Fall 9-21-2023

Residential Metals Abatement Program Investigation Summary Report (Non-Residential Parcels – Indoor Dust) - Lincoln Head Start

Environmental Resource Management (ERM)

Atlantic Richfield Company

317 Anaconda Road
Butte MT 59701

Mike McAnulty
Liability Manager

Direct (406) 782-9964
Fax (406) 782-9980

November 9, 2023

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Helena, Montana 59620-0901

Jonathan Morgan, Esq.
DEQ, Legal Counsel
P.O. Box 200901
Helena, Montana 59620-0901

RE: Residential Metals Abatement Program – Interior School Dust – Investigation Summary Report – Lincoln Head Start

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 Dust) – Lincoln Head Start.*

The report may be downloaded at the following link:

https://theermgroupnam-my.sharepoint.com/:f:/g/personal/thomas_beckman_erm_com/Eg72u21HgsZCtT1CWCsk860BEDGH_di8I6FrtwBfAo6hUw?e=1ueTET

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

Sincerely,

Mike McAnulty

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

November 8, 2023

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) Draft Residential Metals Abatement Program (RMAP) (Non-Residential Parcels) - Interior School Dust Investigation Summary Report – Lincoln Head Start (dated October 2, 2023)

Dear Mike:

The U. S. Environmental Protection Agency (EPA), in consultation with the Montana Department of Environmental Quality (DEQ), is approving the *Draft Residential Metals Abatement Program (RMAP) (Non-Residential Parcels) - Interior School Dust Investigation Summary Report – Lincoln Head Start (dated October 2, 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: 2023.11.08 07:18:57 -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
Brianne McClafferty / Holland & Hart
Daryl Reed / 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 Duaime / 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 Mavrinac / 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 Stoick / W&C
Pat Sampson / Pioneer
Andy Dare / Pioneer
Karen Helfrich / Pioneer
Randa Colling / Pioneer
Scott Sampson / 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
Aaron Urdiales / EPA
Jamie Miller / EPA
Carolina Balliew / 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 Dust)

Lincoln Head Start

21 September 2023

Project No.: 0701985

The business of sustainability

ERM

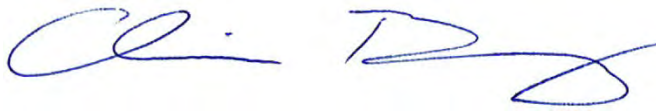
Signature Page

21 September 2023

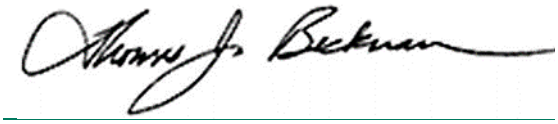
Residential Metals Abatement Program Investigation Summary Report (Non-Residential Parcels – Indoor Dust)

Lincoln Head Start

Elsie King
Quality Manager



Christopher Berg
Project Manager



Thomas J. Beckman
Partner

ERM
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CONTENTS

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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
ERM	Environmental Resources Management, Inc.
Environmental Standards	Environmental Standards, 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 field indoor dust sampling activities and presents the results of the 2023 Residential Metals Abatement Program (RMAP) school indoor dust sampling for Lincoln Head Start preschool.

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 dust.

Environmental Resources Management, Inc. (ERM) performed sampling and assessment to determine whether remediation or abatement was required using the following decision logic:

- Remediation/abatement was required where accessible interior dust contains arsenic, lead, or mercury at concentrations in excess of solid media action levels in areas currently accessible to children, students, or faculty. Accessible dust is defined as surface dust located in areas that are commonly occupied such as classrooms, hallways, bathrooms, and other areas (e.g., cafeterias) within the school or daycare.
- Remediation/abatement was required where inaccessible interior dust contains arsenic, lead, or mercury at concentrations in excess of solid media action levels in areas mainly accessible to facility staff. Inaccessible dust is defined as surface dust found in locations such as boiler or mechanical rooms, tops of ceiling tiles, janitorial closets, on ventilation system ductwork or vents, and storage rooms in areas that are not commonly accessed or occupied by children or students.
- Remediation/abatement was required for buildings constructed in 1980 and earlier, where dust contained arsenic, lead, or mercury at concentrations in attics and/or crawlspaces in excess of solid media action levels and where there is an exposure pathway to an interior occupied space.

1.2 Site Description

Lincoln Head Start is located at 100 North Clark Street in Butte, Montana (Figure 1). It was constructed in 1958 and has been remodeled extensively in 2021 and 2022. An attic is not present, but a crawlspace is present beneath portions of the building. Exposure pathways from the crawlspace to interior spaces are not complete. Exterior surface soils contained lead at concentrations above action levels requiring limited soil remediation. Interior dust sampling locations for Lincoln Head Start are subdivided into four location groups described below.

Based on the BPSOU Non-Residential School/Daycare Dust Sampling Decision Framework provided in the *Residential Metals Abatement Program Quality Assurance Project Plan (Non-Residential Parcels – Indoor Dust)* (QAPP) (ERM 2022a), interior dust sampling focused on collection of indoor dust samples

from entrance floor mats. Sampling locations for the Lincoln Head Start preschool are subdivided into four location groups described below.

- Decision Unit 1 – Gymnasium, stage
- Decision Unit 2 – East classrooms
- Decision Unit 3 – Southwest classrooms, administration
- Inaccessible Areas – Closets, storage

Indoor dust sampling was limited to floor mat sampling, due to the recent extensive remodeling in 2021/2022.

2. FIELD SAMPLING ACTIVITIES

ERM collected indoor dust samples in accordance with the QAPP (ERM 2022a) and *2022 Residential Metals Abatement Program (RMAP) Field Sampling Plan – Indoor Dust – Group 1* (FSP) (ERM 2022b). Figure 2 shows the sample locations within the school. Table 1 summarizes the sample locations, collection dates, and location descriptions. Appendix A includes site photographs, and Appendix B includes field notes and sample data sheets.

Three floor mats were placed at building entrances on 15 May 2023. Three floor mat samples, a field duplicate, a floor mat blank, and an equipment blank were collected on 23 May 2023. The floor mat samples collected are representative of eight-day (six school days) dust accumulation timeframe.

The following deviation to the FSP (ERM 2022b) occurred during sampling. Indoor dust sampling was limited to Step One (floor mat sampling) as defined in section 4.0 of the FSP, due to the recent extensive remodeling. Additionally, floor surface samples from the main hallways were not collected due to replacement of the carpet during the extensive remodeling effort. This deviation does not impact data quality as the areas sampled meet the data quality objectives stated in the QAPP.

3. INVESTIGATION RESULTS

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

3.1 Floor Mat Sample Results

Arsenic, lead, and mercury were detected at concentrations below the residential action levels in all floor mat samples (see 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 Level A/B Field Documentation Screening Reviews and validated laboratory data in in the form of a Stage 4 Quality Assurance Review (Appendix D). Environmental Standards assigned applicable validation qualifiers and usability qualifiers in an electronic data deliverable (EDD) format.

Data that meet 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 reported data met Level A and Level B criteria.

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.

When sample results were qualified both as estimated with a direction of bias (“J+” or “J-”) and as estimated with unknown bias (“J”) or the opposite bias, only the unknown bias qualifier was included in the qualified EDD.

One equipment blank and one floor mat blank were collected in accordance with the QAPP. There were no detections of target analytes in the blank samples; no sample results required qualification.

All results for lead were qualified as estimated (J) due to a high spike recovery, a high difference in spike duplicate results, and a high difference between the field duplicate results. All results for mercury were qualified as estimated (J) due to a high difference in spike duplicate results.

All data meet either enforcement or screening 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

All data quality objectives were met and indoor dust concentrations of arsenic, lead, and mercury are below the residential action levels. No further action is needed.

6. REFERENCES

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 (ERM-West, Inc.). 2022a. *Residential Metals Abatement Program Quality Assurance Project Plan (Non-Residential Parcels – Indoor Dust*). October.

ERM. 2022b. *2022 Residential Metals Abatement Program (RMAP) Field Sampling Plan (FSP) – Indoor Dust – Group 1 – Revision 1*. August.

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” (USEPA Docket No. CERCLA-08-2011-0011).

TABLES

Table 1
Summary of Analytical Sampling Results
Lincoln Head Start
Butte RMAP Indoor Dust
Butte, Montana

							Constituent	Arsenic					Lead					Mercury				
							Priority Soils Residential Action Level	250 mg/kg					1200 mg/kg					147 mg/kg				
Location Type	Location ID	Sample ID	Sample Type	Date	Matrix	Location Desc	Result	MDL	RL	Interp Qual	E / S	Result	MDL	RL	Interp Qual	E / S	Result	MDL	RL	Interp Qual	E / S
Floor Mat	S-0013-FM-01	S-0013-D-FM-01-20230523	N	5/23/2023	Dust	Main Entrance	**9.0**	0.68	2.4		E	**64.2**	0.44	2.4	J	S	**2.4**	0.041	0.094	J	S
Floor Mat	S-0013-FM-02	S-0013-D-FM-02-20230523	N	5/23/2023	Dust	East entrance	**9.0**	0.71	2.5		E	**49.7**	0.46	2.5	J	S	**0.041**	0.0086	0.020	J	S
Floor Mat	S-0013-FM-02	S-0013-D-FM-02D-20230523	FD	5/23/2023	Dust	East entrance	**8.8**	0.71	2.5		E	**33.5**	0.46	2.5	J	S	**0.030**	0.0075	0.017	J	S
Floor Mat	S-0013-FM-03	S-0013-D-FM-03-20230523	N	5/23/2023	Dust	East exit to playground	**9.3**	0.68	2.4		E	**102**	0.44	2.4	J	S	**0.093**	0.0087	0.020	J	S
QC		S-0013-D-O-01-20230523	FB	5/23/2023	Dust	Field blank for floor mats	ND	0.14	0.48	U	E	ND	0.088	0.48	U	E	ND	0.0084	0.019	U	E
		S-0013-D-EB-01-20230523	EB	45069.53	Dust	Equipment Blank	ND	0.14	0.49	U	E	ND	0.091	0.49	U	E	ND	0.0074	0.017	U	E

Notes:

Gray highlighting indicates result value is greater than or equal to the Butte Priority Soils Site-Specific Residential Action Levels for indoor soil and dust. Reference: 2006 Record of Decision, Butte Priority Soils

Bold text indicates detection.

All reported values in mg/kg.

Acronyms:

FB	Field Blank
FD	Field Duplicate
MDL	Method Detection Limit
mg/kg	milligrams per kilogram
N	Normal / Primary
ND	Not detected above the MDL
QC	Quality Control
RL	Reporting Limit

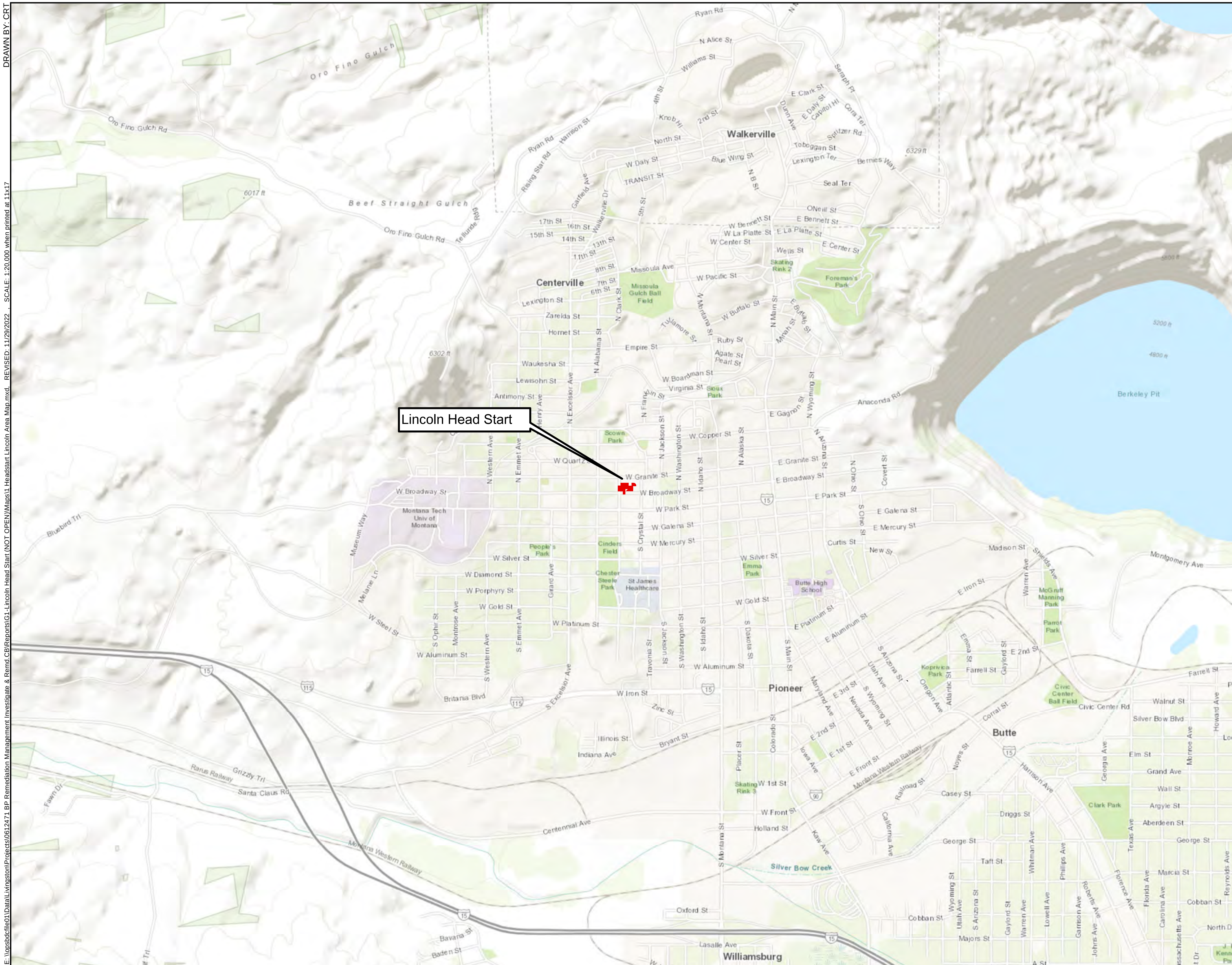
Interpreted Qualifiers:

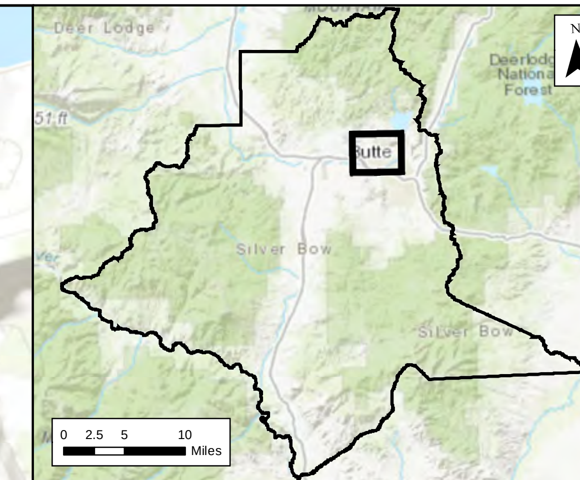
J	The analyte was positively identified; the associated numerical value is an estimate of the concentration of the analyte in the sample. This will also include results reported between the MDL and RL.
U	The result is qualified as non-detect due to the detection of the analyte in anassociated QC blank.

E / S:

E	Enforcement quality. No qualifiers, U qualifier, or J qualifier and meets Level A and B criteria.
S	Screening quality. J or UJ qualifier and/or meets only Level A criteria.

FIGURES





Legend

Site Area

Notes:
Room ID's reflect verbiage used on site maps provided by Butte School District

N

0 1,000 2,000
Feet

Figure 1
Lincoln Head Start
100 N Clark St
Butte, MT 59701

Environmental Resources Management
www.erm.com
ERM

Source: Esri - USGS Topo Webservice; NAD 1983 StatePlane Montana FIPS 2500 Feet

FILE: \\iopsbdcfile01\Data\Livingston\Projects\0612471 BP Remediation Management Investigate & Remd.CB\Reports\G1-Lincoln Head Start (NOT OPEN)\Maps\1 Headstart Lincoln Area Map.mxd, REVISED: 11/29/2022 , SCALE: 1:20,000 when printed at 11x17

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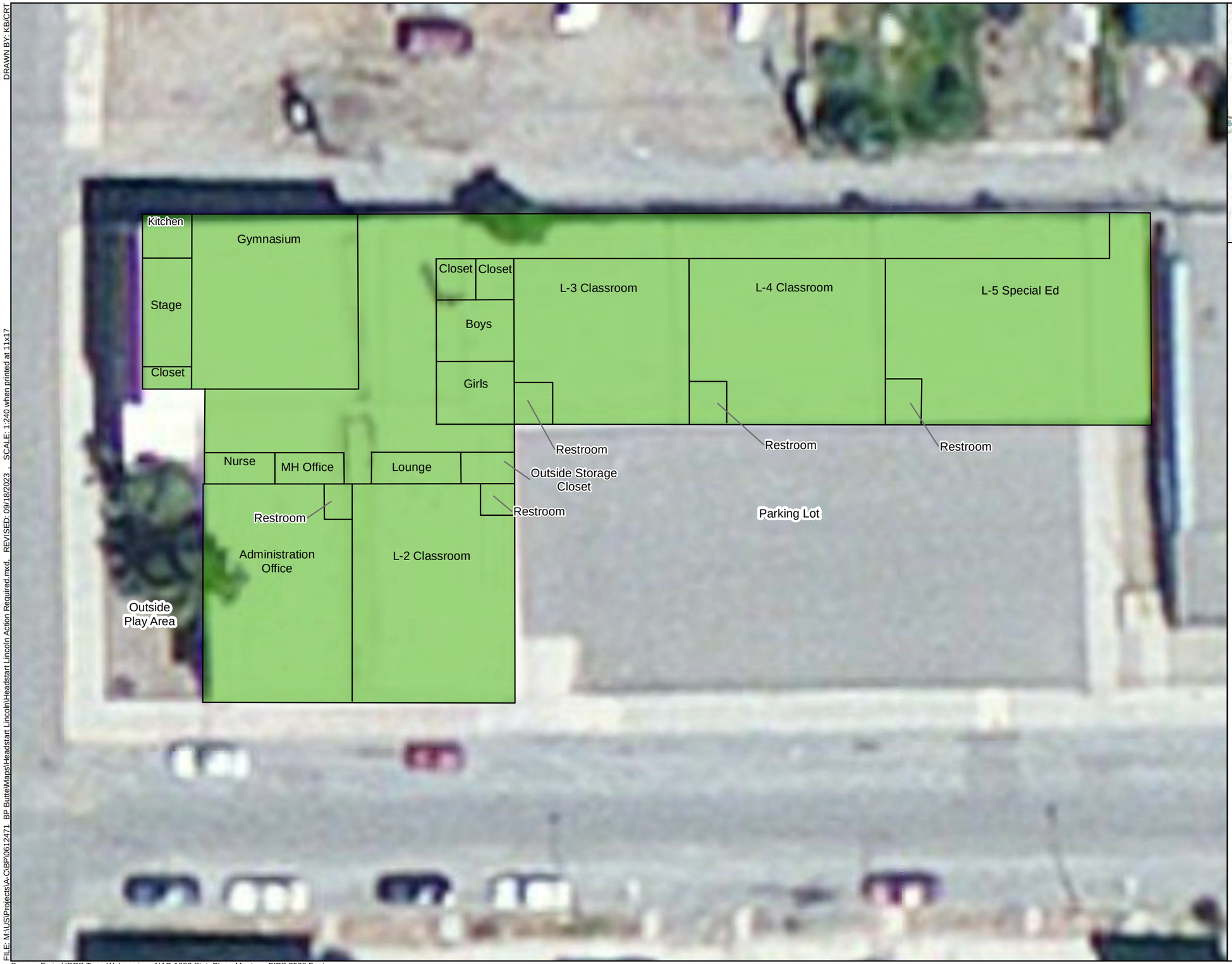
Figure 2
Lincoln Head Start
Sample Locations
100 N Clark St
Butte, MT 59701

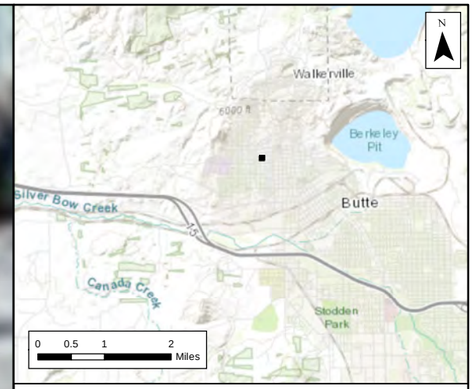
Environmental Resources Management
www.erm.com
ERM

DRAWN BY: KB/CRT

FILE: M:\US\Projects\A-C\BP\0612471 BP Butte\Maps\Headstart Lincoln\Headstart Lincoln Site Map.mxd REVISED: 09/18/2023 SCALE: 1:240 when printed at 11x17

Source: Esri - USGS Topo Webservice; NAD 1983 StatePlane Montana FIPS 2500 Feet





Legend

No Action Required

Notes:
Room ID's reflect verbiage used on site maps provided by Lincoln Headstart.

N

0 20 40
Feet

Figure 3
Lincoln Head Start
Action Required Locations
100 N Clark St
Butte, MT 59701

Environmental Resources Management
www.erm.com

Source: Esri - USGS Topo Webservice; NAD 1983 StatePlane Montana FIPS 2500 Feet

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FILE: M:\US\Projects\A-C\BP\0612471_BP Butte\Maps\Headstart Lincoln\Headstart Lincoln Action Required.mxd REVISED: 09/18/2023 , SCALE: 1:240 when printed at 11x17

APPENDIX A SITE PHOTOGRAPHS

Photograph: 1682	Floor surface sample, main west entrance by front office (S-0013-D-FM-01-20230523).

Photograph: 1683	Floor surface sample, faculty entrance by southeast parking lot (S-0013-D-FM-02-20230523).

Photograph: 1684	Floor surface sample, east entrance by playground (S-0013-D-FM-03-20230523).

Photograph: 1685	Floor surface sample QA/QC sample.

APPENDIX B FIELD NOTES AND SAMPLE DATA SHEETS

BUTTE RMAP REMEDIATION (11) 5-23-23

NC TW VAC. SCRATCH 2006

1100 - ARRIVE IN BUTTE, PICK UP VACUUM FROM CHAD ANDERSON

1145 - ARRIVE AT LINCOLN HEADSTART. UNLOAD EQUIPMENT. DECON VACUUM. PERFORM LEAK TEST.

1200 - START SAMPLING AT FM-01 (MAIN ENTRANCE) PHOTO 1682

1215 - COLLECT FM-01 (S-0013-D-FM-01-20230523)

1220 - DECON VAC & EQUIPMENT. PERFORM LEAK TEST

1300 - START SAMPLING AT FM-02 (EAST ENTRANCE)

1305 - COLLECT FM-02 (S-0013-D-FM-02-20230523) PHOTO 1683

1250 - COLLECT EQUIPMENT BLANK, DECON VAC.

1305 - COLLECT DUPLICATE (S-0015-D-FM-020-20230523) PHOTO 1683

1310 - DECON VAC

1330 - START SAMPLING AT FM-03 (EAST EXIT TO PLAYGROUND)

1335 - COLLECT FM-03 (S-0013-D-FM-03-20230523) PHOTO 1684

1345 - COLLECT FIELD BLANK (S-0013-D-O-01-20230523) PHOTO 1685

1400 - COMMUNICATE WITH ELSIE KING VIA TEAMS CONCERNING FIELD BLANK PROCEDURES

1430 - BEGIN EQUIPMENT DECON/PACK-UP

1445 - DEPART LINCOLN HEADSTART

S NATHAN CAMPEN

Scale: 1 square = _____

Rite in the Rain

RMAP FIELD SAMPLE DATA SHEET (FSDS) FOR HVS3 FLOOR DUST

Project Name/Number: Butte RMAP Indoor Dust / 0643586
Location: Butte, Montana
School: LINCOLN HEADSTART
Group #: 1

Sampling Date: 5-23-23
Field Logbook No: 3 pg. 11
Page No: 1 of 2

Sampling Team (ERM) Other _____ Name(s): NATHAN CHAMPLIN, TIM WILSON

Data Item	1	2	3
Sample ID	S-0013-D-FM-01-20230523	S-0013-D-EB-01-20230523	S-0013-D-FM-02-20230523
Bottle Lot #	101722-1KM	101722-1KM	101722-1KM
Sample Category (circle)	(FS-(Field Sample)) FD-(Field Duplicate) FB-(Field Blank) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))	FS-(Field Sample) FD-(Field Duplicate) FB-(Field Blank) (EB-(Equipment Blank)) MS/MSD-(Matix Spike/(duplicate))	(FS-(Field Sample)) FD-(Field Duplicate) FB-(Field Blank) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))
Sample Parent ID (if a duplicate sample)	N/A	N/A	N/A
Location Description (e.g., room number, etc.)	MAIN ENTRANCE	EQUIPMENT BLANK	EAST ENTRANCE
Location Floor (circle)	Basement, Ground, (Main Floor), 1st Floor, 2nd Floor, 3rd Floor Other_____	Basement, Ground, (Main Floor), 1st Floor, 2nd Floor, 3rd Floor Other_____	Basement, Ground, (Main Floor), 1st Floor, 2nd Floor, 3rd Floor Other_____
Floor Type (circle)	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, Floor Mat Other: N/A	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____
Approximate Sample Area (include units)	15ft²	N/A	15ft²
Date Last Vacuumed/ Cleaned	N/A	N/A	N/A
Photo ID	1682	N/A	1683
HVS3 Vacuum ID No.	SN#2006	SN#2006	SN#2006
Leak Check? (circle)	(Yes) No	(Yes) No	(Yes) No
20 sec cleaning @ end? (circle)	(Yes) No	(Yes) No	(Yes) No
Total Sample Time	5 minutes	N/A minutes	5 minutes
Flow Drop	5 inches of water	N/A inches of water	5 inches of water
Nozzle Drop	10 inches of water	N/A inches of water	10 inches of water
Final Weight	132.44 grams	136.80 ~~136.08~~ NC 5/23/23 grams	131.21 grams
Tare Weight	128.32 grams	128.71 grams	126.65 grams
Net Weight (Final - Tare)	4.12 grams	8.09 grams	4.56 grams
Decon Time	10 min.	10 mins.	10 ~~MM~~ NC 5/23/23 mins.
Time Sample Collected	1215	1250	1305
Comments	N/A	N/A	N/A

Lab: Pace Analytical Container: HVS3 Catch Bottle = 250 mL LDPE; Transfer to 4 oz. glass jar

For Field Team Completion (Initials) _____ Completed by: NC QC by: TW

RMAP FIELD SAMPLE DATA SHEET (FSDS) FOR HVS3 FLOOR DUST

Project Name/Number: Butte RMAP Indoor Dust / 0643586
Location: Butte, Montana
School: LINCOLN HEADSTART
Group #: 1

Sampling Date: 5.25.23
Field Logbook No: 3 MH
Page No: 2 of 2

Sampling Team: (ERM) Other _____ Name(s): NATHAN CHAMPLIN, TIM WILSON

Data Item	1	2	3
Sample ID	5-0013-D-FM-03-20230523	5-0013-D-FM-020-20230523	5-0013-D-O-01-20230523
Bottle Lot #	101722-1KM	101722-1KM	NAi Plastic Bag
Sample Category (circle)	(FS-(Field Sample)) FD-(Field Duplicate) FB-(Field Blank) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))	FS-(Field Sample) (FD-(Field Duplicate)) FB-(Field Blank) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))	FS-(Field Sample) FD-(Field Duplicate) (FB-(Field Blank)) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))
Sample Parent ID (if a duplicate sample)	N/A	5-0013-D-FM-02-20230523	N/A
Location Description (e.g., room number, etc.)	EAST EXIT TO PLAYGROUND	EAST ENTRANCE	FIELD BLANK
Location Floor (circle)	Basement, Ground/(Main Floor) 1st Floor, 2nd Floor, 3rd Floor Other_____	Basement, Ground/(Main Floor) 1st Floor, 2nd Floor, 3rd Floor Other_____	Basement, Ground/(Main Floor), 1st Floor, 2nd Floor, 3rd Floor Other_____
Floor Type (circle)	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____
Approximate Sample Area (include units)	15ft²	15ft²	15ft²
Date Last Vacuumed/ Cleaned	N/A	N/A	N/A
Photo ID	1684	1683	1685
HVS3 Vacuum ID No.	SU#2006	SU#2006	SU#2006
Leak Check? (circle)	(Yes) No	(Yes) No	(Yes) No
20 sec cleaning @ end? (circle)	(Yes) No	(Yes) No	(Yes) No
Total Sample Time	5 minutes	5 minutes	5 minutes
Flow Drop	5 inches of water	5 inches of water	5 inches of water
Nozzle Drop	10 inches of water	10 inches of water	10 inches of water
Final Weight	131.00 grams	133.29 grams	.05 grams (Bag)
Tare Weight	128.00 grams	126.70 grams	7.10 grams
Net Weight (Final - Tare)	3.00 grams	6.59 grams	7.05 grams
Decon Time	10 mins.	10 mins	10 mins.
Time Sample Collected	1335	1305	1345
Comments	N/A	DUPLICATE	FIELD BLANK Sample was placed in plastic bag
For Field Team Completion (Initials)	Completed by: NC QC by: TW		

Lab: Pace Analytical Container: HVS3 Catch Bottle = 250 mL LDPE; Transfer to 4 oz. glass jar

APPENDIX C LABORATORY REPORTS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

June 22, 2023

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

RE: Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Dear Christopher Berg:

Enclosed are the analytical results for sample(s) received by the laboratory on May 26, 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

This report was revised on June 22, 2023, to include a revised chain of custody.

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

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

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

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Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10654887001	**S-0013-D-FM-01-20230523**	Solid	05/23/23 12:15	05/26/23 08:50
10654887002	**S-0013-D-EB-01-20230523**	Solid	05/23/23 12:50	05/26/23 08:50
10654887003	**S-0013-D-FM-02-20230523**	Solid	05/23/23 13:05	05/26/23 08:50
10654887004	**S-0013-D-FM-02D-20230523**	Solid	05/23/23 13:05	05/26/23 08:50
10654887005	**S-0013-D-FM-03-20230523**	Solid	05/23/23 13:35	05/26/23 08:50
10654887006	**S-0013-D-O-01-20230523**	Solid	05/23/23 13:45	05/26/23 08:50

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10654887001	**S-0013-D-FM-01-20230523**	EPA 6020B	NN2	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
10654887002	**S-0013-D-EB-01-20230523**	EPA 6020B	NN2	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
10654887003	**S-0013-D-FM-02-20230523**	EPA 6020B	NN2	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
10654887004	**S-0013-D-FM-02D-20230523**	EPA 6020B	NN2	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
10654887005	**S-0013-D-FM-03-20230523**	EPA 6020B	NN2	2	PASI-M
		EPA 7471B	LMW	1	PASI-M
10654887006	**S-0013-D-O-01-20230523**	EPA 6020B	NN2	2	PASI-M
		EPA 7471B	LMW	1	PASI-M

PASI-M = Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Method: **EPA 6020B**
Description: 6020B MET ICPMS
Client: BP-ERM-MT
Date: June 22, 2023

General Information:
6 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.

QC Batch: 884669

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10654887004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 4661435)
  - Lead

R1: RPD value was outside control limits.

- MSD (Lab ID: 4661436)
  - Lead

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

Additional Comments:

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BP-ERM-MT
Date: June 22, 2023

General Information:
6 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.

QC Batch: 884384

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10654887001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 4659865)
  - Mercury
- MSD (Lab ID: 4659866)
  - Mercury

R1: RPD value was outside control limits.

- MSD (Lab ID: 4659866)
  - Mercury

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

Additional Comments:

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BP-ERM-MT
Date: June 22, 2023

Analyte Comments:

QC Batch: 884384

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MSD (Lab ID: 4659866)
  - Mercury

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

Pace Analytical Services, LLC
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(612)607-1700

ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Sample: S-0013-D-FM-01-20230523 **Lab ID: 10654887001** Collected: 05/23/23 12:15 Received: 05/26/23 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	**9.0**	mg/kg	2.4	0.68	5	06/02/23 12:30	06/04/23 19:26	7440-38-2	
Lead	**64.2**	mg/kg	2.4	0.44	5	06/02/23 12:30	06/04/23 19:26	7439-92-1	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**2.4**	mg/kg	0.094	0.041	5	06/02/23 07:47	06/05/23 13:25	7439-97-6	M1,R1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Sample: S-0013-D-EB-01-20230523 **Lab ID: 10654887002** Collected: 05/23/23 12:50 Received: 05/26/23 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	**<0.14**	mg/kg	0.49	0.14	1	06/02/23 12:30	06/04/23 19:29	7440-38-2	
Lead	**<0.091**	mg/kg	0.49	0.091	1	06/02/23 12:30	06/04/23 19:29	7439-92-1	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0074**	mg/kg	0.017	0.0074	1	06/02/23 07:47	06/05/23 12:26	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
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ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Sample: S-0013-D-FM-02-20230523 **Lab ID: 10654887003** Collected: 05/23/23 13:05 Received: 05/26/23 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	**9.0**	mg/kg	2.5	0.71	5	06/02/23 12:30	06/04/23 19:33	7440-38-2	
Lead	**49.7**	mg/kg	2.5	0.46	5	06/02/23 12:30	06/04/23 19:33	7439-92-1	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.041**	mg/kg	0.020	0.0086	1	06/02/23 07:47	06/05/23 12:27	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Sample: S-0013-D-FM-02D-20230523 **Lab ID: 10654887004** Collected: 05/23/23 13:05 Received: 05/26/23 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	**8.8**	mg/kg	2.5	0.71	5	06/02/23 12:30	06/04/23 19:42	7440-38-2	
Lead	**33.5**	mg/kg	2.5	0.46	5	06/02/23 12:30	06/04/23 19:42	7439-92-1	M1,R1
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.030**	mg/kg	0.017	0.0075	1	06/02/23 07:47	06/05/23 12:32	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
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ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Sample: S-0013-D-FM-03-20230523 **Lab ID: 10654887005** Collected: 05/23/23 13:35 Received: 05/26/23 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	**9.3**	mg/kg	2.4	0.68	5	06/02/23 12:30	06/04/23 20:00	7440-38-2	
Lead	**102**	mg/kg	2.4	0.44	5	06/02/23 12:30	06/04/23 20:00	7439-92-1	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**0.093**	mg/kg	0.020	0.0087	1	06/02/23 07:47	06/05/23 12:34	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Sample: S-0013-D-O-01-20230523 **Lab ID: 10654887006** Collected: 05/23/23 13:45 Received: 05/26/23 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	**<0.14**	mg/kg	0.48	0.14	1	06/02/23 12:30	06/04/23 20:04	7440-38-2	
Lead	**<0.088**	mg/kg	0.48	0.088	1	06/02/23 12:30	06/04/23 20:04	7439-92-1	
7471B Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B Pace Analytical Services - Minneapolis								
Mercury	**<0.0084**	mg/kg	0.019	0.0084	1	06/02/23 07:47	06/05/23 12:36	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

QC Batch: 884384 Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B Analysis Description: 7471B Mercury Solids
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10654887001, 10654887002, 10654887003, 10654887004, 10654887005, 10654887006

METHOD BLANK: 4659862 Matrix: Solid
Associated Lab Samples: 10654887001, 10654887002, 10654887003, 10654887004, 10654887005, 10654887006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	<0.0078	0.018	0.0078	06/05/23 12:08	

LABORATORY CONTROL SAMPLE: 4659863

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.49	0.49	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4659865 4659866

Parameter	Units	10654887001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	2.4	0.44	0.47	2.3	5.1	-19	559	80-120	74	20	E,M1, R1

SAMPLE DUPLICATE: 4659864

Parameter	Units	10654887001 Result	Dup Result	RPD	Max RPD	Qualifiers
Mercury	mg/kg	2.4	2.4	3	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

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

QC Batch: 884669
QC Batch Method: EPA 3050B
Analysis Method: EPA 6020B
Analysis Description: 6020B Solids UPD5
Laboratory: Pace Analytical Services - Minneapolis
Associated Lab Samples: 10654887001, 10654887002, 10654887003, 10654887004, 10654887005, 10654887006

METHOD BLANK: 4661432 Matrix: Solid
Associated Lab Samples: 10654887001, 10654887002, 10654887003, 10654887004, 10654887005, 10654887006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	<0.13	0.46	0.13	06/04/23 19:20	
Lead	mg/kg	<0.086	0.46	0.086	06/04/23 19:20	

LABORATORY CONTROL SAMPLE: 4661433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	48.9	50.1	102	80-120	
Lead	mg/kg	48.9	53.2	109	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4661435 4661436

Parameter	Units	10654887004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	8.8	49.1	49.1	64.4	55.7	113	96	75-125	14	20	
Lead	mg/kg	33.5	49.1	49.1	112	83.5	160	102	75-125	29	20	M1,R1

SAMPLE DUPLICATE: 4661434

Parameter	Units	10654887004 Result	Dup Result	RPD	Max RPD	Qualifiers
Arsenic	mg/kg	8.8	9.0	2	20	
Lead	mg/kg	33.5	34.6	3	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

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

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

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10654887001	**S-0013-D-FM-01-20230523**	EPA 3050B	884669	EPA 6020B	884883
10654887002	**S-0013-D-EB-01-20230523**	EPA 3050B	884669	EPA 6020B	884883
10654887003	**S-0013-D-FM-02-20230523**	EPA 3050B	884669	EPA 6020B	884883
10654887004	**S-0013-D-FM-02D-20230523**	EPA 3050B	884669	EPA 6020B	884883
10654887005	**S-0013-D-FM-03-20230523**	EPA 3050B	884669	EPA 6020B	884883
10654887006	**S-0013-D-O-01-20230523**	EPA 3050B	884669	EPA 6020B	884883
10654887001	**S-0013-D-FM-01-20230523**	EPA 7471B	884384	EPA 7471B	885082
10654887002	**S-0013-D-EB-01-20230523**	EPA 7471B	884384	EPA 7471B	885082
10654887003	**S-0013-D-FM-02-20230523**	EPA 7471B	884384	EPA 7471B	885082
10654887004	**S-0013-D-FM-02D-20230523**	EPA 7471B	884384	EPA 7471B	885082
10654887005	**S-0013-D-FM-03-20230523**	EPA 7471B	884384	EPA 7471B	885082
10654887006	**S-0013-D-O-01-20230523**	EPA 7471B	884384	EPA 7471B	885082

Laboratory Management Program (LaMP) Chain of Custody Record

Soil, Sediment and Groundwater Samples

WO# : 10654887

10654887

BP/RM Facility No: MT_Butte Priority Soils **Lab Work Order Number:**

Chain of Custody: 20230525-1254-PACE_MPLS-S-0013

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 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 Anulty/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																	
										Pres	Ambient	<6°C																	
											SW6020B (arsenic and lead)	SW7471B (mercury)																	
1	S-0013-D-FM-01-20230523	05/23/2023	12:15	SDU				G	1		X	X																	001
2	S-0013-D-EB-01-20230523	05/23/2023	12:50	SQ				G	1		X	X																	002
3	S-0013-D-FM-02-20230523	05/23/2023	13:05	SDU				G	1		X	X																	003
4	S-0013-D-FM-02D-20230523	05/23/2023	13:05	SDU				G	1		X	X																	004
5	S-0013-D-FM-03-20230523	05/23/2023	13:35	SDU				G	1		X	X																	005
6	S-0013-D-O-01-20230523	05/23/2023	13:45	SDU				G	1		X	X																	In labeled plastic bag 006

	Relinquished By / Affiliation	Date / Time	Accepted By / Affiliation	Date / Time
Sampler's Name: Nathan Champlin, Tim Wilson				
Sampler's Company: ERM	[signature] / ERM	5/25/2023 2:00:00 PM	[signature] GI/PACE	5/26/23 8:50
Ship Method: Ship Date: 5/25/2023 15:00:00 PM				
Shipment Tracking No: 6092 7234 9350				

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 0.5 °F/C | Trip Blank: Yes / (No) | MS/MSD Sample Submitted: Yes / (No)

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DC#_Title: ENV-FRM-MIN4-0149 v08_Sample Condition Upon Receipt (SCUR) - ESI
Effective Date: 4/18/2023

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: BP rm

Project #: WO#: 10654887
PM: JMA Due Date: 06/02/23
CLIENT: BP-ERM-MT

Courier: ☑ FedEx ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: 6092 7234 9350 ☐ See Exceptions ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1 (0461) ☑ T2 (0436) ☐ T3 (0459) ☐ T4 (0402) ☐ T5 (0178) ☐ T6 (0235) ☐ T7 (0042) ☐ T8 (0775) ☐ T9 (0727) ☐ 01339252/1710 **Type of Ice:** ☑ Wet ☐ Blue ☐ Dry ☐ None ☐ Melted

Temp should be above freezing to 6 °C **Cooler temp Read w/Temp Blank:** 0.3 °C
Correction Factor: +0.2 **Cooler Temp Corrected w/temp blank:** 0.5 °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: Solid) **Date/Initials of Person Examining Contents:** BG2 5/26/23

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 ☑ Minneapolis ☐ Virginia

				COMMENTS
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E.coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other ____
Rush Turn Around Time Requested?	☑ Yes	☐ No		6. 5 Day
Sufficient Sample Volume?	☑ Yes	☐ No		7.
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☐ Yes	☑ No	☒ N/A	JMA 5/26/23
Correct Containers Used?	☑ Yes	☐ No		8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☑ Yes	☐ No		11. **If no, write ID/Date/Time of container below:** ☐ See Exceptions ENV-FRM-MIN4-0142
Matrix: ☐ Water ☐ Soil ☐ Oil ☑ Other Solid				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ 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)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ 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.)	☐ Yes	☐ No	☑ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142
				pH Paper Lot #
				Residual Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): ____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins			
Opened Time: 1340	Temp: 0.3	Corrected Temp: 0.5	
Time: 1358	put in cooler		
Time:	Temp:	Corrected Temp:	

CLIENT NOTIFICATION/RESOLUTION **Field Date Required?** ☐ Yes ☐ No
Person Contacted: ____ Date/Time: ____
Comments/Resolution: ____

Project Manager Review: [signature] **Date:** 05/26/2023

NOTE: Whenever there is a discrepancy affecting 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: ____ **Line:** ____

REV_01

WO# : 10654887

emk 06/20/2023

Revised COC received 6/20/23 JMA

10654887

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:

Chain of Custody: 20230525-1254-PACE_MPLS-S-0013

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:**

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 / Pres: Ambient / <6°C	N	N															
										SW6020B (arsenic and lead) / SW7471B (mercury)																	
1	S-0013-D-FM-01-20230523	05/23/2023	12:15	SDU				G	1		X	X															001
2	S-0013-D-EB-01-20230523	05/23/2023	12:50	SQ				G	1		X	X															002
3	S-0013-D-FM-02-20230523	05/23/2023	13:05	SDU				G	1		X	X															003
4	S-0013-D-FM-02D-20230523	05/23/2023	13:05	SDU				G	1		X	X															004
5	S-0013-D-FM-03-20230523	05/23/2023	13:35	SDU				G	1		X	X															005
6	S-0013-D-O-01-20230523	05/23/2023	13:45	SDU				G	1		X	X															In labeled plastic bag 006

	Relinquished By / Affiliation	Date / Time	Accepted By / Affiliation	Date / Time
Sampler's Name: Nathan Champlin, Tim Wilson				
Sampler's Company: ERM	[signature] / ERM	5/25/2023 2:00:00 PM	[signature] / PACE	5/26/23 8:50
Ship Method: FEDEX emk 06/20/2023 Ship Date: 5/25/2023 15:00:00 PM				
Shipment Tracking No: 6092 7234 9350				

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 0.5 °F/C | Trip Blank: Yes / (No) | MS/MSD Sample Submitted: Yes / (No)

REV_01

emk 06/20/2023

Revised COC received 6/20/23 JMA

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From: Elsie King
To: Jennifer Anderson
Cc: Amanda Whitney
Subject: Butte Indoor Dust SDG 10654887 Revised COC
Date: Tuesday, June 20, 2023 5:23:38 PM
Attachments: image001.png
10654887_coc_REV_01.pdf

Hi Jennifer,

We left the shipper method off that last COC. I've attached a revised COC to be included in the final report.
Sorry for the delay and inconvenience.

Thanks,

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

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

DUST SAMPLES COLLECTED ON

MAY 23, 2023

RESIDENT IDENTIFICATION: S-0013

SAMPLE DELIVERY GROUPS: 10654887

JUNE 26, 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

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 May 23, 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; February 28, 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: Lincoln Head Start (S-0013)
Project: Residential Metals Abatement Program
Client: Atlantic Richfield Company
Sample Matrix: Dust

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 ☒ No ☐	Recorded in Logbook ☒ COC ☒ Bottle Labels ☒
Sampling team or leader name	Yes ☒ No ☐	Recorded in Logbook ☒ COC ☒
Physical description of sampling location	Yes ☒ No ☐	Recorded in Logbook ☒ Field Forms ☒ Photo Log ☒
Sample collection depth (soils)	Yes ☒ No ☐	Recorded in Logbook ☒ Field Forms ☒
Sample collection technique	Yes ☒ No ☐	Collected in accordance with the SOPs in Appendix B of QAPP Yes ☒ No ☐
Field preparation technique	Yes ☒ No ☐	Collected in accordance with the SOPs in Appendix B of QAPP Yes ☒ No ☐
Sample preservation technique	Yes ☒ No ☐	Dust samples for arsenic, lead and mercury analyses submitted on ice? Yes ☒ No ☐
Sample shipping records	Yes ☒ No ☐	Did sample arrive at < 6°C but not frozen (mercury analysis)? Yes ☒ No ☐ ___0.5°C___ Reported (corrected) temperature

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

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

5. Authorization of Field Documentation Screening Review

Report prepared by: Brett Dunphy, Staff Geoscientist
Report reviewed by: Joseph Kraycik, Senior Consulting Geoscientist
Report approved by: Lester J. Dupes, CEAC, Senior Quality Assurance Chemist
Report approved by: Rock J. Vitale, CEAC, Technical Director of Chemistry/Principal
Date: 6/26/2023

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

RMAP FIELD SAMPLE DATA SHEET (FSDS) FOR HVS3 FLOOR DUST

Project Name/Number: Butte RMAP Indoor Dust / 0643586
Location: Butte, Montana
School: LINCOLN HEADSTART
Group #: 1

Sampling Date: 5-23-23
Field Logbook No: 3 pg. 11
Page No: 1 of 2

Sampling Team (ERM) Other _____ Name(s): NATHAN CHAMPLIN, TIM WILSON

Data Item	1	2	3
Sample ID	S-0013-D-FM-01-20230523	S-0013-D-EB-01-20230523	S-0013-D-FM-02-20230523
Bottle Lot #	101722-1KM	101722-1KM	101722-1KM
Sample Category (circle)	(FS-(Field Sample)) FD-(Field Duplicate) FB-(Field Blank) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))	FS-(Field Sample) FD-(Field Duplicate) FB-(Field Blank) (EB-(Equipment Blank)) MS/MSD-(Matix Spike/(duplicate))	(FS-(Field Sample)) FD-(Field Duplicate) FB-(Field Blank) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))
Sample Parent ID (if a duplicate sample)	N/A	N/A	N/A
Location Description (e.g., room number, etc.)	MAIN ENTRANCE	EQUIPMENT BLANK	EAST ENTRANCE
Location Floor (circle)	Basement, Ground, (Main Floor), 1st Floor, 2nd Floor, 3rd Floor Other_____	Basement, Ground, (Main Floor), 1st Floor, 2nd Floor, 3rd Floor Other_____	Basement, Ground, (Main Floor), 1st Floor, 2nd Floor, 3rd Floor Other_____
Floor Type (circle)	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, Floor Mat Other: N/A	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____
Approximate Sample Area (include units)	15ft²	N/A	15ft²
Date Last Vacuumed/ Cleaned	N/A	N/A	N/A
Photo ID	1682	N/A	1683
HVS3 Vacuum ID No.	SN#2006	SN#2006	SN#2006
Leak Check? (circle)	(Yes) No	(Yes) No	(Yes) No
20 sec cleaning @ end? (circle)	(Yes) No	(Yes) No	(Yes) No
Total Sample Time	5 minutes	N/A minutes	5 minutes
Flow Drop	5 inches of water	N/A inches of water	5 inches of water
Nozzle Drop	10 inches of water	N/A inches of water	10 inches of water
Final Weight	132.44 grams	136.80 ~~136.08~~ NC 5/23/23 grams	131.21 grams
Tare Weight	128.32 grams	128.71 grams	126.65 grams
Net Weight (Final - Tare)	4.12 grams	8.09 grams	4.56 grams
Decon Time	10 min.	10 mins.	10 ~~MM~~ NC 5/23/23 mins.
Time Sample Collected	1215	1250	1305
Comments	N/A	N/A	N/A

Lab: Pace Analytical Container: HVS3 Catch Bottle = 250 mL LDPE; Transfer to 4 oz. glass jar

For Field Team Completion (Initials) _____ Completed by: NC QC by: TW

RMAP FIELD SAMPLE DATA SHEET (FSDS) FOR HVS3 FLOOR DUST

Project Name/Number: Butte RMAP Indoor Dust / 0643586
Location: Butte, Montana
School: LINCOLN HEADSTART
Group #: 1

Sampling Date: 5.25.23
Field Logbook No: 3 MH
Page No: 2 of 2

Sampling Team: (ERM) Other _____ Name(s): NATHAN CHAMPLIN, TIM WILSON

Data Item	1	2	3
Sample ID	5-0013-D-FM-03-20230523	5-0013-D-FM-020-20230523	5-0013-D-O-01-20230523
Bottle Lot #	101722-1KM	101722-1KM	NAi Plastic Bag
Sample Category (circle)	(FS-(Field Sample)) FD-(Field Duplicate) FB-(Field Blank) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))	FS-(Field Sample) (FD-(Field Duplicate)) FB-(Field Blank) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))	FS-(Field Sample) FD-(Field Duplicate) (FB-(Field Blank)) EB-(Equipment Blank) MS/MSD-(Matix Spike/(duplicate))
Sample Parent ID (if a duplicate sample)	N/A	5-0013-D-FM-02-20230523	N/A
Location Description (e.g., room number, etc.)	EAST EXIT TO PLAYGROUND	EAST ENTRANCE	FIELD BLANK
Location Floor (circle)	Basement, Ground/(Main Floor) 1st Floor, 2nd Floor, 3rd Floor Other_____	Basement, Ground/(Main Floor) 1st Floor, 2nd Floor, 3rd Floor Other_____	Basement, Ground/(Main Floor), 1st Floor, 2nd Floor, 3rd Floor Other_____
Floor Type (circle)	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____	Bare Floor: Tile, Laminate, Wood Carpet: Plush, Level Loop, Multilevel, Shag, (Floor Mat) Other: _____
Approximate Sample Area (include units)	15ft²	15ft²	15ft²
Date Last Vacuumed/ Cleaned	N/A	N/A	N/A
Photo ID	1684	1683	1685
HVS3 Vacuum ID No.	SU#2006	SU#2006	SU#2006
Leak Check? (circle)	(Yes) No	(Yes) No	(Yes) No
20 sec cleaning @ end? (circle)	(Yes) No	(Yes) No	(Yes) No
Total Sample Time	5 minutes	5 minutes	5 minutes
Flow Drop	5 inches of water	5 inches of water	5 inches of water
Nozzle Drop	10 inches of water	10 inches of water	10 inches of water
Final Weight	131.00 grams	133.29 grams	.05 grams (Bag)
Tare Weight	128.00 grams	126.70 grams	7.10 grams
Net Weight (Final - Tare)	3.00 grams	6.59 grams	7.05 grams
Decon Time	10 mins.	10 mins	10 mins.
Time Sample Collected	1335	1305	1345
Comments	N/A	DUPLICATE	FIELD BLANK Sample was placed in plastic bag
For Field Team Completion (Initials)	Completed by: NC QC by: TW		

Lab: Pace Analytical Container: HVS3 Catch Bottle = 250 mL LDPE; Transfer to 4 oz. glass jar

BUTTE RMAP REMEDIATION (11) 5-23-23

NC TW VAC. SCRIACH 2006

TW 6/23/23

1100 - ARRIVE IN BUTTE, PICK UP VACUUM FROM CHAD ANDERSON

1145 - ARRIVE AT LINCOLN HEADSTART. UNLOAD EQUIPMENT. DECON VACUUM. PERFORM LEAK TEST.

1210 - START SAMPLING AT FM-01 (MAIN ENTRANCE) PHOTO 1682

1215 - COLLECT FM-01 (S-0013-D-FM-01-20230523)

1220 - DECON VAC & EQUIPMENT. PERFORM LEAK TEST

1300 - START SAMPLING AT FM-02 (EAST ENTRANCE)

1305 - COLLECT FM-02 (S-0013-D-FM-02-20230523) PHOTO 1683

1250 - COLLECT EQUIPMENT BLANK, DECON VAC

1305 - COLLECT DUPLICATE (S-0013-D-FM-020-20230523) PHOTO 1683

1310 - DECON VAC

1330 - START SAMPLING AT FM-03 (EAST EXIT TO PLAYGROUND)

1335 - COLLECT FM-03 (S-0013-D-FM-03-20230523) PHOTO 1684

1345 - COLLECT FIELD BLANK (S-0013-D-O-01-20230523) PHOTO 1685

1400 - COMMUNICATE WITH ELSIE KING VIA TEAMS CONCERNING FIELD BLANK PROCEDURES

1430 - BEGIN EQUIPMENT DECON/PACK-UP

1445 - DEPART LINCOLN HEADSTART

S NATHAN CHAPMAN

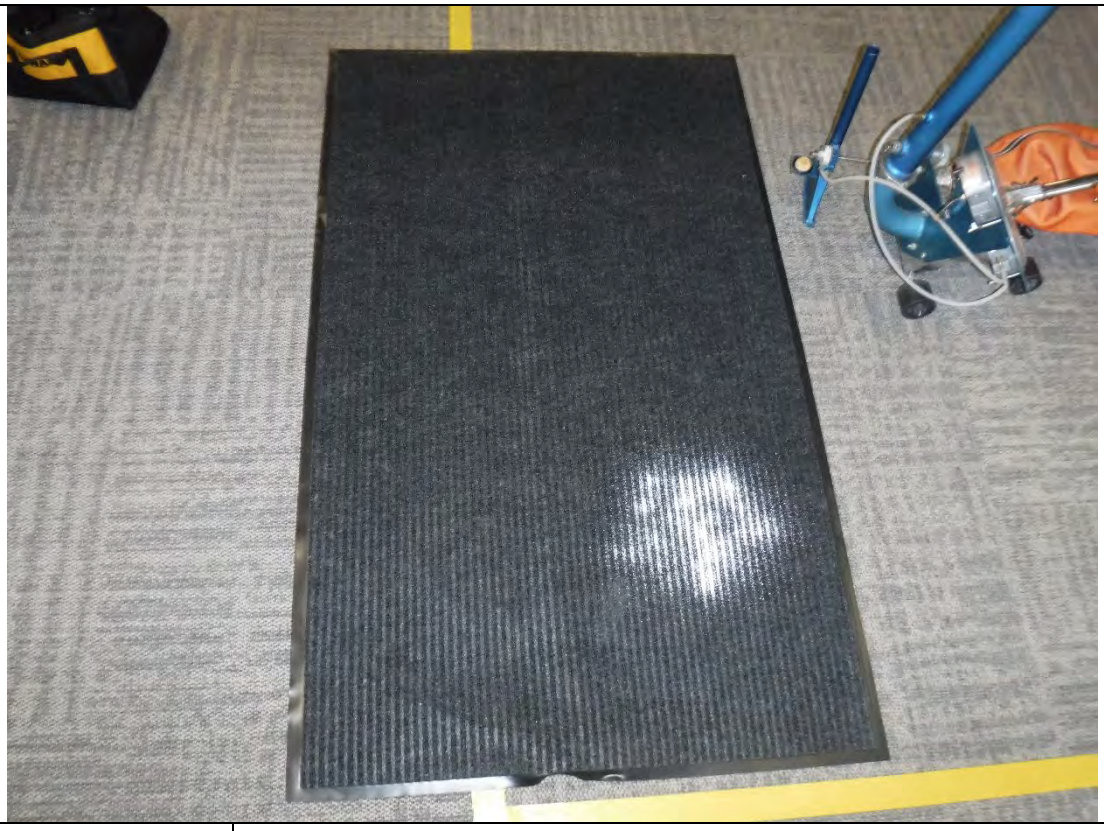
Scale: 1 square = _____

Rite in the Rain.

Photograph: 1682	Floor surface sample, main entrance by front office (S-0013-D-FM-01-20230523).

Photograph: 1683	Floor surface sample, faculty entrance by east parking lot (S-0013-D-FM-02-20230523)

Photograph: 1684	Floor surface sample, back entrance from playground (S-0013-D-FM-03-20230523)



Photograph: 1685	Floor surface sample QA/QC sample.

bp rm

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:**

WO# : 10654887

10654887

Chain of Custody: 20230525-1254-PACE_MPLS-S-0013

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 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 Anulty/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 / Pres: Ambient / SW6020B (arsenic and lead)	N / <6°C / SW7471B (mercury)	N																
1	S-0013-D-FM-01-20230523	05/23/2023	12:15	SDU				G	1	X	X																	001
2	S-0013-D-EB-01-20230523	05/23/2023	12:50	SQ				G	1	X	X																	002
3	S-0013-D-FM-02-20230523	05/23/2023	13:05	SDU				G	1	X	X																	003
4	S-0013-D-FM-02D-20230523	05/23/2023	13:05	SDU				G	1	X	X																	004
5	S-0013-D-FM-03-20230523	05/23/2023	13:35	SDU				G	1	X	X																	005
6	S-0013-D-O-01-20230523	05/23/2023	13:45	SDU				G	1	X	X																	In labeled plastic bag 006

	Relinquished By / Affiliation	Date / Time	Accepted By / Affiliation	Date / Time
Sampler's Name: Nathan Champlin, Tim Wilson				
Sampler's Company: ERM	[signature] / ERM	5/25/2023 2:00:00 PM	[signature] GI/PACE	5/26/23 8:50
Ship Method: Ship Date: 5/25/2023 15:00:00 PM				
Shipment Tracking No: 6092 7234 9350				

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 0.5 °F/C | Trip Blank: Yes / (No) | MS/MSD Sample Submitted: Yes / (No)

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REV_01

emk 06/20/2023

WO# : 10654887

10654887

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:

Chain of Custody: 20230525-1254-PACE_MPLS-S-0013

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	Filt N	Pres Ambient	Pres <6°C	SW6020B (arsenic and lead)	SW7471B (mercury)	Comments
1	S-0013-D-FM-01-20230523	05/23/2023	12:15	SDU				G	1			N	X	X	001
2	S-0013-D-EB-01-20230523	05/23/2023	12:50	SQ				G	1			N	X	X	002
3	S-0013-D-FM-02-20230523	05/23/2023	13:05	SDU				G	1			N	X	X	003
4	S-0013-D-FM-02D-20230523	05/23/2023	13:05	SDU				G	1			N	X	X	004
5	S-0013-D-FM-03-20230523	05/23/2023	13:35	SDU				G	1			N	X	X	005
6	S-0013-D-O-01-20230523	05/23/2023	13:45	SDU				G	1			N	X	X	In labeled plastic bag 006

	Relinquished By / Affiliation	Date / Time	Accepted By / Affiliation	Date / Time
Sampler's Name: Nathan Champlin, Tim Wilson				
Sampler's Company: ERM	[signature] / ERM	5/25/2023 2:00:00 PM	[signature] / PACE	5/26/23 8:50
Ship Method: FEDEX emk 06/20/2023 Ship Date: 5/25/2023 15:00:00 PM				
Shipment Tracking No: 6092 7234 9350				

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 0.5 °F/C | Trip Blank: Yes / (No) | MS/MSD Sample Submitted: Yes / (No)

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DC#_Title: ENV-FRM-MIN4-0149 v08_Sample Condition Upon Receipt (SCUR) - ESI
Effective Date: 4/18/2023

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: BP rm

Project #: WO#: 10654887
PM: JMA Due Date: 06/02/23
CLIENT: BP-ERM-MT

Courier: ☑ FedEx ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: 6092 7234 9350 ☐ See Exceptions ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1 (0461) ☑ T2 (0436) ☐ T3 (0459) ☐ T4 (0402) ☐ T5 (0178) ☐ T6 (0235) ☐ T7 (0042) ☐ T8 (0775) ☐ T9 (0727) ☐ 01339252/1710 **Type of Ice:** ☑ Wet ☐ Blue ☐ Dry ☐ None ☐ Melted

Temp should be above freezing to 6 °C **Cooler temp Read w/Temp Blank:** 0.3 °C
Correction Factor: +0.2 **Cooler Temp Corrected w/temp blank:** 0.5 °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: Solid) **Date/Initials of Person Examining Contents:** BG2 5/26/23

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 ☑ Minneapolis ☐ Virginia				**COMMENTS**
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E.coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other ____
Rush Turn Around Time Requested?	☑ Yes	☐ No		6. 5 Day
Sufficient Sample Volume?	☑ Yes	☐ No		7.
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☐ Yes	☑ No	☒ N/A	JMA 5/26/23
Correct Containers Used?	☑ Yes	☐ No		8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☑ Yes	☐ No		11. **If no, write ID/Date/Time of container below:** ☐ See Exceptions ENV-FRM-MIN4-0142
Matrix: ☐ Water ☐ Soil ☐ Oil ☑ Other Solid				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ 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)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ 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.)	☐ Yes	☐ No	☑ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142
				pH Paper Lot #
				Residual Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): ____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins			
Opened Time: 1340	Temp: 0.3	Corrected Temp: 0.5	
Time: 1358	put in cooler		
Time:	Temp:	Corrected Temp:	

CLIENT NOTIFICATION/RESOLUTION **Field Date Required?** ☐ Yes ☐ No
Person Contacted: ____ Date/Time: ____
Comments/Resolution: ____

Project Manager Review: [signature] **Date:** 05/26/2023

NOTE: Whenever there is a discrepancy affecting 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: ____ **Line:** ____

1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ACKNOWLEDGMENT

Samples Submitted By: BP-ERM-MT
Client Project ID: 0643586 RMAP Interior School
Client PO#:
Invoice Comments: Level 4 data package surcharge included in unit pricing.

Pace Project Manager: Jennifer Anderson
Phone (612)607-6436
jennifer.anderson@pacelabs.com
Pace Analytical Project ID: 10654887
Samples Received: May 26, 2023 08:50 AM
Estimated Completion: June 05, 2023

CC: AR Deliverables ESI,Christopher Berg,Elsie King,Emmy Zartman,Tom Beckman

Customer Sample ID	Pace Analytical Lab ID	Matrix	Date/Time Collected	Method
S-0013-D-FM-01-20230523	10654887001	Solid	05/23/23 12:15	6020B MET ICPMS Arsenic, Lead 7471B Mercury Environmental Impact Fee Level 4 Data Package Metals Digestion Sample Disposal
S-0013-D-EB-01-20230523	10654887002	Solid	05/23/23 12:50	6020B MET ICPMS Arsenic, Lead 7471B Mercury Metals Digestion Sample Disposal
S-0013-D-FM-02-20230523	10654887003	Solid	05/23/23 13:05	6020B MET ICPMS Arsenic, Lead 7471B Mercury Metals Digestion Sample Disposal
S-0013-D-FM-02D-20230523	10654887004	Solid	05/23/23 13:05	6020B MET ICPMS Arsenic, Lead 7471B Mercury Metals Digestion Sample Disposal
S-0013-D-FM-03-20230523	10654887005	Solid	05/23/23 13:35	6020B MET ICPMS Arsenic, Lead 7471B Mercury Metals Digestion Sample Disposal
S-0013-D-O-01-20230523	10654887006	Solid	05/23/23 13:45	6020B MET ICPMS Arsenic, Lead 7471B Mercury Metals Digestion Sample Disposal

Please contact your project manager if you recognize any discrepancy in this form or have any questions about your project.

Thank you for choosing Pace Analytical Services, LLC.

1700 Elm Street, Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ACKNOWLEDGMENT

Analyte List

Customer Sample ID	Method	Compound	Reporting Limit	Units
S-0013-D-FM-01-20230523	6020B MET ICPMS	Arsenic	0.5	mg/kg
		Lead	0.5	mg/kg
	7471B Mercury	Mercury	0.02	mg/kg
S-0013-D-EB-01-20230523	6020B MET ICPMS	Arsenic	0.5	mg/kg
		Lead	0.5	mg/kg
	7471B Mercury	Mercury	0.02	mg/kg
S-0013-D-FM-02-20230523	6020B MET ICPMS	Arsenic	0.5	mg/kg
		Lead	0.5	mg/kg
	7471B Mercury	Mercury	0.02	mg/kg
S-0013-D-FM-02D-20230523	6020B MET ICPMS	Arsenic	0.5	mg/kg
		Lead	0.5	mg/kg
	7471B Mercury	Mercury	0.02	mg/kg
S-0013-D-FM-03-20230523	6020B MET ICPMS	Arsenic	0.5	mg/kg
		Lead	0.5	mg/kg
	7471B Mercury	Mercury	0.02	mg/kg
S-0013-D-O-01-20230523	6020B MET ICPMS	Arsenic	0.5	mg/kg
		Lead	0.5	mg/kg
	7471B Mercury	Mercury	0.02	mg/kg

Please contact your project manager if you recognize any discrepancy in this form or have any questions about your project.

Thank you for choosing Pace Analytical Services, LLC.

SECTION 4

PROJECT CORRESPONDENCE

Amanda Whitney

From: Elsie King <Elsie.King@erm.com>
Sent: Tuesday, June 20, 2023 6:19 PM
To: Amanda Whitney; Leslie Brooks; Thomas Beckman; Christopher Berg
Cc: AR_Deliverables; Lester Dupes; Joe Kraycik; Connor Firor; Brett Dunphy
Subject: RE: Field Documentation Review: AR Indoor - Lincoln Head Start (Event 05232023)
Attachments: 10654887_coc_REV_01.pdf; Field Notebook - Lincoln Floor Mat_Rev01.pdf

Hi Amanda,

Attached are the revised CoC and Field Notebook for the May 2023 Lincoln samples.

Let me know if you have any questions.

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

From: Amanda Whitney <awhitney@envstd.com>
Sent: Tuesday, June 20, 2023 10:36 AM
To: Elsie King <Elsie.King@erm.com>; Leslie Brooks <Leslie.Brooks@erm.com>; Thomas Beckman <thomas.beckman@erm.com>; Christopher Berg <christopher.berg@erm.com>
Cc: AR_Deliverables <AR_Deliverables@envstd.com>; Lester Dupes <ldupes@envstd.com>; Joe Kraycik <jkraycik@envstd.com>; Connor Firor <cfiror@envstd.com>; Brett Dunphy <bdunphy@envstd.com>
Subject: RE: Field Documentation Review: AR Indoor - Lincoln Head Start (Event 05232023)

EXTERNAL MESSAGE

Good afternoon,

I just wanted to follow up on the review noted below. Thanks!

Amanda Whitney
Project Quality Assurance Chemist
Environmental Standards, Inc.

1140 Valley Forge Road • PO Box 810 • Valley Forge, PA 19482
610.935.5577 **x110247**
• www.envstd.com • awhitney@envstd.com

Emergency Response Quality Assurance Hotline: 855.374.7272

From: Amanda Whitney <awhitney@envstd.com>
Sent: Monday, June 12, 2023 11:12 AM
To: Elsie.King@erm.com; Leslie Brooks <Leslie.Brooks@erm.com>; Thomas Beckman <thomas.beckman@erm.com>; Christopher Berg <christopher.berg@erm.com>
Cc: AR_Deliverables <AR_Deliverables@envstd.com>; Lester Dupes <ldupes@envstd.com>; Joe Kraycik <jkraycik@envstd.com>; Connor Firor <cfiror@envstd.com>; Brett Dunphy <bdunphy@envstd.com>
Subject: Field Documentation Review: AR Indoor - Lincoln Head Start (Event 05232023)

Good morning,

During our geoscientist's review of the field documentation for Lincoln Head Start collected 5/23/2023, please review the following comments and provide revisions. I attached the field notebook and COC for reference:

- Shipping Method on CoC is blank
- Sampler should cross out lines that are not used in the filed logbook.

If you have any questions, please don't hesitate to ask. Thanks!

Amanda Whitney
Project Quality Assurance Chemist
Environmental Standards, Inc.
1140 Valley Forge Road • PO Box 810 • Valley Forge, PA 19482
610.935.5577 **x110247**
• www.envstd.com • awhitney@envstd.com

Emergency Response Quality Assurance Hotline: 855.374.7272

STAGE 4 QUALITY ASSURANCE REVIEW

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

DUST SAMPLES COLLECTED ON

MAY 23, 2023

RESIDENT IDENTIFICATION: S-0013

SAMPLE DELIVERY GROUP: 10654887

JUNE 26, 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

TABLE OF CONTENTS

INTRODUCTION

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the samples collected on May 23, 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; February 28, 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, 3rd Edition" (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 (February 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 Number	Sample Delivery Group	Collection Date	Parameters Examined	Stage Validation (2B or 4)
S-0013-D-FM-01-20230523	10654887001	10654887	5/23/23	M, Hg	4
S-0013-D-EB-01-20230523 (Equipment Blank)	10654887002	10654887	5/23/23	M, Hg	4
S-0013-D-FM-02-20230523	10654887003	10654887	5/23/23	M, Hg	4
S-0013-D-FM-02D-20230523 (Field Duplicate of S-0013-D-FM-02-20230523)	10654887004	10654887	5/23/23	M, Hg	4
S-0013-D-FM-03-20230523	10654887005	10654887	5/23/23	M, Hg	4
S-0013-D-O-01-20230523 (Field Blank)	10654887006	10654887	5/23/23	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 (February 2022)
4 - Data Validation in accordance with Section 5.2 of QAPP (February 2022)

SECTION 1 QUALITY ASSURANCE REVIEW

The dust samples were collected on May 23, 2023, as part of the Silver Bow Creek/Butte Area NPL Site, Butte Priority Soils Operable Unit, RMAP sampling event. The samples were collectively shipped in iced coolers to Pace of Minneapolis, Minnesota and analyzed for lead and arsenic by inductively coupled plasma/mass spectrometry (ICP/MS) for digestion and analysis by SW-846 Method 6020B. The dust samples were also analyzed for mercury by Cold Vapor Atomic Absorption (CVAA), for wet digestion and analysis by SW-846 Method 7471B. 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, post-digestion spike 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

- During field documentation review, it was noted that the Chain-of-Custody (COC) Record did not identify the shipment method for the samples. Upon Environmental Standards' request, the COC Record was revised to include the shipment method (see Project Correspondence [Section 6]). Upon client's request, the laboratory provided revised data packages to include the revised COC (see Project Case Narrative and Chain-of-Custody Record [Section 5]).

With regard to data usability, the principal areas of concerns are field duplicate imprecision, high LMS recovery and LMS/LMSD imprecision. 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	5/23/23	884883	6/4/23	Y	N/A
Mercury	Pace – Minneapolis, MN	Dust	SW-846 Method 7471B	28 days from sample collection	5/23/23	885082	6/5/23	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 ≤ 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:

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

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 quantitation limit (QL). The QL is the method detection limit (MDL) as referenced in the QAPP (February 2022). 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 source of the LCS?
Metals: 385717 and 415073
Mercury: 410040
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 reporting limit (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 (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 ☒ N/A ☐
Were any data flagged because of LMS problems? Yes ☒ No ☐ N/A ☐
Was a Post Digestion Spike (PDS) performed? Yes ☒ No ☐
Were PDS percent recovery (%R) results within the control window (75-125%)? Yes ☒ No ☐
Were any data flagged because of PDS problems? Yes ☐ No ☒

Describe Any Actions Taken:

Analytes	SDG	Samples with Estimated Results ("J")
lead and mercury	10654887	S-0013-D-FM-01-20230523, S-0013-D-FM-02-20230523, S-0013-D-FM-02D-20230523, and S-0013-D-FM-03-20230523

Comments:

The reported positive results for the lead in the samples listed above should be considered estimated, biased high, and have been flagged "J" in the qualified EDD. High recoveries (> 125%) were observed in the associated LMS analyses and the PDS was within acceptance limits. Since the sample matrix for field collected blanks (*i.e.*, filter blanks, field blanks, equipment blanks, floor mat blanks) varies from that of field samples, qualification due to LMS/LMSD failures is not applied to field collected blanks.

The reported positive results for mercury and lead in the samples listed above should be considered estimated and have been flagged "J" in the qualified EDD. Large discrepancies (RPD > 20%) were observed in the associated LMS analyses. Since the sample matrix for field collected blanks (*i.e.*, filter blanks, field blanks, equipment blanks, floor mat blanks) varies from that of field samples, qualification due to LMS/LMSD failures is not applied to field collected blanks.

The recovery of the LMS was not evaluated when mercury was present in the native sample at a concentration > 4× the LMS spike concentration.

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:

SD analysis was within method acceptance criteria; the percent difference ≤ 25% when the original undiluted concentration was greater than 50× MDL. The SD analysis was not evaluated when the original undiluted concentrations was less than 50× 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

Were field blanks submitted as specified in the Sampling Analysis Plan (SAP)?
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:

In addition to field blank collection, an equipment blank had also been collection on May 23, 2023. Section 10 was completed in regard to the field blank and the equipment blank.

Qualification of data was not warranted.

12. Field Duplicates

Were field duplicates submitted as specified in the Field Sampling Plan (FSP)?
Yes ☒ No ☐ N/A ☐
Were the field duplicates within the control window? Yes ☐ No ☒ N/A ☐
Were any data qualified because of field duplicate problems? Yes ☒ No ☐ N/A ☐

Describe Any Actions Taken:

Analyte	SDG	Samples with Estimated Results ("J")
lead	10654887	S-0013-D-FM-02-20230523 and S-0013-D-FM-02D-20230523

Comments:

The reported positive results for the analytes in the samples listed above should be considered estimated and have been flagged "J" in the qualified EDD. Field duplicate imprecision (the RPD was > 35% when both results were ≥ 5× the RL, or the difference between results was > 2× the RL when at least one result was < 5× the RL) was observed in the associated field duplicate analysis. Qualification is only associated with the field duplicate and the parent sample. Qualification of all other samples reported 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 (February 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 (February 2022). Level A and Level B acceptance of these data are documented in a separate report.

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 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/Principal
Date: 6/26/23

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

ENVIRONMENTAL STANDARDS

INORGANIC ANALYSIS SUPPORT DOCUMENTATION

Client Name:	Atlantic Richfield	EnvStd Project Manager:	Lester Dupes
Site/Project Name:	2022 RMAP DV and DM	Reviewed by:	Katelyn Kelly
Job Number/Task/Subtask:		Approved by:	Amanda E. Whitney
Laboratory/Location:	Pace Minneapolis	Completion Date:	6/12/23
SDG:	10654887	Validation Level:	4
Sample Collection Dates:	5/23/23		

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

Criteria Examined in Detail

Note: All items examined have been included in the Support Document unless otherwise noted.

Problems Identified

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	√	√												
Others:														

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	
							(5×)	(10×)
			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: ○ Aqueous ◉ Non-aq.
Reporting Level: ◉ MDL ○ QL
Units: mg/kg

PRECISION OBJECTIVES:
If Both Results ≥ 5 × Their QL, RPD ≤: 35
If Either Result < 5 × Its QL, Dif. ≤: 2 **× Highest QL**

Sample ID:	S-0013-D-FM-02-20230523				**Duplicate Sample ID:**	S-0013-D-FM-02D-20230523					
Analyte	**Sample Concentration**	**Qual**	**QL**	**MDL**	**Duplicate Concentration**	**Qual**	**QL**	**MDL**	**Difference**	**RPD**	**Flag**
Arsenic	9	J	2.5	0.71	8.8	J	2.5	0.71	0.2	NA	
Lead	49.7		2.5	0.46	33.5		2.50	0.46	NA	39%	J
Mercury	0.041	J	0.02	0.0086	0.030	J	0.017	0.0075	0.011	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:

SAMPLE NO.

S-0013-D-FM-01-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887001 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7440-38-2	Arsenic	✔ 9.0		mg/kg	5	06/04/2023 19:26
7439-92-1	Lead	64.2		mg/kg	5	06/04/2023 19:26

SAMPLE NO.

S-0013-D-EB-01-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887002 Clean Blank Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7440-38-2	Arsenic	<0.14	U	mg/kg	1	06/04/2023 19:29
7439-92-1	Lead	<0.091	U	mg/kg	1	06/04/2023 19:29

SAMPLE NO.

S-0013-D-FM-02-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887003 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7440-38-2	Arsenic	9.0		mg/kg	5	06/04/2023 19:33
7439-92-1	Lead	✔ 49.7		mg/kg	5	06/04/2023 19:33

SAMPLE NO.

S-0013-D-FM-02D-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887004 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7440-38-2	Arsenic	✔ 8.8		mg/kg	5	06/04/2023 19:42
7439-92-1	Lead	33.5		mg/kg	5	06/04/2023 19:42

SAMPLE NO.

S-0013-D-FM-03-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887005 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7440-38-2	Arsenic	9.3		mg/kg	5	06/04/2023 20:00
7439-92-1	Lead	102		mg/kg	5	06/04/2023 20:00

SAMPLE NO.

S-0013-D-O-01-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887006 Percent Moisture:

Clean Blank

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7440-38-2	Arsenic	<0.14	U	mg/kg	1	06/04/2023 20:04
7439-92-1	Lead	<0.088	U	mg/kg	1	06/04/2023 20:04

FORM II INORGANIC-1

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source: 421955

Continuing Calibration Verification Source: 421955

Concentration Units: ug/L Instrument ID: 10ICMB

	Initial Calibration Verification				Continuing Calibration Verification						
	06/04/2023 15:10				06/04/2023 15:24			06/04/2023 16:36			
Analyte	True	Found	%R	Control Limit	True	Found	%R	True	Found	%R	Control Limit
Arsenic	80	80.3	100.4	90-110	80	80.7	100.9	80	79.7	99.7	90-110
Lead	80 ✔	83.8 ✔	104.8	90-110	80	84.7 No Eval	105.9	80	83.4 No Eval	104.2	90-110

FORM II INORGANIC-2

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source:

Continuing Calibration Verification Source: 421955

Concentration Units: ug/L Instrument ID: 10ICMB

	Continuing Calibration Verification									
	06/04/2023 17:17			06/04/2023 19:14			06/04/2023 19:36			Control Limit
Analyte	True	Found	%R	True	Found	%R	True	Found	%R	
Arsenic	80	79.9	99.9	80	80.8 ✔	101.1	80	81.1	101.4	90-110
Lead	80	83.4	104.3	80	83.3	104.1	80 ✔	84.2	105.2	90-110
		No Eval				✔			✔	

FORM II INORGANIC-3

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source:

Continuing Calibration Verification Source: 421955

Concentration Units: ug/L Instrument ID: 10ICMB

	Continuing Calibration Verification						
	06/04/2023 20:07			06/04/2023 20:48			Control Limit
Analyte	True	Found	%R	True	Found	%R	
Arsenic	80	80.2 ✔	100.2	80	80.7	100.9	90-110
Lead	80	83.2	104.0 ✔	80	83.8	104.8	90-110

No Eval

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 421957 Analysis Date/Time: 06/04/2023 16:43

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Arsenic	0.5	0.49	97.2 ✔	80-120
Lead	0.5	0.51	102.6 ✔	80-120

70-130

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 421957 Analysis Date/Time: 06/04/2023 20:13

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Arsenic	0.5	0.48	96.9 ✔	80-120
Lead	0.5	0.51	102.7 ✔	80-120

70-130

FORM III INORGANIC-1

BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 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	
	06/04/2023 15:14	C	06/04/2023 15:27	C	06/04/2023 16:38	C	06/04/2023 17:19	C	4661432	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	<0.086	U
	Clean Blank		No Eval		No Eval		No Eval		Clean Blank	

FORM III INORGANIC-2

BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 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	06/04/2023 19:17	C	06/04/2023 19:39	C	06/04/2023 20:10	C
Arsenic			0.14	U	0.14	U	0.14	U
Lead			0.093	U	0.093	U	0.093	U

Clean Blank

FORM III INORGANIC-3

BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 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	06/04/2023 20:51	C		C		C
Arsenic			0.14	U				
Lead			0.093	U				

No Eval

FORM IV INORGANIC-1
INTERFERENCE CHECK SAMPLE

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Instrument ID: 10ICMB Solution A Run Date: 06/04/2023 15:17

ICS Source: 420293,420294 Solution AB Run Date: 06/04/2023 15:21

Concentration Units: ug/L

Analyte	True		Found				
	Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R	Limits
Aluminum	25000	27500	25163.241	100.7	27427.864	99.7	80-120
Arsenic		100	0.0102		104.5771	104.6	80-120
Calcium	25000	27500	24460.846	97.8	26983.056	98.1	80-120
Iron	25000	26250	25494.397	102	26874.354	102.4	80-120
Lead		100	0.0312		106.5206	106.5	80-120
Magnesium	25000	27500	25092.856	100.4	27380.452	99.6	80-120
Molybdenum	500	600	528.9576	105.8	639.5173	106.6	80-120
Potassium	25000	27500	24739.500	99	27612.196	100.4	80-120
Sodium	25000	27500	25335.084	101.3	27863.700	101.3	80-120
Titanium	500	600	509.8743	102	618.5473	103.1	80-120

85-115

SAMPLE NO.

4661435MS

FORM V INORGANIC-1

MATRIX SPIKE SAMPLE RECOVERY

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid Basis: Wet Parent Sample ID: S-0013-D-FM-02D-20230523

Percent Moisture:

Analyte	Units	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R
Arsenic	mg/kg	75-125	64.4	8.8	49.1 ✔	113
Lead	mg/kg	75-125	112	33.5	49.1 ✔	160*

75-125

J,4H
Pb 1,3,4,5
PDS passes

* Spike Recovery outside QC Limits

SAMPLE NO.

4661436MSD

FORM V INORGANIC-2

MATRIX SPIKE SAMPLE RECOVERY

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid Basis: Wet Parent Sample ID: S-0013-D-FM-02D-20230523

Percent Moisture:

Analyte	Units	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R
Arsenic	mg/kg	75-125	55.7	8.8	49.1 ✔	96
Lead	mg/kg	75-125	83.5	33.5	49.1 ✔	102

75-125

SAMPLE NO.

4662677PDS

FORM V INORGANIC-1

POST-DIGESTION SPIKE SAMPLE RECOVERY

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Matrix: Solid Parent Sample ID: S-0013-D-FM-02D-20230523

Analyte	Units	Control Limit %R	DF	Spiked Sample Result (SSR)	DF	Sample Result (SR)	Spike Added (SA)	%R
Arsenic	ug/L	80-120	5	89.4	5	2.9U	80	111.8
Lead	ug/L	80-120	5	97.9	5	6.7J	80	114.0

75-125

SAMPLE NO.

4661434DUP

FORM VI INORGANIC-1
DUPLICATES

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: mg/kg

Percent Moisture: Basis: Wet

Analyte	RPD Control Limit	Sample	Duplicate	RPD
Arsenic	20	8.8	9.0	2
Lead	20	33.5	34.6	3

SAMPLE NO.

4661436MSD

FORM VI INORGANIC-2
DUPLICATES

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: mg/kg

Percent Moisture: _____ Basis: Wet

Analyte	RPD Control Limit	Sample	Duplicate	RPD
Arsenic	20	64.4	55.7	14
Lead	20	112	83.5	29*

J,5
all field samples

* RPD outside QC Limits

SAMPLE NO.

4661433LCS

FORM VII INORGANIC-1
LABORATORY CONTROL SAMPLE

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid

Analyte	Units	True	Found	%R	Limits	
Arsenic	mg/kg	48.9	50.1	102	80	120
Lead	mg/kg	48.9	53.2	109	80	120

70-130

SAMPLE NO.

4662678SD

FORM VIII INORGANIC-1
SERIAL DILUTIONS

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Matrix: Solid Parent Sample ID: S-0013-D-FM-02D-20230523

Analyte	Units	Initial Sample Result	Serial Dilution Result	% Difference	Control Limit %D
Arsenic	ug/L	2.9U	14.3U	No Eval	10
Lead	ug/L	6.7J	9.3U	< RL	25

* 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. : 10654887 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. : 10654887 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. : 10654887 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. : 10654887 Contract: 0643586 RMAP Interior School

Preparation Method: EPA 3050B Batch: MPRP 134419

Lab Sample ID	Sample Name	Preparation Date	Initial Weight (g)	Final Volume (mL)
4661432	4661432	06/02/2023	1.082	50
4661433	4661433	06/02/2023	1.022	50
4661434	4661434	06/02/2023	1.005	50
4661435	4661435	06/02/2023	1.019	50
4661436	4661436	06/02/2023	1.019	50
10654887001	S-0013-D-FM-01-20230523	06/02/2023	1.055	50
10654887002	S-0013-D-EB-01-20230523	06/02/2023	1.025	50
10654887003	S-0013-D-FM-02-20230523	06/02/2023	1.006	50
10654887004	S-0013-D-FM-02D-20230523	06/02/2023	1.005	50
10654887005	S-0013-D-FM-03-20230523	06/02/2023	1.053	50
10654887006	S-0013-D-O-01-20230523	06/02/2023	1.052	50

FORM XIII INORGANIC-1
ANALYSIS RUN LOG

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Instrument ID: 10ICMB Analysis Method: EPA 6020B

Start Date: 06/04/2023 14:39 End Date: 06/04/2023 20:51

Sample Name	Lab Sample ID	D/F	Date	Time	As	Pb
32689957CAL0	32689957CAL0	1	06/04/2023	14:39	X	X
32689958CAL2	32689958CAL2	1	06/04/2023	14:46	X	X
32689959CAL1	32689959CAL1	1	06/04/2023	14:50	X	X
32689960CAL3	32689960CAL3	1	06/04/2023	14:54	X	X
32689961CAL4	32689961CAL4	1	06/04/2023	14:57	X	X
32689962CAL5	32689962CAL5	1	06/04/2023	15:01	X	X
32689963CAL6	32689963CAL6	1	06/04/2023	15:04	X	X
32689964CAL7	32689964CAL7	1	06/04/2023	15:07	X	X
32689965ICV	32689965ICV	1	06/04/2023	15:10	X	X
32689966ICB	32689966ICB	1	06/04/2023	15:14	X	X
32689967ICSA	32689967ICSA	1	06/04/2023	15:17	X	X
32689968ICSAB	32689968ICSAB	1	06/04/2023	15:21	X	X
32689969CCV	32689969CCV	1	06/04/2023	15:24	X	X
32689970CCB	32689970CCB	1	06/04/2023	15:27	X	X
32689985CCV	32689985CCV	1	06/04/2023	16:36	X	X
32689986CCB	32689986CCB	1	06/04/2023	16:38	X	X
32689987CRDL	32689987CRDL	1	06/04/2023	16:43	X	X
32689988CCV	32689988CCV	1	06/04/2023	17:17	X	X
32689989CCB	32689989CCB	1	06/04/2023	17:19	X	X
32690002CCV	32690002CCV	1	06/04/2023	19:14	X	X
32690003CCB	32690003CCB	1	06/04/2023	19:17	X	X
4661432BLANK	4661432	1	06/04/2023	19:20	X	X
4661433LCS	4661433	1	06/04/2023	19:23	X	X
S-0013-D-FM-01-20230523	10654887001	5	06/04/2023	19:26	X	X
S-0013-D-EB-01-20230523	10654887002	1	06/04/2023	19:29	X	X
S-0013-D-FM-02-20230523	10654887003	5	06/04/2023	19:33	X	X
32690006CCV	32690006CCV	1	06/04/2023	19:36	X	X
32690007CCB	32690007CCB	1	06/04/2023	19:39	X	X
S-0013-D-FM-02D-20230523	10654887004	5	06/04/2023	19:42	X	X
4662677PDS	4662677	5	06/04/2023	19:45	X	X
4662678SD	4662678	25	06/04/2023	19:48	X	X
4661434DUP	4661434	5	06/04/2023	19:51	X	X
4661435MS	4661435	5	06/04/2023	19:54	X	X
4661436MSD	4661436	5	06/04/2023	19:57	X	X
S-0013-D-FM-03-20230523	10654887005	5	06/04/2023	20:00	X	X
S-0013-D-O-01-20230523	10654887006	1	06/04/2023	20:04	X	X
32690013CCV	32690013CCV	1	06/04/2023	20:07	X	X
32690014CCB	32690014CCB	1	06/04/2023	20:10	X	X
32690015CRDL	32690015CRDL	1	06/04/2023	20:13	X	X
32690016CCV	32690016CCV	1	06/04/2023	20:48	X	X
32690017CCB	32690017CCB	1	06/04/2023	20:51	X	X

US EPA 200.8/6020 Tune Check Report

Acq/Data Batch	C:\Agilent\ICPMH\1\DATA\060423.b
Report Comment	10ICMB NN2
Instrument Name	G8421A JP16120262

[He]

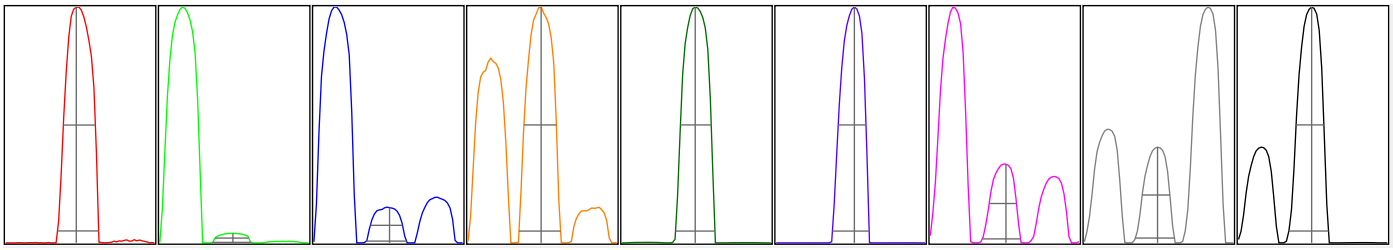
Sensitivity

Mass	Count	RSD%	RSD%(Rqd)	RSD%(Flag)
9	172	1.807 ✔	5.000	
24	1095	0.348	5.000	
25	163	2.537 ✔	5.000	
26	209	1.424	5.000	
59	21490	0.710	5.000	
115	20813	1.036	5.000	
206	8821	1.582	5.000	
207	7438	1.481	5.000	
208	18489	1.123	5.000	

Rep#1 Count	Rep#2 Count	Rep#3 Count	Rep#4 Count	Rep#5 Count
172	173	175	172	166
1096	1090	1100	1093	1096
165	159	168	159	166
210	212	210	207	205
21580	21650	21524	21441	21254
21018	20983	20839	20741	20483
8945	8957	8849	8702	8651
7562	7473	7503	7358	7292
18724	18596	18584	18290	18250

Integration Time [sec] 0.1

Resolution/Axis



Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)	W-5%	W-5% (Required)	W-5% (Flag)
9	282.78	8.95	8.90 - 9.10		0.817	0.900	
24	1774.21	24.00	23.90 - 24.10		0.774	0.900	
25	263.98	25.05	24.90 - 25.10		0.799	0.900	
26	343.50	26.00	25.90 - 26.10		0.825	0.900	
59	36529.92	59.00	58.90 - 59.10		0.782	0.900	
115	39144.95	115.10	114.90 - 115.10		0.729	0.900	
206	16582.47	206.05	205.90 - 206.10		0.762	0.900	
207	13998.75	207.00	206.90 - 207.10		0.777	0.900	
208	34498.10	208.00	207.90 - 208.10		0.786	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 C:\Agilent\ICPMH\1\DATA\060423.b
Report Comment 10ICMB NN2
Instrument Name G8421A JP16120262

[H2]

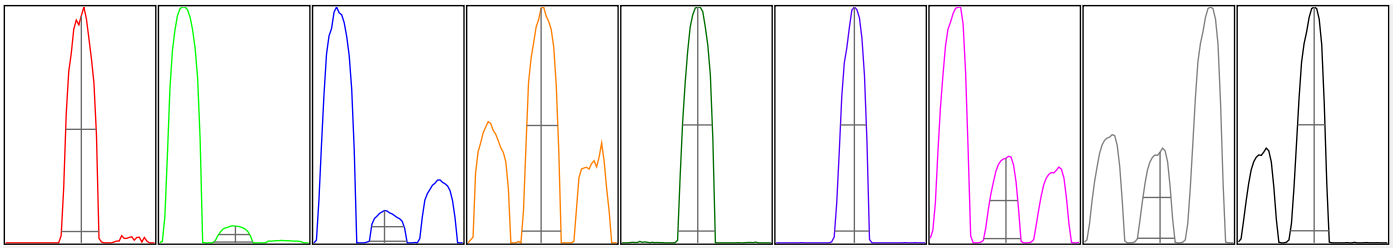
Sensitivity

Mass	Count	RSD%	RSD%(Rqd)	RSD%(Flag)
9	29	3.706	5.000	
24	70	3.861	5.000	
25	10	2.959	5.000	
26	19	3.738	5.000	
59	145	0.814	5.000	
115	131	2.259	5.000	
206	89	0.469	5.000	
207	77	2.543	5.000	
208	192	1.933	5.000	

Rep#1 Count	Rep#2 Count	Rep#3 Count	Rep#4 Count	Rep#5 Count
29	27	30	29	28
72	71	73	66	69
10	10	10	10	10
19	19	18	19	19
144	146	146	146	144
130	131	128	128	135
88	89	89	88	89
77	80	77	75	75
195	191	187	196	189

Integration Time [sec] 0.1

Resolution/Axis



Mass	Peak Height	Axis	Axis (Required)	Axis (Flag)	W-5%	W-5% (Required)	W-5% (Flag)
9	50.35	9.05	8.90 - 9.10		0.742	0.900	
24	119.11	24.05	23.90 - 24.10		0.778	0.900	
25	16.75	24.95	24.90 - 25.10		0.744	0.900	
26	32.45	26.00	25.90 - 26.10		0.775	0.900	
59	257.98	59.05	58.90 - 59.10		0.737	0.900	
115	266.38	115.10	114.90 - 115.10		0.687	0.900	
206	163.56	206.05	205.90 - 206.10		0.738	0.900	
207	140.41	207.05	206.90 - 207.10		0.739	0.900	
208	364.91	208.05	207.90 - 208.10		0.763	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. : 10654887 Contract: 0643586 RMAP Interior School

Instrument ID: 10ICMB Start Date: 06/04/2023 14:39 End Date: 06/04/2023 20:51

Sample Name	Time	GE-72	Ge-72-IS1	In-115	Ir-193-IS	Sc-45-IS	Sc-45-IS1	Tb-159
32689957CAL0	14:39	100.0	100.0	100.0	100.0	100.0	100.0	100.0
32689958CAL2	14:46	95.7	96.4	96.5	97.2	93.6	94.8	95.5
32689959CAL1	14:50	94.2	94.8	94.3	96.4	90.9	91.4	96.3
32689960CAL3	14:54	92.4	91.3	93.4	95.0	88.8	88.5	94.8
32689961CAL4	14:57	90.1	92.7	90.7	93.1	85.5	87.9	93.9
32689962CAL5	15:01	88.3	92.0	89.0	91.6	85.5	86.9	93.5
32689963CAL6	15:04	88.9	90.6	88.0	91.0	86.9	89.2	92.7
32689964CAL7	15:07	88.6	89.9	88.3	89.4	87.4	92.4	93.7
32689965ICV	15:10	94.0	95.7	95.7	98.1	88.4	89.4	97.8
32689966ICB	15:14	90.8	91.0	94.9	99.4	86.0	86.1	96.2
32689967ICSA	15:17	90.9	91.5	91.5	93.9	87.7	90.6	95.2
32689968ICSAB	15:21	88.9	89.7	89.5	93.4	86.5	89.4	95.6
32689969CCV	15:24	92.8	92.4	96.3	99.3	87.0	87.0	98.4
32689970CCB	15:27	89.4	89.9	94.0	100.2	84.0	85.2	97.0
32689985CCV	16:36	93.6	95.0	93.4	92.6	90.0	87.8	93.5
32689986CCB	16:38	90.4	91.1	93.7	94.4	86.0	86.3	93.3
32689987CRDL	16:43	90.4	93.4	92.7	93.7	85.7	85.1	93.9
32689988CCV	17:17	87.8	88.2	90.6	94.0	81.6	80.7	93.3
32689989CCB	17:19	89.3	91.0	92.9	96.4	84.2	84.6	94.8
32690002CCV	19:14	88.9	83.8	91.1	93.7	84.0	78.3	94.2
32690003CCB	19:17	86.9	83.5	90.4	93.8	80.8	79.3	92.8
4661432	19:20	86.0	80.6	90.2	94.5	81.1	78.0	92.8
4661433	19:23	88.1	84.7	90.5	93.6	82.8	79.5	92.9
S-0013-D-FM-01-	19:26	88.1	85.0	90.3	92.2	81.7	79.0	91.9
S-0013-D-EB-01-	19:29	85.0	81.7	89.3	92.9	79.8	76.5	92.1
S-0013-D-FM-02-	19:33	88.6	84.9	91.6	92.8	82.9	78.7	93.4
32690006CCV	19:36	88.0	83.2	90.8	92.7	82.6	79.2	92.9
32690007CCB	19:39	87.8	83.9	91.0	94.0	82.5	77.5	92.8
S-0013-D-FM-02D-	19:42	88.5	85.9	90.9	93.9	83.1	79.2	94.6
4662677	19:45	88.0	80.5	89.2	93.1	82.0	77.2	93.4
4662678	19:48	87.9	82.6	91.2	95.1	82.5	78.7	93.9
4661434	19:51	87.7	82.2	89.6	93.2	82.5	77.5	92.8
4661435	19:54	87.4	82.3	90.3	93.2	81.3	77.6	93.2
4661436	19:57	87.4	81.9	90.2	93.7	81.5	76.7	93.1
S-0013-D-FM-03-	20:00	87.4	82.6	90.5	93.6	81.8	77.7	92.4
S-0013-D-O-01-	20:04	85.8	79.0	89.3	95.0	79.8	75.3	92.4
32690013CCV	20:07	87.5	80.6	90.7	94.4	81.7	77.1	93.0
32690014CCB	20:10	87.1	81.3	91.2	94.7	81.3	76.2	92.4
32690015CRDL	20:13	86.7	79.4	90.2	94.7	80.9	76.5	93.3
32690016CCV	20:48	86.3	77.9	89.2	95.5	79.2	73.4	94.3

06/06/2023 12:24

FORM XV INORGANIC-2

INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Instrument ID: 10ICMB Start Date: 06/04/2023 14:39 End Date: 06/04/2023 20:51

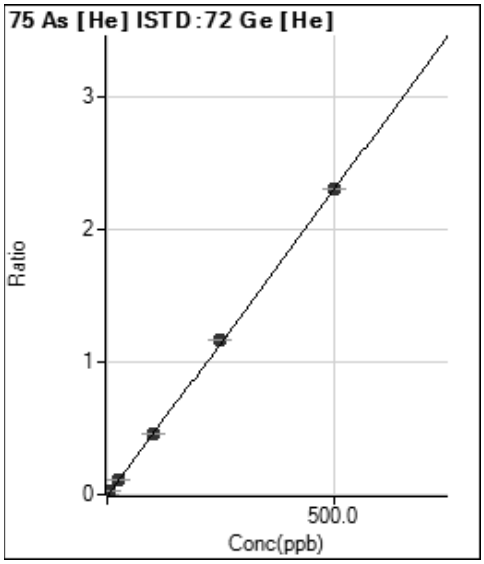
Sample Name	Time	GE-72	Ge-72-IS1	In-115	Ir-193-IS	Sc-45-IS	Sc-45-IS1	Tb-159
32690017CCB	20:51	86.4	79.8	90.8	96.6	79.8	74.9	93.2

Calibration for 013CALS.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\060423a.b\
Analysis File: 060423a.batch.bin
DA Date-Time: 6/5/2023 07:24:47
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	009CALB.d	CAL 0	6/4/2023 14:39:00
2	012CALS.d	CAL 1	6/4/2023 14:50:32
3	011CALS.d	CAL 2	6/4/2023 14:46:48
4	013CALS.d	CAL 3	6/4/2023 14:54:10
5	014CALS.d	CAL 4	6/4/2023 14:57:46
6	015CALS.d	CAL 5	6/4/2023 15:01:11
7	016CALS.d	CAL 6	6/4/2023 15:04:18
8	017CALS.d	CAL 7	6/4/2023 15:07:30

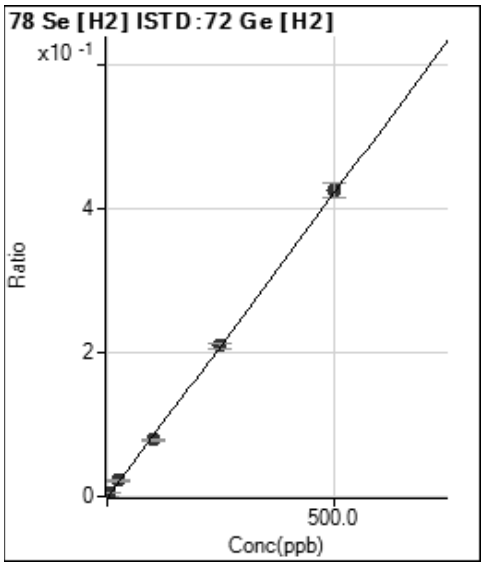
Calibration for 013CALS.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD	%RE
1	☐	0.0000	0.0000	57.67	0.0001	P	16.0	
2	☐	0.5000	0.4968	1126.38	0.0024	P	2.9	-0.6
3	☐	5.0000	5.0642	11158.93	0.0236	P	1.3	1.3
4	☐	25.0000	25.0260	53069.64	0.1160	P	0.3	0.1
5	☐	100.0000	99.8643	206300.42	0.4627	P	0.5	-0.1
6	☐	250.0000	252.3967	510992.40	1.1693	P	0.5	1.0
7	☐	500.0000	498.8268	1015830.54	2.3108	P	0.3	-0.2
8	☐			381.34	0.0009	P	4.0	

y = 0.0046 * x + 1.1654E-004
R = 1.0000
DL = 0.0121 ppb
BEC = 0.02516 ppb

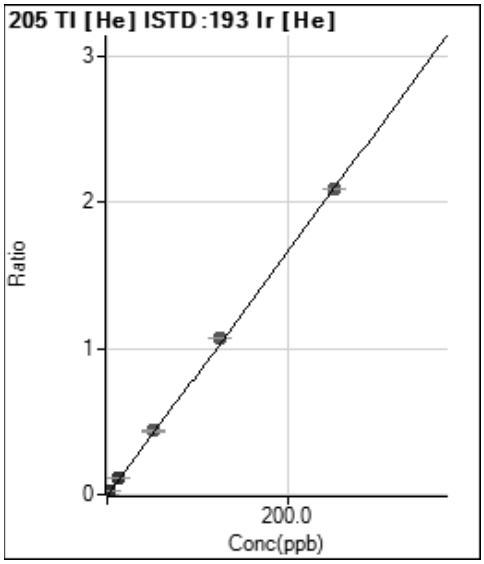
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD	%RE
1	☐	0.0000	0.0000	0.33	0.0001	P	173.	
2	☐	0.5000	0.7491	3.00	0.0007	P	33.1	49.8
3	☐	5.0000	5.4167	20.00	0.0047	P	24.6	8.3
4	☐	25.0000	25.7611	89.33	0.0219	P	22.3	3.0
5	☐	100.0000	93.0128	326.33	0.0789	P	3.1	-7.0
6	☐	250.0000	247.7384	862.70	0.2101	P	3.6	-0.9
7	☐	500.0000	502.4858	1721.11	0.4260	P	5.0	0.5
8	☐			2.67	0.0007	P	81.9	

y = 8.4773E-004 * x + 7.3506E-005
R = 0.9999
DL = 0.4506 ppb
BEC = 0.08671 ppb

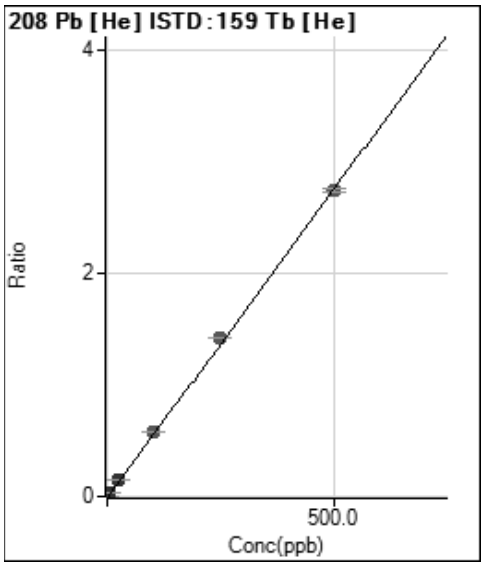
Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD	%RE
1	☐	0.0000	0.0000	90.00	0.0000	P	46.7	
2	☐	0.1000	0.1031	4460.80	0.0009	P	3.5	3.1
3	☐	2.5000	2.5535	109258.31	0.0215	P	1.3	2.1
4	☐	12.5000	12.8621	537315.38	0.1081	P	1.8	2.9
5	☐	50.0000	51.7623	2120094.86	0.4351	A	0.7	3.5
6	☐	125.0000	127.3907	5130252.95	1.0708	A	0.8	1.9
7	☐	250.0000	248.4336	9937586.73	2.0882	A	0.4	-0.6
8	☐			2081.85	0.0004	P	8.2	

y = 0.0084 * x + 1.7254E-005
R = 0.9999
DL = 0.002877 ppb
BEC = 0.002053 ppb

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD	%RE
1	☐	0.0000	0.0000	1185.03	0.0001	P	1.8	
2	☐	0.5000	0.5108	29176.37	0.0029	P	0.5	2.2
3	☐	5.0000	5.3996	295001.42	0.0300	P	0.6	8.0
4	☐	25.0000	26.6593	1440675.28	0.1478	P	0.8	6.6
5	☐	100.0000	104.5649	5599361.35	0.5795	A	0.7	4.6
6	☐	250.0000	256.7093	13672890.84	1.4224	A	0.7	2.7
7	☐	500.0000	495.6454	26196402.73	2.7463	A	0.9	-0.9
8	☐			12819.24	0.0013	P	3.9	

y = 0.0055 * x + 1.1521E-004
R = 0.9998 ✔
DL = 0.001099 ppb
BEC = 0.02079 ppb

Weight: <None>
Min Conc: <None>

Prep Log Report

Batch Information: MPRP 884669 6020B S

3050B | ICP_ICPMS Soil

Prep Method	EPA 3050B	Analysis Method	EPA 6020B	Prepared By	MT2	Instrument	10BL03
Block ID	10MET04	Thermometer ID	210772118	Correction Factor (C)	-0.7	Block Temp (C)	93.7
Corrected Temp. (C)	93.00	Digestion Start Date/Time	06/02/2023 12:30:20:965	Digestion End Date/Time	06/02/2023 14:35:35:696	Block End Temp (C)	96
Corrected End Temp. (C)	95.30	Digestion Vessel	418906	Resin Pellets Solid Matrix	417697	Metals Pipette 1	Q896
Metals Pipette 2		Dispenser ID 1	Q902	Dispenser ID 2	Q897	Dispenser ID 3	Q452
Reviewed By	NJ1	Reviewed By Date	06/02/2023 14:37	Batch Notes			

Sample Information:

QC Rule	Sample Type	Lab Sample ID	Matrix	Initial Weight (g)	Conc. HNO3 (L)	H2O2 (L)	Conc. HCL (mL)	Final Volume (mL)	Sample Notes	Hg-SPK (mL)	METALS-STK1 (mL)	METALS-STK2 (mL)
6020BS_P	BLANK	**4661432**	Solid	1.082	411917 (7.5)	385316 (2.5)	417132 (5)	50				
6020BS_P	LCS	**4661433**	Solid	1.022	411917 (7.5)	385316 (2.5)	417132 (5)	50		408636 (0.5)	385717 (.5)	415073 (.5)
6020BS_P	PS	**10654887001**	Solid	1.055	411917 (7.5)	385316 (2.5)	417132 (5)	50				
6020BS_P	PS	**10654887002**	Solid	1.025	411917 (7.5)	385316 (2.5)	417132 (5)	50				
6020BS_P	PS	**10654887003**	Solid	1.006	411917 (7.5)	385316 (2.5)	417132 (5)	50				
6020BS_P	PS	**10654887004**	Solid	1.005	411917 (7.5)	385316 (2.5)	417132 (5)	50				
6020BS_P	DUP	**4661434**	Solid	1.005	411917 (7.5)	385316 (2.5)	417132 (5)	50				
6020BS_P	MS	**4661435**	Solid	1.019	411917 (7.5)	385316 (2.5)	417132 (5)	50		408636 (0.5)	385717 (.5)	415073 (.5)
6020BS_P	MSD	**4661436**	Solid	1.019	411917 (7.5)	385316 (2.5)	417132 (5)	50		408636 (0.5)	385717 (.5)	415073 (.5)
6020BS_P	PS	**10654887005**	Solid	1.053	411917 (7.5)	385316 (2.5)	417132 (5)	50				
6020BS_P	PS	**10654887006**	Solid	1.052	411917 (7.5)	385316 (2.5)	417132 (5)	50				

Standard Notes:

385717: ZPACEMN-116 (MIX 1)

408636: Intermediate Spike for ICPMS Soil

415073: ZPACEMN-106

SAMPLE NO.

S-0013-D-FM-01-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887001 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7439-97-6	Mercury	✔ 2.4		mg/kg	5	06/05/2023 13:25

SAMPLE NO.

S-0013-D-EB-01-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887002 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7439-97-6	Mercury	<0.0074	U	mg/kg	1	06/05/2023 12:26

Clean Blank

SAMPLE NO.

S-0013-D-FM-02-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887003 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7439-97-6	Mercury	0.041		mg/kg	1	06/05/2023 12:27

SAMPLE NO.

S-0013-D-FM-02D-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887004 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7439-97-6	Mercury	0.030		mg/kg	1	06/05/2023 12:32

SAMPLE NO.

S-0013-D-FM-03-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887005 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7439-97-6	Mercury	0.093		mg/kg	1	06/05/2023 12:34

SAMPLE NO.

S-0013-D-O-01-20230523

FORM I INORGANIC-1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Lab Sample ID: 10654887006 Percent Moisture:

CAS No.	Analyte	Concentration	Q	Units	DF	Analysis Date/Time
7439-97-6	Mercury	<0.0084	U	mg/kg	1	06/05/2023 12:36

Clean Blank

FORM II INORGANIC-1

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source: 422141

Continuing Calibration Verification Source: 422141

Concentration Units: ug/L Instrument ID: 10HG09

85-115

	Initial Calibration Verification				Continuing Calibration Verification						
	06/05/2023 12:02				06/05/2023 12:29			06/05/2023 12:39			
Analyte	True	Found	%R	Control Limit	True	Found	%R	True	Found	%R	Control Limit
Mercury	5.0	5.1 ✔	102.2	90-110	5.0	5.0 ✔	100.6	5.0	5.0 ✔	100.4	90-110

FORM II INORGANIC-2

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source:

Continuing Calibration Verification Source: 422141

Concentration Units: ug/L Instrument ID: 10HG09

85-115

	Continuing Calibration Verification									
	06/05/2023 13:07			06/05/2023 13:22			06/05/2023 14:46			Control Limit
Analyte	True	Found	%R	True	Found	%R	True	Found	%R	
Mercury	5.0	5.0	99.4	5.0	4.9 ✔	98.4	5.0	4.8 ✔	96.2	90-110

No Eval

FORM II INORGANIC-3

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Initial Calibration Verification Source:

Continuing Calibration Verification Source: 422141

Concentration Units: ug/L Instrument ID: 10HG09

85-115

	Continuing Calibration Verification						
	06/05/2023 15:02			06/05/2023 15:19			Control Limit
Analyte	True	Found	%R	True	Found	%R	
Mercury	5.0	4.8	96.8	5.0	4.9	97.2	90-110

No Eval

No Eval

FORM II INORGANIC-1
CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 422136,422151 Analysis Date/Time: 06/05/2023 12:06

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Mercury	0.2	0.20	100.0 ✔	70-130

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 422136,422151 Analysis Date/Time: 06/05/2023 12:37

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Mercury	0.2	0.20	100.0 ✔	70-130

FORM II INORGANIC-1

CRDL CHECK STANDARD

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 422136,422151 Analysis Date/Time: 06/05/2023 13:20

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. : 10654887 Contract: 0643586 RMAP Interior School

CRDL Check Standard Source: 422136,422151 Analysis Date/Time: 06/05/2023 15:17

Concentration Units: ug/L

Analyte	CRDL Check Standard			
	True	Found	%R	Control Limit %R
Mercury	0.2	0.20	100.0 ✔	70-130

FORM III INORGANIC-1

BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 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	
	06/05/2023 12:04	C	06/05/2023 12:31	C	06/05/2023 12:40	C	06/05/2023 13:09	C	4659862	C
Mercury	0.087	U	0.087	U	0.087	U	0.087	U	<0.0078	U

Clean Blank Clean Blank No Eval Clean Blank

FORM III INORGANIC-2

BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 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	06/05/2023 13:24	C	06/05/2023 14:48	C	06/05/2023 15:04	C
Mercury			0.087	U	0.087	U	0.087	U

Clean Blank

No Eval

FORM III INORGANIC-3

BLANKS

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 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	06/05/2023 15:20	C		C		C
Mercury			0.087	U				

Clean Blank

SAMPLE NO.

4659865MS

FORM V INORGANIC-1

MATRIX SPIKE SAMPLE RECOVERY

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid Basis: Wet Parent Sample ID: S-0013-D-FM-01-20230523

Percent Moisture:

Analyte	Units	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R
Mercury	mg/kg	80-120	2.3	2.4	0.44	-19*
		75-125				sample > 4x spike, no eval

* Spike Recovery outside QC Limits

SAMPLE NO.

4659866MSD

FORM V INORGANIC-2

MATRIX SPIKE SAMPLE RECOVERY

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid Basis: Wet Parent Sample ID: S-0013-D-FM-01-20230523

Percent Moisture:

Analyte	Units	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R
Mercury	mg/kg	80-120	5.1	2.4	0.47	559*
		75-125		sample > 4x spike, no eval		

* Spike Recovery outside QC Limits

SAMPLE NO.

FORM VI INORGANIC-1
DUPLICATES

4659864DUP

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: mg/kg

Percent Moisture: Basis: Wet

Analyte	RPD Control Limit	Sample	Duplicate	RPD
Mercury	20	2.4	2.4	3 ✔

SAMPLE NO.

4659866MSD

FORM VI INORGANIC-2
DUPLICATES

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid Concentration Units: mg/kg

Percent Moisture: _____ Basis: Wet

Analyte	RPD Control Limit	Sample	Duplicate	RPD
Mercury	20	2.3	5.1	74*

J/no flag, 5

* RPD outside QC Limits

SAMPLE NO.

4659863LCS

FORM VII INORGANIC-1
LABORATORY CONTROL SAMPLE

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior

Matrix: Solid

Analyte	Units	True	Found	%R	Limits	
Mercury	mg/kg	0.49	0.49 ✔	101	80	120

70-130

FORM IX INORGANIC-1
INSTRUMENT DETECTION LIMITS

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 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. : 10654887 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. : 10654887 Contract: 0643586 RMAP Interior School

Preparation Method: EPA 7471B Batch: MERP 40639

Lab Sample ID	Sample Name	Preparation Date	Initial Weight (g)	Final Volume (mL)
4659862	4659862	06/02/2023	0.333	30
4659863	4659863	06/02/2023	0.307	30
4659864	4659864	06/02/2023	0.319	30
4659865	4659865	06/02/2023	0.342	30
4659866	4659866	06/02/2023	0.318	30
10654887001	S-0013-D-FM-01-20230523	06/02/2023	0.319	30
10654887002	S-0013-D-EB-01-20230523	06/02/2023	0.352	30
10654887003	S-0013-D-FM-02-20230523	06/02/2023	0.303	30
10654887004	S-0013-D-FM-02D-20230523	06/02/2023	0.349	30
10654887005	S-0013-D-FM-03-20230523	06/02/2023	0.301	30
10654887006	S-0013-D-O-01-20230523	06/02/2023	0.311	30

FORM XIII INORGANIC-1
ANALYSIS RUN LOG

Lab Name: Pace Analytical - Minnesota SDG No. : 10654887 Contract: 0643586 RMAP Interior School

Instrument ID: 10HG09 Analysis Method: EPA 7471B

Start Date: 06/05/2023 11:53 End Date: 06/05/2023 15:20

Sample Name	Lab Sample ID	D/F	Date	Time	Hg
32696510CAL0	32696510CAL0	1	06/05/2023	11:53	X
32696511CAL1	32696511CAL1	1	06/05/2023	11:54	X
32696512CAL2	32696512CAL2	1	06/05/2023	11:56	X
32696513CAL3	32696513CAL3	1	06/05/2023	11:57	X
32696514CAL4	32696514CAL4	1	06/05/2023	11:59	X
32696515CAL5	32696515CAL5	1	06/05/2023	12:01	X
32696516ICV	32696516ICV	1	06/05/2023	12:02	X
32696517ICB	32696517ICB	1	06/05/2023	12:04	X
32696518CRDL	32696518CRDL	1	06/05/2023	12:06	X
4659862BLANK	4659862	1	06/05/2023	12:08	X
4659863LCS	4659863	1	06/05/2023	12:10	X
S-0013-D-EB-01-20230523	10654887002	1	06/05/2023	12:26	X
S-0013-D-FM-02-20230523	10654887003	1	06/05/2023	12:27	X
32696519CCV	32696519CCV	1	06/05/2023	12:29	X
32696520CCB	32696520CCB	1	06/05/2023	12:31	X
S-0013-D-FM-02D-20230523	10654887004	1	06/05/2023	12:32	X
S-0013-D-FM-03-20230523	10654887005	1	06/05/2023	12:34	X
S-0013-D-O-01-20230523	10654887006	1	06/05/2023	12:36	X
32696521CRDL	32696521CRDL	1	06/05/2023	12:37	X
32696522CCV	32696522CCV	1	06/05/2023	12:39	X
32696523CCB	32696523CCB	1	06/05/2023	12:40	X
32696531CCV	32696531CCV	1	06/05/2023	13:07	X
32696532CCB	32696532CCB	1	06/05/2023	13:09	X
32696534CRDL	32696534CRDL	1	06/05/2023	13:20	X
32696535CCV	32696535CCV	1	06/05/2023	13:22	X
32696536CCB	32696536CCB	1	06/05/2023	13:24	X
S-0013-D-FM-01-20230523	10654887001	5	06/05/2023	13:25	X
4659864DUP	4659864	5	06/05/2023	13:27	X
4659865MS	4659865	5	06/05/2023	13:29	X
4659866MSD	4659866	5	06/05/2023	13:30	X
32696538CCV	32696538CCV	1	06/05/2023	14:46	X
32696539CCB	32696539CCB	1	06/05/2023	14:48	X
32696540CCV	32696540CCV	1	06/05/2023	15:02	X
32696541CCB	32696541CCB	1	06/05/2023	15:04	X
32696548CRDL	32696548CRDL	1	06/05/2023	15:17	X
32696549CCV	32696549CCV	1	06/05/2023	15:19	X
32696550CCB	32696550CCB	1	06/05/2023	15:20	X

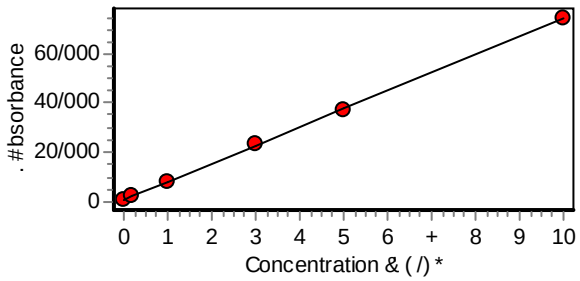
Pace Analytical, LLC

Report Generated By Teledyne Leeman QuickTrace
Analyst: 10metalsuser,LENA WIGER
Worksheet file: S:\METALS\10HG09\05JUN2 S! LI" S10HG09#$ s%&
Creation Date: ' (5(202 11:) 2: 9 AM
Comment: E*A +) +1,

Results

Sample Name	Type	Date/Time	Conc (ug/L)	µAbs	%RSD	Residual	Flags	DF	% Reco e!y
Calibration Blank	S !	06/05/23 11:53:01 am	0.00	611	2.12			1.0000	" /#
Replicates	595.4	608.0	626.8	612.0					
Stanar %1 &0.2 ' (/) *	S !	06/05/23 11:54:38 am	0.20	2109	0.60	1.26,		1.0000	" /#
Replicates	2111.4	2102.9	2096.2	2125.+					
Stanar %2 &1 ' (/) *	S !	06/05/23 11:56:15 am	1.00	+881	0.25	-1.32,		1.0000	" /#
Replicates	+854.8	+886.0	+901.3	+883.0					
Stanar %3 &3 ' (/) *	S !	06/05/23 11:5+:53 am	3.00	22864	0.28	0.+5,		1.0000	" /#
Replicates	22+83.6	22843.6	22911.1	22918.4					
Stanar %4 &5 ' (/) *	S !	06/05/23 11:59:31 am	5.00	3+339	0.21	-0.21,		1.0000	" /#
Replicates	3+2+8.5	3+269.4	3+386.+	3+421.+					
Stanar %5 &10 ' (/) *	S !	06/05/23 12:01:09 pm	10.00	+4215	0.28	0.00,		1.0000	" /#
Replicates	+39+6.2	+4129.5	+428+.8	+446+.8					

Calibration ✔
01' ation: #bs 3 +359.8094 5 618.519 ✔
R2: 0.99999 RS0: 1.15,
S00:
104.4425
2la(s:



6C7 ✔	6C7	06/05/23 12:02:53 pm ✔	5.11	38195	0.33			1.0000	102.11
Replicates	3804+.+	38140.4	38265.9	3832+.4					
6CB	6CB	06/05/23 12:04:32 pm	0.00	633	48.15			1.0000	" /#
Replicates	629.8	642.6	635.1	626.1					
CR!)	CR!)	06/05/23 12:06:09 pm	0.20	2125	0.41			1.0000	102.32
Replicates	2131.8	211+.2	2126.4	2123.4					
465986284+659	9" :	06/05/23 12:08:49 pm	0.02	+86	8.2+			1.0000	" /#
Replicates	+93.4	801.+	++9.4	++0.+					
465986384+659	9" :	06/05/23 12:10:25 pm	5.03	3+6+3	0.49			1.0000	" /#
Replicates	3+4+1.3	3+59+.5	3++2+.+	3+896.0					
1065488+00184+659	9" :	06/05/23 12:12:02 pm	22.+5	168085	0.29		;	1.0000	" /#
Replicates	168601.5	168251.0	168044.0	16+444.3					

Prep Log Report

Batch Information: MERP 884384 7471B S

7471 | CVAA_HG Solid

Prep Method	EPA 7471B	Analysis Method	EPA 7471B	Prepared By	IMB	Instrument	10BL03
Block ID	10MET54	Thermometer ID	221739839	Correction Factor (C)	+0.2	Block Temp (C)	92.7
Corrected Temp. (C)	92.90	Digestion Start Date/Time	06/02/2023 07:47:42:471	Digestion End Date/Time	06/02/2023 08:26:17:221	Block End Temp (C)	93.4
Corrected End Temp. (C)	93.60	Digestion Vessel	418906	Resin Pellets Solid Matrix	417697	Metals Pipette 1	Q765
Metals Pipette 2	Q851	Dispenser ID 1	Q902	Dispenser ID 2	Q452	Dispenser ID 3	Q852
Dispenser ID 4	Q671	Dispenser ID 5		Reviewed By	MT2	Reviewed By Date	06/02/2023 08:26
Batch Notes	WEIGHED BY JGV						

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	**4659862**	Solid	0.333	421744 (3)	420806 (9)	421340 (3.6)	30		
7471B S_P	LCS	**4659863**	Solid	0.307	421744 (3)	420806 (9)	421340 (3.6)	30		410040 (.15)
7471B S_P	PS	**10654887001**	Solid	0.319	421744 (3)	420806 (9)	421340 (3.6)	30		
7471B S_P	DUP	**4659864**	Solid	0.319	421744 (3)	420806 (9)	421340 (3.6)	30		
7471B S_P	MS	**4659865**	Solid	0.342	421744 (3)	420806 (9)	421340 (3.6)	30		410040 (.15)
7471B S_P	MSD	**4659866**	Solid	0.318	421744 (3)	420806 (9)	421340 (3.6)	30		410040 (.15)
7471B S_P	PS	**10654887002**	Solid	0.352	421744 (3)	420806 (9)	421340 (3.6)	30		
7471B S_P	PS	**10654887003**	Solid	0.303	421744 (3)	420806 (9)	421340 (3.6)	30		
7471B S_P	PS	**10654887004**	Solid	0.349	421744 (3)	420806 (9)	421340 (3.6)	30		
7471B S_P	PS	**10654887005**	Solid	0.301	421744 (3)	420806 (9)	421340 (3.6)	30		
7471B S_P	PS	**10654887006**	Solid	0.311	421744 (3)	420806 (9)	421340 (3.6)	30		

Standard Notes:

410040: LCS, MS, MSD Spike Solution

SECTION 5

PROJECT CASE NARRATIVE AND

CHAIN-OF-CUSTODY RECORD

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10654887001	**S-0013-D-FM-01-20230523**	Solid	05/23/23 12:15	05/26/23 08:50
10654887002	**S-0013-D-EB-01-20230523**	Solid	05/23/23 12:50	05/26/23 08:50
10654887003	**S-0013-D-FM-02-20230523**	Solid	05/23/23 13:05	05/26/23 08:50
10654887004	**S-0013-D-FM-02D-20230523**	Solid	05/23/23 13:05	05/26/23 08:50
10654887005	**S-0013-D-FM-03-20230523**	Solid	05/23/23 13:35	05/26/23 08:50
10654887006	**S-0013-D-O-01-20230523**	Solid	05/23/23 13:45	05/26/23 08:50

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Method: **EPA 6020B**
Description: 6020B MET ICPMS
Client: BP-ERM-MT
Date: June 22, 2023

General Information:
6 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.

QC Batch: 884669

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10654887004

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 4661435)
  - Lead

R1: RPD value was outside control limits.

- MSD (Lab ID: 4661436)
  - Lead

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

Additional Comments:

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BP-ERM-MT
Date: June 22, 2023

General Information:
6 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.

QC Batch: 884384

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10654887001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 4659865)
  - Mercury
- MSD (Lab ID: 4659866)
  - Mercury

R1: RPD value was outside control limits.

- MSD (Lab ID: 4659866)
  - Mercury

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

Additional Comments:

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

Method: **EPA 7471B**
Description: 7471B Mercury
Client: BP-ERM-MT
Date: June 22, 2023

Analyte Comments:

QC Batch: 884384

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MSD (Lab ID: 4659866)
  - Mercury

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

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:**

WO# : 10654887

10654887

Chain of Custody: 20230525-1254-PACE_MPLS-S-0013

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 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 Anulty/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 / Pres: Ambient / <6°C	N	N			
										SW6020B (arsenic and lead)	SW7471B (mercury)				
1	S-0013-D-FM-01-20230523	05/23/2023	12:15	SDU				G	1		X	X			001
2	S-0013-D-EB-01-20230523	05/23/2023	12:50	SQ				G	1		X	X			002
3	S-0013-D-FM-02-20230523	05/23/2023	13:05	SDU				G	1		X	X			003
4	S-0013-D-FM-02D-20230523	05/23/2023	13:05	SDU				G	1		X	X			004
5	S-0013-D-FM-03-20230523	05/23/2023	13:35	SDU				G	1		X	X			005
6	S-0013-D-O-01-20230523	05/23/2023	13:45	SDU				G	1		X	X			In labeled plastic bag 006

	Relinquished By / Affiliation	Date / Time	Accepted By / Affiliation	Date / Time
Sampler's Name: Nathan Champlin, Tim Wilson				
Sampler's Company: ERM	[signature] / ERM	5/25/2023 2:00:00 PM	[signature] / PACE	5/26/23 8:50
Ship Method: Ship Date: 5/25/2023 15:00:00 PM				
Shipment Tracking No: 6092 7234 9350				

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 0.5 °F/C | Trip Blank: Yes / (No) | MS/MSD Sample Submitted: Yes / (No)

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DC#_Title: ENV-FRM-MIN4-0149 v08_Sample Condition Upon Receipt (SCUR) - ESI
Effective Date: 4/18/2023

Sample Condition Upon Receipt - ESI Tech Specs

Client Name: BP rm

Project #: WO#: 10654887
PM: JMA Due Date: 06/02/23
CLIENT: BP-ERM-MT

Courier: ☑ FedEx ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ SpeeDee ☐ Commercial

Tracking Number: 6092 7234 9350 ☐ See Exceptions ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other **Temp Blank?** ☑ Yes ☐ No

Thermometer: ☐ T1 (0461) ☑ T2 (0436) ☐ T3 (0459) ☐ T4 (0402) ☐ T5 (0178) ☐ T6 (0235) ☐ T7 (0042) ☐ T8 (0775) ☐ T9 (0727) ☐ 01339252/1710 **Type of Ice:** ☑ Wet ☐ Blue ☐ Dry ☐ None ☐ Melted

Temp should be above freezing to 6 °C **Cooler temp Read w/Temp Blank:** 0.3 °C
Correction Factor: +0.2 **Cooler Temp Corrected w/temp blank:** 0.5 °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: Solid) **Date/Initials of Person Examining Contents:** BG2 5/26/23

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 ☑ Minneapolis ☐ Virginia				**COMMENTS**
Chain of Custody Present and Filled Out?	☑ Yes	☐ No		1.
Chain of Custody Relinquished?	☑ Yes	☐ No		2.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	3.
Samples Arrived within Hold Time?	☑ Yes	☐ No		4.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		5. ☐ Fecal Coliform ☐ HPC ☐ Total Coliform/E.coli ☐ BOD/cBOD ☐ Hex Chrom ☐ Turbidity ☐ Nitrate ☐ Nitrite ☐ Orthophos ☐ Other ____
Rush Turn Around Time Requested?	☑ Yes	☐ No		6. 5 Day
Sufficient Sample Volume?	☑ Yes	☐ No		7.
Triple Volume Provided for MS/MSD (if more than 10 samples)?	☐ Yes	☑ No	☒ N/A	JMA 5/26/23
Correct Containers Used?	☑ Yes	☐ No		8.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		9.
Field Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	10. Is sediment visible in the dissolved container? ☐ Yes ☐ No
Is sufficient information available to reconcile the samples to the COC?	☑ Yes	☐ No		11. **If no, write ID/Date/Time of container below:** ☐ See Exceptions ENV-FRM-MIN4-0142
Matrix: ☐ Water ☐ Soil ☐ Oil ☑ Other Solid				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ 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)	☐ Yes	☐ No	☑ N/A	☐ NaOH ☐ HNO3 ☐ H2SO4 ☐ 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.)	☐ Yes	☐ No	☑ N/A	Positive for Residual Chlorine? ☐ Yes ☐ No ☐ See Exceptions ENV-FRM-MIN4-0142
				pH Paper Lot #
				Residual Chlorine | 0-6 Roll | 0-6 Strip | 0-14 Strip
Extra labels present on soil VOA or WIDRO containers?	☐ Yes	☐ No	☑ N/A	13. ☐ See Exceptions ENV-FRM-MIN4-0142
Headspace in VOA Vials (greater than 6mm)?	☐ Yes	☐ No	☑ N/A	
3 Trip Blanks Present?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	Pace Trip Blank Lot # (if purchased): ____

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins			
Opened Time: 1340	Temp: 0.3	Corrected Temp: 0.5	
Time: 1358	put in cooler		
Time:	Temp:	Corrected Temp:	

CLIENT NOTIFICATION/RESOLUTION **Field Date Required?** ☐ Yes ☐ No
Person Contacted: ____ Date/Time: ____
Comments/Resolution: ____

Project Manager Review: [signature] **Date:** 05/26/2023

NOTE: Whenever there is a discrepancy affecting 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: ____ **Line:** ____

REV_01

emk 06/20/2023

WO# : 10654887

10654887

Revised COC received 6/20/23 JMA

bp rm

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:

Chain of Custody: 20230525-1254-PACE_MPLS-S-0013

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:**

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 / Pres	N / Ambient	N / <6°C	SW6020B (arsenic and lead)	SW7471B (mercury)	
1	S-0013-D-FM-01-20230523	05/23/2023	12:15	SDU				G	1		X	X			001
2	S-0013-D-EB-01-20230523	05/23/2023	12:50	SQ				G	1		X	X			002
3	S-0013-D-FM-02-20230523	05/23/2023	13:05	SDU				G	1		X	X			003
4	S-0013-D-FM-02D-20230523	05/23/2023	13:05	SDU				G	1		X	X			004
5	S-0013-D-FM-03-20230523	05/23/2023	13:35	SDU				G	1		X	X			005
6	S-0013-D-O-01-20230523	05/23/2023	13:45	SDU				G	1		X	X			In labeled plastic bag 006

	Relinquished By / Affiliation	Date / Time	Accepted By / Affiliation	Date / Time
Sampler's Name: Nathan Champlin, Tim Wilson				
Sampler's Company: ERM	[signature] / ERM	5/25/2023 2:00:00 PM	[signature] / PACE	5/26/23 8:50
Ship Method: FEDEX emk 06/20/2023 Ship Date: 5/25/2023 15:00:00 PM				
Shipment Tracking No: 6092 7234 9350				

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 0.5 °F/C | Trip Blank: Yes / (No) | MS/MSD Sample Submitted: Yes / (No)

Laboratory Management Program (LaMP) Chain of Custody Record

Soil, Sediment and Groundwater Samples

Revised COC received 6/20/23 JMA

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From: Elsie King
To: Jennifer Anderson
Cc: Amanda Whitney
Subject: Butte Indoor Dust SDG 10654887 Revised COC
Date: Tuesday, June 20, 2023 5:23:38 PM
Attachments: image001.png
10654887_coc_REV_01.pdf

Hi Jennifer,

We left the shipper method off that last COC. I've attached a revised COC to be included in the final report.

Sorry for the delay and inconvenience.

Thanks,

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

Pace Analytical Services, LLC
1700 Elm Street
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 0643586 RMAP Interior School-Revised Report
Pace Project No.: 10654887

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

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

SECTION 6

PROJECT CORRESPONDENCE

Amanda Whitney

From: Elsie King <Elsie.King@erm.com>
Sent: Tuesday, June 20, 2023 6:19 PM
To: Amanda Whitney; Leslie Brooks; Thomas Beckman; Christopher Berg
Cc: AR_Deliverables; Lester Dupes; Joe Kraycik; Connor Firor; Brett Dunphy
Subject: RE: Field Documentation Review: AR Indoor - Lincoln Head Start (Event 05232023)
Attachments: 10654887_coc_REV_01.pdf; Field Notebook - Lincoln Floor Mat_Rev01.pdf

Hi Amanda,

Attached are the revised CoC and Field Notebook for the May 2023 Lincoln samples.

Let me know if you have any questions.

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

From: Amanda Whitney <awhitney@envstd.com>
Sent: Tuesday, June 20, 2023 10:36 AM
To: Elsie King <Elsie.King@erm.com>; Leslie Brooks <Leslie.Brooks@erm.com>; Thomas Beckman <thomas.beckman@erm.com>; Christopher Berg <christopher.berg@erm.com>
Cc: AR_Deliverables <AR_Deliverables@envstd.com>; Lester Dupes <ldupes@envstd.com>; Joe Kraycik <jkraycik@envstd.com>; Connor Firor <cfiror@envstd.com>; Brett Dunphy <bdunphy@envstd.com>
Subject: RE: Field Documentation Review: AR Indoor - Lincoln Head Start (Event 05232023)

EXTERNAL MESSAGE

Good afternoon,

I just wanted to follow up on the review noted below. Thanks!

Amanda Whitney
Project Quality Assurance Chemist
Environmental Standards, Inc.

1140 Valley Forge Road • PO Box 810 • Valley Forge, PA 19482
610.935.5577 **x110247**
• www.envstd.com • awhitney@envstd.com

Emergency Response Quality Assurance Hotline: 855.374.7272

From: Amanda Whitney <awhitney@envstd.com>
Sent: Monday, June 12, 2023 11:12 AM
To: Elsie.King@erm.com; Leslie Brooks <Leslie.Brooks@erm.com>; Thomas Beckman <thomas.beckman@erm.com>; Christopher Berg <christopher.berg@erm.com>
Cc: AR_Deliverables <AR_Deliverables@envstd.com>; Lester Dupes <ldupes@envstd.com>; Joe Kraycik <jkraycik@envstd.com>; Connor Firor <cfiror@envstd.com>; Brett Dunphy <bdunphy@envstd.com>
Subject: Field Documentation Review: AR Indoor - Lincoln Head Start (Event 05232023)

Good morning,

During our geoscientist's review of the field documentation for Lincoln Head Start collected 5/23/2023, please review the following comments and provide revisions. I attached the field notebook and COC for reference:

- Shipping Method on CoC is blank
- Sampler should cross out lines that are not used in the filed logbook.

If you have any questions, please don't hesitate to ask. Thanks!

Amanda Whitney
Project Quality Assurance Chemist
Environmental Standards, Inc.
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