	104.1	100.7	101.4	102.2	105.0	103.1 ✓
33262735CCV	12:04	101.2	105.5	99.8	101.3	100.6	103.4	102.8
33262736CCB	12:06	98.6	103.7	98.9	100.8	98.9	103.6	102.1
33262737CRDL	12:09	99.6	104.1	99.0	102.1	99.5	102.3	100.6
33262743CCV	12:33	99.6	103.5	99.4	100.4	96.6	100.7	102.1
33262744CCB	12:36	99.7	104.8	99.3	100.5	99.6	102.6	101.7

Calibration for 010CAL.S.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\081023.b\
Analysis File: 081023.batch.bin
DA Date-Time: 8/10/2023 14:43:57
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	006CALB.d	CAL 0	8/10/2023 09:05:15
2	007CAL.S.d	CAL 1	8/10/2023 09:08:54
3	008CAL.S.d	CAL 2	8/10/2023 09:12:11
4	009CAL.S.d	CAL 3	8/10/2023 09:15:25
5	010CAL.S.d	CAL 4	8/10/2023 09:18:37
6	011CAL.S.d	CAL 5	8/10/2023 09:21:30
7	012CAL.S.d	CAL 6	8/10/2023 09:24:17
8	013CAL.S.d	CAL 7	8/10/2023 09:27:03



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	Det	RSD	%RE
1	<input type="checkbox"/>	0.0000	0.0000	78.17	0.0001	P	3.2	
2	<input type="checkbox"/>	0.5000	0.4822	1297.73	0.0022	P	4.1	-3.6
3	<input type="checkbox"/>	5.0000	4.7984	12311.07	0.0209	P	1.4	-4.0
4	<input type="checkbox"/>	25.0000	23.5164	60232.17	0.1021	P	1.0	-5.9
5	<input type="checkbox"/>	100.0000	93.0214	236556.35	0.4034	P	0.3	-7.0
6	<input type="checkbox"/>	250.0000	237.9685	594319.96	1.0319	P	0.9	-4.8
7	<input type="checkbox"/>	500.0000	507.4877	1237961.29	2.2004	A	2.0	1.5
8	<input type="checkbox"/>			741.02	0.0014	P	5.1	

$y = 0.0043 * x + 1.3279E-004$

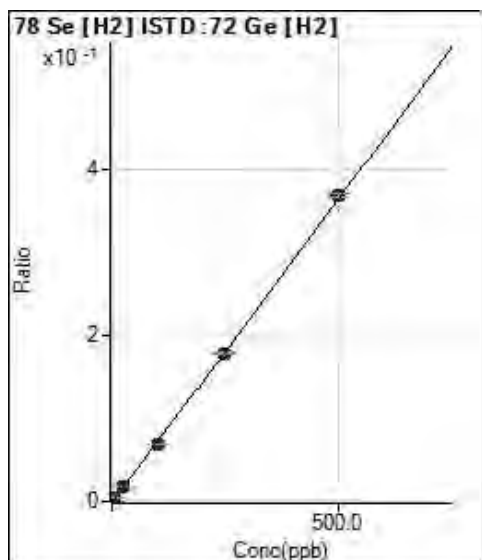
R = 0.9995

DL = 0.002908 ppb

BEC = 0.03063 ppb

Weight: <None>

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	Det	RSD	%RE
1	<input type="checkbox"/>	0.0000	0.0000	120.67	0.0000	P	6.9	
2	<input type="checkbox"/>	0.5000	0.4630	1034.37	0.0004	P	1.6	-7.4
3	<input type="checkbox"/>	5.0000	4.7880	9732.07	0.0035	P	1.0	-4.2
4	<input type="checkbox"/>	25.0000	24.0393	47991.41	0.0176	P	1.8	-3.8
5	<input type="checkbox"/>	100.0000	94.6653	190216.84	0.0693	P	0.6	-5.3
6	<input type="checkbox"/>	250.0000	243.5651	476075.44	0.1782	P	1.3	-2.6
7	<input type="checkbox"/>	500.0000	504.3346	923554.92	0.3689	P	0.9	0.9
8	<input type="checkbox"/>			1391.07	0.0006	P	0.7	

$y = 7.3138E-004 * x + 4.4740E-005$

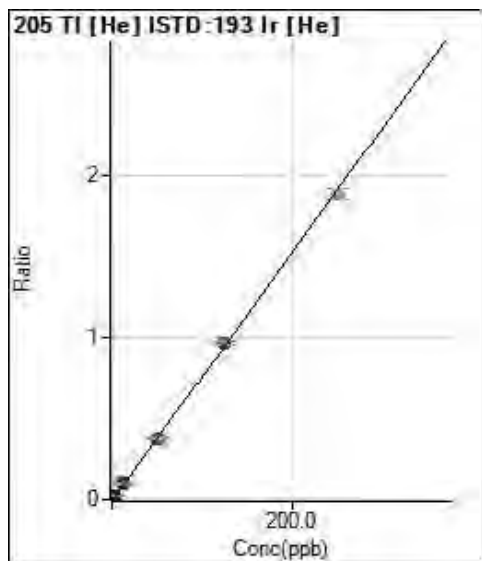
R = 0.9998

DL = 0.01262 ppb

BEC = 0.06117 ppb

Weight: <None>

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	Det	RSD	%RE
1	<input type="checkbox"/>	0.0000	0.0000	406.68	0.0001	P	7.6	
2	<input type="checkbox"/>	0.1000	0.0926	3615.53	0.0008	P	2.4	-7.4
3	<input type="checkbox"/>	2.5000	2.5104	89110.09	0.0195	P	1.2	0.4
4	<input type="checkbox"/>	12.5000	12.5122	442254.06	0.0967	P	0.9	0.1
5	<input type="checkbox"/>	50.0000	49.1170	1733930.55	0.3793	A	3.7	-1.8
6	<input type="checkbox"/>	125.0000	125.3518	4213797.85	0.9679	A	1.6	0.3
7	<input checked="" type="checkbox"/>	250.0000		8225060.71	1.8875	A	3.5	
8	<input type="checkbox"/>			5671.30	0.0014	P	12.1	

$y = 0.0077 * x + 8.6702E-005$

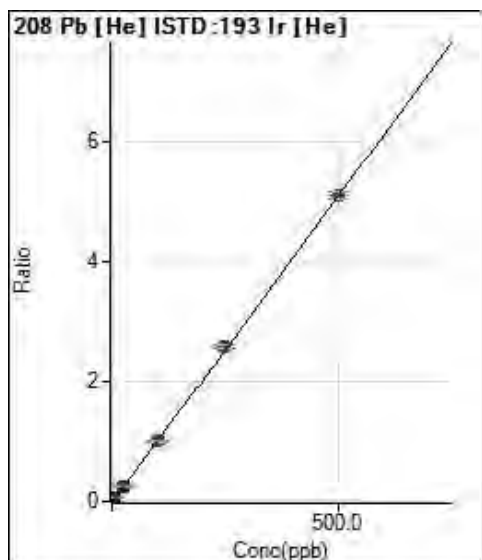
R = 1.0000

DL = 0.002577 ppb

BEC = 0.01123 ppb

Weight: <None>

Min Conc: <None>



	Rj ct	Conc.	Calc Conc.	CPS	Ratio	Det	RSD	%RE
1	<input type="checkbox"/>	0.0000	0.0000	1308.37	0.0003	P	2.2	
2	<input type="checkbox"/>	0.5000	0.5038	24567.78	0.0054	P	0.7	0.8
3	<input type="checkbox"/>	5.0000	5.1250	241796.63	0.0528	P	1.2	2.5
4	<input type="checkbox"/>	25.0000	25.4923	1196818.32	0.2617	P	0.3	2.0
5	<input type="checkbox"/>	100.0000	98.0427	4597686.99	1.0055	A	2.2	-2.0
6	<input type="checkbox"/>	250.0000	252.8017	11285784.52	2.5923	A	1.5	1.1
7	<input type="checkbox"/>	500.0000	498.9647	22295524.56	5.1163	A	2.9	-0.2
8	<input type="checkbox"/>			16339.14	0.0040	P	1.3	

$y = 0.0103 * x + 2.7935E-004$

R = 1.0000 ✓

DL = 0.001771 ppb

BEC = 0.02725 ppb

Weight: <None>

Min Conc: <None>



Prep Log Report

Batch Information: MPRP 898982 6020B S_P

3050B | ICP_ICPMS Soil

Prep Method	EPA 3050B
Block ID	10MET55
Corrected Temp. (C)	94.60
Corrected End Temp. (C)	92.10
Metals Pipette 2	
Reviewed By	NJ1

Analysis Method	EPA 6020B
Thermometer ID	See Note
Digestion Start Date/Time	08/09/2023 13:40:25:869
Digestion Vessel	427566
Dispenser ID 1	Q918
Reviewed By Date	08/09/2023 17:59

Prepared By	JGV
Correction Factor (C)	-0.4
Digestion End Date/Time	08/09/2023 15:46:19:998
Resin Pellets Solid Matrix	425773
Dispenser ID 2	Q897
Batch Notes	WEIGHED BY QD, THERMO 221739845

Instrument	10BL04
Block Temp (C)	95
Block End Temp (C)	92.5
Metals Pipette 1	Q896
Dispenser ID 3	Q452

Sample Information:

QC Rule	Sample Type	Lab Sample ID	Matrix	Initial Weight (g)	Conc. HNO3 (L)	H2O2 (L)	Conc. HCL (L)	Final Volume (mL)	Sample Notes	Hg-SPK (mL)	METALS-STK1 (mL)	METALS-STK2 (mL)
6020BS_P	BLANK	4734977	Solid	1.064	410042 (7.5)	430111 (2.5)	427424 (5)	50				
6020BS_P	LCS	4734978	Solid	1.067	410042 (7.5)	430111 (2.5)	427424 (5)	50		428988 (0.5)	428032 (.5)	428024 (.5)
6020BS_P	RQS	10663488003	Solid	1.061	410042 (7.5)	430111 (2.5)	427424 (5)	50				
6020BS_P	DUP	4734981	Solid	1.061	410042 (7.5)	430111 (2.5)	427424 (5)	50				
6020BS_P	MS	4734979	Solid	1.05	410042 (7.5)	430111 (2.5)	427424 (5)	50		428988 (0.5)	428032 (.5)	428024 (.5)
6020BS_P	MSD	4734980	Solid	1.073	410042 (7.5)	430111 (2.5)	427424 (5)	50		428988 (0.5)	428032 (.5)	428024 (.5)
6020BS_P	PS	10663488004	Solid	1.062	410042 (7.5)	430111 (2.5)	427424 (5)	50				

Standard Notes:

428024: ZPACEMN-106

428032: ZPACEMN-116 (MIX 1)

428988: Intermediate Spike for ICPMS Soil

FORM I INORGANIC-1
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

S-0015-S-C-01-20230726

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior
Lab Sample ID: 10663488001 Percent Moisture: 2.1

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7439-97-6	Mercury	✓ 0.018	J	mg/kg	1	08/08/2023 15:49

FORM I INORGANIC-1
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

S-0015-S-C-01D-20230726

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior
Lab Sample ID: 10663488002 Percent Moisture: 2.1

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7439-97-6	Mercury	✓ 0.018	J	mg/kg	1	08/08/2023 15:56

FORM II INORGANIC-1
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source: 431418

Continuing Calibration Verification Source: 431418

Concentration Units: ug/L Instrument ID: 10HG09

85-115

Analyte	Initial Calibration Verification				Continuing Calibration Verification						
	08/08/2023 11:42				08/08/2023 12:24			08/08/2023 15:30			Control Limit
	True	Found	%R	Control Limit	True	Found	%R	True	Found	%R	
Mercury	5.0	4.9	97.6	90-110	5.0	4.7	94.8	5.0	5.1	102.0	90-110

No Eval

No Eval

FORM II INORGANIC-2
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source: _____

Continuing Calibration Verification Source: 431418

Concentration Units: ug/L Instrument ID: 10HG09

85-115

Analyte	Continuing Calibration Verification						Control Limit
	08/08/2023 15:42			08/08/2023 16:02			
	True	Found	%R	True	Found	%R	
Mercury	5.0	5.2 ✓	104.0	5.0	4.6 ✓	91.6	90-110

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 431413,431427 Analysis Date/Time: 08/08/2023 11:46

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Mercury	0.2	0.16	✓ 80.0	70-130

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 431413,431427 Analysis Date/Time: 08/08/2023 15:40

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Mercury	0.2	0.19	✓ 95.0	70-130

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 431413,431427 Analysis Date/Time: 08/08/2023 16:01

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Mercury	0.2	0.16	✓ 80.0	70-130

FORM III INORGANIC-1
BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract : 0643586 RMAP Interior School

Method Blank Matrix: Solid Instrument ID: 10HG09

Method Blank Concentration Units: mg/kg

Analyte	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Method Blank	
	08/08/2023 11:44	C	08/08/2023 12:25	C	08/08/2023 15:32	C	08/08/2023 15:44	C	4732970	C
Mercury	0.087	U	0.087	U	0.087	U	0.087	U	<0.0082	U

Clean Blank

No Eval

No Eval

Clean Blank

FORM III INORGANIC-2

BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract : 0643586 RMAP Interior School

Method Blank Matrix: _____ Instrument ID: 10HG09

Method Blank Concentration Units: _____

Analyte	Initial Calibration Blank		Continuing Calibration Blank (ug/L)					
		C	08/08/2023 16:04	C		C		C
Mercury			0.087	U				

Clean Blank

FORM V INORGANIC-1
MATRIX SPIKE SAMPLE RECOVERY

SAMPLE NO.

4732973MS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Basis: Dry Parent Sample ID: S-0015-S-C-01-20230726

Percent Moisture: 2.1

Analyte	Units	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R
Mercury	mg/kg	80-120	0.49	0.018J	0.50	94

75-125

FORM V INORGANIC-2
MATRIX SPIKE SAMPLE RECOVERY

SAMPLE NO.

4732974MSD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Basis: Dry Parent Sample ID: S-0015-S-C-01-20230726

Percent Moisture: 2.1

Analyte	Units	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R
Mercury	mg/kg	80-120	0.48	0.018J	0.51	92

75-125

FORM VI INORGANIC-1
DUPLICATES

SAMPLE NO.


4732972DUP

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: mg/kg

Percent Moisture: 2.1 Basis: Dry

S1

Analyte	RPD Control Limit	Sample	Duplicate	RPD
Mercury	20	0.018J	0.019J	

FORM VI INORGANIC-2
DUPLICATES

SAMPLE NO.

4732974MSD

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: mg/kg

Percent Moisture: 2.1 Basis: Dry

S1

Analyte	RPD Control Limit	Sample	Duplicate	RPD
Mercury	20	0.49	0.48	1

FORM VII INORGANIC-1
LABORATORY CONTROL SAMPLE

SAMPLE NO.

4732971LCS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid

Analyte	Units	True	Found	%R	Limits	
Mercury	mg/kg	0.48	0.46	96	80	120

70-130

FORM IX INORGANIC-1
INSTRUMENT DETECTION LIMITS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Preparation Method: None Instrument ID: 10HG09

Concentration Units: ug/L

Analyte	PQL	IDL	IDL Date
Mercury	0.20	0.087	03/30/2021

FORM IX INORGANIC-2
METHOD DETECTION LIMITS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Preparation Method: EPA 7471B Instrument ID: 10HG09

Concentration Units: mg/kg

Analyte	PQL	MDL	MDL Date
Mercury	0.020	0.0087	03/30/2021

FORM XII INORGANIC-1
PREPARATION LOG

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Preparation Method: EPA 7471B Batch: MERP 41364

Lab Sample ID	Sample Name	Preparation Date	Initial Weight (g)	Final Volume (mL)
4732970	4732970	08/07/2023	0.318	30
4732971	4732971	08/07/2023	0.313	30
4732972	4732972	08/07/2023	0.305	30
4732973	4732973	08/07/2023	0.305	30
4732974	4732974	08/07/2023	0.303	30
10663488001	S-0015-S-C-01-20230726	08/07/2023	✓ 0.305	30
10663488002	S-0015-S-C-01D-20230726	08/07/2023	0.311	30

FORM XIII INORGANIC-1
ANALYSIS RUN LOG

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Instrument ID: 10HG09

Analysis Method: EPA 7471B

Start Date: 08/08/2023 11:29

End Date: 08/08/2023 16:04

Sample Name	Lab Sample ID	D/F	Date	Time	Hg
33239154CAL0	33239154CAL0	1	08/08/2023	11:29	X
33239155CAL1	33239155CAL1	1	08/08/2023	11:31	X
33239156CAL2	33239156CAL2	1	08/08/2023	11:33	X
33239157CAL3	33239157CAL3	1	08/08/2023	11:34	X
33239158CAL4	33239158CAL4	1	08/08/2023	11:36	X
33239159CAL5	33239159CAL5	1	08/08/2023	11:38	X
33239160ICV	33239160ICV	1	08/08/2023	11:42	X
33239161ICB	33239161ICB	1	08/08/2023	11:44	X
33239162CRDL	33239162CRDL	1	08/08/2023	11:46	X
33239163CCV	33239163CCV	1	08/08/2023	12:24	X
33239164CCB	33239164CCB	1	08/08/2023	12:25	X
33239189CCV	33239189CCV	1	08/08/2023	15:30	X
33239190CCB	33239190CCB	1	08/08/2023	15:32	X
33239191CRDL	33239191CRDL	1	08/08/2023	15:40	X
33239192CCV	33239192CCV	1	08/08/2023	15:42	X
33239193CCB	33239193CCB	1	08/08/2023	15:44	X
4732970BLANK	4732970	1	08/08/2023	15:45	X
4732971LCS	4732971	1	08/08/2023	15:47	X
S-0015-S-C-01-20230726	10663488001	1	08/08/2023	15:49	X
4732972DUP	4732972	1	08/08/2023	15:51	X
4732973MS	4732973	1	08/08/2023	15:53	X
4732974MSD	4732974	1	08/08/2023	15:54	X
S-0015-S-C-01D-20230726	10663488002	1	08/08/2023	15:56	X
33239194CRDL	33239194CRDL	1	08/08/2023	16:01	X
33239195CCV	33239195CCV	1	08/08/2023	16:02	X
33239196CCB	33239196CCB	1	08/08/2023	16:04	X

Pace Analytical, LLC

Report Generated By Teledyne Leeman QuickTrace

Analyst: 10metalsuser,LENA WIGER

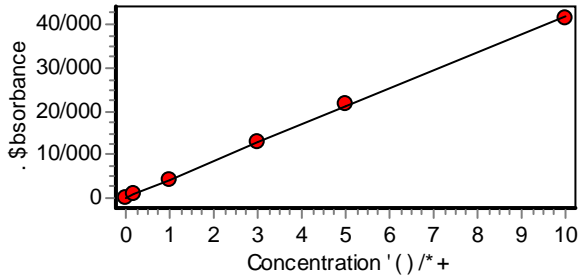
Worksheet file: S:\METALS\10HG09\08AUG23S LI! S10HG09"# s\$%

Creation Date: 8/8/2023 11:1' : (0 AM

Comment: E) A *+*1,

Results

Sample Name	Type	Date/Time	Conc (ug/L)	μAbs	%RSD	Residual	Flags	DF	% Reco	ely
Calibration Blank	!"	08/08/23 11:29:56 am	0.00	88	17.41			1.0000	#/\$	
Replicates		103.7 98.1 75.4 74.1								
tan%ar%&1 '0.2 () / * +	!"	08/08/23 11:31:33 am	0.20	942	2.11	,15.75-		1.0000	#/\$	
Replicates		922.6 934.3 941.8 969.3								
tan%ar%&2 '1 () / * +	!"	08/08/23 11:33:11 am	1.00	4391	1.11	,0.39-		1.0000	#/\$	
Replicates		4333.1 4378.8 4403.0 4450.3								
tan%ar%&3 '3 () / * +	!"	08/08/23 11:34:48 am	3.00	12830	1.31	0.69-		1.0000	#/\$	
Replicates		12660.7 12753.6 12854.6 13051.6								
tan%ar%&4 '5 () / * +	!"	08/08/23 11:36:26 am	5.00	21550	1.04	2.25-		1.0000	#/\$	
Replicates		21318.6 21453.3 21584.0 21844.0								
tan%ar%&5 '10 () / * +	!"	08/08/23 11:38:04 am	10.00	41664	0.88	,0.62-		1.0000	#/\$	
Replicates		41267.0 41493.0 41787.7 42107.5								
Calibration										
01(ation: \$bs	3 4168.0684 5 239.696									
R2:	0.99974	R 0:	9.20-							
00:	289.2514									
2la) s:										
6C7	6C7	08/08/23 11:42:53 am	4.88	20584	1.15			1.0000	97.62	
Replicates		20346.6 20471.0 20629.5 20888.5								
6CB	6CB	08/08/23 11:44:32 am	,0.04	58	5.20			1.0000	#/\$	
Replicates		58.4 71.3 50.1 52.8								
CR" *	CR" *	08/08/23 11:46:09 am	0.16	919	1.82			1.0000	81.51	
Replicates		915.8 910.4 912.9 937.4								
4725550848445	9#:	08/08/23 11:49:05 am	0.02	306	15.23			1.0000	#/\$	
Replicates		300.4 295.1 312.4 316.9								
4725551848445	9#:	08/08/23 11:50:41 am	5.02	21174	0.86			1.0000	#/\$	
Replicates		21004.8 21065.8 21216.3 21408.0								
10662988001848445	9#:	08/08/23 11:52:18 am	181.48	756643	0.50			1.0000	#/\$	
Replicates		753387.0 754236.1 757102.1 761845.1								





Prep Log Report

Batch Information: MERP 898457 7471B S

7471 | CVAA_HG Solid

Prep Method	EPA 7471B
Block ID	10MET54
Corrected Temp. (C)	94.40
Corrected End Temp. (C)	96.40
Metals Pipette 2	N/A
Dispenser ID 4	Q671
Batch Notes	WEIGH BY IMB, PIPETTE 2: Q920, DISPENSER 3: Q925

Analysis Method	EPA 7471B
Thermometer ID	221739839
Digestion Start Date/Time	08/07/2023 12:22:50:232
Digestion Vessel	427566
Dispenser ID 1	Q918
Dispenser ID 5	

Prepared By	JGV
Correction Factor (C)	-0.3
Digestion End Date/Time	08/07/2023 13:09:25:369
Resin Pellets Solid Matrix	425773
Dispenser ID 2	Q452
Reviewed By	NJ1

Instrument	10BL04
Block Temp (C)	94.7
Block End Temp (C)	96.7
Metals Pipette 1	Q765
Dispenser ID 3	N/A
Reviewed By Date	08/07/2023 20:00

Sample Information:

QC Rule	Sample Type	Lab Sample ID	Matrix	Initial Weight (g)	Aqua Regia (mL)	5% KMnO4 (mL)	12% NH2OH*HCL (mL)	Final Volume (mL)	Sample Notes	MERCURY-SPK (mL)
7471B S_P	BLANK	4732970	Solid	0.318	430981 (3)	430579 (9)	430074 (3.6)	30		
7471B S_P	LCS	4732971	Solid	0.313	430981 (3)	430579 (9)	430074 (3.6)	30		426077 (.15)
7471B S_P	RQS	10663488001	Solid	0.305	430981 (3)	430579 (9)	430074 (3.6)	30		
7471B S_P	DUP	4732972	Solid	0.305	430981 (3)	430579 (9)	430074 (3.6)	30		
7471B S_P	MS	4732973	Solid	0.305	430981 (3)	430579 (9)	430074 (3.6)	30		426077 (.15)
7471B S_P	MSD	4732974	Solid	0.303	430981 (3)	430579 (9)	430074 (3.6)	30		426077 (.15)
7471B S_P	PS	10663488002	Solid	0.311	430981 (3)	430579 (9)	430074 (3.6)	30		

Standard Notes:

426077: LCS, MS, MSD Spike Solution

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FORM I INORGANIC-1
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

S-0015-S-C-01-20230726

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior
Lab Sample ID: 10663488001 Percent Moisture: _____

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
	Percent Moisture	✓ 2.1		%	1	08/09/2023 10:28

FORM I INORGANIC-1
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

S-0015-S-C-01D-20230726

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior
Lab Sample ID: 10663488002 Percent Moisture: _____

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
	Percent Moisture	✓ 2.1		%	1	08/09/2023 10:33

FORM VI INORGANIC-1
DUPLICATES

SAMPLE NO.

4735205DUP

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: %

Percent Moisture: _____ Basis: Wet

Analyte	RPD Control Limit	Sample	Duplicate	RPD
Percent Moisture	30	2.1	2.0	3

FORM VI INORGANIC-2
DUPLICATES

SAMPLE NO.

4735206DUP

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: %

Percent Moisture: _____ Basis: Wet


Analyte	RPD Control Limit	Sample	Duplicate	RPD
Percent Moisture	30	9.3	9.5	2 ✓

FORM IX INORGANIC-1
METHOD DETECTION LIMITS

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Preparation Method: ASTM D2974 Instrument ID: 10BALG

Concentration Units: %

Analyte	PQL	MDL	MDL Date
Percent Moisture	0.10	 0.10	01/01/2003

FORM XII INORGANIC-1
PREPARATION LOG

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Preparation Method: ASTM D2974 Batch: MPRP 136914

Lab Sample ID	Sample Name	Preparation Date	Initial Volume (mL)	Final Volume (mL)
4735205	4735205	08/09/2023	1	1
4735206	4735206	08/09/2023	1	1
10663488001	S-0015-S-C-01-20230726	08/09/2023	1	1
10663488002	S-0015-S-C-01D-20230726	08/09/2023	1	1

FORM XIII INORGANIC-1
ANALYSIS RUN LOG

Lab Name: Pace Analytical - Minnesota SDG No. : 10663488 Contract: 0643586 RMAP Interior School

Instrument ID: 10BALG

Analysis Method: ASTM D2974

Start Date: 08/09/2023 10:28

End Date: 08/09/2023 10:57

Sample Name	Lab Sample ID	D/F	Date	Time	MO IST
S-0015-S-C-01-20230726	10663488001	1	08/09/2023	10:28	X
4735205DUP	4735205	1	08/09/2023	10:30	X
S-0015-S-C-01D-20230726	10663488002	1	08/09/2023	10:33	X
10663167003	10663167003	1	08/09/2023	10:56	X
4735206DUP	4735206	1	08/09/2023	10:57	X



Prep Log Report

Batch Information: 899036 136914 DW

ASTM D2974 | % Moisture / % Total Solids / Saturation %

Analysis Method	ASTM D2974	Analyzed By	IMB	Instrument	10BALG	Oven ID	10MET52
Acceptance Range	100-110 C	Thermometer ID	V79006	Oven Correction Factor (C)	0	Oven Temp In1 (C) Corr Date/Time Init	104.0 104.0 08/09/2023 11:04 IMB
Oven Temp Out1 (C) Corr Date/Time Init	104.0 104.0 08/10/2023 06:56 IMB	Desic. In 1 ID Date/Time Init	10WT88 08/10/2023 06:56 IMB	Desic. Out 1 Date/Time Init	08/10/2023 07:37 IMB	Reviewed By	RAM
Reviewed By Date	08/10/2023 13:02	Batch Notes					

Sample Information:

QC Rule	Sample Type	Lab Sample ID	Select	ID	TS Posted (%)	Percent Moisture	Run Date/Time	Posted Dry Weight /w Dish (g)	Dish Weight (g)	Wet Weight /w Dish (g)	Dry Weight 1 (g)	Dry Wt Use 1	Sample Notes
DRY WEIGHT	PS	10663433002	Y		94.36	5.638	08/09/2023 10:10:15	7.7571	1.2704	8.1447	7.7571	M	
DRY WEIGHT	PS	10663433004	Y		93.42	6.579	08/09/2023 10:14:06	8.3518	1.2615	8.8511	8.3518	M	
DRY WEIGHT	PS	10663433006	Y		94.13	5.874	08/09/2023 10:16:35	7.6442	1.2575	8.0428	7.6442	M	
DRY WEIGHT	PS	10663433008	Y		97.07	2.932	08/09/2023 10:18:58	8.4561	1.2644	8.6733	8.4561	M	
DRY WEIGHT	PS	10663433010	Y		95.05	4.953	08/09/2023 10:21:07	8.3415	1.2573	8.7107	8.3415	M	
DRY WEIGHT	PS	10663433012	Y		94.64	5.360	08/09/2023 10:24:06	8.4418	1.2641	8.8483	8.4418	M	
DRY WEIGHT	PS	10663433014	Y		94.59	5.413	08/09/2023 10:25:50	8.3829	1.2773	8.7895	8.3829	M	
DRY WEIGHT	RQS	10663488001	Y		97.94	2.057	08/09/2023 10:28:07	8.3351	1.2632	8.4836	8.3351	M	
DRY WEIGHT	DUP	4735205	Y		98.01	1.986	08/09/2023 10:30:27	8.355	1.258	8.4988	8.355	M	
DRY WEIGHT	PS	10663488002	Y		97.94	2.057	08/09/2023 10:33:45	8.6568	1.262	8.8121	8.6568	M	
DRY WEIGHT	PS	10662723001	Y		81.56	18.44	08/09/2023 10:35:34	7.2318	1.275	8.5787	7.2318	M	
DRY WEIGHT	PS	10662723002	Y		70.28	29.72	08/09/2023 10:38:21	6.3373	1.2588	8.4845	6.3373	M	
DRY WEIGHT	PS	10662723003	Y		76.99	23.01	08/09/2023 10:42:17	6.977	1.257	8.6863	6.977	M	
DRY WEIGHT	PS	10662723004	Y		69.31	30.69	08/09/2023 10:44:59	6.5322	1.2696	8.8628	6.5322	M	
DRY WEIGHT	PS	10662723005	Y		68.79	31.21	08/09/2023 10:48:19	6.2053	1.2713	8.4435	6.2053	M	
DRY WEIGHT	PS	10662723006	Y		68.21	31.79	08/09/2023 10:50:06	6.3332	1.2635	8.6956	6.3332	M	

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Prep Log Report

QC Rule	Sample Type	Lab Sample ID	Select	ID	TS Posted (%)	Percent Moisture	Run Date/Time	Posted Dry Weight /w Dish (g)	Dish Weight (g)	Wet Weight /w Dish (g)	Dry Weight 1 (g)	Dry Wt Use 1	Sample Notes
DRY WEIGHT	PS	10663167001	Y		84.90	15.10	08/09/2023 10:53:10	7.0674	1.2606	8.1003	7.0674	M	
DRY WEIGHT	PS	10663167002	Y		84.28	15.72	08/09/2023 10:54:42	7.5355	1.2721	8.7035	7.5355	M	
DRY WEIGHT	PS	10663167003	Y		90.70	9.304	08/09/2023 10:56:21	7.6473	1.2689	8.3016	7.6473	M	
DRY WEIGHT	DUP	4735206	Y		90.52	9.484	08/09/2023 10:57:49	7.6774	1.2626	8.3495	7.6774	M	
DRY WEIGHT	PS	10663282001	Y		91.15	8.854	08/09/2023 10:59:44	8.0425	1.2606	8.7013	8.0425	M	
DRY WEIGHT	PS	10663382001	Y		93.45	6.553	08/09/2023 11:01:53	8.1974	1.268	8.6833	8.1974	M	



Batch Information: Soil Sieve 51158 WET

Log | Sieve

Analysis Method	Dry Sieve	Prepared By	LTT	Date/Time In	08/02/2023 11:29:26:387
Date/Time Out	08/03/2023 06:53:50:899	Instrument	40BALW	Sieve Size	#60
Drying Space	40DRY01	Humidistat ID	I204797	Thermometer ID	I204797
Correction Factor (C)	0.5	Temp In Corr. (C)	22.10 22.60	Temp Out Corr. (C)	22.20 22.70
Humidity In (%)	52	Humidity Out (%)	57	Reviewed By	
Reviewed By Date		Batch Notes	archive & coarse retained; #10 sieve also used; Pace 4 oz Amber Glass used to tare; freezer paper lab lot #408996; dried by LTT; primary review by SCS		

Sample Information:

QC Rule	Sample Type	Lab Sample ID	Select	Client ID	Archive Sample Wt (g)	Shaker ID	Shaker Start Date/Time	Shaker End Date/Time
SIEVE	RQS	10663488003	Y	PACE - MN	22.09	40SKR4	08/03/2023 06:56:32	08/03/2023 07:06:36
SIEVE	PS	10663488004	Y	PACE - MN	51.91	40SKR4	08/03/2023 06:56:32	08/03/2023 07:06:36

QC Rule	Sample Type	Lab Sample ID	Sample Weight Greater Than (g)	Sample Weight Less Than (g)	Sample Notes
SIEVE	RQS	10663488003	94.37	67.02	1*
SIEVE	PS	10663488004	85.94	54.98	1*

Sample Notes:

1*: dry, loose, rocks, roots; disaggregated by EMS; sorted by SCS

SECTION 5

**PROJECT CASE NARRATIVE AND
CHAIN-OF-CUSTODY RECORD**



SAMPLE SUMMARY

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10663488

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10663488001	S-0015-S-C-01-20230726	Solid	07/26/23 13:10	08/01/23 08:50
10663488002	S-0015-S-C-01D-20230726	Solid	07/26/23 13:10	08/01/23 08:50
10663488003	S-0015-S-C-01-20230726	Solid	07/26/23 13:10	08/01/23 08:50
10663488004	S-0015-S-C-01D-20230726	Solid	07/26/23 13:10	08/01/23 08:50

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10663488

Date: August 29, 2023

Samples analyzed for method 6020 arsenic and lead were analyzed after they were dried and sieved using a number 60 sieve.

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 0643586 RMAP Interior School-Revised Report

Pace Project No.: 10663488

Method: EPA 6020B

Description: 6020B MET ICPMS

Client: BP-ERM-MT

Date: August 29, 2023

General Information:

2 samples were analyzed for EPA 6020B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 0643586 RMAP Interior School-Revised Report

Pace Project No.: 10663488

Method: EPA 7471B

Description: 7471B Mercury

Client: BP-ERM-MT

Date: August 29, 2023

General Information:

2 samples were analyzed for EPA 7471B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 7471B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

BP/RM Facility No: MT_Butte Priority Soils

Lab Work Order Number:

Turn Around Time (Days): 5

Chain of Custody: 20230726-0115-PACE MPLS-S-0015

Lab Name: PACE, INC., MINNEAPOLIS, MN	BP/ARC Facility Address:	Consultant/Contractor: ERM
Lab Address: 1700 Elm Street SE	City, State, ZIP Code: Butte, MT, 59701	Consultant/Contractor Project No: 0643586
Lab PM:	Lead Regulatory Agency:	Address: 19th St Island Dr, Livingston, MT 59047
Lab Phone: 612-607-6398	California Global ID No.:	Consultant/Contractor PM: Christopher Berg
Lab Shipping Acct:	Accounting Information:	Phone: 9167699050 Email: Christopher.Berg@erm.com
Lab Bottle Order No:		Send/Submit EDD to: mcanumc@bp.com; Christopher.Berg@erm.com
Other Info:		Invoice To: mcanumc@bp.com; Christopher.Berg@erm.com
BP/RM PM: Mike Mc Anuty/mcanumc@bp.com	PM Phone: PM Email:	Report Type & QC Level:

Sample Details										Requested Analyses										Comments				
Lab No.	Sample Description	Date	Time	Field Matrix	Start Depth	End Depth	Depth Unit	Grab (G) or Composite (C)	Total # of Containers	Filt		N	N	N	N	N	N	N	N		N	N		
										Pres	Ambient C													
1	S-0015-S-C-01-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2			X	X											001
2	S-0015-S-C-01D-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2			X	X											002

Samplers Name: Tim Wilson	Relinquished By / Affiliation	Date / Time	Accepted By / Affiliation	Date / Time
Samplers Company: ERM	Tim Wilson / ERM	7/31/2023 3:30:00 PM	<i>Chris Berg</i>	8-1-23 08:00
Ship Method:	Ship Date: 7/31/2023 4:00:00 PM			
Shipment Tracking No: 592371483209				

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place Yes / No | Temp Blank Yes / No | Cooler Temp on Receipt: 17 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

WO#: 10663488



10663488

17 of 238



Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

18 of 238

Page 18 of 38

Sample Condition Upon Receipt - ESI Tech Specs
 Client Name: ERM

Project #: **WO# : 10663488**
 PM: JMA Due Date: 08/08/23
 CLIENT: BP-ERM-MT

Courier: FedEx UPS USPS Client
 Pace Speedee Commercial
 Tracking Number: 592371483209 See Exceptions ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other
 Thermometer: T1 (0461) T2 (0436) T3 (0459) T4 (0402) T5 (0178)
 T6 (0235) T7 (0042) T8 (0775) T9 (0727) 01339252/1710
 Biological Tissue Frozen? Yes No N/A
 Temp Blank? Yes No
 Type of Ice: Wet Blue Dry None
 Melted

Temp should be above freezing to 6 °C Cooler temp Read w/Temp Blank: 1.7 °C
 Correction Factor: True Cooler Temp Corrected w/temp blank: 1.7 °C
 Average Corrected Temp (no temp blank only): _____ °C
 See Exceptions ENV-FRM-MIN4-0142 1 Container

USDA Regulated Soil: N/A, water sample/other: _____
 Date/Initials of Person Examining Contents: ARC 8-1-23
 Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No

If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one):	Chain of Custody Present and Filled Out?	Chain of Custody Relinquished?	Sampler Name and/or Signature on COC?	Samples Arrived within Hold Time?	Short Hold Time Analysis (<72 hr)?	Rush Turn Around Time Requested?	Sufficient Sample Volume?	Triple Volume Provided for MS/MSD (if more than 10 samples)?	Correct Containers Used?	-Pace Containers Used?	Containers Intact?	Field Filtered Volume Received for Dissolved Tests?	Is sufficient information available to reconcile the samples to the COC?	Matrix: <input type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input checked="" type="checkbox"/> Other	All containers needing acid/base preservation have been checked?	All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH >10 Cyanide)	Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.)	Extra labels present on soil VOA or WIDRO containers?	Headspace in VOA Vials (greater than 6mm)?	3 Trip Blanks Present?	Trip Blank Custody Seals Present?	COMMENTS
<input type="checkbox"/> Duluth <input checked="" type="checkbox"/> Minneapolis <input type="checkbox"/> Virginia	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	1. JMA 8/2/23 2. 3. JMA 8/2/23 4. 5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E.coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrom <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other 6. 7. 8. 9. 10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No 11. If no, write ID/Date/Time of container below: <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142 12. Sample # <input type="checkbox"/> NaOH <input type="checkbox"/> HNO3 <input type="checkbox"/> H2SO4 <input type="checkbox"/> Zinc Acetate Positive for Residual Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142 pH Paper Lot # Residual Chlorine 0-6 Roll 0-6 Strip 0-14 Strip 13. <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142 14. Pace Trip Blank Lot # (if purchased):

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1:30</u>	Temp: <u>1.7</u>	Corrected Temp: <u>True</u>
Time: <u>1:50</u>	put in cooler	
Time:	Temp:	Corrected Temp:

CLIENT NOTIFICATION/RESOLUTION Field Date Required? Yes No
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: Confirmed that air dry & sieve required. Sample volume forwarded to Pace GB.
 Date: 08/02/2023

Project Manager Review: [Signature]



Laboratory Management Program (LaMP) Chain of Custody Record

Soil, Sediment and Groundwater Samples

Revised COC received 8/3/23 JMA

Rev_01

emk 08/03/23
Page 1 of 2

BP/RM Facility No: MT_Butte Priority Soils

Lab Work Order Number:

Turn Around Time (Days): 5

Chain of Custody: 20230726-0115-PACE MPLS-S-0015_Rev_01

Lab Name: PACE, INC., MINNEAPOLIS, MN	BP/ARC Facility Address:	Consultant/Contractor: ERM
Lab Address: 1700 Elm Street SE	City, State, ZIP Code: Butte, MT, 59701	Consultant/Contractor Project No: 0643586
Lab PM:	Lead Regulatory Agency:	Address: 1 9th St Island Dr, Livingston, MT 59047
Lab Phone: 612-607-6398	California Global ID No.:	Consultant/Contractor PM: Christopher Berg
Lab Shipping Accnt:	Accounting Information:	Phone: 9167699050 Email: Christopher.Berg@erm.com
Lab Bottle Order No: -		Send/Submit EDD to: mcanumc@bp.com; Christopher.Berg@erm.com
Other Info:		Invoice To: mcanumc@bp.com; Christopher.Berg@erm.com
BP/RM PM: Mike Mc Anulty@mcanumc@bp.com	PM Phone: PM Email:	Report Type & QC Level:

Lab No.	Sample Description	Date	Time	Field Matrix	Start Depth	End Depth	Depth Unit	Grab (G) or Composite (C)	Total # of Containers	emk 08/03/23				Comments
										Pres	N	N	N	
										SW6020B (arsenic and lead)	SW7471B (mercury)	Air Dry & Sieve	Ambient	
1	S-0015-S-C-01-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2	X	X	X		MS/MSD 001 emk 08/03/23
2	S-0015-S-C-01D-20230726	07/26/2023	13:10	SO SUR	0	2	IN	G	2	X	X	X		002

Sampler's Name: Tim Wilson	Relinquished By / Affiliation	Date / Time	Accepted By / Affiliation	Date / Time
Sampler's Company: ERM	Tim Wilson / ERM	7/31/2023 3:30:00 PM	<i>Chris Berg</i>	8-1-23 08:40
Ship Method: FedEx emk 08/03/23	Ship Date: 7/31/2023 4:00:00 PM			
Shipment Tracking No: 592371483209				

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place Yes / No | Temp Blank Yes / No | Cooler Temp on Receipt: 16.7 °F/C | Trip Blank Yes / No | MS/MSD Sample Submitted: Yes / No

WO#: 10663488



10663488



Laboratory Management Program (LaMP) Chain of Custody Record
Soil, Sediment and Groundwater Samples

Revised COC received 8/3/23 JMA

Rev_01
emk 08/03/23

Page 2 of 2

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Page 21 of 38

From: [Tim Wilson](#)
To: [Jennifer Anderson](#)
Cc: [Elsie King](#)
Subject: Butte RMAP Analysis Notes
Date: Monday, July 31, 2023 6:10:10 PM
Attachments: [image001.png](#)

CAUTION: This email originated from outside Pace Analytical. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Jennifer,

I just sent a shipment to Pace for the Butte RMAP project, it has samples from 3 schools (3 separate COCs). I was in a bit of a rush to get the samples in before the FedEx shipped for the day, and forgot a few things:

- Samples from S-0021 and S-0023 both have cassette filter blanks and field blanks, I forgot to add notes to the COC, however samples S-0021-D-O-01-20230729 (filter blank), S-0021-D-O-02-20230729 (field blank), S-0023-D-O-01-20230728 (filter blank), S-0023-D-O-02-20230728 (field blank) will not have sufficient mass, but please analyze for lead/arsenic and mercury as they are blanks
- Please do a MS/MSD on S-0015-S-C-01-20230726. These are soil samples and the 4 ounce soil jars are full, so I believe there should be enough.
- We used a new type of cassette for Gold Hill, there are 10 blank cassettes in the cooler in two bags labeled "blanks" (possibly "filter blanks")
- Just a reminder that per the EPA, the Gold Hill samples (S-0021) need to be rushed and are first priority.

The tracking number is: 592371483209

My apologies on not getting this information on the COC. Please reach out if you have any questions. Thank you.

Tim Wilson
Consultant II, Data Analytics and Visualization

ERM

1 Ninth St. Island Drive | Livingston, MT | 59047

T (215) 287-2063

E tim.wilson@erm.com | W www.erm.com



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From: [Elsie King](#)
To: [Jennifer Anderson](#); [Tim Wilson](#)
Subject: RE: Butte RMAP Analysis Notes
Date: Tuesday, August 1, 2023 2:54:16 PM
Attachments: [image002.png](#)

CAUTION: This email originated from outside Pace Analytical. Do not click links or open attachments unless you recognize the sender and know the content is safe.
The sieve step is needed for the composite soils, but we could not split the shipment on our end.

Thanks,

Elsie

From: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Sent: Tuesday, August 1, 2023 11:52 AM
To: Tim Wilson <Tim.Wilson@erm.com>
Cc: Elsie King <Elsie.King@erm.com>
Subject: RE: Butte RMAP Analysis Notes

EXTERNAL MESSAGE

Thank you Tim!

One more quick question, you mentioned that the S-0015 samples are soils, do these need to be air dried and sieved prior to the 6020 arsenic and lead analysis? I did not see a note on the COC that sieving was needed but wanted to double check.

Thanks again!

Jennifer Anderson, PMP
Project Manager
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
D: 612.607.6436 | pacelabs.com



From: Tim Wilson <Tim.Wilson@erm.com>
Sent: Tuesday, August 1, 2023 12:38 PM
To: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Cc: Elsie King <Elsie.King@erm.com>
Subject: RE: Butte RMAP Analysis Notes

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Hi Jennifer,

Sure thing, they are attached. Please reach out if anything else comes up.

Tim

From: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Sent: Monday, July 31, 2023 6:32 PM
To: Tim Wilson <Tim.Wilson@erm.com>
Cc: Elsie King <Elsie.King@erm.com>
Subject: RE: Butte RMAP Analysis Notes

EXTERNAL MESSAGE

Hi Tim,

Thank you for letting me know! Would it please be possible to email me copies of the COCs? (Just for me to work on getting them into our system before they arrive to help expedite the processing).

Thanks again!

Jennifer

Jennifer Anderson, PMP
Project Manager
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
D: 612.607.6436 | pacelabs.com



From: Tim Wilson <Tim.Wilson@erm.com>
Sent: Monday, July 31, 2023 6:10 PM
To: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Cc: Elsie King <Elsie.King@erm.com>
Subject: Butte RMAP Analysis Notes

CAUTION: This email originated from outside Pace Analytical. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Jennifer,

I just sent a shipment to Pace for the Butte RMAP project, it has samples from 3 schools (3 separate COCs). I was in a bit of a rush to get the samples in before the FedEx shipped for the day, and forgot a few things:

- Samples from S-0021 and S-0023 both have cassette filter blanks and field blanks, I forgot to add notes to the COC, however samples S-0021-D-O-01-20230729 (filter blank), S-0021-D-O-02-20230729 (field blank), S-0023-D-O-01-20230728 (filter blank), S-0023-D-O-02-20230728

(field blank) will not have sufficient mass, but please analyze for lead/arsenic and mercury as they are blanks

- Please do a MS/MSD on S-0015-S-C-01-20230726. These are soil samples and the 4 ounce soil jars are full, so I believe there should be enough.
- We used a new type of cassette for Gold Hill, there are 10 blank cassettes in the cooler in two bags labeled “blanks” (possibly “filter blanks”)
- Just a reminder that per the EPA, the Gold Hill samples (S-0021) need to be rushed and are first priority.

The tracking number is: 592371483209

My apologies on not getting this information on the COC. Please reach out if you have any questions. Thank you.

Tim Wilson
Consultant II, Data Analytics and Visualization

ERM

1 Ninth St. Island Drive | Livingston, MT | 59047

T (215) 287-2063

E tim.wilson@erm.com | W www.erm.com



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From: [Elsie King](#)
To: [Amanda Whitney](#); [Jennifer Anderson](#); [Emmy Zartman](#); [Thomas Beckman](#); [Christopher Berg](#)
Cc: [AR_Deliverables](#); [Lester Dupes](#)
Subject: RE: Samples Received, "0643586 RMAP Interior School" Pace® Project #10663488
Date: Thursday, August 3, 2023 1:29:23 PM
Attachments: [image001.png](#)
[10663488_coc_Rev01.pdf](#)

CAUTION: This email originated from outside Pace Analytical. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Amanda,

See Attached for the revised COC for the Silver Bow Indoor Soil samples collected 7/26/2023.

Regards.

Elsie King
Senior Consultant
ERM
900 E. Benson Blvd. | Suite 480 | Anchorage, AK 99508
T +1 925 482 3792 | M +1 907 201 6785
E Elsie.King@erm.com | W www.erm.com



ERM *The business of sustainability*

From: Amanda Whitney <awhitney@envstd.com>
Sent: Thursday, August 3, 2023 3:20 AM
To: jennifer.anderson@pacelabs.com; [Emmy Zartman <emmy.zartman@erm.com>](mailto:emmy.zartman@erm.com); [Elsie King <elsie.king@erm.com>](mailto:elsie.king@erm.com); [Thomas Beckman <thomas.beckman@erm.com>](mailto:thomas.beckman@erm.com); [Christopher Berg <christopher.berg@erm.com>](mailto:christopher.berg@erm.com)
Cc: [AR_Deliverables <AR_Deliverables@envstd.com>](#); [Lester Dupes <ldupes@envstd.com>](#)
Subject: RE: Samples Received, "0643586 RMAP Interior School" Pace® Project #10663488

EXTERNAL MESSAGE

Good morning ERM,

On the attached COC, please revise the following:

- Update to include Ship Method
- Update line item 1 to include a comment stating "MS/MSD"
- Under "Requested Analyses", please add a "Air dry & sieve" as a separate line item, preservative "Ambient", Filtered "N" and add an "X" to each sample for this analysis. Typically it's included with the metals analysis field but since there is no room, I would just make it a separate line item.

For all revisions, please strike through the error and write the revision next to the error. In addition, please initial and date next to all revisions. In the top right corner of each page of the COC, please add "Rev_01" with initials and the date.

Thanks!

Amanda Whitney

Project Quality Assurance Chemist
Environmental Standards, Inc.
Valley Forge, PA | US Eastern Time
Office: +1-610-935-5577 x110247
awhitney@envstd.com | www.envstd.com

From: jennifer.anderson@pacelabs.com <jennifer.anderson@pacelabs.com>
Sent: Wednesday, August 2, 2023 9:30 PM
To: emmy.zartman@erm.com; elsie.king@erm.com; thomas.beckman@erm.com; AR_Deliverables <AR_Deliverables@envstd.com>; christopher.berg@erm.com
Subject: Samples Received, "0643586 RMAP Interior School" Pace® Project #10663488

Hello,

Thank you for submitting your samples to Pace® Analytical Services! We appreciate your business.

Samples were received and logged-in at Pace® Analytical in Minneapolis, MN.

Please review the attached Sample Acknowledgement Form (SAF) for a summary description of the project as received and logged.

If you notice any discrepancies, please contact your project manager as soon as possible.

Sincerely,

Jennifer Anderson

jennifer.anderson@pacelabs.com

[emmy.zartman@erm.com, elsie.king@erm.com, thomas.beckman@erm.com, ar_deliverables@envstd.com, christopher.berg@erm.com]

[emmy.zartman@erm.com, elsie.king@erm.com, thomas.beckman@erm.com, ar_deliverables@envstd.com, christopher.berg@erm.com]

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Client Name: Pace, MN
 All containers needing preservation have been checked and noted below.

Sample Preservation Receipt Form
 Project # 40216071
 Yes No N/A

Pace Lab #	Glass						Plastic						Vials					Jars				General		Initial when completed:					Date/Time:						
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN 1	GN 2	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)	
001																																			
002																																			2.5/5
003																																			2.5/5
004																																			2.5/5
005																																			2.5/5
006																																			2.5/5
007																																			2.5/5
008																																			2.5/5
009																																			2.5/5
010																																			2.5/5
011																																			2.5/5
012																																			2.5/5
013																																			2.5/5
014																																			2.5/5
015																																			2.5/5
016																																			2.5/5
017																																			2.5/5
018																																			2.5/5
019																																			2.5/5
020																																			2.5/5

Exceptions to preservation check. VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other:


Headspace in VOA Vials (>6mm): Yes No N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	VG9C	40 mL clear ascorbic w/ HCl	JGFU	4 oz amber jar unpres
BG1U	1 liter clear glass	BP3U	250 mL plastic unpres	DG9T	40 mL amber Na Thio	JG9U	9 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP3B	250 mL plastic NaOH	VG9U	40 mL clear vial unpres	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG5U	100 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH + Zn	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres					GN 1	
						GN 2	

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Sample Condition Upon Receipt Form (SCUR)

Client Name: Pace, Minneapolis, MN
 Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____
 Tracking #: 3639794

Project #: _____
WO#: 40266011

 40266011

Custody Seal on Cooler/Box Present: Yes No Seals intact: Yes No
 Custody Seal on Samples Present: Yes No Seals intact: Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other
 Thermometer Used SR - 117 Type of Ice: Wet Blue Dry None Meltwater Only
 Cooler Temperature Uncorr: 0.0 / Corr: -0.5
 Temp Blank Present: Yes No Biological Tissue is Frozen: Yes No

Person examining contents:
 Date: 08/02/23 Initials: SEU
 Labeled By Initials: mt

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4. <u>FRWO</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: <u>08/02/23</u> <u>80</u>
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: Pace Green Bay, <u>Pace IB</u> , Non-Pace		
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>S</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:
 Person Contacted: _____ Date/Time: _____ If checked, see attached form for additional comments
 Comments/ Resolution: _____

Internal Transfer Chain of Custody

Rev 01 JMA 8/29/23



Samples Pre-Logged into eCOC.

State Of Origin: MT

Cert. Needed: Yes No

Workorder: 10663488 Workorder Name: 0643586 RMAP Interior School

Owner Received Date: 8/1/2023 Results Requested By: 8/8/2023

Report To: Jennifer Anderson Subcontract To: Pace Analytical Green Bay Requested Analysis:

Jennifer Anderson
Pace Analytical Minnesota
1700 Elm Street
Minneapolis, MN 55414
Phone (612)607-6436

Pace Analytical Green Bay
1241 Bellevue Street
Suite 9
Green Bay, WI 54302
Phone (920)469-2436

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers				Air Dry & Sieve	LAB USE ONLY
						Unpreserved					
1	S-0015-S-C-01-20230726	RQS	7/23/2023 13:10	10663488003	Solid	1				X	
2	S-0015-S-C-01D-20230728	PS	7/23/2023 13:10	10663488004	Solid	1				X	001 002
3			7/28/23 JMA 8/29/23								
4											
5											

Comments

Transfers	Released By	Date/Time	Received By	Date/Time
1	Jane Pace	8/23 13:10		
2	Walt CO	08/23 0730	Sumant Kulkarni, Pace	08/23 0730
3	Walt CO	8-23 1600	[Signature]	8-23 0809

Cooler Temperature on Receipt -0.5°C Custody Seal (Y) or N Received on Ice (Y) or N Samples Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Forwarding for analysis 8/3/23

WO#: 10663488

10663488

36 of 238

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Effective Date: 4/14/2023

Sample Condition Upon Receipt
 Client Name: Pace Greenbay

Project #: **WO#: 10663488**
 PM: JMA Due Date: 08/10/23
 CLIENT: BP-ERM-MT

Courier: FedEx UPS USPS Client
 Pace Speedee Commercial

See Exceptions
 Tracking Number: ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Packing Material: Bubble Wrap Bubble Bags None Other
 Thermometer: T1 (0461) T2 (0436) T3 (0459) T4 (0402) T5 (0178)
 T6 (0235) T7 (0042) T8 (0775) T9(0727) 01339252/1710
 Biological Tissue Frozen? Yes No N/A
 Temp Blank? Yes No
 Type of Ice: Wet Blue Dry None
 Melted

Did Samples Originate in West Virginia? Yes No Were All Container Temps Taken? Yes No N/A
 Temp should be above freezing to 6 °C Cooler temp Read w/Temp Blank: _____ °C
 Average Corrected Temp (no temp blank only): 2.1 °C
 Correction Factor: True Cooler Temp Corrected w/temp blank: _____ °C
 See Exceptions ENV-FRM-MIN4-0142 1 Container

USDA Regulated Soil: N/A, water sample/other: _____ Date/Initials of Person Examining Contents: APC 8-4-23
 Did samples originate in a quarantine zone within the United States: AL, AR, AZ CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No


If Yes to either question, fill out a Regulated Soil Checklist (ENV-FRM-MIN4-0154) and include with SCUR/COC paperwork.

Location (Check one):	Duluth	<input checked="" type="checkbox"/> Minneapolis	Virginia	COMMENTS
Chain of Custody Present and Filled Out?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	4. If fecal: <input type="checkbox"/> <8 hrs <input type="checkbox"/> >8 hr, <24 <input type="checkbox"/> No
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E.coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrom <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other _____
Rush Turn Around Time Requested?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	6.
Sufficient Sample Volume?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	7.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	8.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	9.
Containers Intact?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? Matrix: <input type="checkbox"/> Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	11. If no, write ID/Date/Time of container below: <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO3, H2SO4, <2pH, NaOH >9 Sulfide, NaOH >10 Cyanide)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> NaOH <input type="checkbox"/> HNO3 <input type="checkbox"/> H2SO4 <input type="checkbox"/> Zinc Acetate
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxins/PFAS (*If adding preservative to a container, it must be added to associated field and equipment blanks--verify with PM first.)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Positive for Residual Chlorine? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142 pH Paper Lot #
Headspace in Methyl Mercury Container?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Residual Chlorine 0-6 Roll 0-6 Strip 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	13.
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	14. <input type="checkbox"/> See Exceptions ENV-FRM-MIN4-0142
3 Trip Blanks Present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	Pace Trip Blank Lot # (if purchased): _____

CLIENT NOTIFICATION/RESOLUTION
 Person Contacted: _____ Date/Time: _____
 Comments/Resolution: _____
 Project Manager Review: [Signature] Date: 08/07/2023

NOTE: Whenever there is a discrepancy among North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e., out of hold, incorrect preservative, out of temp, incorrect containers):

Labeled By: APC Line: 2

	DC#_Title: ENV-FRM-MIN4-0142 v02_Sample Condition Upon Receipt (SCUR) Exception Form
	Effective Date: 09/22/2022

Workorder #: _____

No Temp Blank		
Read Temp	Corrected Temp	Average temp
21.0	True	21.1
21.1		

PM Notified of Out of Temp Cooler? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, indicate who was contacted, date and time. If no, indicate reason why. _____
Multiple Cooler Project? <input type="checkbox"/> Yes <input type="checkbox"/> No

If anything is OVER 6.0° C, you **MUST** document containers in this section **HERE**



Tracking Number	Temperature



Out of Temp Sample ID	Container Type	# of Containers

pH Adjustment Log for Preserved Samples										
Sample ID	Type Of Preserve	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance After Addition?		Initials
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	
								<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Comments:



QUALIFIERS

Project: 0643586 RMAP Interior School-Revised Report

Pace Project No.: 10663488

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

REPORT OF LABORATORY ANALYSIS

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SECTION 6

PROJECT CORRESPONDENCE

Amanda Whitney

From: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>
Sent: Friday, August 25, 2023 3:53 PM
To: Amanda Whitney; Elsie.King@erm.com
Cc: AR_Deliverables; Lester Dupes; Katelyn Kelly
Subject: RE: AR Parks Lab Request: Silver Bow Montessori (10663488)

Categories: Blue Category

This sender is trusted.

Hi Amanda,

There was not volume shipped for sieving directly to Pace GB from ERM, all volume was received in Minneapolis and the sieving volume was forward to GB for processing.

Unfortunately, it looks like there is a typo on the collected dates for samples -003 and -004. I will get this revised and the report/data package corrected. The revision will also include the comment we add noting arsenic and lead were completed after the samples were sieved.

Thanks!
Jennifer

Jennifer Anderson, PMP

Project Manager
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
D: 612.607.6436 | pacelabs.com

Pace will be closed on Monday, September 4th in observance of Labor Day. Please work with your project manager to schedule any rush or short hold analyses around this date.



From: Amanda Whitney <awhitney@envstd.com>
Sent: Friday, August 25, 2023 10:15 AM
To: Jennifer Anderson <Jennifer.Anderson@pacelabs.com>; Elsie.King@erm.com
Cc: AR_Deliverables <AR_Deliverables@envstd.com>; Lester Dupes <ldupes@envstd.com>; Katelyn Kelly <kkelly@envstd.com>
Subject: AR Parks Lab Request: Silver Bow Montessori (10663488)

CAUTION: This email originated from outside Pace Analytical. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning,

In Work Order 10663488, please review the following discrepancies:

- The Internal COC Record lists the sample collection times as “7/23/2023” while the COC references “7/26/2023”. Were these samples shipped from Pace MN to Pace GB for sieving? I don’t see another COC that samples were directly shipped to Pace GB from ERM so just wanted to confirm. Please also revise the Internal COC Record to “7/26/2023”.
 - Additionally, the Sample Summary references “7/23/2023” for SW-846 Method 6020 sample collection date. Please revise.
- The Project Narrative appears to be missing the page that states the samples analyzed for method 6020 were analyzed after they were dried and sieved. Please confirm and revise, if necessary.

Thanks!

Amanda Whitney

Project Quality Assurance Chemist

Environmental Standards, Inc.

Valley Forge, PA | US Eastern Time

Office: +1-610-935-5577 x110247

awhitney@envstd.com | www.envstd.com

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