MONTANA RESOURCES LLP

DATA REPORT FOR TSP AND DUSTFALL MONITORING STATIONS IN BUTTE, MONTANA

QUARTER 3, 2023

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CERTIFICATION OF DATA INTEGRITY

Bison Engineering, Inc. certifies the data in this report is an accurate summary of the air quality and meteorological conditions measured at the Greeley School ambient monitoring site. Every reasonable effort was made to obtain accurate and representative data and to comply with the procedures set forth in the project-specific *Quality Assurance Project Plan (QAPP)*, *State of Montana Ambient Air Monitoring Program Quality Assurance Project Plan (April 2013)*, and the Environmental Protection Agency's *Volume II: Ambient Air Quality Program (January 2017) and Volume IV: Meteorological Measurements.*

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

Particulate monitoring has been conducted in the Greeley School area for many years, since the days of the Anaconda Company operation during the 1970s. Montana Department of Environmental Quality (MDEQ) and Butte-Silver Bow (BSB) County are currently performing the following monitoring:

- Continuous monitoring for PM_{10} using a Met One Model 1020 Beta Attenuation Monitor (BAM-1020).

- Continuous monitoring for $PM_{2.5}$ using a second Met One BAM-1020.

- Episodic monitoring for $PM_{2.5}$ using a BGI Model PQ-200 sampler. This sampler collects particulate matter on a filter over a 24-hour period, which is subsequently analyzed gravimetrically to determine the average airborne $PM_{2.5}$ concentration during the sampling period. The filter is then analyzed by an EPA laboratory for trace elements and mineralized compounds. This episodic sampling is performed every six days, concurrent with EPA's national one-in-six-day sampling schedule.

- The Greeley School site includes meteorological instruments that measure wind speed, wind direction and temperature.

MDEQ/BSB's monitoring provides continuous, real-time hourly $PM_{2.5}$ and PM_{10} concentrations, as well as $PM_{2.5}$ chemical composition data. In March 2019 and at Montana Resources' (MR) request, Bison Engineering Inc. (Bison) installed additional collocated monitoring equipment at the Greeley School:

- Total Suspended Particulate Sampler: A Met One E-Sampler that continuously measures hourly total suspended particulate (TSP) concentrations using a nephelometric technique that relates light scattering to ambient particulate concentration. Additionally, the sampler includes a filter that is analyzed for total particulate mass and trace elements. Prior to this study, no ongoing TSP monitoring was being performed,

- PM_{10} Particulate Sampler: A BGI Model PQ-200 sampler that collects 24-hour inhalable particulate (PM_{10}) samples on a filter, concurrent with the EPA one-in-six-day sampling schedule. The filter is analyzed for particulate mass and for selected trace elements. The MDEQ BAM-1020 that is used for PM_{10} hourly monitoring does not produce a filter suitable for chemical analysis.

The Bison data have been presented in quarterly reports since the first quarter of 2019. With few exceptions, the trace element data have shown airborne concentrations below the Guideline values shown in Section 4.0 of this report. However, citizens in the area between the Greeley school and MTR have expressed concerns about airborne particulate and the

associated trace element concentrations, as well as the composition of settled dust that residents have observed.

In response, MTR contracted Bison to perform additional monitoring as described below:

- BGI Model PQ-200 samplers are being used to collect 24-hour TSP samples on filters, concurrent with the EPA one-in-six-day sampling schedule. The filters are analyzed for particulate mass and for selected trace elements. These samplers were deployed at 2616 Pine Street and 1910 Walnut Street, with the first samples collected on July 11, 2023.

- Monthly Dustfall sampling was initiated on August 4, 2023 at the Pine Street and Walnut Street sites, and also at the existing Greeley School site. This sampling involves exposing a 6 inch diameter bucket to ambient conditions for a period of approximately 30 days, and then analyzing the collected particulate for total mass and trace elements. From these results, monthly particulate and trace element deposition rates are calculated.

- All sample collection duties are performed by Bison. Gravimetric analysis of TSP filters is also performed by Bison, while chemical analysis of those filters is performed by the Energy Laboratory Billings, MT facility. Both gravimetric and chemical analyses of the Dustfall samples are performed by the Energy Laboratory Helena facility.

Figure 1: Butte Ambient Monitoring Locations

2.0 TSP SAMPLING DATA

The National Ambient Air Quality Standards (NAAQS) for TSP were first promulgated in 1971. The TSP standards were superseded by PM_{10} standards in 1987, and additional particulate standards have been enacted since. Although no longer a criteria pollutant, TSP monitoring is appropriate for the objectives of the expanded monitoring since residents' concerns arose from visual observations of ***total*** particulate, rather than a particular size fraction.

Table 1 summarizes the TSP data collected during the third quarter of 2023. Overall, the TSP concentrations at the Walnut Street (Walnut) and Pine Street (Pine) sites are similar, with respective quarterly averages of 43 $\mu g/m^3$ and 40 $\mu g/m^3$. The maximum daily values of 71 $\mu g/m^3$ and 75 $\mu g/m^3$ also were similar, although they weren't concurrent. The quarterly TSP averages were less than 60 percent of the historical annual standard[1] of 75 $\mu g/m^3$. The maximum daily values were each less than 30 percent of the historical 24-hour standard[2] of 260 $\mu g/m^3$.

Data used to calculate average TSP concentrations from gravimetric analysis are presented in Appendix A. Chemical analysis results for the TSP filters are presented in Section 4.0 of this report.

[1] Both the annual and 24-hour TSP standards were revoked in 1987. The annual standard was calculated as a geometric mean of all daily values in a single year. The 24-hour standard was determined as the 2nd highest recorded value per year.
[2] *Ibid.*

Table 1: Summary of TSP Monitoring Data for Quarter 3, 2023

Sample Collection Date (2023)	Walnut Street TSP[1] (µg/m³)	Pine Street TSP[1] (µg/m³)
Jul 11	67	34
Jul 17	63	75
Jul 23	69	57
Jul 29	71	54
Aug 04	29	29
Aug 10	31	19
Aug 16	46	68
Aug 22	24	19
Aug 28	37	45
Sep 03	30	33
Sep 09	29	16
Sep 15	52	36
Sep 21	19	19
Sep 27	34	49
Average	**43**	**40**
Single Day Maximum	**71**	**75**
Historical 24-Hour Standard [3]	**260**	
Historical Annual Standard [4]	**75**	

[1]All values at local temperature and pressure (LTP).

[3] *Ibid.*
[4] *Ibid.*

3.0 DUSTFALL SAMPLING DATA

Dustfall monitoring was initiated at the Walnut, Pine and Greeley sites on August 4, 2023. Samples were collected over the following time periods at each site:

- August 4 – September 2
- September 2 – October 3

Samples were collected using ASTM Method D1739-98R17. Each sampling event was started by placing clean, dry dustfall buckets at each site. They were then exposed to ambient conditions for approximately 30 days. No water was added to the buckets prior to deployment, although they collected any rain or snow that fell during the sampling period. Following collection, they were submitted to the Energy Lab Helena facility. Samples were visually inspected for insects or other non-dustfall detritus. Wet masses of each sample were collected, as received. Samples with insects present were passed through a No. 10 (2mm) sieve, removing the insects but allowing the dust and liquid to pass through. Sieves were rinsed with laboratory reagent water to ensure no dust was lost on the sieve. Samples were then air dried on a clean non-porous plastic to remove moisture. The dry weight of each sample was then recorded using the plastic as a tared mass. Collected dust was transferred to a digestion vessel using digestion reagents to ensure all dust was removed from the plastic; and digested for total metals analysis.

Table 2 summarizes the dustfall monitoring results for the third quarter of 2023. All dustfall results were below the Montana Dustfall standard of 10 $g/m^2/30$ days.

Sample Collection Date (2023)	Greeley School DF ($g/m^2/30$ days)	Walnut Street DF ($g/m^2/30$ days)	Pine Street DF ($g/m^2/30$ days)
Aug 4 – Sep 2	3.9	7.8	0.7
Sep 2 – Oct 3	2.6	2.4	5.1
Maximum	**3.9**	**7.8**	**5.1**
Montana Standard [5]	**10**		

Chemical analysis results for the Dustfall samples are presented in Section 5.0 of this report.

[5] ARM 17.8.220

4.0 CHEMICAL ANALYSIS DATA – TSP SAMPLES

Following gravimetric analysis, the particulate samples were submitted to Energy Laboratories, Inc. (ELI) in Billings, Montana, for elemental analysis including arsenic, cadmium, copper, lead, manganese, molybdenum and zinc. This analyte list is subject to modification as results from this monitoring are obtained, and as other information becomes available.

All TSP samples were digested and then analyzed by ICP-MS using EPA Method E200.8. Laboratory results are presented in Appendix D and are reported in units of micrograms (µg) per filter. Fourteen TSP samples collected from the Walnut Street and Pine Street sites during the third quarter were analyzed for trace elements, as well as four Field Blanks and four filter lot blanks (Lab Blanks).

Tables 4a and 4b summarize the total particulate mass and ELI analytical results for samples collected during the third quarter. Detectable results were usually obtained for copper, while results for other elements (particularly arsenic, cadmium and zinc) were often non-detectable. Table 4c shows the Field Blank and Lab Blank results associated with the third quarter samples. The bottom row of Table 4c shows the laboratory's maximum Method Blank (MB) Method Detection Limit (MDL) during the quarter, which represents the minimum detectable amount of each trace element per filter. Field Blank, Lab (filter) Blank and MB concentrations for the third quarter were all non-detectable, except for a Lab Blank result for lead of 0.5 µg/filter in analysis batch B23091584; this was just above the MDL of 0.3 µg/filter.

Tables 5a and 5b show the calculated airborne concentration of each trace element over the indicated sampling periods. To facilitate data interpretation, the number of leading zeroes in the results has been minimized by expressing results in units of ***nanograms*** (ng) per cubic meter rather than micrograms.

- All trace element concentrations for the Walnut Street site were below suggested Guideline values.[6] The closest approach was for manganese in the sample collected on July 17, with a concentration of 37.4 ng/m^3, or 75% of the lifetime exposure Guideline value of 50 ng/m^3. Maximum concentrations of other parameters were less than 30% of their respective Guideline, lifetime or otherwise, values.

- All trace element concentrations for the Pine Street site were also below suggested Guideline values.[7] The closest approach was for manganese in the samples collected on July 17 and August 16, with a concentration of 41.6 ng/m^3, or 83% of the lifetime exposure Guideline value of 50 ng/m^3. Maximum concentrations of other parameters were less than 30% of their respective Guideline values.

[6] These suggested guidelines, and their sources, are presented in Table 6.
[7] Ibid.

Table 6 shows the sources of the "Guideline" values used for these analyses, and their derivations.[8] Additionally, Table 6 shows the approximate airborne concentration corresponding to each MDL listed in Table 4c.

Laboratory results are included in Appendix B. A detailed table showing commonly accepted values from regulatory agencies and reputable private organizations is provided in Appendix D.

[8] The guideline values were updated (starting with the Greeley School 4th quarter report 2020) to be consistent with those from the Montana Department of Public Health and Human Services (MDPHHS). Guidelines for copper and molybdenum are lower than those used in previous quarterly reports. Although MDPHHS suggested a higher guideline for manganese, the lower previously reported value was retained. Guidelines for arsenic, cadmium, lead and zinc are unchanged.

Table 4a: Summary of Analytical Results – TSP Walnut Street

DATE	PART MASS (µg)	As (µg)	Cd (µg)	Cu (µg)	Mn (µg)	Mo (µg)	Pb (µg)	Zn (µg)
07/11	1,607	0.08	ND	2	0.6	0.2	0.1	1
07/17	1,524	ND	ND	3	0.9	0.8	0.2	1
07/23	1,659	ND	ND	3	0.8	0.3	0.1	ND
07/29	1,705	ND	ND	1	0.4	0.1	0.1	ND
08/04	695	ND	ND	0.6	0.5	ND	0.1	ND
08/10	750	ND	ND	1	ND	ND	ND	ND
08/16	1,107	ND	ND	0.6	0.6	ND	0.09	ND
08/22	564	ND	ND	0.5	0.3	ND	0.09	ND
08/28	892	ND	ND	2	0.5	0.08	0.2	1
09/03	724	ND	ND	0.6	0.3	ND	ND	ND
09/09	703	ND	ND	1	0.4	ND	0.1	ND
09/15	1,254	ND	ND	3	0.6	0.1	0.2	2
09/21	455	ND	ND	1	0.4	ND	ND	0.9
09/27	827	ND	ND	0.8	0.4	ND	0.1	0.8

All values expressed as micrograms per filter. ND denotes not detected.

Table 4b: Summary of Analytical Results – TSP Pine Street

DATE	PART MASS (µg)	As (µg)	Cd (µg)	Cu (µg)	Mn (µg)	Mo (µg)	Pb (µg)	Zn (µg)
07/11	812	ND	ND	6	0.3	0.4	0.2	0.9
07/17	1,807	0.1	0.01	13	1	2	0.3	2
07/23	1,380	0.08	ND	4	0.8	0.6	0.2	1
07/29	1,307	ND	ND	2	0.6	0.08	0.09	ND
08/04	707	ND	ND	0.9	0.4	ND	0.09	ND
08/10	460	ND	ND	2	ND	0.09	ND	ND
08/16	1,643	ND	ND	4	1	0.1	0.2	1
08/22	456	ND	ND	0.9	ND	ND	ND	ND
08/28	1,086	ND	ND	3	0.5	0.08	0.1	1
09/03	787	ND	ND	1	0.4	0.09	ND	ND
09/09	392	ND	ND	0.4	ND	ND	ND	ND
09/15	870	ND	ND	2	0.5	0.2	0.1	ND
09/21	449	ND	ND	0.4	ND	ND	ND	ND
09/27	1,180	ND	ND	6	0.5	0.2	0.2	2

All values expressed as micrograms per filter. ND denotes not detected.

Table 4c: Summary of Analytical Results – Blanks

DATE	PART MASS (µg)	As (µg)	Cd (µg)	Cu (µg)	Mn (µg)	Mo (µg)	Pb (µg)	Zn (µg)
08/29-LB	2	ND	ND	ND	ND	ND	ND	ND
08/01-FFB	7	ND	ND	ND	ND	ND	ND	ND
08/24-FFB	2	ND	ND	ND	ND	ND	ND	ND
10/03-LB	1	ND	ND	0.5	ND	ND	ND	ND
11/15-LB	-1	ND	ND	ND	ND	ND	ND	ND
09/17-FFB	16	ND	ND	ND	ND	ND	ND	ND
11/22-LB	4	ND	ND	ND	ND	ND	ND	ND
10/13-FFB	35	ND	ND	ND	ND	ND	ND	ND
Lab Method Blank MDL		0.08	0.009	0.3	0.2	0.07	0.09	0.8

All values expressed as micrograms per filter. ND denotes not detected.
LB denotes laboratory filter blank. FFB denotes field filter blank.

Table 5a: Summary of Airborne Trace Element Concentrations – TSP Walnut St

DATE	Sample Volume (m^3)	As (ng/m^3)	Cd (ng/m^3)	Cu (ng/m^3)	Mn (ng/m^3)	Mo (ng/m^3)	Pb (ng/m^3)	Zn (ng/m^3)
07/11	24.05	3.33	ND	83.2	24.9	8.32	4.16	41.6
07/17	24.05	ND	ND	125	37.4	33.3	8.32	41.6
07/23	24.05	ND	ND	125	33.3	12.5	4.16	ND
07/29	24.05	ND	ND	41.6	16.6	4.16	4.16	ND
08/04	24.05	ND	ND	24.9	20.8	ND	4.16	ND
08/10	24.05	ND	ND	41.6	ND	ND	ND	ND
08/16	24.05	ND	ND	24.9	24.9	ND	3.74	ND
08/22	24.05	ND	ND	20.8	12.5	ND	3.74	ND
08/28	24.05	ND	ND	83.2	20.8	3.33	8.32	41.6
09/03	24.05	ND	ND	24.9	12.5	ND	ND	ND
09/09	24.05	ND	ND	41.6	16.6	ND	4.16	ND
09/15	24.05	ND	ND	125	24.9	4.16	8.32	83.2
09/21	24.05	ND	ND	41.6	16.6	ND	ND	37.4
09/27	24.05	ND	ND	33.3	16.6	ND	4.16	33.3
Mean (ng/m^3)*		1.78	0.19	59.8	20.3	5.89	4.50	29.4
Guideline (ng/m^3) **		15	10	2,000	50	400	150	47,619

* Rather than treat non detectable (ND) data as zero, the mean was calculated using ½ of the detectable value (Table 6) for the parameter and date in question.

** The guideline values, except lead (Pb), are applicable to a lifetime or chronic exposure. The lead (Pb) guideline is an ambient air quality standard applicable to a 3-month average. The quarterly average lead concentration of 4.50 ng/m^3 was 3 percent of the guideline value; non-detect lead concentrations were set at ½ of the typical lead detection limit of 3.75 ng/m^3 for this calculation.

Table 5b: Summary of Airborne Trace Element Concentrations – TSP Pine Street

DATE	Sample Volume (m^3)	As (ng/m^3)	Cd (ng/m^3)	Cu (ng/m^3)	Mn (ng/m^3)	Mo (ng/m^3)	Pb (ng/m^3)	Zn (ng/m^3)
07/11	24.05	ND	ND	249	12.5	16.6	8.32	37.4
07/17	24.05	4.16	0.42	541	41.6	83.2	12.5	83.2
07/23	24.05	3.33	ND	166	33.3	24.9	8.32	41.6
07/29	24.05	ND	ND	83.2	24.9	3.33	3.74	ND
08/04	24.05	ND	ND	37.4	16.6	ND	3.74	ND
08/10	24.05	ND	ND	83.2	ND	3.74	ND	ND
08/16	24.05	ND	ND	166	41.6	4.16	8.32	41.6
08/22	24.05	ND	ND	37.4	ND	ND	ND	ND
08/28	24.05	ND	ND	125	20.8	3.33	4.16	41.6
09/03	24.05	ND	ND	41.6	16.6	3.74	ND	ND
09/09	24.05	ND	ND	16.6	ND	ND	ND	ND
09/15	24.05	ND	ND	83.2	20.8	8.32	4.16	ND
09/21	24.05	ND	ND	16.6	ND	ND	ND	ND
09/27	24.05	ND	ND	249	20.8	8.32	8.32	83.2
Mean (ng/m^3) *		1.96	0.21	135	19.6	12.0	5.07	33.0
Guideline (ng/m^3) **		15	10	2,000	50	400	150	47,619

* Rather than treat non detectable (ND) data as zero, the mean was calculated using ½ of the detectable value (Table 6) for the parameter and date in question.

*The guideline values, except lead (Pb), are applicable to a lifetime or chronic exposure. The lead (Pb) guideline is an ambient air quality standard applicable to a 3-month average. The quarterly average lead concentration of 5.07 ng/m^3 was 3 percent of the guideline value; non-detect lead concentrations were set at ½ of the typical lead detection limit of 3.75 ng/m^3 for this calculation.

Table 6: Summary of Airborne Trace Element Concentration Guidelines (ng/m³)

Analyte	Dose/ Risk[A]	Source	Description	Time Period	Detectable TSP[D]
Arsenic (inorganic)	15	EPA / DPHHS[F]	RfC[B]	Lifetime	3.33
Cadmium	10	ATSDR / DPHHS[F]	Non-cancer / CV[F]	Chronic	0.38
	200	IRIS	Cancer	Chronic	
Copper	2,000	DPHHS[F] / Michigan DEQ	RfC[B]	Chronic	12.5
Lead	150	EPA / ATSDR / DPHHS[F]	National Ambient Air Quality Standard [C]	3-month	3.75
Manganese	50	EPA	RfC[B]	Lifetime	12.5
Molybdenum	11,905 (=500,000/42) [E]	CAL/OSHA, ACGIH	CAL/OSHA, ACGIH	Chronic [E]	4.17
	400	DPHHS[F] / Michigan DEQ	CV	Chronic	
Zinc	47,619 (=2,000,000/42)[E]	ACGIH TLV	ACGIH TLV	Chronic [E]	33.3

[A] See Appendix E for definitions and listing of dose and risk assessment values reviewed to produce this summary table.
[B] RfC = Reference Concentration (EPA) is an estimate (with uncertainty added) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.
[C] This standard is based on a three-month average.
[D] Based on 24-hour sampling period and total sample volume of 24 m³.
[E] This value derived by dividing the OSHA/NIOSH exposure limit by 42. This was done to include a factor of 10 to account for a general population, not just healthy adults and then including another factor of 4.2 to include a year-long exposure as opposed to 8 hours per day, 5 days a week and 52 weeks per year.
[F] Reference information from letter and analysis by DPHHS (regarding Greeley School ambient data) to Butte-Silver Bow Health Department dated October 28,2020.

EPA = Environmental Protection Agency
ATSDR = Agency for Toxic Substances & Disease Registry
CV = "Comparison Value" – a term used by DPHHS (10/28/20 letter) to indicate an ATSDR (or other) guideline or reference value
DPHHS = Montana Department of Health and Human Services
RfC = Reference Concentration (see above)
RSL = EPA Regional Screening Levels (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables)
OSHA = Occupational Safety and Health Administration
ACGIH = American Congress of Governmental Industrial Hygienists
NIOSH= National Institute of Occupational Safety and Health
TLV = Threshold limit value

5.0 CHEMICAL ANALYSIS DATA – DUSTFALL SAMPLES

After each Dustfall sample was prepared as described in Section 3.0, the remaining particulate mass was transferred to a digestion vessel using digestion reagents to ensure that all dust was removed from the plastic and digested for total metals analysis. The digestate was analyzed using EPA Method SW6020 "Inductively Coupled Plasma - Mass Spectrometry."

Laboratory results are presented in Appendix C and are reported in units of milligrams per kilogram (mg/kg) in the captured particulate, along with the total dried particulate mass. Six Dustfall samples collected from the Walnut Street, Pine Street and Greeley School sites during the third quarter were analyzed for trace elements. Two Field Blanks also were analyzed.

Tables 7a and 7b present the Dustfall analysis data for the third quarter. Each Table shows the sample collection information, amount of particulate captured from each sample, and the concentrations of seven parameters in the particulate mass on a mg/kg basis. Finally, each table shows a calculated deposition rate for each parameter in units of milligrams per square meter per 30-days (g/m^2/30-days).

The 30-day total particulate deposition rates were all below the MAAQS of 10 g/m^2/30-days.[9] The highest observed deposition rate was 7.8 g/m^2/30-days at the Walnut Street site between August 4 and September 2.

[9] It should be noted that the sampling procedure and analysis were conducted with quality in mind, they were not necessarily conducted in strict accordance with the specific methods outlined in the Montana standard (ARM17.8.220).

Table 7a: Dustfall Results for August 4 – September 2, 2023

Sample Collection Information

	Greeley School	Pine Street	Walnut Street	Field Blank
Start Date	08/04/23	08/04/23	08/04/23	
End Date	09/02/23	09/02/23	09/02/23	
Days of Exposure	29	29	29	
Dry Particulate Weight (g)	0.0668	0.0127	0.1329	0.0000
Dustfall (g/m²/30-days)	**3.9**	**0.7**	**7.8**	**0.0**

Trace Element Concentration in Particulate (mg/kg)

Analyte	Greeley School	Pine Street	Walnut Street	Field Blank
As	25	167	58	ND
Cd	3	15	2	ND
Cu	2,320	20,600	1,710	ND
Pb	110	540	105	ND
Mn	589	2,820	381	ND
Mo	1,780	7,220	751	ND
Zn	658	3,680	579	ND

Trace Element Deposition Rate (mg/m²/30-days)

Analyte	Greeley School	Pine Street	Walnut Street	Field Blank
As	0.10	0.12	0.45	ND
Cd	0.01	0.01	0.02	ND
Cu	9.07	15.32	13.30	ND
Pb	0.43	0.40	0.82	ND
Mn	2.30	2.10	2.96	ND
Mo	6.96	5.37	5.84	ND
Zn	2.57	2.74	4.50	ND

Table 7b: Dustfall Results for September 2 – October 3, 2023

Sample Collection Information

	Greeley School	Pine Street	Walnut Street	Field Blank
Start Date	09/02/23	09/02/23	09/02/23	
End Date	10/03/23	10/03/23	10/03/23	
Days of Exposure	31	31	31	
Dry Particulate Weight (g)	0.0468	0.0932	0.0441	0.0035
Dustfall (g/m²/30-days)	2.6	5.1	2.4	0.2

Trace Element Concentration in Particulate (mg/kg)

Analyte	Greeley School	Pine Street	Walnut Street	Field Blank
As	38	27	48	ND
Cd	3	2	4	ND
Cu	3,090	2,590	3,380	ND
Pb	146	101	265	ND
Mn	548	397	637	ND
Mo	1,620	731	1,150	ND
Zn	1,030	696	1,410	434

Trace Element Deposition Rate (mg/m²/30-days)

Analyte	Greeley School	Pine Street	Walnut Street	Field Blank
As	0.10	0.14	0.12	ND
Cd	0.01	0.01	0.01	ND
Cu	7.92	13.22	8.16	ND
Pb	0.37	0.52	0.64	ND
Mn	1.40	2.03	1.54	ND
Mo	4.15	3.73	2.78	ND
Zn	2.64	3.55	3.41	0.09

6.0 CALIBRATION DATA

Calibration checks of the BGI TSP samplers are performed in at least two months of each quarter. In the third month, an audit is performed by a different person using different calibration standards. Monthly verification checks were performed on the TSP samplers on July 9, July 18, August 24, and September 17.[10]

Table 8 summarizes the verification checks performed each month and the applicable acceptance criteria. In the event of unsatisfactory results, corrective actions are performed as specified in the rightmost column. Table 9 summarizes the results of the calibration checks performed during the third quarter, as well as any corrective actions. Detailed verification check results are shown in Appendix E. Appendix F presents certifications for flow calibration standards used during the quarter.

Table 8: Summary of Montana Resources – Pine St and Walnut St Sites Calibration/ Audit Activities and Acceptance Criteria

Activity	**Acceptance Criteria / Actions**	
TSP Sampler Calibration Checks		
Flow Verification	±4%	Multipoint recalibration if flow error exceeds ±2%
Leak Check	Investigate / correct if vacuum drop exceeds 4 cm of water in 2 minutes	
Temperature Verification	±2.0°C	Multipoint recalibration if error exceeds ±2.0°C
Pressure	±10 mmHg	Adjust calibration if error exceeds ±10 mmHg
Other		
TSP Inlet Head	Disassemble and clean	

[10] The calibration checks performed on October 31, 2023, also are shown to demonstrate data validity through the end of the quarter.

Table 9: Summary of Quarter 3, 2023 Calibration Verification Results

Date	Calibration Check	Results	Limits	Actions
07/09/2023	BGI TSP Flow Verification (A)	-0.4%	±4%	
Walnut Street	BGI TSP Flow Verification (B)	+0.4%	±4%	
	BGI Ambient Temperature	-0.5°C	±2.0°C	
	BGI Filter Temperature	+0.6°C	±2.0°C	
	BGI Ambient Pressure	-0.5 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	
07/09/2023	BGI TSP Flow Verification (A)	+2.0%	±4%	
Pine Street	BGI TSP Flow Verification (B)	-1.9%	±4%	
	BGI Ambient Temperature	-0.2°C	±2.0°C	
	BGI Filter Temperature	+0.6°C	±2.0°C	
	BGI Ambient Pressure	0.0 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	
07/18/2023	BGI TSP Flow Verification (A)	-0.5%	±4%	
Walnut Street	BGI TSP Flow Verification (B)	+0.5%	±4%	
	BGI Ambient Temperature	-0.5°C	±2.0°C	
	BGI Filter Temperature	+1.0°C	±2.0°C	
	BGI Ambient Pressure	0.0 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	
07/18/2023	BGI TSP Flow Verification (A)	+2.4%	±4%	
Pine Street	BGI TSP Flow Verification (B)	-2.3%	±4%	
	BGI Ambient Temperature	-0.5°C	±2.0°C	
	BGI Filter Temperature	+0.8°C	±2.0°C	
	BGI Ambient Pressure	0.0 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	
08/24/2023	BGI TSP Flow Verification (A)	+0.3%	±4%	
Walnut Street	BGI TSP Flow Verification (B)	-0.3%	±4%	
	BGI Ambient Temperature	-0.2°C	±2.0°C	
	BGI Filter Temperature	+0.8°C	±2.0°C	
	BGI Ambient Pressure	-0.5 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	
08/24/2023	BGI TSP Flow Verification (A)	+4.1%	±4%	C
Pine Street	BGI TSP Flow Verification (B)	-3.9%	±4%	C
	BGI Ambient Temperature	+0.4°C	±2.0°C	
	BGI Filter Temperature	+0.6°C	±2.0°C	
	BGI Ambient Pressure	+0.5 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	2 cm H_2O	≤4 cm H_20	
09/17/2023	BGI TSP Flow Verification (A)	+0.4%	±4%	
Walnut Street	BGI TSP Flow Verification (B)	-0.4%	±4%	
	BGI Ambient Temperature	-0.9°C	±2.0°C	
	BGI Filter Temperature	-0.1°C	±2.0°C	
	BGI Ambient Pressure	-0.5 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	

Date	Calibration Check	Results	Limits	Actions
09/17/2023	BGI TSP Flow Verification (A)	-0.4%	±4%	
Pine Street	BGI TSP Flow Verification (B)	+0.4%	±4%	
	BGI Ambient Temperature	-0.9°C	±2.0°C	
	BGI Filter Temperature	+0.4°C	±2.0°C	
	BGI Ambient Pressure	+0.5 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	
10/31/2023	BGI TSP Flow Verification (A)	+1.2%	±4%	
Walnut Street	BGI TSP Flow Verification (B)	-1.1%	±4%	
	BGI Ambient Temperature	-0.9°C	±2.0°C	
	BGI Filter Temperature	-1.0°C	±2.0°C	
	BGI Ambient Pressure	+0.5 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	3 cm H_2O	≤4 cm H_20	
10/31/2023	BGI TSP Flow Verification (A)	+5.1%	±4%	C
Pine Street	BGI TSP Flow Verification (B)	-4.9%	±4%	C
	BGI Ambient Temperature	-0.7°C	±2.0°C	
	BGI Filter Temperature	+1.0°C	±2.0°C	
	BGI Ambient Pressure	+0.5 mm Hg	±10 mmHg	
	BGI Leak Test (pressure drop)	1 cm H_2O	≤4 cm H_20	

Codes:
A = Difference of reported flow from reference standard flow.
B = Difference of reference standard flow from design flow of 16.7 LPM.
C = Performed multipoint flow recalibration

7.0 QUARTERLY AUDIT/CALIBRATION RESULTS

An audit is performed once in each full calendar quarter. The checks and acceptance criteria are identical to those for monthly calibrations (see Table 8). The primary difference is that the audits are performed by a different person, using different calibration standards. Calibration adjustments then are made as necessary, based on the as-found audit results. The third quarter audit was performed on July 18, 2023. Results for the TSP samplers were satisfactory as shown in Table 10, and no adjustments were required.

Table 10: Quarter 3, 2023 Audit Results

BGI PQ200 TSP Sampler – Performance Audit			
Date: 07/18/2023	Time: 1145-1155 MST	Sampler Serial Number: 90129 / Walnut St	
Performed By: Daniel Bitz		Observer: Steve Heck	
Ref Standard and S/N: Tetra Cal SN 149645		Certification Date: 07-28-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Audit (b)	Difference (a - b) (must be ≤ ±10)
Ambient Pressure	626	626.5	-0.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Audit (b)	Difference (a - b) (must be ≤ ±2ºC)
Ambient Temperature	23.6 C	24.0 C	-0.4 C
Filter Temperature	25.9 C	26.1 C	-0.2 C
Leak Check			
Vacuum Readings (mm Hg)	Start 140	End 139	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Audit (b)	% Difference 100*(a – b)/b (must be ≤ ±4%)
Operating flow rate check	16.7	16.83	-0.8%
Reading (liters per minute)	Audit (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ±5%)
Design flow rate calculation	16.83	16.7	+0.8%
Comments: No adjustments made.			

BGI PQ200 TSP Sampler – Performance Audit			
Date: 07/18/2023	Time: 1044-1057 MST	Sampler Serial Number: 90133 / Pine St	
Performed By: Daniel Bitz		Observer: Steve Heck	
Ref Standard and S/N: Tetra Cal SN 149645		Certification Date: 07-28-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Audit (b)	Difference (a - b) (must be ≤ ±10)
Ambient Pressure	626	626.0	0.0
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Audit (b)	Difference (a - b) (must be ≤ ±2ºC)
Ambient Temperature	22.4 C	23.3 C	-0.9 C
Filter Temperature	23.5 C	22.6 C	+0.9 C
Leak Check			
Vacuum Readings (mm Hg)	Start 141	End 140	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Audit (b)	% Difference 100*(a – b)/b (must be ≤ ±4%)
Operating flow rate check	16.7	16.41	+1.8%
Reading (liters per minute)	Audit (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ±5%)
Design flow rate calculation	16.41	16.7	+1.7%
Comments: No adjustments made.			

8.0 DATA COMPLETENESS

Data recovery statistics for the particulate filter samples are presented in Table 11. The quarterly data recovery goal for TSP filter samples is ≥80 percent for both the gravimetric and trace element analyses. The actual data recovery was 100.0 percent for the TSP gravimetric and trace element analyses.

Dustfall sampling involves no active instrumentation; it merely requires exposure of a 6-inch diameter open container for a period of approximately 30-days. It would therefore be highly unusual for any scheduled sample to not be collected and analyzed. Because Dustfall sampling didn't begin until August 4, only 2 rounds of ~30-day sampling at the Greeley School, Walnut Street and Pine Street sites were possible during the third quarter of 2023 – for a total of six possible samples. All six samples were collected as scheduled, giving a data recovery of 100 percent.

Table 11: Quarterly Data Completeness Summary – Filter Analysis Data

Montana Resources LLP			
Parameter	Readings Possible	Valid Results	Percent Recovery
July 2023			
TSP – Walnut St / Gravimetric	5	5	100.0
TSP – Walnut St / Trace Elements	35	35	100.0
TSP – Pine St / Gravimetric	5	5	100.0
TSP – Pine St / Trace Elements	35	35	100.0
Total	80	80	100.0
August 2023			
TSP – Walnut St / Gravimetric	5	5	100.0
TSP – Walnut St / Trace Elements	35	35	100.0
TSP – Pine St / Gravimetric	5	5	100.0
TSP – Pine St / Trace Elements	35	35	100.0
Total	80	80	100.0
September 2023			
TSP – Walnut St / Gravimetric	5	5	100.0
TSP – Walnut St / Trace Elements	35	35	100.0
TSP – Pine St / Gravimetric	5	5	100.0
TSP – Pine St / Trace Elements	35	35	100.0
Total	80	80	100.0
Quarter 3, 2023			
TSP – Walnut St / Gravimetric	15	15	100.0
TSP – Walnut St / Trace Elements	105	105	100.0
TSP – Pine St / Gravimetric	15	15	100.0
TSP – Pine St / Trace Elements	105	105	100.0
Total	240	240	100.0

9.0 COMPARISON TO AMBIENT AIR QUALITY STANDARDS

This study is not intended to determine compliance with the NAAQS[11] or the Montana ambient air quality standards[12] (MAAQS). Nonetheless, a generalized comparison is possible. The filter-based TSP data collected indicate ambient TSP concentrations well below the historical 24-hour standard of 260 μg/m^3 and the historical annual geometric average standard of 75 μg/m^3. ***Note that all TSP standards were superseded by PM_{10} standards in 1987.***[13]

Similarly, the lead concentrations analyzed from the exposed TSP filters indicate quarterly average airborne concentrations well below the 0.15 μg/m^3 ambient NAAQS based on a 3-month average of the 24-hour samples. The MAAQS is 1.5 μg/m^3 and is based on a 90-day rolling average of 24-hour samples. The TSP samples presented herein were collected for 24-hour periods, at a much lower sampling rate (16.7 liters per minute) compared to the standard method (≥40 standard cubic feet per minute). Nonetheless, the results indicate quarterly average ambient lead concentrations below the MAAQS and NAAQS. Table 12 summarizes these comparisons through the third quarter of 2023.

Additionally, the analyses presented in Section 4.0 indicate that average airborne concentrations of the other six trace elements were below guidelines presented in Table 6.

Finally, the MAAQS for Dustfall specifies a particulate deposition rate not to exceed 10 g/m^2/30-days. All Dustfall samples collected during the third quarter were below this value. There is no NAAQS for Dustfall.

[11] 40 CFR 50 *et seq.*
[12] ARM 17.8.201 *et. seq.*
[13] 52 FR 24634, July 1, 1987

Table 12: Summary of Airborne Concentration vs. NAAQS

Analyte	Location	Observed Concentration (µg/m³)	Averaging Period	Ambient Standard (µg/m³)	Authority
TSP	Walnut St	71[1]	24-hour (max)	260[3]	NAAQS
	Pine St	75			
TSP	Walnut St	43	Annual Average	75[3]	NAAQS
	Pine St	40			
Pb	Walnut St	0.005[2]	90-day	1.50	MAAQS
	Pine St	0.005[2]	3-month	0.15	NAAQS
Analyte	**Location**	**Max. Observed Deposition Rate (g/m²/30-days)**	**Averaging Period**	**Ambient Standard (g/m²/30-days)**	**Authority**
Dustfall	Greeley Sch.	3.9	30-days	10	MAAQS
	Walnut St	5.1			
	Pine St	7.8			

[1] This value was the maximum 24-hour value from the filter-based TSP sampler.

[2] This value was the quarterly average from the filter-based TSP sampler. Non-detect results were set to ½ of the typical detection limit when calculating the average.

[3] The historical TSP standard shown for comparison purposes is no longer in effect. NAAQS standard for TSP was based on geometric mean and MAAQS on arithmetic average. Value shown represents arithmetic average for monitoring period of Quarter 3, 2023, based on gravimetric filter analysis.

APPENDIX A: GRAVIMETRIC ANALYSIS DATA

Quarter 3, 2023 Filter Analysis Results - Pine & Walnut - Blanks

FILTER	TYPE	DATE*	PRE WEIGHT (MG)	PRE-WEIGHT DATE	POST WEIGHT (MG)	POST-WEIGHT DATE	PART MASS (MG)
P0908131	Lab	29-Aug	144.569	30-Jun	144.571	22-Aug	0.002
P0908140	Field	1-Aug	145.594	30-Jun	145.601	22-Aug	0.007
C1523756	Field	24-Aug	126.464	28-Jul	126.466	14-Sep	0.002
C1523760	Lab	3-Oct	130.033	28-Jul	130.034	14-Sep	0.001
C1523776	Lab	15-Nov	126.955	21-Aug	126.954	23-Oct	-0.001
C1523780	Field	17-Sep	126.298	21-Aug	126.314	23-Oct	0.016
C1527185	Lab	22-Nov	126.952	15-Sep	126.956	10-Nov	0.004
C1527190	Field	13-Oct	127.803	15-Sep	127.838	10-Nov	0.035

*Denotes collection date for Field Blank, analysis date for Laboratory Blanks

Quarter 3, 2023 Filter Analysis Results - TSP - Pine St

FILTER	DATE	AVG FLOW LPM	HOURS	SAMPLE VOLUME (M3)	PRE WEIGHT (MG)	PRE-WEIGHT DATE	POST WEIGHT (MG)	POST-WEIGHT DATE	PART MASS (MG)	CONC (UG/M3)
P0908132	07/11	16.70	24:00	24.05	144.804	30-Jun	145.616	22-Aug	0.812	33.8
P0908134	07/17	16.70	24:00	24.05	143.066	30-Jun	144.873	22-Aug	1.807	75.1
P0908136	07/23	16.70	24:00	24.05	144.595	30-Jun	145.975	22-Aug	1.380	57.4
P0908138	07/29	16.70	24:00	24.05	140.388	30-Jun	141.695	22-Aug	1.307	54.3
C1523751	08/04	16.70	24:00	24.05	124.895	28-Jul	125.602	14-Sep	0.707	29.4
C1523753	08/10	16.70	24:00	24.05	128.056	28-Jul	128.516	14-Sep	0.460	19.1
C1523755	08/16	16.70	24:00	24.05	128.845	28-Jul	130.488	14-Sep	1.643	68.3
C1523758	08/22	16.70	24:00	24.05	126.808	28-Jul	127.264	14-Sep	0.456	19.0
C1523771	08/28	16.70	24:00	24.05	125.389	21-Aug	126.475	23-Oct	1.086	45.2
C1523773	09/03	16.70	24:00	24.05	117.818	21-Aug	118.605	23-Oct	0.787	32.7
C1523775	09/09	16.70	24:00	24.05	125.552	21-Aug	125.944	23-Oct	0.392	16.3
C1523777	09/15	16.70	24:00	24.05	127.274	21-Aug	128.144	23-Oct	0.870	36.2
C1527184	09/21	16.70	24:00	24.05	124.394	15-Sep	124.843	10-Nov	0.449	18.7
C1527188	09/27	16.70	24:00	24.05	123.454	15-Sep	124.634	10-Nov	1.180	49.1

Quarter 3, 2023 Filter Analysis Results - TSP - Walnut St

FILTER	TYPE	DATE	AVG FLOW LPM	HOURS	SAMPLE VOLUME (M3)	PRE WEIGHT (MG)	PRE-WEIGHT DATE	POST WEIGHT (MG)	POST-WEIGHT DATE	PART MASS (MG)	CONC (UG/M3)
P0908133	TSP	07/11	16.70	24:00	24.05	140.857	30-Jun	142.464	22-Aug	1.607	66.8
P0908135	TSP	07/17	16.70	24:00	24.05	144.060	30-Jun	145.584	22-Aug	1.524	63.4
P0908137	TSP	07/23	16.70	24:00	24.05	143.263	30-Jun	144.922	22-Aug	1.659	69.0
P0908139	TSP	07/29	16.70	24:00	24.05	146.118	30-Jun	147.823	22-Aug	1.705	70.9
C1523752	TSP	08/04	16.70	24:00	24.05	128.902	28-Jul	129.597	14-Sep	0.695	28.9
C1523754	TSP	08/10	16.70	24:00	24.05	128.582	28-Jul	129.332	14-Sep	0.750	31.2
C1523757	TSP	08/16	16.70	24:00	24.05	126.261	28-Jul	127.368	14-Sep	1.107	46.0
C1523759	TSP	08/22	16.70	24:00	24.05	126.979	28-Jul	127.543	14-Sep	0.564	23.5
C1523772	TSP	08/28	16.70	24:00	24.05	126.504	21-Aug	127.396	23-Oct	0.892	37.1
C1523774	TSP	09/09	16.70	24:00	24.05	124.758	21-Aug	125.482	23-Oct	0.724	30.1
C1523778	TSP	09/15	16.70	24:00	24.05	128.029	21-Aug	128.732	23-Oct	0.703	29.2
C1523779	TSP	09/18	16.70	24:00	24.05	125.814	21-Aug	127.068	23-Oct	1.254	52.1
C1527186	TSP	09/21	16.70	24:00	24.05	127.391	15-Sep	127.846	10-Nov	0.455	18.9
C1527189	TSP	09/27	16.70	24:00	24.05	127.851	15-Sep	128.678	10-Nov	0.827	34.4

APPENDIX B: LABORATORY ANALYSIS REPORTS - TSP

ANALYTICAL SUMMARY REPORT

September 22, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: B23082166 Quote ID: B4795

Project Name: Montana Resources/Greely School

Energy Laboratories Inc Billings MT received the following 10 samples for Bison Engineering on 8/22/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23082166-001	Particulate filter #P0908131 Lab Blank	07/03/23 15:40	08/22/23	Air	Metals on air filter by ICP/ICPMS Nitric acid-extraction by 40CFR50G
B23082166-002	Particulate filter #P0908132 Pine TSP Composite	07/11/23 0:00	08/22/23	Air	Same As Above
B23082166-003	Particulate filter #P0908133T Walnut TSP Composite	07/11/23 0:00	08/22/23	Air	Same As Above
B23082166-004	Particulate filter #P0908134 Pine TSP Composite	07/17/23 0:00	08/22/23	Air	Same As Above
B23082166-005	Particulate filter #P0908135 Walnut TSP Composite	07/17/23 0:00	08/22/23	Air	Same As Above
B23082166-006	Particulate filter #P0908136 Pine TSP Composite	07/23/23 0:00	08/22/23	Air	Same As Above
B23082166-007	Particulate filter #P0908137 Walnut TSP Composite	07/23/23 0:00	08/22/23	Air	Same As Above
B23082166-008	Particulate filter #P0908138 Pine TSP Composite	07/29/23 0:00	08/22/23	Air	Same As Above
B23082166-009	Particulate filter #P0908139 Walnut TSP Composite	07/29/23 0:00	08/22/23	Air	Same As Above
B23082166-010	Particulate filter #P0908140 Field Blank	08/01/23 0:00	08/22/23	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

CLIENT: Bison Engineering
Project: Montana Resources/Greely School
Work Order: B23082166

Revised Date: 09/22/23
Report Date: 09/05/23

CASE NARRATIVE

Per client request, results are based on the final concentration using 25 mL of extraction solution per filter.

All "J" qualified analyte concentrations are below the laboratory minimum recommended Reporting Limit (RL) and above the lowest method detection limit (MDL)/Limit of Detection (LOD). Inorganic analytes reported with "J" qualifiers should be verified against the corresponding method blank and continuing calibration blanks. Inorganic "J" quantitations near the MDL/LOD may be suspect due to possible method background levels, sample matrix effects, and/or daily variability in instrument signal-to-noise levels.

Revised Date: 9/22/2023

On 9/13/2023 a request was received from Don Milmine at Bison Engineering to re-evaluate the arsenic result in the method blank. Upon further review the original results sent were biased high. The method blank and the samples were re-ran on 9/15/2023. Below are the results:

B23082166-001

8/29	9/2	9/15
0.1	0.2	ND

B23082166-002

8/29	9/2	9/15
0.1	0.3	ND

B23082166-003

8/29	9/2	9/15
0.1	0.3	0.08

B23082166-004

8/29	9/2	9/15
0.2	0.3	0.1

B23082166-005

8/29	9/2	9/15
0.1	0.3	ND

B23082166-006

8/29	9/2	9/15
0.1	0.2	0.08

B23082166-007, B23082166-008, B23082166-009, B23082166-010

8/29	9/2	9/15
0.1	0.2	ND

Method Blank

8/29	9/2	9/15
0.1	0.2	ND

The results from 9/15/2023 will be reported. We apologize for any inconvenience this may have caused. The report has been revised and replaces the previously issued report dated 9/5/2023 in its entirety.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-001
Client Sample ID: Particulate filter #P0908131 Lab Blank

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 07/03/23 15:40
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	09/15/23 14:24 / aem
Cadmium	ND	ug/filter		1		E200.8	08/29/23 01:29 / jks
Copper	ND	ug/filter		1		E200.8	08/29/23 01:29 / jks
Lead	ND	ug/filter		1		E200.8	08/29/23 01:29 / jks
Manganese	ND	ug/filter		1		E200.8	08/29/23 01:29 / jks
Molybdenum	ND	ug/filter		1		E200.8	08/29/23 01:29 / jks
Zinc	ND	ug/filter		1		E200.8	08/29/23 01:29 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-002
Client Sample ID: Particulate filter #P0908132 Pine TSP Composite

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 07/11/23
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	09/15/23 14:30 / aem
Cadmium	ND	ug/filter		1		E200.8	08/29/23 01:35 / jks
Copper	6	ug/filter		1		E200.8	09/02/23 05:59 / aem
Lead	0.2	ug/filter	J	1		E200.8	09/02/23 05:59 / aem
Manganese	0.3	ug/filter	J	1		E200.8	09/02/23 05:59 / aem
Molybdenum	0.4	ug/filter	J	1		E200.8	09/02/23 05:59 / aem
Zinc	0.9	ug/filter	J	1		E200.8	09/02/23 05:59 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-003
Client Sample ID: Particulate filter #P0908133T Walnut TSP Composite

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 07/11/23
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.08	ug/filter	J	1		E200.8	09/15/23 14:49 / aem
Cadmium	ND	ug/filter		1		E200.8	08/29/23 01:41 / jks
Copper	2	ug/filter		1		E200.8	09/02/23 06:05 / aem
Lead	0.1	ug/filter	J	1		E200.8	09/02/23 06:05 / aem
Manganese	0.6	ug/filter	J	1		E200.8	09/02/23 06:05 / aem
Molybdenum	0.2	ug/filter	J	1		E200.8	09/02/23 06:05 / aem
Zinc	1	ug/filter	J	1		E200.8	09/02/23 06:05 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-004
Client Sample ID: Particulate filter #P0908134 Pine TSP Composite

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 07/17/23
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.1	ug/filter	J	1		E200.8	09/15/23 14:56 / aem
Cadmium	0.01	ug/filter	J	1		E200.8	09/02/23 06:11 / aem
Copper	13	ug/filter		1		E200.8	09/02/23 06:11 / aem
Lead	0.3	ug/filter	J	1		E200.8	09/02/23 06:11 / aem
Manganese	1	ug/filter		1		E200.8	09/02/23 06:11 / aem
Molybdenum	2	ug/filter		1		E200.8	09/02/23 06:11 / aem
Zinc	2	ug/filter		1		E200.8	08/29/23 01:47 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-005
Client Sample ID: Particulate filter #P0908135 Walnut TSP Composite

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 07/17/23
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	09/15/23 15:02 / aem
Cadmium	ND	ug/filter		1		E200.8	08/29/23 01:53 / jks
Copper	3	ug/filter		1		E200.8	09/02/23 06:17 / aem
Lead	0.2	ug/filter	J	1		E200.8	09/02/23 06:17 / aem
Manganese	0.9	ug/filter	J	1		E200.8	09/02/23 06:17 / aem
Molybdenum	0.8	ug/filter	J	1		E200.8	09/02/23 06:17 / aem
Zinc	1	ug/filter		1		E200.8	09/02/23 06:17 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-006
Client Sample ID: Particulate filter #P0908136 Pine TSP Composite

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 07/23/23
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	0.08	ug/filter	J	1		E200.8	09/15/23 15:08 / aem
Cadmium	ND	ug/filter		1		E200.8	08/29/23 01:59 / jks
Copper	4	ug/filter		1		E200.8	09/02/23 06:23 / aem
Lead	0.2	ug/filter	J	1		E200.8	09/02/23 06:23 / aem
Manganese	0.8	ug/filter	J	1		E200.8	09/02/23 06:23 / aem
Molybdenum	0.6	ug/filter	J	1		E200.8	09/02/23 06:23 / aem
Zinc	1	ug/filter	J	1		E200.8	09/02/23 06:23 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-007
Client Sample ID: Particulate filter #P0908137 Walnut TSP Composite

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 07/23/23
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	09/15/23 15:15 / aem
Cadmium	ND	ug/filter		1		E200.8	08/29/23 02:17 / jks
Copper	3	ug/filter		1		E200.8	09/02/23 06:29 / aem
Lead	0.1	ug/filter	J	1		E200.8	09/02/23 06:29 / aem
Manganese	0.8	ug/filter	J	1		E200.8	09/02/23 06:29 / aem
Molybdenum	0.3	ug/filter	J	1		E200.8	09/02/23 06:29 / aem
Zinc	ND	ug/filter		1		E200.8	08/29/23 02:17 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-008
Client Sample ID: Particulate filter #P0908138 Pine TSP Composite

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 07/29/23
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	09/15/23 15:21 / aem
Cadmium	ND	ug/filter		1		E200.8	08/29/23 02:23 / jks
Copper	2	ug/filter		1		E200.8	09/02/23 06:35 / aem
Lead	0.09	ug/filter	J	1		E200.8	09/02/23 06:35 / aem
Manganese	0.6	ug/filter	J	1		E200.8	09/02/23 06:35 / aem
Molybdenum	0.08	ug/filter	J	1		E200.8	09/02/23 06:35 / aem
Zinc	ND	ug/filter		1		E200.8	08/29/23 02:23 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-009
Client Sample ID: Particulate filter #P0908139 Walnut TSP Composite

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 07/29/23
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	09/15/23 15:27 / aem
Cadmium	ND	ug/filter		1		E200.8	08/29/23 02:29 / jks
Copper	1	ug/filter		1		E200.8	09/02/23 06:41 / aem
Lead	0.1	ug/filter	J	1		E200.8	09/02/23 06:41 / aem
Manganese	0.4	ug/filter	J	1		E200.8	09/02/23 06:41 / aem
Molybdenum	0.1	ug/filter	J	1		E200.8	09/02/23 06:41 / aem
Zinc	ND	ug/filter		1		E200.8	08/29/23 02:29 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23082166-010
Client Sample ID: Particulate filter #P0908140 Field Blank

Revised Date: 09/22/23
Report Date: 09/05/23
Collection Date: 08/01/23
DateReceived: 08/22/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	09/15/23 15:34 / aem
Cadmium	ND	ug/filter		1		E200.8	08/29/23 02:35 / jks
Copper	ND	ug/filter		1		E200.8	08/29/23 02:35 / jks
Lead	ND	ug/filter		1		E200.8	08/29/23 02:35 / jks
Manganese	ND	ug/filter		1		E200.8	08/29/23 02:35 / jks
Molybdenum	ND	ug/filter		1		E200.8	08/29/23 02:35 / jks
Zinc	ND	ug/filter		1		E200.8	08/29/23 02:35 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch **Revised Date:** 09/22/23

Client: Bison Engineering **Work Order:** B23082166 **Report Date:** 09/05/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Analytical Run: ICPMS207-B_230828A	
Lab ID: QCS	6	Initial Calibration Verification Standard								08/28/23 19:28
Cadmium		0.0258	mg/L	0.0010	103	90	110			
Copper		0.0526	mg/L	0.010	105	90	110			
Lead		0.0507	mg/L	0.0010	101	90	110			
Manganese		0.252	mg/L	0.0050	101	90	110			
Molybdenum		0.0485	mg/L	0.0050	97	90	110			
Zinc		0.0541	mg/L	0.0050	108	90	110			
Lab ID: CCV	6	Continuing Calibration Verification Standard								08/29/23 00:41
Cadmium		0.0510	mg/L	0.0010	102	90	110			
Copper		0.0508	mg/L	0.010	102	90	110			
Lead		0.0489	mg/L	0.0010	98	90	110			
Manganese		0.0495	mg/L	0.0050	99	90	110			
Molybdenum		0.0490	mg/L	0.0050	98	90	110			
Zinc		0.0517	mg/L	0.0050	103	90	110			
Lab ID: CCV	6	Continuing Calibration Verification Standard								08/29/23 02:05
Cadmium		0.0511	mg/L	0.0010	102	90	110			
Copper		0.0500	mg/L	0.010	100	90	110			
Lead		0.0490	mg/L	0.0010	98	90	110			
Manganese		0.0493	mg/L	0.0050	99	90	110			
Molybdenum		0.0489	mg/L	0.0050	98	90	110			
Zinc		0.0531	mg/L	0.0050	106	90	110			
Method: E200.8										Batch: 182217
Lab ID: MB-182217	7	Method Blank				Run: ICPMS207-B_230828A				08/29/23 01:05
Arsenic		0.1	ug/filter	0.08						
Cadmium		ND	ug/filter	0.009						
Copper		ND	ug/filter	0.3						
Lead		ND	ug/filter	0.09						
Manganese		ND	ug/filter	0.2						
Molybdenum		ND	ug/filter	0.07						
Zinc		ND	ug/filter	0.8						
Lab ID: LCS-182217	7	Laboratory Control Sample				Run: ICPMS207-B_230828A				08/29/23 01:11
Arsenic		95.8	ug/filter	1.0	96	85	115			
Cadmium		50.6	ug/filter	1.0	101	85	115			
Copper		95.7	ug/filter	1.0	96	85	115			
Lead		98.8	ug/filter	1.0	99	85	115			
Manganese		477	ug/filter	1.0	95	85	115			
Molybdenum		99.6	ug/filter	1.0	100	85	115			
Zinc		96.0	ug/filter	1.0	96	85	115			
Lab ID: LCSD-182217	7	Laboratory Control Sample Duplicate				Run: ICPMS207-B_230828A				08/29/23 01:17
Arsenic		97.0	ug/filter	1.0	97	85	115			
Cadmium		51.2	ug/filter	1.0	102	85	115			
Copper		96.7	ug/filter	1.0	97	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch **Revised Date:** 09/22/23

Client: Bison Engineering **Work Order:** B23082166 **Report Date:** 09/05/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: 182217
Lab ID: LCSD-182217	7	Laboratory Control Sample Duplicate				Run: ICPMS207-B_230828A				08/29/23 01:17
Lead		99.9	ug/filter	1.0	100	85	115			
Manganese		482	ug/filter	1.0	96	85	115			
Molybdenum		100	ug/filter	1.0	100	85	115			
Zinc		97.0	ug/filter	1.0	97	85	115			
Method: E200.8										Analytical Run: ICPMS207-B_230901A
Lab ID: QCS	6	Initial Calibration Verification Standard								09/02/23 05:29
Cadmium		0.0258	mg/L	0.0010	103	90	110			
Copper		0.0542	mg/L	0.010	108	90	110			
Lead		0.0495	mg/L	0.0010	99	90	110			
Manganese		0.262	mg/L	0.0050	105	90	110			
Molybdenum		0.0503	mg/L	0.0050	101	90	110			
Zinc		0.0541	mg/L	0.0050	108	90	110			
Lab ID: CCV	6	Continuing Calibration Verification Standard								09/02/23 05:35
Cadmium		0.0501	mg/L	0.0010	100	90	110			
Copper		0.0521	mg/L	0.010	104	90	110			
Lead		0.0499	mg/L	0.0010	100	90	110			
Manganese		0.0516	mg/L	0.0050	103	90	110			
Molybdenum		0.0504	mg/L	0.0050	101	90	110			
Zinc		0.0517	mg/L	0.0050	103	90	110			
Lab ID: CCV	6	Continuing Calibration Verification Standard								09/02/23 06:47
Cadmium		0.0495	mg/L	0.0010	99	90	110			
Copper		0.0520	mg/L	0.010	104	90	110			
Lead		0.0495	mg/L	0.0010	99	90	110			
Manganese		0.0507	mg/L	0.0050	101	90	110			
Molybdenum		0.0496	mg/L	0.0050	99	90	110			
Zinc		0.0521	mg/L	0.0050	104	90	110			
Method: E200.8										Batch: 182217
Lab ID: MB-182217	6	Method Blank				Run: ICPMS207-B_230901A				09/02/23 05:47
Cadmium		ND	ug/filter	0.009						
Copper		ND	ug/filter	0.3						
Lead		ND	ug/filter	0.09						
Manganese		ND	ug/filter	0.2						
Molybdenum		ND	ug/filter	0.07						
Zinc		ND	ug/filter	0.8						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch **Revised Date:** 09/22/23

Client: Bison Engineering **Work Order:** B23082166 **Report Date:** 09/05/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E200.8**									Analytical Run: ICPMS208-B_230915A	
Lab ID: **QCS**	Initial Calibration Verification Standard									09/15/23 11:58
Arsenic		0.0498	mg/L	0.0050	100	90	110			
Lab ID: **CCV**	Continuing Calibration Verification Standard									09/15/23 13:14
Arsenic		0.0506	mg/L	0.0050	101	90	110			
Lab ID: **CCV**	Continuing Calibration Verification Standard									09/15/23 14:37
Arsenic		0.0497	mg/L	0.0050	99	90	110			
Method: **E200.8**										Batch: 182217
Lab ID: **MB-182217**	Method Blank					Run: ICPMS208-B_230915A				09/15/23 13:40
Arsenic		ND	ug/filter	0.08						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Bison Engineering

B23082166

Login completed by: Lyndsi E. LeProwse
Date Received: 8/22/2023
Reviewed by: gmccartney
Received by: tjg
Reviewed Date: 8/25/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.3°C On Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

Chain of Custody & Analytical Request Record

ENERGY LABORATORIES — Trust our People. Trust our Data.

www.energylab.com

Account Information (Billing information)

Company/Name	Bison Engineering, Inc.
Contact	Shelley Brown-Argott
Phone	(406) 442-5768
Mailing Address	3143 E Lyndale Avenue
City, State, Zip	Helena MT, 59601
Email	sbrown-argott@bison-eng.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ■Email
Purchase Order	MTR223018
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	Bison Engineering, Inc.
Contact	Don Milmine
Phone	(406) 208-4833
Mailing Address	2751 Enterprise Avenue Suite 2
City, State, Zip	Billings, MT 59102
Email	dmilmine@bison-eng.com
Receive Report	☐Hard Copy ☒Email

Special Report/Formats: ☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other_____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources / Greely School
Sampler Name	Sampler Phone
Sample Origin State	Montana
EPA/State Compliance	☒ Yes ☐ No

URANIUM MINING CLIENTS MUST indicate sample type.
☐ NOT Source or Byproduct Material
☐ Source/Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11e.(2) Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Arsenic	Cadmium	Copper	Lead	Manganese	Molybdenum	Zinc			See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	Particulate filter #P0908131 Lab Blank	7/3/23	1540	1	on Teflon filter	x	x	x	x	x	x	x					B23082166
2	Particulate filter #P0908132 Pine TSP	7/11/23	24 hr Composite	1	on Teflon filter	x	x	x	x	x	x	x					
3	Particulate filter #P0908133T Walnut TSP	7/11/23	24 hr composite	1	on Teflon filter	x	x	x	x	x	x	x					
4	Particulate filter #P0908134 Pine TSP	7/17/23	24 hr Composite	1	on Teflon filter	x	x	x	x	x	x	x					
5	Particulate filter #P0908135 Walnut TSP	7/17/23	24 hr Composite	1	on Teflon Filter	x	x	x	x	x	x	x					
6	Particulate filter #P0908136 Pine TSP	7/23/23	24 hr Composite	1	on Teflon filter	x	x	x	x	x	x	x					
7	Particulate filter #P0908137 Walnut TSP	7/23/23	24 hr composite	1	on Teflon filter	x	x	x	x	x	x	x					
8	Particulate filter #P0908138 Pine TSP	7/29/23	24 hr Composite	1	on Teflon filter	x	x	x	x	x	x	x					
9	Particulate filter #P0908139 Walnut TSP	7/29/23	24 hr composite	1	on Teflon filter	x	x	x	x	x	x	x					
10	Particulate filter #P0908140 Field Blank	8/1/23		1	on Teflon filter	x	x	x	x	x	x	x					

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Don Milmine	8/22/23 1657	Don V. Milmine			
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				Peter Basser	8/22/23 1657	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check_____	Amount $	Receipt Number (cash/check only)
				3.3	Y N	Y N			

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-10/18 v.3

ANALYTICAL SUMMARY REPORT

October 06, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: B23091584 Quote ID: B4795

Project Name: Montana Resources/Greely School

Energy Laboratories Inc Billings MT received the following 10 samples for Bison Engineering on 9/19/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23091584-001	Particulate Filter #C1523751 TSP Pine Composite	08/04/23 0:00	09/19/23	Air	Metals on air filter by ICP/ICPMS Nitric acid-extraction by 40CFR50G
B23091584-002	Particulate Filter #C1523752 TSP Walnut Composite	08/04/23 0:00	09/19/23	Air	Same As Above
B23091584-003	Particulate Filter #C1523753 TSP Pine Composite	08/10/23 0:00	09/19/23	Air	Same As Above
B23091584-004	Particulate Filter #C1523754 TSP Walnut Composite	08/10/23 0:00	09/19/23	Air	Same As Above
B23091584-005	Particulate Filter #C1523755 TSP Pine Composite	08/16/23 0:00	09/19/23	Air	Same As Above
B23091584-006	Particulate Filter #C1523756 TSP Field Blank Composite	08/24/23 0:00	09/19/23	Air	Same As Above
B23091584-007	Particulate Filter #C1523757 TSP Walnut Composite	08/16/23 0:00	09/19/23	Air	Same As Above
B23091584-008	Particulate Filter #C1523758 TSP Pine Composite	08/22/23 0:00	09/19/23	Air	Same As Above
B23091584-009	Particulate Filter #C1523759 TSP Walnut Composite	08/22/23 0:00	09/19/23	Air	Same As Above
B23091584-010	Particulate Filter #C1523760 Lab Blank Composite	05/25/23 0:00	09/19/23	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

CLIENT: Bison Engineering
Project: Montana Resources/Greely School
Work Order: B23091584

Report Date: 10/06/23

CASE NARRATIVE

Per client request, results are based on the final concentration using 25 mL of extraction solution per filter.

All "J" qualified analyte concentrations are below the laboratory minimum recommended Reporting Limit (RL) and above the lowest method detection limit (MDL)/Limit of Detection (LOD). Inorganic analytes reported with "J" qualifiers should be verified against the corresponding method blank and continuing calibration blanks. Inorganic "J" quantitations near the MDL/LOD may be suspect due to possible method background levels, sample matrix effects, and/or daily variability in instrument signal-to-noise levels.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-001
Client Sample ID: Particulate Filter #C1523751 TSP Pine Composite

Report Date: 10/06/23
Collection Date: 08/04/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/03/23 08:42 / aem
Cadmium	ND	ug/filter		1		E200.8	10/03/23 08:42 / aem
Copper	0.9	ug/filter	J	1		E200.8	10/03/23 08:42 / aem
Lead	0.09	ug/filter	J	1		E200.8	10/03/23 08:42 / aem
Manganese	0.4	ug/filter	J	1		E200.8	10/03/23 08:42 / aem
Molybdenum	ND	ug/filter		1		E200.8	10/03/23 08:42 / aem
Zinc	ND	ug/filter		1		E200.8	10/03/23 08:42 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-002
Client Sample ID: Particulate Filter #C1523752 TSP Walnut Composite

Report Date: 10/06/23
Collection Date: 08/04/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/03/23 08:49 / aem
Cadmium	ND	ug/filter		1		E200.8	10/03/23 08:49 / aem
Copper	0.6	ug/filter	J	1		E200.8	10/03/23 08:49 / aem
Lead	0.1	ug/filter	J	1		E200.8	10/03/23 08:49 / aem
Manganese	0.5	ug/filter	J	1		E200.8	10/03/23 08:49 / aem
Molybdenum	ND	ug/filter		1		E200.8	10/03/23 08:49 / aem
Zinc	ND	ug/filter		1		E200.8	10/03/23 08:49 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-003
Client Sample ID: Particulate Filter #C1523753 TSP Pine Composite

Report Date: 10/06/23
Collection Date: 08/10/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/03/23 09:07 / aem
Cadmium	ND	ug/filter		1		E200.8	10/03/23 09:07 / aem
Copper	2	ug/filter		1		E200.8	10/03/23 09:07 / aem
Lead	ND	ug/filter		1		E200.8	10/03/23 09:07 / aem
Manganese	ND	ug/filter		1		E200.8	10/03/23 09:07 / aem
Molybdenum	0.09	ug/filter	J	1		E200.8	10/03/23 09:07 / aem
Zinc	ND	ug/filter		1		E200.8	10/03/23 09:07 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-004
Client Sample ID: Particulate Filter #C1523754 TSP Walnut Composite

Report Date: 10/06/23
Collection Date: 08/10/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/05/23 22:18 / aem
Cadmium	ND	ug/filter		1		E200.8	10/05/23 22:18 / aem
Copper	1	ug/filter		1		E200.8	10/05/23 22:18 / aem
Lead	ND	ug/filter		1		E200.8	10/05/23 22:18 / aem
Manganese	ND	ug/filter		1		E200.8	10/05/23 22:18 / aem
Molybdenum	ND	ug/filter		1		E200.8	10/05/23 22:18 / aem
Zinc	ND	ug/filter		1		E200.8	10/05/23 22:18 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-005
Client Sample ID: Particulate Filter #C1523755 TSP Pine Composite

Report Date: 10/06/23
Collection Date: 08/16/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/05/23 22:25 / aem
Cadmium	ND	ug/filter		1		E200.8	10/05/23 22:25 / aem
Copper	4	ug/filter		1		E200.8	10/05/23 22:25 / aem
Lead	0.2	ug/filter	J	1		E200.8	10/05/23 22:25 / aem
Manganese	1	ug/filter		1		E200.8	10/05/23 22:25 / aem
Molybdenum	0.1	ug/filter	J	1		E200.8	10/05/23 22:25 / aem
Zinc	1	ug/filter		1		E200.8	10/05/23 22:25 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-006
Client Sample ID: Particulate Filter #C1523756 TSP Field Blank Composite

Report Date: 10/06/23
Collection Date: 08/24/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/03/23 09:26 / aem
Cadmium	ND	ug/filter		1		E200.8	10/03/23 09:26 / aem
Copper	ND	ug/filter		1		E200.8	10/03/23 09:26 / aem
Lead	ND	ug/filter		1		E200.8	10/03/23 09:26 / aem
Manganese	ND	ug/filter		1		E200.8	10/03/23 09:26 / aem
Molybdenum	ND	ug/filter		1		E200.8	10/03/23 09:26 / aem
Zinc	ND	ug/filter		1		E200.8	10/03/23 09:26 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-007
Client Sample ID: Particulate Filter #C1523757 TSP Walnut Composite

Report Date: 10/06/23
Collection Date: 08/16/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/03/23 09:33 / aem
Cadmium	ND	ug/filter		1		E200.8	10/03/23 09:33 / aem
Copper	0.6	ug/filter	J	1		E200.8	10/03/23 09:33 / aem
Lead	0.09	ug/filter	J	1		E200.8	10/03/23 09:33 / aem
Manganese	0.6	ug/filter	J	1		E200.8	10/03/23 09:33 / aem
Molybdenum	ND	ug/filter		1		E200.8	10/03/23 09:33 / aem
Zinc	ND	ug/filter		1		E200.8	10/03/23 09:33 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-008
Client Sample ID: Particulate Filter #C1523758 TSP Pine Composite

Report Date: 10/06/23
Collection Date: 08/22/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/03/23 09:39 / aem
Cadmium	ND	ug/filter		1		E200.8	10/03/23 09:39 / aem
Copper	0.9	ug/filter	J	1		E200.8	10/03/23 09:39 / aem
Lead	ND	ug/filter		1		E200.8	10/03/23 09:39 / aem
Manganese	ND	ug/filter		1		E200.8	10/03/23 09:39 / aem
Molybdenum	ND	ug/filter		1		E200.8	10/03/23 09:39 / aem
Zinc	ND	ug/filter		1		E200.8	10/03/23 09:39 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-009
Client Sample ID: Particulate Filter #C1523759 TSP Walnut Composite

Report Date: 10/06/23
Collection Date: 08/22/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/03/23 09:45 / aem
Cadmium	ND	ug/filter		1		E200.8	10/03/23 09:45 / aem
Copper	0.5	ug/filter	J	1		E200.8	10/03/23 09:45 / aem
Lead	0.09	ug/filter	J	1		E200.8	10/03/23 09:45 / aem
Manganese	0.3	ug/filter	J	1		E200.8	10/03/23 09:45 / aem
Molybdenum	ND	ug/filter		1		E200.8	10/03/23 09:45 / aem
Zinc	ND	ug/filter		1		E200.8	10/03/23 09:45 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23091584-010
Client Sample ID: Particulate Filter #C1523760 Lab Blank Composite

Report Date: 10/06/23
Collection Date: 05/25/23
DateReceived: 09/19/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	10/03/23 09:52 / aem
Cadmium	ND	ug/filter		1		E200.8	10/03/23 09:52 / aem
Copper	0.5	ug/filter	J	1		E200.8	10/03/23 09:52 / aem
Lead	ND	ug/filter		1		E200.8	10/03/23 09:52 / aem
Manganese	ND	ug/filter		1		E200.8	10/03/23 09:52 / aem
Molybdenum	ND	ug/filter		1		E200.8	10/03/23 09:52 / aem
Zinc	ND	ug/filter		1		E200.8	10/03/23 09:52 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23091584 **Report Date:** 10/06/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E200.8**										Batch: 183296
Lab ID: **LCS-183296**	7	Laboratory Control Sample				Run: ICPMS207-B_230929A				09/30/23 05:26
Arsenic		101	ug/filter	1.0	101	85	115			
Cadmium		51.6	ug/filter	1.0	103	85	115			
Copper		100	ug/filter	1.0	101	85	115			
Lead		103	ug/filter	1.0	103	85	115			
Manganese		505	ug/filter	1.0	101	85	115			
Molybdenum		105	ug/filter	1.0	105	85	115			
Zinc		98.9	ug/filter	1.0	99	85	115			
Lab ID: **LCSD-183296**	7	Laboratory Control Sample Duplicate				Run: ICPMS207-B_230929A				09/30/23 05:32
Arsenic		99.2	ug/filter	1.0	99	85	115			
Cadmium		50.6	ug/filter	1.0	101	85	115			
Copper		98.7	ug/filter	1.0	99	85	115			
Lead		102	ug/filter	1.0	102	85	115			
Manganese		498	ug/filter	1.0	100	85	115			
Molybdenum		103	ug/filter	1.0	103	85	115			
Zinc		96.5	ug/filter	1.0	96	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23091584 **Report Date:** 10/06/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Analytical Run: ICPMS208-B_231002A	
Lab ID: QCS	7	Initial Calibration Verification Standard							10/03/23 05:40	
Arsenic		0.0506	mg/L	0.0050	101	90	110			
Cadmium		0.0250	mg/L	0.0010	100	90	110			
Copper		0.0522	mg/L	0.010	104	90	110			
Lead		0.0506	mg/L	0.0010	101	90	110			
Manganese		0.258	mg/L	0.0050	103	90	110			
Molybdenum		0.0497	mg/L	0.0050	99	90	110			
Zinc		0.0523	mg/L	0.0050	105	90	110			
Lab ID: CCV	7	Continuing Calibration Verification Standard							10/03/23 07:33	
Arsenic		0.0502	mg/L	0.0050	100	90	110			
Cadmium		0.0496	mg/L	0.0010	99	90	110			
Copper		0.0509	mg/L	0.010	102	90	110			
Lead		0.0496	mg/L	0.0010	99	90	110			
Manganese		0.0506	mg/L	0.0050	101	90	110			
Molybdenum		0.0494	mg/L	0.0050	99	90	110			
Zinc		0.0499	mg/L	0.0050	100	90	110			
Lab ID: CCV	7	Continuing Calibration Verification Standard							10/03/23 08:55	
Arsenic		0.0494	mg/L	0.0050	99	90	110			
Cadmium		0.0495	mg/L	0.0010	99	90	110			
Copper		0.0497	mg/L	0.010	99	90	110			
Lead		0.0499	mg/L	0.0010	100	90	110			
Manganese		0.0497	mg/L	0.0050	99	90	110			
Molybdenum		0.0492	mg/L	0.0050	98	90	110			
Zinc		0.0486	mg/L	0.0050	97	90	110			
Method: E200.8									Batch: 183296	
Lab ID: MB-183296	7	Method Blank				Run: ICPMS208-B_231002A			10/03/23 08:36	
Arsenic		ND	ug/filter	0.08						
Cadmium		ND	ug/filter	0.009						
Copper		ND	ug/filter	0.3						
Lead		ND	ug/filter	0.09						
Manganese		ND	ug/filter	0.2						
Molybdenum		ND	ug/filter	0.07						
Zinc		ND	ug/filter	0.8						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23091584 **Report Date:** 10/06/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Analytical Run: ICPMS208-B_231004B	
Lab ID: QCS	7	Initial Calibration Verification Standard							10/05/23 21:15	
Arsenic		0.0490	mg/L	0.0050	98	90	110			
Cadmium		0.0253	mg/L	0.0010	101	90	110			
Copper		0.0518	mg/L	0.010	104	90	110			
Lead		0.0493	mg/L	0.0010	99	90	110			
Manganese		0.251	mg/L	0.0050	101	90	110			
Molybdenum		0.0472	mg/L	0.0050	94	90	110			
Zinc		0.0503	mg/L	0.0050	101	90	110			
Lab ID: CCV	7	Continuing Calibration Verification Standard							10/05/23 21:47	
Arsenic		0.0486	mg/L	0.0050	97	90	110			
Cadmium		0.0498	mg/L	0.0010	100	90	110			
Copper		0.0504	mg/L	0.010	101	90	110			
Lead		0.0480	mg/L	0.0010	96	90	110			
Manganese		0.0491	mg/L	0.0050	98	90	110			
Molybdenum		0.0463	mg/L	0.0050	93	90	110			
Zinc		0.0496	mg/L	0.0050	99	90	110			
Method: E200.8									Batch: 183296	
Lab ID: MB-183296	7	Method Blank				Run: ICPMS208-B_231004B			10/05/23 21:59	
Arsenic		ND	ug/filter	0.08						
Cadmium		ND	ug/filter	0.009						
Copper		ND	ug/filter	0.3						
Lead		ND	ug/filter	0.09						
Manganese		ND	ug/filter	0.2						
Molybdenum		ND	ug/filter	0.07						
Zinc		ND	ug/filter	0.8						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Bison Engineering

B23091584

Login completed by: Yvonna E. Smith
Date Received: 9/19/2023
Reviewed by: gmccartney
Received by: lel
Reviewed Date: 9/21/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.9°C On Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information *(Billing information)*

Company/Name	Bison Engineering, Inc.
Contact	Shelley Brown-Argott
Phone	(406) 442-5768
Mailing Address	3143 E Lyndale Avenue
City, State, Zip	Helena MT, 59601
Email	sbrown-argott@bison-eng.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ■Email
Purchase Order	MTR223018
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	Bison Engineering, Inc.
Contact	Don Milmine
Phone	(406) 208-4833
Mailing Address	2751 Enterprise Avenue Suite 2
City, State, Zip	Billings, MT 59102
Email	dmilmine@bison-eng.com
Receive Report	☐Hard Copy ☒Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources / Greely School
Sampler Name	Sampler Phone
Sample Origin State Montana	EPA/State Compliance ☒ Yes ☐ No

URANIUM MINING CLIENTS MUST indicate sample type.
☐ NOT Source or Byproduct Material
☐ Source/Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11e.(2) Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Arsenic	Cadmium	Copper	Lead	Manganese	Molybdenum	Zinc			See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	Particulate filter #C1523751 TSP Pine	8/4/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					B23091584
2	Particulate filter #C1523752 TSP Walnut	8/4/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
3	Particulate filter #C1523753 TSP Pine	8/10/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
4	Particulate filter #C1523754 TSP Walnut	8/10/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
5	Particulate filter #C1523755 TSP Pine	8/16/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
6	Particulate filter #C1523756 TSP Field Blank	8/24/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
7	Particulate filter #C1523757 TSP Walnut	8/16/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
8	Particulate filter #C1523758 TSP Pine	8/22/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
9	Particulate filter #C1523759 TSP Walnut	8/22/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					
10	Particulate filter #C1523760 Lab Blank	5/25/23	24 hr composite	1	on teflon filter	x	x	x	x	x	x	x					

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Don Milmine	9/19/23 1231	Don Milmine			
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				Mandi LeBrowse	9/19/23 12:31	Mandi LeBrowse

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check_____	Amount $	Receipt Number *(cash/check only)*
				3.9 °C	Y N	Y N			

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-10/18 v.3

ANALYTICAL SUMMARY REPORT

November 20, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: B23110473 Quote ID: B4795

Project Name: Montana Resources/Greely School PW

Energy Laboratories Inc Billings MT received the following 10 samples for Bison Engineering on 11/7/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23110473-001	Particulate Filter #C1523771 TSP Pine	08/28/23 0:00	11/07/23	Air	Metals on air filter by ICP/ICPMS Nitric acid-extraction by 40CFR50G
B23110473-002	Particulate Filter #C1523772 TSP Walnut	08/28/23 0:00	11/07/23	Air	Same As Above
B23110473-003	Particulate Filter #C1523773 TSP Pine	09/03/23 0:00	11/07/23	Air	Same As Above
B23110473-004	Particulate Filter #C1523774 TSP Walnut	09/09/23 0:00	11/07/23	Air	Same As Above
B23110473-005	Particulate Filter #C1523775 TSP Pine	09/09/23 0:00	11/07/23	Air	Same As Above
B23110473-006	Particulate Filter #C1523776 Lab Blank	08/21/23 15:40	11/07/23	Air	Same As Above
B23110473-007	Particulate Filter #C1523777 TSP Pine	09/15/23 0:00	11/07/23	Air	Same As Above
B23110473-008	Particulate Filter #C1523778 TSP Walnut	09/15/23 0:00	11/07/23	Air	Same As Above
B23110473-009	Particulate Filter #C1523779 TSP Walnut	09/18/23 0:00	11/07/23	Air	Same As Above
B23110473-010	Particulate Filter #C1523780 Field Blank	09/17/23 16:20	11/07/23	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-001
Client Sample ID: Particulate Filter #C1523771 TSP Pine

Report Date: 11/20/23
Collection Date: 08/28/23
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/14/23 23:57 / aem
Cadmium	ND	ug/filter		1		E200.8	11/14/23 23:57 / aem
Copper	3	ug/filter		1		E200.8	11/14/23 23:57 / aem
Lead	0.1	ug/filter	J	1		E200.8	11/14/23 23:57 / aem
Manganese	0.5	ug/filter	J	1		E200.8	11/14/23 23:57 / aem
Molybdenum	0.08	ug/filter	J	1		E200.8	11/14/23 23:57 / aem
Zinc	1	ug/filter		1		E200.8	11/14/23 23:57 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-002
Client Sample ID: Particulate Filter #C1523772 TSP Walnut

Report Date: 11/20/23
Collection Date: 08/28/23
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/15/23 00:03 / aem
Cadmium	ND	ug/filter		1		E200.8	11/15/23 00:03 / aem
Copper	2	ug/filter		1		E200.8	11/15/23 00:03 / aem
Lead	0.2	ug/filter	J	1		E200.8	11/15/23 00:03 / aem
Manganese	0.5	ug/filter	J	1		E200.8	11/15/23 00:03 / aem
Molybdenum	0.08	ug/filter	J	1		E200.8	11/15/23 00:03 / aem
Zinc	1	ug/filter		1		E200.8	11/15/23 00:03 / aem

Report Definitions:
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ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-003
Client Sample ID: Particulate Filter #C1523773 TSP Pine

Report Date: 11/20/23
Collection Date: 09/03/23
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/15/23 00:09 / aem
Cadmium	ND	ug/filter		1		E200.8	11/15/23 00:09 / aem
Copper	1	ug/filter		1		E200.8	11/15/23 00:09 / aem
Lead	ND	ug/filter		1		E200.8	11/15/23 00:09 / aem
Manganese	0.4	ug/filter	J	1		E200.8	11/15/23 00:09 / aem
Molybdenum	0.09	ug/filter	J	1		E200.8	11/15/23 00:09 / aem
Zinc	ND	ug/filter		1		E200.8	11/15/23 00:09 / aem

Report Definitions:
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MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-004
Client Sample ID: Particulate Filter #C1523774 TSP Walnut

Report Date: 11/20/23
Collection Date: 09/09/23
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/15/23 00:16 / aem
Cadmium	ND	ug/filter		1		E200.8	11/15/23 00:16 / aem
Copper	0.6	ug/filter	J	1		E200.8	11/15/23 00:16 / aem
Lead	ND	ug/filter		1		E200.8	11/15/23 00:16 / aem
Manganese	0.3	ug/filter	J	1		E200.8	11/15/23 20:12 / aem
Molybdenum	ND	ug/filter		1		E200.8	11/15/23 00:16 / aem
Zinc	ND	ug/filter		1		E200.8	11/15/23 00:16 / aem

Report Definitions:
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MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-005
Client Sample ID: Particulate Filter #C1523775 TSP Pine

Report Date: 11/20/23
Collection Date: 09/09/23
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/15/23 00:22 / aem
Cadmium	ND	ug/filter		1		E200.8	11/15/23 00:22 / aem
Copper	0.4	ug/filter	J	1		E200.8	11/15/23 00:22 / aem
Lead	ND	ug/filter		1		E200.8	11/15/23 00:22 / aem
Manganese	ND	ug/filter		1		E200.8	11/15/23 20:18 / aem
Molybdenum	ND	ug/filter		1		E200.8	11/15/23 00:22 / aem
Zinc	ND	ug/filter		1		E200.8	11/15/23 00:22 / aem

Report Definitions:
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MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-006
Client Sample ID: Particulate Filter #C1523776 Lab Blank

Report Date: 11/20/23
Collection Date: 08/21/23 15:40
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/15/23 00:28 / aem
Cadmium	ND	ug/filter		1		E200.8	11/15/23 00:28 / aem
Copper	ND	ug/filter		1		E200.8	11/15/23 00:28 / aem
Lead	ND	ug/filter		1		E200.8	11/15/23 00:28 / aem
Manganese	ND	ug/filter		1		E200.8	11/15/23 00:28 / aem
Molybdenum	ND	ug/filter		1		E200.8	11/15/23 00:28 / aem
Zinc	ND	ug/filter		1		E200.8	11/15/23 00:28 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-007
Client Sample ID: Particulate Filter #C1523777 TSP Pine

Report Date: 11/20/23
Collection Date: 09/15/23
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/15/23 00:35 / aem
Cadmium	ND	ug/filter		1		E200.8	11/15/23 00:35 / aem
Copper	2	ug/filter		1		E200.8	11/15/23 00:35 / aem
Lead	0.1	ug/filter	J	1		E200.8	11/15/23 00:35 / aem
Manganese	0.5	ug/filter	J	1		E200.8	11/15/23 00:35 / aem
Molybdenum	0.2	ug/filter	J	1		E200.8	11/15/23 00:35 / aem
Zinc	ND	ug/filter		1		E200.8	11/15/23 00:35 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-008
Client Sample ID: Particulate Filter #C1523778 TSP Walnut

Report Date: 11/20/23
Collection Date: 09/15/23
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/15/23 00:41 / aem
Cadmium	ND	ug/filter		1		E200.8	11/15/23 00:41 / aem
Copper	1	ug/filter	J	1		E200.8	11/15/23 00:41 / aem
Lead	0.1	ug/filter	J	1		E200.8	11/15/23 00:41 / aem
Manganese	0.4	ug/filter	J	1		E200.8	11/15/23 00:41 / aem
Molybdenum	ND	ug/filter		1		E200.8	11/15/23 00:41 / aem
Zinc	ND	ug/filter		1		E200.8	11/15/23 00:41 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-009
Client Sample ID: Particulate Filter #C1523779 TSP Walnut

Report Date: 11/20/23
Collection Date: 09/18/23
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/15/23 01:00 / aem
Cadmium	ND	ug/filter		1		E200.8	11/15/23 01:00 / aem
Copper	3	ug/filter		1		E200.8	11/15/23 01:00 / aem
Lead	0.2	ug/filter	J	1		E200.8	11/15/23 01:00 / aem
Manganese	0.6	ug/filter	J	1		E200.8	11/15/23 01:00 / aem
Molybdenum	0.1	ug/filter	J	1		E200.8	11/15/23 01:00 / aem
Zinc	2	ug/filter		1		E200.8	11/15/23 01:00 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School PW
Lab ID: B23110473-010
Client Sample ID: Particulate Filter #C1523780 Field Blank

Report Date: 11/20/23
Collection Date: 09/17/23 16:20
DateReceived: 11/07/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/15/23 01:06 / aem
Cadmium	ND	ug/filter		1		E200.8	11/15/23 01:06 / aem
Copper	ND	ug/filter		1		E200.8	11/15/23 01:06 / aem
Lead	ND	ug/filter		1		E200.8	11/15/23 01:06 / aem
Manganese	ND	ug/filter		1		E200.8	11/15/23 01:06 / aem
Molybdenum	ND	ug/filter		1		E200.8	11/15/23 01:06 / aem
Zinc	ND	ug/filter		1		E200.8	11/15/23 01:06 / aem

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23110473 **Report Date:** 11/20/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Analytical Run: ICPMS208-B_231113A	
Lab ID: QCS	7	Initial Calibration Verification Standard								11/14/23 18:48
Arsenic		0.0512	mg/L	0.0050	102	90	110			
Cadmium		0.0245	mg/L	0.0010	98	90	110			
Copper		0.0517	mg/L	0.010	103	90	110			
Lead		0.0496	mg/L	0.0010	99	90	110			
Manganese		0.259	mg/L	0.0050	104	90	110			
Molybdenum		0.0479	mg/L	0.0050	96	90	110			
Zinc		0.0503	mg/L	0.0050	101	90	110			
Lab ID: CCV	7	Continuing Calibration Verification Standard								11/14/23 23:31
Arsenic		0.0501	mg/L	0.0050	100	90	110			
Cadmium		0.0496	mg/L	0.0010	99	90	110			
Copper		0.0514	mg/L	0.010	103	90	110			
Lead		0.0481	mg/L	0.0010	96	90	110			
Manganese		0.0507	mg/L	0.0050	101	90	110			
Molybdenum		0.0483	mg/L	0.0050	97	90	110			
Zinc		0.0525	mg/L	0.0050	105	90	110			
Lab ID: CCV	7	Continuing Calibration Verification Standard								11/15/23 00:47
Arsenic		0.0490	mg/L	0.0050	98	90	110			
Cadmium		0.0493	mg/L	0.0010	99	90	110			
Copper		0.0505	mg/L	0.010	101	90	110			
Lead		0.0490	mg/L	0.0010	98	90	110			
Manganese		0.0499	mg/L	0.0050	100	90	110			
Molybdenum		0.0476	mg/L	0.0050	95	90	110			
Zinc		0.0496	mg/L	0.0050	99	90	110			
Method: E200.8										Batch: 184816
Lab ID: MB-184816	7	Method Blank				Run: ICPMS208-B_231113A				11/14/23 22:04
Arsenic		ND	ug/filter	0.08						
Cadmium		ND	ug/filter	0.009						
Copper		ND	ug/filter	0.3						
Lead		ND	ug/filter	0.09						
Manganese		ND	ug/filter	0.2						
Molybdenum		ND	ug/filter	0.07						
Zinc		ND	ug/filter	0.8						
Lab ID: LCS-184816	7	Laboratory Control Sample				Run: ICPMS208-B_231113A				11/14/23 22:23
Arsenic		94.8	ug/filter	1.0	95	85	115			
Cadmium		45.0	ug/filter	1.0	90	85	115			
Copper		93.1	ug/filter	1.0	93	85	115			
Lead		86.7	ug/filter	1.0	87	85	115			
Manganese		465	ug/filter	1.0	93	85	115			
Molybdenum		87.1	ug/filter	1.0	87	85	115			
Zinc		92.6	ug/filter	1.0	93	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23110473 **Report Date:** 11/20/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: 184816
Lab ID: LCSD-184816	7	Laboratory Control Sample Duplicate				Run: ICPMS208-B_231113A				11/14/23 22:28
Arsenic		94.4	ug/filter	1.0	94	85	115			
Cadmium		44.0	ug/filter	1.0	88	85	115			
Copper		92.0	ug/filter	1.0	92	85	115			
Lead		85.4	ug/filter	1.0	85	85	115			
Manganese		462	ug/filter	1.0	92	85	115			
Molybdenum		86.4	ug/filter	1.0	86	85	115			
Zinc		91.2	ug/filter	1.0	91	85	115			
Method: E200.8										Analytical Run: ICPMS208-B_231115A
Lab ID: QCS		Initial Calibration Verification Standard								11/15/23 12:28
Manganese		0.255	mg/L	0.0050	102	90	110			
Lab ID: CCV		Continuing Calibration Verification Standard								11/15/23 19:21
Manganese		0.0484	mg/L	0.0050	97	90	110			
Lab ID: CCV		Continuing Calibration Verification Standard								11/15/23 20:37
Manganese		0.0514	mg/L	0.0050	103	90	110			
Method: E200.8										Batch: 184816
Lab ID: MB-184816		Method Blank				Run: ICPMS208-B_231115A				11/15/23 18:50
Manganese		ND	ug/filter	0.2						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Bison Engineering

B23110473

Login completed by: Addison A. Gilbert
Date Received: 11/7/2023

Reviewed by: ysmith
Received by: lrs

Reviewed Date: 11/11/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.0°C On Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

For methods that require zero headspace or require preservation check at the time of analysis due to potential interference, the pH is verified at analysis. Nonconforming sample pH is documented as part of the analysis and included in the sample analysis comments.

Contact and Corrective Action Comments:

None

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information *(Billing information)*

Company/Name	Bison Engineering, Inc.
Contact	Shelley Brown-Argott
Phone	(406) 442-5768
Mailing Address	3143 E Lyndale Avenue
City, State, Zip	Helena MT, 59601
Email	sbrown-argott@bison-eng.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ■Email
Purchase Order	MTR231018
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	Bison Engineering, Inc.
Contact	Don Milmine
Phone	(406) 208-4833
Mailing Address	2751 Enterprise Avenue Suite 2
City, State, Zip	Billings, MT 59102
Email	dmilmine@bison-eng.com
Receive Report	☐Hard Copy ☒Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources / Greely School PW
Sampler Name	
Sampler Phone	
Sample Origin State	Montana
EPA/State Compliance	☒ Yes ☐ No

URANIUM MINING CLIENTS MUST indicate sample type.
☐ NOT Source or Byproduct Material
☐ Source/Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11e.(2) Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
(A - Air)
W- Water
S - Soils/ Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification *(Name, Location, Interval, etc.)*	Collection Date	Collection Time	Number of Containers	Matrix *(See Codes Above)*	Arsenic	Cadmium	Copper	Lead	Manganese	Molybdenum	Zinc			See Attached	RUSH TAT	ELI LAB ID *Laboratory Use Only*
1	Particulate filter #C1523771 TSP Pine	8/28/23	24 hr Composite	1	Tefton filter	X	X	X	X	X	X	X					B23110473
2	Particulate filter #C1523772 TSP Walnut	8/28/23	24 hr composite	1	Tefton filter	X	X	X	X	X	X	X					
3	Particulate filter #C1523773 TSP Pine	9/3/23	24 hr composite	1	Tefton filter	X	X	X	X	X	X	X					
4	Particulate filter #C1523774 TSP Walnut	9/9/23	24 hr composite	1	Tefton filter	X	X	X	X	X	X	X					
5	Particulate filter #C1523775 TSP Pine	9/9/23	24 hr composite	1	Tefton filter	X	X	X	X	X	X	X					
6	Particulate filter #C1523776 Lab Blank	8/21/23	1540	1	Tefton filter	X	X	X	X	X	X	X					
7	Particulate filter #C1523777 TSP Pine	9/15/23	24 hr composite	1	Tefton filter	X	X	X	X	X	X	X					
8	Particulate filter #C1523778 TSP Walnut	9/15/23	24 hr. composite	1	Tefton filter	X	X	X	X	X	X	X					
9	Particulate filter #C1523779 TSP Walnut	9/18/23	24 hr composite	1	Tefton filter	X	X	X	X	X	X	X					
10	Particulate filter #C1523780 Field Blank	9/17/23	1620	1	Tefton filter	X	X	X	X	X	X	X					

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Don Milmine	11/7/23 1418	Don V. Milmine			
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				Ben Shirbon	11/7/23 1418	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check_____	Amount $	Receipt Number *(cash/check only)*

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-10/18 v.3

ANALYTICAL SUMMARY REPORT

November 29, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: B23110914 Quote ID: B4795

Project Name: Montana Resources/Greely School

Energy Laboratories Inc Billings MT received the following 10 samples for Bison Engineering on 11/13/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B23110914-001	Particulate Filter #C1527184 TSP Pine ST	09/21/23 00:00	11/13/23	Air	Metals on air filter by ICP/ICPMS Nitric acid-extraction by 40CFR50G
B23110914-002	Particulate Filter #C1527185 TSP Lab Blank	09/15/23 16:30	11/13/23	Air	Same As Above
B23110914-003	Particulate Filter #C1527186 TSP Walnut ST	09/21/23 00:00	11/13/23	Air	Same As Above
B23110914-004	Particulate Filter #C1527187 TSP Walnut ST	10/03/23 00:00	11/13/23	Air	Same As Above
B23110914-005	Particulate Filter #C1527188 TSP Pine ST	09/27/23 00:00	11/13/23	Air	Same As Above
B23110914-006	Particulate Filter #C1527189 Walnut ST	09/27/23 00:00	11/13/23	Air	Same As Above
B23110914-007	Particulate Filter #C1527190 TSP Field Blank	10/13/23 09:47	11/13/23	Air	Same As Above
B23110914-008	Particulate Filter #C1527191 TSP Walnut ST	10/09/23 00:00	11/13/23	Air	Same As Above
B23110914-009	Particulate Filter #C1527192 TSP Pine ST	10/03/23 00:00	11/13/23	Air	Same As Above
B23110914-010	Particulate Filter #C1527193 TSP Pine ST	10/09/23 00:00	11/13/23	Air	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-001
Client Sample ID: Particulate Filter #C1527184 TSP Pine ST

Report Date: 11/29/23
Collection Date: 09/21/23
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 04:41 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 04:41 / jks
Copper	0.4	ug/filter	J	1		E200.8	11/28/23 15:08 / aem
Lead	ND	ug/filter		1		E200.8	11/22/23 04:41 / jks
Manganese	ND	ug/filter		1		E200.8	11/22/23 04:41 / jks
Molybdenum	ND	ug/filter		1		E200.8	11/28/23 15:08 / aem
Zinc	ND	ug/filter		1		E200.8	11/22/23 04:41 / jks

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-002
Client Sample ID: Particulate Filter #C1527185 TSP Lab Blank

Report Date: 11/29/23
Collection Date: 09/15/23 16:30
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 04:47 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 04:47 / jks
Copper	ND	ug/filter		1		E200.8	11/22/23 04:47 / jks
Lead	ND	ug/filter		1		E200.8	11/22/23 04:47 / jks
Manganese	ND	ug/filter		1		E200.8	11/22/23 04:47 / jks
Molybdenum	ND	ug/filter		1		E200.8	11/22/23 04:47 / jks
Zinc	ND	ug/filter		1		E200.8	11/22/23 04:47 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-003
Client Sample ID: Particulate Filter #C1527186 TSP Walnut ST

Report Date: 11/29/23
Collection Date: 09/21/23
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 04:53 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 04:53 / jks
Copper	1	ug/filter		1		E200.8	11/22/23 04:53 / jks
Lead	ND	ug/filter		1		E200.8	11/22/23 04:53 / jks
Manganese	0.4	ug/filter	J	1		E200.8	11/23/23 03:26 / aem
Molybdenum	ND	ug/filter		1		E200.8	11/22/23 04:53 / jks
Zinc	0.9	ug/filter	J	1		E200.8	11/23/23 03:26 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-004
Client Sample ID: Particulate Filter #C1527187 TSP Walnut ST

Report Date: 11/29/23
Collection Date: 10/03/23
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 05:00 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 05:00 / jks
Copper	ND	ug/filter		1		E200.8	11/22/23 05:00 / jks
Lead	ND	ug/filter		1		E200.8	11/22/23 05:00 / jks
Manganese	ND	ug/filter		1		E200.8	11/22/23 05:00 / jks
Molybdenum	ND	ug/filter		1		E200.8	11/22/23 05:00 / jks
Zinc	ND	ug/filter		1		E200.8	11/22/23 05:00 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-005
Client Sample ID: Particulate Filter #C1527188 TSP Pine ST

Report Date: 11/29/23
Collection Date: 09/27/23
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 05:19 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 05:19 / jks
Copper	6	ug/filter		1		E200.8	11/22/23 05:19 / jks
Lead	0.2	ug/filter	J	1		E200.8	11/23/23 03:33 / aem
Manganese	0.5	ug/filter	J	1		E200.8	11/23/23 03:33 / aem
Molybdenum	0.2	ug/filter	J	1		E200.8	11/23/23 03:33 / aem
Zinc	2	ug/filter		1		E200.8	11/22/23 05:19 / jks

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-006
Client Sample ID: Particulate Filter #C1527189 Walnut ST

Report Date: 11/29/23
Collection Date: 09/27/23
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 05:25 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 05:25 / jks
Copper	0.8	ug/filter	J	1		E200.8	11/23/23 03:39 / aem
Lead	0.1	ug/filter	J	1		E200.8	11/23/23 03:39 / aem
Manganese	0.4	ug/filter	J	1		E200.8	11/23/23 03:39 / aem
Molybdenum	ND	ug/filter		1		E200.8	11/22/23 05:25 / jks
Zinc	0.8	ug/filter	J	1		E200.8	11/23/23 03:39 / aem

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-007
Client Sample ID: Particulate Filter #C1527190 TSP Field Blank

Report Date: 11/29/23
Collection Date: 10/13/23 09:47
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 05:31 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 05:31 / jks
Copper	ND	ug/filter		1		E200.8	11/22/23 05:31 / jks
Lead	ND	ug/filter		1		E200.8	11/22/23 05:31 / jks
Manganese	ND	ug/filter		1		E200.8	11/22/23 05:31 / jks
Molybdenum	ND	ug/filter		1		E200.8	11/22/23 05:31 / jks
Zinc	ND	ug/filter		1		E200.8	11/22/23 05:31 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-008
Client Sample ID: Particulate Filter #C1527191 TSP Walnut ST

Report Date: 11/29/23
Collection Date: 10/09/23
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 05:38 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 05:38 / jks
Copper	2	ug/filter		1		E200.8	11/22/23 05:38 / jks
Lead	0.1	ug/filter	J	1		E200.8	11/23/23 03:45 / aem
Manganese	0.4	ug/filter	J	1		E200.8	11/23/23 03:45 / aem
Molybdenum	0.2	ug/filter	J	1		E200.8	11/23/23 03:45 / aem
Zinc	1	ug/filter		1		E200.8	11/22/23 05:38 / jks

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-009
Client Sample ID: Particulate Filter #C1527192 TSP Pine ST

Report Date: 11/29/23
Collection Date: 10/03/23
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 05:44 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 05:44 / jks
Copper	2	ug/filter		1		E200.8	11/22/23 05:44 / jks
Lead	ND	ug/filter		1		E200.8	11/22/23 05:44 / jks
Manganese	ND	ug/filter		1		E200.8	11/23/23 03:52 / aem
Molybdenum	ND	ug/filter		1		E200.8	11/22/23 05:44 / jks
Zinc	ND	ug/filter		1		E200.8	11/22/23 05:44 / jks

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Bison Engineering
Project: Montana Resources/Greely School
Lab ID: B23110914-010
Client Sample ID: Particulate Filter #C1527193 TSP Pine ST

Report Date: 11/29/23
Collection Date: 10/09/23
DateReceived: 11/13/23
Matrix: Air

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS IN AIR							
Arsenic	ND	ug/filter		1		E200.8	11/22/23 05:50 / jks
Cadmium	ND	ug/filter		1		E200.8	11/22/23 05:50 / jks
Copper	4	ug/filter		1		E200.8	11/22/23 05:50 / jks
Lead	0.2	ug/filter	J	1		E200.8	11/23/23 03:58 / aem
Manganese	0.5	ug/filter	J	1		E200.8	11/23/23 03:58 / aem
Molybdenum	0.7	ug/filter	J	1		E200.8	11/23/23 03:58 / aem
Zinc	1	ug/filter		1		E200.8	11/22/23 05:50 / jks

Report Definitions:

RL - Analyte Reporting Limit
QCL - Quality Control Limit
J - Estimated value - analyte was present but less than the Reporting Limit (RL)
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23110914 **Report Date:** 11/29/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Analytical Run: ICPMS208-B_231120A	
Lab ID: QCS	7	Initial Calibration Verification Standard								11/22/23 01:58
Arsenic		0.0506	mg/L	0.0050	101	90	110			
Cadmium		0.0260	mg/L	0.0010	104	90	110			
Copper		0.0535	mg/L	0.010	107	90	110			
Lead		0.0497	mg/L	0.0010	99	90	110			
Manganese		0.260	mg/L	0.0050	104	90	110			
Molybdenum		0.0504	mg/L	0.0050	101	90	110			
Zinc		0.0519	mg/L	0.0050	104	90	110			
Lab ID: CCV	7	Continuing Calibration Verification Standard								11/22/23 03:50
Arsenic		0.0490	mg/L	0.0050	98	90	110			
Cadmium		0.0484	mg/L	0.0010	97	90	110			
Copper		0.0519	mg/L	0.010	104	90	110			
Lead		0.0474	mg/L	0.0010	95	90	110			
Manganese		0.0499	mg/L	0.0050	100	90	110			
Molybdenum		0.0473	mg/L	0.0050	95	90	110			
Zinc		0.0489	mg/L	0.0050	98	90	110			
Lab ID: CCV	7	Continuing Calibration Verification Standard								11/22/23 05:06
Arsenic		0.0485	mg/L	0.0050	97	90	110			
Cadmium		0.0480	mg/L	0.0010	96	90	110			
Copper		0.0518	mg/L	0.010	104	90	110			
Lead		0.0463	mg/L	0.0010	93	90	110			
Manganese		0.0493	mg/L	0.0050	99	90	110			
Molybdenum		0.0468	mg/L	0.0050	94	90	110			
Zinc		0.0506	mg/L	0.0050	101	90	110			
Method: E200.8										Batch: 185013
Lab ID: MB-185013	7	Method Blank				Run: ICPMS208-B_231120A				11/22/23 02:42
Arsenic		ND	ug/filter	0.08						
Cadmium		ND	ug/filter	0.009						
Copper		ND	ug/filter	0.3						
Lead		ND	ug/filter	0.09						
Manganese		ND	ug/filter	0.2						
Molybdenum		ND	ug/filter	0.07						
Zinc		ND	ug/filter	0.8						
Lab ID: LCS-185013	7	Laboratory Control Sample				Run: ICPMS208-B_231120A				11/22/23 03:07
Arsenic		97.0	ug/filter	1.0	97	85	115			
Cadmium		48.3	ug/filter	1.0	97	85	115			
Copper		94.5	ug/filter	1.0	95	85	115			
Lead		92.7	ug/filter	1.0	93	85	115			
Manganese		482	ug/filter	1.0	96	85	115			
Molybdenum		94.9	ug/filter	1.0	95	85	115			
Zinc		94.7	ug/filter	1.0	95	85	115			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23110914 **Report Date:** 11/29/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8										Batch: 185013
Lab ID: LCSD-185013	7	Laboratory Control Sample Duplicate				Run: ICPMS208-B_231120A				11/22/23 03:12
Arsenic		98.8	ug/filter	1.0	99	85	115			
Cadmium		53.5	ug/filter	1.0	107	85	115			
Copper		100	ug/filter	1.0	100	85	115			
Lead		101	ug/filter	1.0	101	85	115			
Manganese		476	ug/filter	1.0	95	85	115			
Molybdenum		104	ug/filter	1.0	104	85	115			
Zinc		99.5	ug/filter	1.0	100	85	115			
Method: E200.8										Analytical Run: ICPMS208-B_231122B
Lab ID: CCV	5	Continuing Calibration Verification Standard								11/23/23 03:07
Copper		0.0494	mg/L	0.010	99	90	110			
Lead		0.0481	mg/L	0.0010	96	90	110			
Manganese		0.0485	mg/L	0.0050	97	90	110			
Molybdenum		0.0477	mg/L	0.0050	95	90	110			
Zinc		0.0493	mg/L	0.0050	99	90	110			
Lab ID: QCS	5	Initial Calibration Verification Standard								11/23/23 17:35
Copper		0.0511	mg/L	0.010	102	90	110			
Lead		0.0489	mg/L	0.0010	98	90	110			
Manganese		0.250	mg/L	0.0050	100	90	110			
Molybdenum		0.0490	mg/L	0.0050	98	90	110			
Zinc		0.0514	mg/L	0.0050	103	90	110			
Lab ID: QCS	5	Initial Calibration Verification Standard								11/24/23 03:47
Copper		0.0505	mg/L	0.010	101	90	110			
Lead		0.0483	mg/L	0.0010	97	90	110			
Manganese		0.248	mg/L	0.0050	99	90	110			
Molybdenum		0.0472	mg/L	0.0050	94	90	110			
Zinc		0.0507	mg/L	0.0050	101	90	110			
Method: E200.8										Batch: 185013
Lab ID: MB-185013	5	Method Blank				Run: ICPMS208-B_231122B				11/23/23 02:55
Copper		ND	ug/filter	0.3						
Lead		ND	ug/filter	0.09						
Manganese		ND	ug/filter	0.2						
Molybdenum		ND	ug/filter	0.07						
Zinc		ND	ug/filter	0.8						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Bison Engineering **Work Order:** B23110914 **Report Date:** 11/29/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E200.8**									Analytical Run: ICPMS208-B_231127A	
Lab ID: **QCS**	2	Initial Calibration Verification Standard							11/28/23 08:11	
Copper		0.0529	mg/L	0.010	106	90	110			
Molybdenum		0.0507	mg/L	0.0050	101	90	110			
Lab ID: **CCV**	2	Continuing Calibration Verification Standard							11/28/23 13:59	
Copper		0.0484	mg/L	0.010	97	90	110			
Molybdenum		0.0468	mg/L	0.0050	94	90	110			
Method: **E200.8**									Batch: 185013	
Lab ID: **MB-185013**	2	Method Blank				Run: ICPMS208-B_231127A			11/28/23 14:49	
Copper		ND	ug/filter	0.3						
Molybdenum		ND	ug/filter	0.07						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Bison Engineering

B23110914

Login completed by: Danielle N. Harris
Date Received: 11/13/2023

Reviewed by: lcadreau
Received by: aag

Reviewed Date: 11/16/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☑	No ☐	Not Applicable ☐
Container/Temp Blank temperature:	3.4°C On Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

For methods that require zero headspace or require preservation check at the time of analysis due to potential interference, the pH is verified at analysis. Nonconforming sample pH is documented as part of the analysis and included in the sample analysis comments.

Contact and Corrective Action Comments:

None

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Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information (Billing information)

Company/Name	Bison Engineering, Inc.
Contact	Shelley Brown-Argott
Phone	(406) 442-5768
Mailing Address	3143 E Lyndale Avenue
City, State, Zip	Helena MT, 59601
Email	sbrown-argott@bison-eng.com
Receive Invoice	☐Hard Copy ☑Email
Receive Report	☐Hard Copy ■Email
Purchase Order	MTR231018
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	Bison Engineering, Inc.
Contact	Don Milmine
Phone	(406) 208-4833
Mailing Address	2751 Enterprise Avenue Suite 2
City, State, Zip	Billings, MT 59102
Email	dmilmine@bison-eng.com
Receive Report	☐Hard Copy ☑Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other________

Comments

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources / Greely School PW
Sampler Name	Sampler Phone
Sample Origin State Montana	EPA/State Compliance ☑ Yes ☐ No

URANIUM MINING CLIENTS MUST indicate sample type.
☐ NOT Source or Byproduct Material
☐ Source/Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11e.(2) Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
(A - Air) (circled)
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

Analysis Requested

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Arsenic	Cadmium	Copper	Lead	Manganese	Molybdenum	Zinc				See Attached	RUSH TAT	ELI LAB ID Laboratory Use Only
1	Particulate filter #C1527184 TSP Pine St	9/21/23	24 hr composite	1	Teflon filter	×	×	×	×	×	×	×						B23110914
2	Particulate filter #C1527185 TSP Lab Blank	9/15/23	1630	1	Teflon filter	×	×	×	×	×	×	×						
3	Particulate filter #C1527186 TSP Walnut ST	9/21/23	24 hr composite	1	Teflon filter	×	×	×	×	×	×	×						
4	Particulate filter #C1527187 TSP Walnut ST	10/3/23	24 hr composite	1	Teflon filter	×	×	×	×	×	×	×						
5	Particulate filter #C1527188 TSP Pine ST	9/27/23	24 hr composite	1	Teflon filter	×	×	×	×	×	×	×						
6	Particulate filter #C1527189 Walnut ST	9/27/23	24 hr composite	1	Teflon filter	×	×	×	×	×	×	×						
7	Particulate filter #C1527190 TSP Field Blank	10/13/23	0947	1	Teflon filter	×	×	×	×	×	×	×						
8	Particulate filter #C1527191 TSP Walnut ST	10/9/23	24 hr composite	1	Teflon filter	×	×	×	×	×	×	×						
9	Particulate filter #C1527192TSP Pine ST	10/3/23	24 hr composite	1	Teflon filter	×	×	×	×	×	×	×						
10	Particulate filter #C1527193TSP Pine ST	10/9/23	24 hr composite	1	Teflon filter	×	×	×	×	×	×	×						

Custody Record MUST be signed						
Relinquished by (print) Don Milmine	Date/Time 11/13/23 0951	Signature Don V. Milmine	Received by (print)	Date/Time	Signature
Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print) G. Ibert A.	Date/Time 13Nov23 0951	Signature [signature]

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check____	Amount $	Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-10/18 v.3

APPENDIX C: LABORATORY ANALYSIS REPORTS - DUSTFALL

ANALYTICAL SUMMARY REPORT

October 04, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: H23090077

Project Name: Montana Resources Dustfall

Energy Laboratories Inc Helena MT received the following 4 samples for Bison Engineering on 9/5/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H23090077-001	DF-GREELEY-001	09/02/23 16:05	09/05/23	Sediment	Metals by ICP/ICPMS, Total Client Provided Field Parameters Total Metals Digestion by SW3050B Soil Preparation USDA1
H23090077-002	DF-PINE-001	09/02/23 15:22	09/05/23	Sediment	Metals by ICP/ICPMS, Total Client Provided Field Parameters Total Metals Digestion by SW3050B
H23090077-003	DF-WALNUT-001	09/02/23 15:45	09/05/23	Sediment	Same As Above
H23090077-004	DF-FB-001	09/02/23 15:25	09/05/23	Sediment	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

CLIENT: Bison Engineering
Project: Montana Resources Dustfall
Work Order: H23090077

Report Date: 10/04/23

CASE NARRATIVE

Samples were visually inspected for insects or other non-dustfall detritus. Wet masses of each sample were collected, as received. Samples with insects present were passed through a No. 10 (2mm) sieve, removing the insects but allowing the dust and liquid to pass through, sieves were rinsed with laboratory reagent water to ensure no dust was lost on the sieve. Samples were then air dried on a clean non-porous plastic to remove moisture, the dry weight of each sample was then recorded using the plastic as a tared mass. Collected dust was transferred to a digestion vessel using digestion reagents to ensure all dust was removed from the plastic; and digested for total metals analysis.

All "J" qualified analyte concentrations are below the laboratory minimum recommended Reporting Limit (RL) and above the calculated method detection limit (MDL). Inorganic analytes reported with "J" qualifiers should be verified against the corresponding method blank and continuing calibration blanks. Inorganic "J" quantitations near the MDL may be suspect due to possible method background levels, sample matrix effects, and/or daily variability in instrument signal-to-noise levels.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Bison Engineering
Project: Montana Resources Dustfall
Lab ID: H23090077-001
Client Sample ID: DF-GREELEY-001

Report Date: 10/04/23
Collection Date: 09/02/23 16:05
DateReceived: 09/05/23
Matrix: Sediment

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL - EPA SW846							
Arsenic	25	mg/kg-dry		5		SW6020	09/28/23 17:44 / dck
Cadmium	3	mg/kg-dry		1		SW6020	09/28/23 17:44 / dck
Copper	2320	mg/kg-dry		4		SW6020	09/28/23 17:44 / dck
Lead	110	mg/kg-dry		3		SW6020	09/28/23 17:44 / dck
Manganese	589	mg/kg-dry		4		SW6020	09/28/23 17:44 / dck
Molybdenum	1780	mg/kg-dry		2		SW6020	09/28/23 17:44 / dck
Zinc	658	mg/kg-dry		10		SW6020	09/28/23 17:44 / dck
CLIENT PROVIDED FIELD PARAMETERS							
Wet Wt, g	421.15	g				FIELD	09/25/23 00:00 / kjb
Dry Wt, g	0.0668	g				FIELD	09/25/23 00:00 / kjb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Bison Engineering
Project: Montana Resources Dustfall
Lab ID: H23090077-002
Client Sample ID: DF-PINE-001

Report Date: 10/04/23
Collection Date: 09/02/23 15:22
DateReceived: 09/05/23
Matrix: Sediment

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL - EPA SW846							
Arsenic	167	mg/kg-dry		20		SW6020	09/28/23 17:52 / dck
Cadmium	15	mg/kg-dry		1		SW6020	09/28/23 17:52 / dck
Copper	20600	mg/kg-dry		20		SW6020	09/28/23 17:52 / dck
Lead	540	mg/kg-dry		20		SW6020	09/28/23 17:52 / dck
Manganese	2820	mg/kg-dry		20		SW6020	09/28/23 17:52 / dck
Molybdenum	7220	mg/kg-dry		9		SW6020	09/28/23 17:52 / dck
Zinc	3680	mg/kg-dry		70		SW6020	09/28/23 17:52 / dck
CLIENT PROVIDED FIELD PARAMETERS							
Wet Wt, g	511.25	g				FIELD	09/25/23 00:00 / kjb
Dry Wt, g	0.0127	g				FIELD	09/25/23 00:00 / kjb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Bison Engineering
Project: Montana Resources Dustfall
Lab ID: H23090077-003
Client Sample ID: DF-WALNUT-001

Report Date: 10/04/23
Collection Date: 09/02/23 15:45
DateReceived: 09/05/23
Matrix: Sediment

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL - EPA SW846							
Arsenic	58	mg/kg-dry		2		SW6020	09/28/23 17:58 / dck
Cadmium	2	mg/kg-dry		1		SW6020	09/28/23 17:58 / dck
Copper	1710	mg/kg-dry		2		SW6020	09/28/23 17:58 / dck
Lead	105	mg/kg-dry		1		SW6020	09/28/23 17:58 / dck
Manganese	381	mg/kg-dry		2		SW6020	09/28/23 17:58 / dck
Molybdenum	751	mg/kg-dry		1		SW6020	09/28/23 17:58 / dck
Zinc	579	mg/kg-dry		7		SW6020	09/28/23 17:58 / dck
CLIENT PROVIDED FIELD PARAMETERS							
Wet Wt, g	393.94	g				FIELD	09/25/23 00:00 / kjb
Dry Wt, g	0.1329	g				FIELD	09/25/23 00:00 / kjb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Bison Engineering
Project: Montana Resources Dustfall
Lab ID: H23090077-004
Client Sample ID: DF-FB-001

Report Date: 10/04/23
Collection Date: 09/02/23 15:25
DateReceived: 09/05/23
Matrix: Sediment

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL - EPA SW846							
Arsenic	ND	mg/kg-dry		1		SW6020	09/28/23 18:02 / dck
Cadmium	ND	mg/kg-dry		1		SW6020	09/28/23 18:02 / dck
Copper	ND	mg/kg-dry		1		SW6020	09/28/23 18:02 / dck
Lead	ND	mg/kg-dry		1		SW6020	09/28/23 18:02 / dck
Manganese	ND	mg/kg-dry		1		SW6020	09/28/23 18:02 / dck
Molybdenum	ND	mg/kg-dry		1		SW6020	09/28/23 18:02 / dck
Zinc	ND	mg/kg-dry		1		SW6020	09/28/23 18:02 / dck
CLIENT PROVIDED FIELD PARAMETERS							
Wet Wt, g	0.000	g				FIELD	09/25/23 00:00 / kjb
Dry Wt, g	0.000	g				FIELD	09/25/23 00:00 / kjb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Bison Engineering **Work Order:** H23090077 **Report Date:** 10/04/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**										Batch: 68458
Lab ID: **H23090077-004AMS**	7	Sample Matrix Spike				Run: ICPMS206-H_230927A				09/27/23 17:27
Arsenic		4.39	mg/kg	1.0	88	75	125			
Cadmium		4.72	mg/kg	1.0	94	75	125			
Copper		4.50	mg/kg	1.0	90	75	125			
Lead		4.83	mg/kg	1.0	97	75	125			
Manganese		4.47	mg/kg	1.0	89	75	125			
Molybdenum		4.58	mg/kg	1.0	92	75	125			
Zinc		4.61	mg/kg	1.0	92	75	125			
POST DIGESTION SPIKE										
Lab ID: **H23090077-004AMSD**	7	Sample Matrix Spike Duplicate				Run: ICPMS206-H_230927A				09/27/23 17:30
Arsenic		4.36	mg/kg	1.0	87	75	125	0.6	20	
Cadmium		4.69	mg/kg	1.0	94	75	125	0.7	20	
Copper		4.44	mg/kg	1.0	89	75	125	1.1	20	
Lead		4.72	mg/kg	1.0	95	75	125	2.2	20	
Manganese		4.40	mg/kg	1.0	88	75	125	1.7	20	
Molybdenum		4.52	mg/kg	1.0	90	75	125	1.5	20	
Zinc		4.48	mg/kg	1.0	89	75	125	3.0	20	
POST DIGESTION SPIKE										

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Bison Engineering **Work Order:** H23090077 **Report Date:** 10/04/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Analytical Run: ICPMS206-H_230928A	
Lab ID: **ICV**	7	Initial Calibration Verification Standard								09/28/23 15:02
Arsenic		0.0615	mg/L	0.0010	103	90	110			
Cadmium		0.0307	mg/L	0.0010	102	90	110			
Copper		0.0618	mg/L	0.0010	103	90	110			
Lead		0.0595	mg/L	0.0010	99	90	110			
Manganese		0.304	mg/L	0.0010	101	90	110			
Molybdenum		0.0596	mg/L	0.0010	99	90	110			
Zinc		0.0624	mg/L	0.0010	104	90	110			
Lab ID: **ICSA**	7	Interference Check Sample A								09/28/23 15:13
Arsenic		0.0000231	mg/L	0.0010						
Cadmium		0.000156	mg/L	0.0010						
Copper		0.0000378	mg/L	0.0010						
Lead		0.0000269	mg/L	0.0010						
Manganese		0.000307	mg/L	0.0010		0	0			
Molybdenum		0.865	mg/L	0.0010	108	70	130			
Zinc		0.000280	mg/L	0.0010						
Lab ID: **ICSAB**	7	Interference Check Sample AB								09/28/23 15:21
Arsenic		0.0106	mg/L	0.0010	106	70	130			
Cadmium		0.0104	mg/L	0.0010	104	70	130			
Copper		0.0202	mg/L	0.0010	101	70	130			
Lead		0.0000326	mg/L	0.0010		0	0			
Manganese		0.0211	mg/L	0.0010	105	70	130			
Molybdenum		0.841	mg/L	0.0010	105	70	130			
Zinc		0.0103	mg/L	0.0010	103	70	130			
Lab ID: **CCV**	7	Continuing Calibration Verification Standard								09/28/23 17:32
Arsenic		0.0518	mg/L	0.0010	104	90	110			
Cadmium		0.0519	mg/L	0.0010	104	90	110			
Copper		0.0522	mg/L	0.0010	104	90	110			
Lead		0.0513	mg/L	0.0010	103	90	110			
Manganese		0.0518	mg/L	0.0010	104	90	110			
Molybdenum		0.0519	mg/L	0.0010	104	90	110			
Zinc		0.0525	mg/L	0.0010	105	90	110			
Lab ID: **CCV**	7	Continuing Calibration Verification Standard								09/28/23 18:26
Arsenic		0.0519	mg/L	0.0010	104	90	110			
Cadmium		0.0518	mg/L	0.0010	104	90	110			
Copper		0.0523	mg/L	0.0010	105	90	110			
Lead		0.0510	mg/L	0.0010	102	90	110			
Manganese		0.0520	mg/L	0.0010	104	90	110			
Molybdenum		0.0523	mg/L	0.0010	105	90	110			
Zinc		0.0526	mg/L	0.0010	105	90	110			
Method: **SW6020**									Batch: 68458	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Bison Engineering **Work Order:** H23090077 **Report Date:** 10/04/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Batch: 68458	
Lab ID: MB-68458	7	Method Blank			Run: ICPMS206-H_230928A				09/28/23 17:40	
Arsenic		ND	mg/kg	0.3						
Cadmium		ND	mg/kg	0.01						
Copper		ND	mg/kg	0.3						
Lead		ND	mg/kg	0.2						
Manganese		ND	mg/kg	0.2						
Molybdenum		ND	mg/kg	0.1						
Zinc		ND	mg/kg	0.9						
Lab ID: H23090077-001ADIL	7	Serial Dilution			Run: ICPMS206-H_230928A				09/28/23 17:48	
Arsenic		25.7	mg/kg-dry	23		0	0		10	N
Cadmium		2.75	mg/kg-dry	1.1		0	0		10	N
Copper		2300	mg/kg-dry	19		0	0	0.9	10	
Lead		111	mg/kg-dry	15		0	0		10	N
Manganese		588	mg/kg-dry	18		0	0	0.1	10	
Molybdenum		1750	mg/kg-dry	8.2		0	0	1.5	10	
Zinc		683	mg/kg-dry	70		0	0		10	N
Lab ID: LCS-68458	7	Laboratory Control Sample			Run: ICPMS206-H_230928A				09/28/23 18:06	
Arsenic		161	mg/kg	1.0	82	66.4	104			
Cadmium		95.6	mg/kg	1.0	97	79.2	121			
Copper		124	mg/kg	1.0	91	73.9	113			
Lead		98.7	mg/kg	1.0	94	71.6	128			
Manganese		403	mg/kg	1.0	93	74.4	123			
Molybdenum		115	mg/kg	1.0	91	61.3	124			
Zinc		235	mg/kg	1.8	102	83.1	125			
Lab ID: LFB-68458	7	Laboratory Fortified Blank			Run: ICPMS206-H_230928A				09/28/23 18:10	
Arsenic		24.9	mg/kg	1.0	100	80	120			
Cadmium		12.8	mg/kg	1.0	102	80	120			
Copper		25.2	mg/kg	1.0	101	80	120			
Lead		25.9	mg/kg	1.0	103	80	120			
Manganese		124	mg/kg	1.0	100	80	120			
Molybdenum		24.7	mg/kg	1.0	99	80	120			
Zinc		25.1	mg/kg	1.0	101	80	120			
Lab ID: LFBD-68458	7	Laboratory Fortified Blank Duplicate			Run: ICPMS206-H_230928A				09/28/23 18:14	
Arsenic		24.9	mg/kg	1.0	100	80	120			
Cadmium		12.8	mg/kg	1.0	103	80	120			
Copper		25.6	mg/kg	1.0	102	80	120			
Lead		25.8	mg/kg	1.0	103	80	120			
Manganese		124	mg/kg	1.0	99	80	120			
Molybdenum		24.6	mg/kg	1.0	98	80	120			
Zinc		25.0	mg/kg	1.0	100	80	120			
Lab ID: H23090077-001AMS	7	Sample Matrix Spike			Run: ICPMS206-H_230928A				09/28/23 18:18	
Arsenic		172	mg/kg-dry	4.5	98	75	125			
Cadmium		151	mg/kg-dry	1.0	99	75	125			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

N - Analyte concentration was not sufficiently high to calculate a Relative Percent Difference (RPD) for the serial dilution test

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Bison Engineering **Work Order:** H23090077 **Report Date:** 10/04/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020										Batch: 68458
Lab ID: H23090077-001AMS	7	Sample Matrix Spike				Run: ICPMS206-H_230928A			09/28/23 18:18	
Copper		2490	mg/kg-dry	3.8		75	125			A
Lead		257	mg/kg-dry	3.0	99	75	125			
Manganese		744	mg/kg-dry	3.7	103	75	125			
Molybdenum		1890	mg/kg-dry	1.6		75	125			A
Zinc		804	mg/kg-dry	14		75	125			A
Lab ID: H23090077-001AMSD	7	Sample Matrix Spike Duplicate				Run: ICPMS206-H_230928A			09/28/23 18:22	
Arsenic		166	mg/kg-dry	4.5	94	75	125	3.6	20	
Cadmium		151	mg/kg-dry	1.0	99	75	125	0.4	20	
Copper		2420	mg/kg-dry	3.8		75	125	2.8	20	A
Lead		258	mg/kg-dry	3.0	99	75	125	0.2	20	
Manganese		719	mg/kg-dry	3.7	87	75	125	3.4	20	
Molybdenum		1890	mg/kg-dry	1.6		75	125	0.3	20	A
Zinc		782	mg/kg-dry	14		75	125	2.8	20	A

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

A - Analyte level was greater than four times the spike level - in accordance with the method, percent recovery is not calculated

Work Order Receipt Checklist

Bison Engineering

H23090077

Login completed by: Wanda Johnson
Date Received: 9/5/2023

Reviewed by: tjones
Received by: stp

Reviewed Date: 9/12/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	19.8°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

No date/time on sample containers, used information from the COC. wjj 9/5/2023

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information (Billing information)

Company/Name	Bison Engineering Inc.
Contact	Steve Heck
Phone	406-498-4199
Mailing Address	3143 E Lyndale Ave
City, State, Zip	Helena, MT 59601
Email	sheck@bison-eng.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	MTR22301B
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email

Special Report/Formats: ☐ LEVEL IV ☐NELAC ☐ EDD/EDT (contact laboratory) ☐ Other_____

Comments

These are dustfall samples.
Collected from 8-4-2023 to 9-2-2023.
Sieve Bags out.
Rinse Tubes & DRY Sediment, Need total Mass on sediment.
Treat MB SAME.

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources Dustfall
Sampler Name	Steve Heck
Sampler Phone	406-498-4199
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☒ No

URANIUM MINING CLIENTS MUST indicate sample type
☐ Unprocessed Ore
☐ Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11(e)2 Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Oil
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	Gravimetric - total mass	As, Cd, Cu, Pb, Mn, Mo, Zn (3050)	See Attached	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	DF-GREELEY-001	09/02/2023	4:05 pm	1	A	✓	✓			H23090077
2	DF-PINE-001	09/02/2023	3:22 pm	1	A	✓	✓			
3	DF-WALNUT-001	09/02/2023	3:45 pm	1	A	✓	✓			
4	DF-FB-001	09/02/2023	3:25 pm	1	A	✓	✓			
5										
6										
7										
8										
9										

ELI is REQUIRED to provide preservative traceability. If the preservatives supplied with the bottle order were **NOT** used, please attach your preservative information with this COC.

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Steve Heck	9/5/1309				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				Skyler Tester	9/5/23 13:09	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number (cash/check only)
Hand	N/A	Y (N) C B	Y (N/A)	19.6 °C	Y (N)	Y (N)	CC Cash Check_____	$	

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ANALYTICAL SUMMARY REPORT

December 08, 2023

Bison Engineering
3143 E Lyndale Ave
Helena, MT 59601-6401

Work Order: H23100663

Project Name: Montana Resources Dustfall

Energy Laboratories Inc Helena MT received the following 4 samples for Bison Engineering on 10/18/2023 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H23100663-001	DF-GREELEY-002	10/03/23 12:20	10/18/23	Solid	Metals by ICP/ICPMS, Total Client Provided Field Parameters Total Metals Digestion by SW3050B Soil Preparation USDA1
H23100663-002	DF-PINE-002	10/03/23 12:50	10/18/23	Solid	Metals by ICP/ICPMS, Total Client Provided Field Parameters Total Metals Digestion by SW3050B
H23100663-003	DF-WALNUT-002	10/03/23 13:05	10/18/23	Solid	Same As Above
H23100663-004	DF-FB-002	10/03/23 12:25	10/18/23	Solid	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the report package. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

CLIENT: Bison Engineering
Project: Montana Resources Dustfall
Work Order: H23100663

Revised Date: 12/08/23
Report Date: 12/08/23

CASE NARRATIVE

After sample H23100663-004 (DF-FB-002) was dried, a faint residue was present (0.0035g). When this low sample mass was calculated during sample analysis, it created a large preparation factor. Analyte detections are then magnified by this factor. abc 11/22/2023

Sample masses reported as rounded to the nearest gram, revised report to show raw data withough rounding 12/8/2023. STP

All "J" qualified analyte concentrations are below the laboratory minimum recommended Reporting Limit (RL) and above the calculated method detection limit (MDL). Inorganic analytes reported with "J" qualifiers should be verified against the corresponding method blank and continuing calibration blanks. Inorganic "J" quantitations near the MDL may be suspect due to possible method background levels, sample matrix effects, and/or daily variability in instrument signal-to-noise levels.

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Bison Engineering
Project: Montana Resources Dustfall
Lab ID: H23100663-001
Client Sample ID: DF-GREELEY-002

Revised Date: 12/08/23
Report Date: 12/08/23
Collection Date: 10/03/23 12:20
DateReceived: 10/18/23
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL - EPA SW846							
Arsenic	38	mg/kg		3		SW6020	11/03/23 17:13 / dck
Cadmium	3	mg/kg		1		SW6020	11/03/23 17:13 / dck
Copper	3090	mg/kg		20		SW6020	11/03/23 17:13 / dck
Lead	146	mg/kg		9		SW6020	11/03/23 17:13 / dck
Manganese	548	mg/kg		20		SW6020	11/03/23 17:13 / dck
Molybdenum	1620	mg/kg		5		SW6020	11/03/23 17:13 / dck
Zinc	1030	mg/kg		70		SW6020	11/03/23 17:13 / dck
CLIENT PROVIDED FIELD PARAMETERS							
Wet Wt, g	390.15	g				FIELD	10/25/23 00:00 / kjb
Dry Wt, g	0.0468	g				FIELD	10/25/23 00:00 / kjb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Bison Engineering
Project: Montana Resources Dustfall
Lab ID: H23100663-002
Client Sample ID: DF-PINE-002

Revised Date: 12/08/23
Report Date: 12/08/23
Collection Date: 10/03/23 12:50
DateReceived: 10/18/23
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL - EPA SW846							
Arsenic	27	mg/kg		2		SW6020	11/03/23 17:16 / dck
Cadmium	2	mg/kg		1		SW6020	11/03/23 17:16 / dck
Copper	2590	mg/kg		8		SW6020	11/03/23 17:16 / dck
Lead	101	mg/kg		5		SW6020	11/03/23 17:16 / dck
Manganese	397	mg/kg		10		SW6020	11/03/23 17:16 / dck
Molybdenum	731	mg/kg		2		SW6020	11/03/23 17:16 / dck
Zinc	696	mg/kg		30		SW6020	11/03/23 17:16 / dck
CLIENT PROVIDED FIELD PARAMETERS							
Wet Wt, g	429.43	g				FIELD	10/25/23 00:00 / kjb
Dry Wt, g	0.0932	g				FIELD	10/25/23 00:00 / kjb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Bison Engineering
Project: Montana Resources Dustfall
Lab ID: H23100663-003
Client Sample ID: DF-WALNUT-002

Revised Date: 12/08/23
Report Date: 12/08/23
Collection Date: 10/03/23 13:05
DateReceived: 10/18/23
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL - EPA SW846							
Arsenic	48	mg/kg		4		SW6020	11/03/23 17:19 / dck
Cadmium	4	mg/kg		1		SW6020	11/03/23 17:19 / dck
Copper	3380	mg/kg		20		SW6020	11/03/23 17:19 / dck
Lead	265	mg/kg		10		SW6020	11/03/23 17:19 / dck
Manganese	637	mg/kg		20		SW6020	11/03/23 17:19 / dck
Molybdenum	1150	mg/kg		5		SW6020	11/03/23 17:19 / dck
Zinc	1410	mg/kg		70		SW6020	11/03/23 17:19 / dck
CLIENT PROVIDED FIELD PARAMETERS							
Wet Wt, g	369.16	g				FIELD	10/25/23 00:00 / kjb
Dry Wt, g	0.0441	g				FIELD	10/25/23 00:00 / kjb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Bison Engineering
Project: Montana Resources Dustfall
Lab ID: H23100663-004
Client Sample ID: DF-FB-002

Revised Date: 12/08/23
Report Date: 12/08/23
Collection Date: 10/03/23 12:25
DateReceived: 10/18/23
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, TOTAL - EPA SW846							
Arsenic	ND	mg/kg	D	20		SW6020	11/07/23 17:16 / dck
Cadmium	ND	mg/kg		1		SW6020	11/07/23 16:58 / dck
Copper	ND	mg/kg	D	80		SW6020	11/07/23 17:16 / dck
Lead	ND	mg/kg	D	30		SW6020	11/07/23 16:58 / dck
Manganese	ND	mg/kg	D	100		SW6020	11/07/23 17:16 / dck
Molybdenum	ND	mg/kg	D	20		SW6020	11/11/23 16:31 / dck
Zinc	434	mg/kg		400		SW6020	11/11/23 16:31 / dck
CLIENT PROVIDED FIELD PARAMETERS							
Wet Wt, g	174.68	g				FIELD	10/25/23 00:00 / kjb
Dry Wt, g	0.0035	g				FIELD	10/25/23 00:00 / kjb

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
D - Reporting Limit (RL) increased due to sample matrix
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 12/08/23

Client: Bison Engineering

Work Order: H23100663

Report Date: 12/08/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Analytical Run: ICPMS205-H_231103B	
Lab ID: **ICV**	7	Initial Calibration Verification Standard								11/03/23 10:39
Arsenic		0.0629	mg/L	0.0010	105	90	110			
Cadmium		0.0313	mg/L	0.0010	104	90	110			
Copper		0.0628	mg/L	0.0010	105	90	110			
Lead		0.0608	mg/L	0.0010	101	90	110			
Manganese		0.309	mg/L	0.0010	103	90	110			
Molybdenum		0.0598	mg/L	0.0010	100	90	110			
Zinc		0.0645	mg/L	0.0013	108	90	110			
Lab ID: **ICSA**	7	Interference Check Sample A								11/03/23 10:48
Arsenic		0.0000514	mg/L	0.0010						
Cadmium		0.0000804	mg/L	0.0010						
Copper		0.0000341	mg/L	0.0010						
Lead		-0.0000166	mg/L	0.0010						
Manganese		0.000377	mg/L	0.0010		0	0			
Molybdenum		0.875	mg/L	0.0010	109	70	130			
Zinc		0.00163	mg/L	0.0013						
Lab ID: **ICSAB**	7	Interference Check Sample AB								11/03/23 10:54
Arsenic		0.0106	mg/L	0.0010	105	70	130			
Cadmium		0.0104	mg/L	0.0010	104	70	130			
Copper		0.0204	mg/L	0.0010	102	70	130			
Lead		-0.0000245	mg/L	0.0010		0	0			
Manganese		0.0214	mg/L	0.0010	107	70	130			
Molybdenum		0.872	mg/L	0.0010	109	70	130			
Zinc		0.0126	mg/L	0.0013	126	70	130			
Lab ID: **CCV**	7	Continuing Calibration Verification Standard								11/03/23 17:04
Arsenic		0.0516	mg/L	0.0010	103	90	110			
Cadmium		0.0511	mg/L	0.0010	102	90	110			
Copper		0.0516	mg/L	0.0010	103	90	110			
Lead		0.0500	mg/L	0.0010	100	90	110			
Manganese		0.0516	mg/L	0.0010	103	90	110			
Molybdenum		0.0485	mg/L	0.0010	97	90	110			
Zinc		0.0517	mg/L	0.0013	103	90	110			
Method: **SW6020**										Batch: 69041
Lab ID: **MB-69041**	7	Method Blank				Run: ICPMS205-H_231103B				11/03/23 17:10
Arsenic		ND	mg/kg	0.2						
Cadmium		ND	mg/kg	0.03						
Copper		ND	mg/kg	0.7						
Lead		ND	mg/kg	0.4						
Manganese		ND	mg/kg	1						
Molybdenum		ND	mg/kg	0.2						
Zinc		ND	mg/kg	3						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 12/08/23

Client: Bison Engineering

Work Order: H23100663

Report Date: 12/08/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020										Batch: 69041
Lab ID: H23100663-004ADIL	7	Serial Dilution				Run: ICPMS205-H_231103B				11/03/23 17:25
Arsenic		ND	mg/kg	220		0	0		10	
Cadmium		ND	mg/kg	36		0	0		10	
Copper		ND	mg/kg	1000		0	0		10	
Lead		ND	mg/kg	630		0	0		10	
Manganese		ND	mg/kg	1500		0	0		10	
Molybdenum		ND	mg/kg	300		0	0		10	
Zinc		ND	mg/kg	4400		0	0		10	
Lab ID: LCS-69041	7	Laboratory Control Sample				Run: ICPMS205-H_231103B				11/03/23 17:28
Arsenic		164	mg/kg	1.0	84	66.4	104			
Cadmium		103	mg/kg	1.0	104	79.2	121			
Copper		121	mg/kg	1.5	88	73.9	113			
Lead		110	mg/kg	1.0	104	71.6	128			
Manganese		401	mg/kg	2.1	92	74.4	123			
Molybdenum		125	mg/kg	1.0	99	61.3	124			
Zinc		235	mg/kg	6.2	102	83.1	125			
Lab ID: LFB-69041	7	Laboratory Fortified Blank				Run: ICPMS205-H_231103B				11/03/23 17:31
Arsenic		26.6	mg/kg	1.0	106	80	120			
Cadmium		13.4	mg/kg	1.0	107	80	120			
Copper		26.8	mg/kg	1.0	107	80	120			
Lead		26.6	mg/kg	1.0	106	80	120			
Manganese		131	mg/kg	1.1	105	80	120			
Molybdenum		26.8	mg/kg	1.0	107	80	120			
Zinc		26.6	mg/kg	3.1	107	80	120			
Lab ID: LFBD-69041	7	Laboratory Fortified Blank Duplicate				Run: ICPMS205-H_231103B				11/03/23 17:34
Arsenic		26.7	mg/kg	1.0	107	80	120			
Cadmium		13.6	mg/kg	1.0	109	80	120			
Copper		27.1	mg/kg	1.0	108	80	120			
Lead		26.8	mg/kg	1.0	107	80	120			
Manganese		132	mg/kg	1.1	106	80	120			
Molybdenum		27.2	mg/kg	1.0	109	80	120			
Zinc		26.5	mg/kg	3.1	106	80	120			
Lab ID: H23100663-004AMS	7	Sample Matrix Spike				Run: ICPMS205-H_231103B				11/03/23 17:37
Arsenic		5.01	mg/kg	1.0	100	75	125			
Cadmium		5.12	mg/kg	1.0	102	75	125			
Copper		5.33	mg/kg	1.0	107	75	125			
Lead		5.06	mg/kg	1.0	101	75	125			
Manganese		5.25	mg/kg	1.1	105	75	125			
Molybdenum		5.31	mg/kg	1.0	106	75	125			
Zinc		6.54	mg/kg	3.1	0	75	125			S
POST-EXTRACTION SPIKE										
Lab ID: H23100663-004AMSD	7	Sample Matrix Spike Duplicate				Run: ICPMS205-H_231103B				11/03/23 17:40
Arsenic		5.03	mg/kg	1.0	101	75	125	0.4	20	

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 12/08/23

Client: Bison Engineering

Work Order: H23100663

Report Date: 12/08/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**										Batch: 69041
Lab ID: **H23100663-004AMSD**	7	Sample Matrix Spike Duplicate				Run: ICPMS205-H_231103B				11/03/23 17:40
Cadmium		5.16	mg/kg	1.0	103	75	125	0.9	20	
Copper		5.33	mg/kg	1.0	107	75	125	0	20	
Lead		5.08	mg/kg	1.0	102	75	125	0.5	20	
Manganese		5.09	mg/kg	1.1	102	75	125	3.0	20	
Molybdenum		5.35	mg/kg	1.0	107	75	125	0.8	20	
Zinc		6.78	mg/kg	3.1	0	75	125	3.6	20	S
POST-EXTRACTION SPIKE										
Method: **SW6020**										Analytical Run: ICPMS205-H_231107A
Lab ID: **ICV**	5	Initial Calibration Verification Standard								11/07/23 14:49
Arsenic		0.0590	mg/L	0.0010	98	90	110			
Cadmium		0.0305	mg/L	0.0010	102	90	110			
Copper		0.0617	mg/L	0.0010	103	90	110			
Lead		0.0602	mg/L	0.0010	100	90	110			
Manganese		0.307	mg/L	0.0010	102	90	110			
Lab ID: **ICSA**	5	Interference Check Sample A								11/07/23 14:58
Arsenic		0.0000408	mg/L	0.0010						
Cadmium		0.0000650	mg/L	0.0010						
Copper		-0.0000790	mg/L	0.0010						
Lead		0.0000152	mg/L	0.0010						
Manganese		0.000268	mg/L	0.0010		0	0			
Lab ID: **ICSAB**	5	Interference Check Sample AB								11/07/23 15:04
Arsenic		0.00987	mg/L	0.0010	99	70	130			
Cadmium		0.00986	mg/L	0.0010	99	70	130			
Copper		0.0191	mg/L	0.0010	96	70	130			
Lead		0.0000122	mg/L	0.0010		0	0			
Manganese		0.0204	mg/L	0.0010	102	70	130			
Lab ID: **CCV**	5	Continuing Calibration Verification Standard								11/07/23 16:43
Arsenic		0.0508	mg/L	0.0010	102	90	110			
Cadmium		0.0514	mg/L	0.0010	103	90	110			
Copper		0.0519	mg/L	0.0010	104	90	110			
Lead		0.0512	mg/L	0.0010	102	90	110			
Manganese		0.0524	mg/L	0.0010	105	90	110			
Method: **SW6020**										Batch: 69041
Lab ID: **MB-69041**	7	Method Blank				Run: ICPMS205-H_231107A				11/07/23 16:49
Arsenic		ND	mg/kg	0.03						
Cadmium		ND	mg/kg	0.005						
Copper		ND	mg/kg	0.1						
Lead		ND	mg/kg	0.09						
Manganese		ND	mg/kg	0.2						
Molybdenum		ND	mg/kg	0.04						
Zinc		ND	mg/kg	0.6						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

S - Spike recovery outside of advisory limits

QA/QC Summary Report

Prepared by Helena, MT Branch

Revised Date: 12/08/23

Client: Bison Engineering **Work Order:** H23100663 **Report Date:** 12/08/23

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **SW6020**									Analytical Run: ICPMS205-H_231111B	
Lab ID: **ICV**	2	Initial Calibration Verification Standard							11/11/23 12:59	
Molybdenum		0.0614	mg/L	0.0010	102	90	110			
Zinc		0.0656	mg/L	0.0013	109	90	110			
Lab ID: **ICSA**	2	Interference Check Sample A							11/11/23 13:09	
Molybdenum		0.879	mg/L	0.0010	110	70	130			
Zinc		0.000458	mg/L	0.0013						
Lab ID: **ICSAB**	2	Interference Check Sample AB							11/11/23 13:16	
Molybdenum		0.910	mg/L	0.0010	114	70	130			
Zinc		0.0107	mg/L	0.0013	107	70	130			
Lab ID: **CCV**	2	Continuing Calibration Verification Standard							11/11/23 15:58	
Molybdenum		0.0493	mg/L	0.0010	99	90	110			
Zinc		0.0511	mg/L	0.0013	102	90	110			
Method: **SW6020**									Batch: 69041	
Lab ID: **MB-69041**	7	Method Blank				Run: ICPMS205-H_231111B			11/11/23 16:05	
Arsenic		ND	mg/kg	0.06						
Cadmium		ND	mg/kg	0.01						
Copper		ND	mg/kg	0.3						
Lead		ND	mg/kg	0.2						
Manganese		ND	mg/kg	0.4						
Molybdenum		ND	mg/kg	0.09						
Zinc		ND	mg/kg	1						

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Bison Engineering

H23100663

Login completed by: Rebecca A. Tooke
Date Received: 10/18/2023
Reviewed by: tjones
Received by: RAT
Reviewed Date: 10/25/2023
Carrier name: Hand Deliver

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	21.2°C No Ice		
Containers requiring zero headspace have no headspace or bubble that is <6mm (1/4").	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The reference date for Radon analysis is the sample collection date. The reference date for all other Radiochemical analyses is the analysis date. Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

For methods that require zero headspace or require preservation check at the time of analysis due to potential interference, the pH is verified at analysis. Nonconforming sample pH is documented as part of the analysis and included in the sample analysis comments.

Contact and Corrective Action Comments:

No date/time of collection on containers. Used information from COC.
Per client dustfall bucket rim for DG-PINE-002 warped due to sun exposure. Dustfall samples collected from 9-2-2023 to 10-3-2023.
10/18/23 rt

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Account Information *(Billing information)*

Company/Name	Bison Engineering Inc.
Contact	Steve Heck
Phone	406-498-4199
Mailing Address	3143 E Lyndale Ave
City, State, Zip	Helena, MT 59601
Email	sheck@bison-eng.com
Receive Invoice	☐Hard Copy ☒Email
Receive Report	☐Hard Copy ☒Email
Purchase Order	
Quote	
Bottle Order	

Report Information *(if different than Account Information)*

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	
Receive Report	☐Hard Copy ☐Email
Special Report/Formats:	☐ LEVEL IV ☐NELAC ☐ EDD/EDT *(contact laboratory)* ☐ Other_____

Comments

These are dustfall samples.
Collected from 9-2-2023 to 10-3-2023.

Dustfall bucket rim for DF-PINE-002 warped due to sun exposure.

Project Information

Project Name, PWSID, Permit, etc.	Montana Resources Dustfall
Sampler Name	Steve Heck
Sampler Phone	406-498-4199
Sample Origin State	Montana
EPA/State Compliance	☐ Yes ☒ No

URANIUM MINING CLIENTS MUST indicate sample type
☐ Unprocessed Ore
☐ Processed Ore (Ground or Refined) **CALL BEFORE SENDING
☐ 11(e)2 Byproduct Material (Can ONLY be Submitted to ELI Casper Location)

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Oil
DW - Drinking Water

All turnaround times are standard unless marked as RUSH.
Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification *(Name, Location, Interval, etc.)*	Collection Date	Collection Time	Number of Containers	Matrix *(See Codes Above)*	Gravimetric - total mass	As, Cd, Cu, Pb, Mn, Mo, Zn	See Attached	RUSH TAT	ELI LAB ID *Laboratory Use Only*
1	DF-GREELEY-002	10/03/2023	12:20 pm	1	A	✓	✓			A23100663
2	DF-PINE-002	10/03/2023	12:50 pm	1	A	✓	✓			
3	DF-WALNUT-002	10/03/2023	1:05 pm	1	A	✓	✓			
4	DF-FB-002	10/03/2023	12:25 pm	1	A	✓	✓			
5										
6										
7										
8										
9										

ELI is REQUIRED to provide preservative traceability. If the preservatives supplied with the bottle order were **NOT** used, please attach your preservative information with this COC.

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Steve Heck	10-18 1145				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				Rebecca Todd	10-18-23 1145	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals	Intact	Receipt Temp	Temp Blank	On Ice	Payment Type	Amount	Receipt Number *(cash/check only)*
hand	Box	Y (N) C B	Y N	21.2 °C	Y (N)	Y (N)	CC Cash Check_____	$	

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

APPENDIX D: COMMON GUIDELINES FOR AIRBORNE CONTAMINANTS

Dose and Risk Assessment References

Pollutant	Organization	Standard Type	Description	Value	Units	Time Period	Reference
Arsenic							
	WHO	Air Quality Guideline		0.0015	Unit Risk	Life-time	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	NIOSH	REL		2	µg/m^3	15 min	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	ACGIH	TLV (TWA)		10	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	General - organic As	200	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	General - inorganic As	10	µg/m^3	8-hour	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	OSHA	PEL (TWA)	Construction - organic	500	µg/m^3	8-hour	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	OSHA	PEL (TWA)	Shipyard - organic	500	µg/m^3	8-hour	https://www.atsdr.cdc.gov/toxprofiles/tp2-c8.pdf
	EPA	EPA- Ca	Noncancer	0.015	µg/m^3		https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf
	EPA	IRIS	Risk = 10^{-6} (lifetime)	0.043	µg/m^3	Life-time	https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf
	EPA	REL		0.20	µg/m^3	1-Hour	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	RfC	Inorganic As	0.015	µg/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RSL	Cancer Risk @ 10^{-6}	0.65	ng/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RSL	HI = 1	0.016	µg/m^3		https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
Cadmium							
	ACGIH	TLV (TWA)	(total)	10	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	ACGIH	TLV (TWA)	(respirable)	2	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)		5	µg/m^3		https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	EPA	ATSDR	Noncancer - Cd Compounds	0.01	µg/m^3	Chronic	https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf
	EPA	IRIS	Cancer - Cd Compounds	2	µg/m^3	Chronic	https://www.epa.gov/sites/production/files/2014-05/documents/table1.pdf
	EPA	MRL	Cd Compounds	0.03	µg/m^3	Acute	
	EPA	AEGL-1 (1-hr)	Cd Compounds	100	µg/m^3	1-Hour	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	AEGL-1 (8-hr)	Cd Compounds	41	µg/m^3	8-Hour	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	RfC	Cd (water)	0.01	µg/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RSL: TR @ 10^{-6}	Cd (water) (Cancer Risk)	1.60	ng/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RSL: HI = 1	Cd (water) (Noncancer Risk)	10	ng/m^3	HI=1	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
Copper							
	ACGIH	TLV (TWA)	(dust & mist)	1,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	NIOSH	REL (TWA)		1,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)		1,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
Lead (Pb)							
	ACGIH	TLV (TWA)	(inorganic)	50	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	NIOSH	REL (TWA)	(inorganic+ organic salts)	50	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	(inorganic)	50	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	EPA	NAAQS		0.150	µg/m^3	3-month mean	40 CFR 50.12 (and Appendix R)
	NIOSH	IGHL/10	Lead compounds	10	mg/m^3		https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	RSL: HI = 1	Pb (Noncancer Risk)	0.15	µg/m^3	HI=1	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
Manganese							
	ACGIH	TLV (TWA)	(compounds + fumes)	20	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	NIOSH	REL (TWA)	(compounds + fumes)	1,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	(compounds + fumes)	5,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	ATSDR	Screen for Risk Assessment	Noncancer - Mn Compounds	0.30	µg/m^3	Chronic	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	NIOSH	IGHL/10	Manganese compounds	50	mg/m^3		https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	USDOE	TEEL-1	MnO, MO_2 & $MnSO_4$	4.7	mg/m^3	1-Hour	https://www.epa.gov/sites/production/files/2014-05/documents/table2.pdf
	EPA	RSL: HI = 1	Mn (non-diet) (Noncancer Risk)	0.052	µg/m^3	HI=1	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
	EPA	RfC	Mn (non-diet)	0.05	µg/m^3	Life-time	https://semspub.epa.gov/work/HQ/401635.pdf - (November, 2021)
Molybdenum							
	ACGIH	TLV (TWA)	(soluble compounds)*	500	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	NIOSH	REL (TWA)	(soluble compounds)*	N/A	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	OSHA	PEL (TWA)	(soluble compounds)*	5,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
			* Higher limits for insoluble compounds				

Zinc (Zn)

ACGIH	TLV (TWA)	(zinc oxide - respirable)	2,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
	STEL	(zinc oxide - respirable)	10,000	µg/m^3	15 minutes	https://www.osha.gov/dsg/annotated-pels/tablez-1.html
OSHA	PEL (TWA)	(inorganic)	5,000	µg/m^3	8-hour	https://www.osha.gov/dsg/annotated-pels/tablez-1.html

Term	Definition
ACGIH	American Congress of Governmental Industrial Hygienists
AEGL-1	Acute exposure guideline levels for mild effects: 1-hour and 8-hour
ATSDR	Agency for Toxic Substances & Disease Registry
HI (EPA)	Hazardous Index: Aggregate exposures below a HI of 1.0 will likely not result in adverse noncancer health effects over a lifetime of exposure. A respiratory HI greater than 1.0 can be best described as indicating that a potential may exist for adverse irritation to the respiratory system. https://archive.epa.gov/airtoxics/nata/web/html/gloss.html
IDHL/10	One-tenth of levels determined by NIOSH to be imminently dangerous to life and death.
IRIS	Integrated Risk Information System
NAAQS	National Ambient Air Quality Standards: 40 CFR 50.12
NIOSH	National Institute of Occupational Safety and Health (part of CDC)
PEL	Permissible Exposure Limits (expressed as 8-hour time weighted average (TWA)) 29 CFR 1910.1000 Z-1 Table
REL (NIOSH)	Recommended exposure limit: Level at which NIOSH believes protects worker safety and health over a working lifetime.
REL (Ca EPA)	California EPA concentration level at which no adverse health effect are anticipated. Includes most sensitive individuals Levels exceeding REL does not automatically indicate an adverse health impact.
RfC	Reference Concentration (EPA) is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetim https://www.epa.gov/sites/default/files/2015-08/documents/technical_appendix_a_toxicity_v2_3_3.pdf
RSL	Residential Regional Screening Level (EPA Region X) @ 10^{-6} Cancer Risk or (Noncancer) Hazardous Index (HI) = 1 (based on Hazard Quotient (HQ) of 1. https://semspub.epa.gov/work/HQ/401635.pdf Last (EPA) Table Update: November 2021
STEL	Short-Term Exposure Limit (15-minutes)
TEEL-1	Temporary emergency exposure limits for mild transient effects for 1-hour exposure
TLV	Threshold Limit Value
TWA	Time Weighted Average
WHO	World Health Organization

APPENDIX F: CALIBRATIONS

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 07/09/2023	Time: 1045 - 1105 MST	Sampler Serial Number: 90133	
Performed By: Steve Heck		Location (field or lab): Pine St	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	623 mm Hg	623.0 mmHg	0.0
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	25.0 C	25.2 C	-0.2 C
Filter Temperature	26.7 C	26.1 C	+0.6 C
Leak Check			
Vacuum Readings (mm Hg)	Start 144	End 143	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	16.38	+2.0%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.38	16.7	-1.9%
Startup calibration. Sample filter installed.			

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 07/18/2023	Time: 1030 - 1044 MST	Sampler Serial Number: 90133	
Performed By: Steve Heck		Location (field or lab): Pine St	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	626 mm Hg	626.0 mmHg	0.0
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	21.5 C	22.0 C	-0.5 C
Filter Temperature	23.4 C	22.6 C	+0.8 C
Leak Check			
Vacuum Readings (mm Hg)	Start 141	End 140	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	16.31	+2.4%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.31	16.7	-2.3%
Calibration check just prior to audit.			

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 08/24/2023	Time: 0955-1045 MST	Sampler Serial Number: 90133	
Performed By: Steve Heck		Location (field or lab): Pine St	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	627 mm Hg	626.5 mmHg	+0.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	19.9 C	19.5 C	+0.4 C
Filter Temperature	21.4 C	20.8 C	+0.6 C
Leak Check			
Vacuum Readings (mm Hg)	Start 138	End 136	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	16.05	+4.1%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.05	16.7	-3.9%

Adjusted operating flowrate to obtain the following result:

Adjusted flowrate = 16.68 LPM, sampler indicated 16.7 LPM

% difference from sampler vs reference = +0.1%
% difference from design flow = -0.1%

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 09/17/2023	Time: 1058–1108 MST	Sampler Serial Number: 90133	
Performed By: Steve Heck		Location (field or lab): Pine St	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	625 mm Hg	624.5 mmHg	+0.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	22.2 C	23.1 C	-0.9 C
Filter Temperature	23.5 C	23.1 C	+0.4 C
Leak Check			
Vacuum Readings (mm Hg)	Start 140	End 139	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	16.76	-0.4%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.76	16.7	+0.4%

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 10/31/2023	Time: 1040-1215 MST	Sampler Serial Number: 90133	
Performed By: Steve Heck		Location (field or lab): Pine St	
Ref Standard & S/N: 1) Delta Cal SN 1293 (CAE Rental)		Certification Date: 1) 09-23-2023	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	628 mm Hg	627.5 mmHg	+0.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	1.6 C	2.3 C	-0.7 C
Filter Temperature	4.0 C	3.0 C	+1.0 C
Leak Check			
Vacuum Readings (mm Hg)	Start 132	End 131	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	15.89	+5.1%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.7)/16.7 (must be ≤ ± 5%)
Design flow rate calculation	15.89	16.7	+4.9%

Flow error unexpectedly large. Performed multipoint flow calibration.

New operating flow measured at 16.74 LPM.

Sampler error = -0.2% Error from design flow = +0.2%

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 07/09/2023	Time: 1130 - 1150 MST	Sampler Serial Number: 90129	
Performed By: Steve Heck		Location (field or lab): Walnut St	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	623 mm Hg	623.5 mmHg	-0.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	26.2 C	26.7 C	-0.5 C
Filter Temperature	29.0 C	28.4 C	+0.6 C
Leak Check			
Vacuum Readings (mm Hg)	Start 142	End 141	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	16.77	-0.4%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.77	16.7	+0.4%
Startup calibration. Sample filter installed.			

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 07/18/2023	Time: 1135 - 1145 MST	Sampler Serial Number: 90129	
Performed By: Steve Heck		Location (field or lab): Walnut St	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	626 mm Hg	626.0 mmHg	0.0
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	22.4 C	22.9 C	-0.5 C
Filter Temperature	25.9 C	24.9 C	+1.0 C
Leak Check			
Vacuum Readings (mm Hg)	Start 140	End 139	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	16.79	-0.5%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.79	16.7	+0.5%
Calibration check prior to audit.			

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 08/24/2023	Time: 1115 - 1130 MST	Sampler Serial Number: 90129	
Performed By: Steve Heck		Location (field or lab): Walnut St	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	627 mm Hg	627.5 mmHg	-0.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	21.9 C	22.1 C	-0.2 C
Filter Temperature	24.0 C	23.2 C	+0.8 C
Leak Check			
Vacuum Readings (mm Hg)	Start 139	End 138	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	16.65	+0.3%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.65	16.7	-0.3%
No adjustments made.			

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 09/17/2023	Time: 1038 - 1048 MST	Sampler Serial Number: 90129	
Performed By: Steve Heck		Location (field or lab): Walnut St	
Ref Standard & S/N: 1) Delta Cal SN 1288		Certification Date: 1) 09-20-2022	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	625 mm Hg	625.5 mmHg	-0.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	20.1 C	21.0 C	-0.9 C
Filter Temperature	20.8 C	20.9 C	-0.1 C
Leak Check			
Vacuum Readings (mm Hg)	Start 141	End 140	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	16.64	+0.4%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.67)/16.67 (must be ≤ ± 5%)
Design flow rate calculation	16.64	16.7	-0.4%
No adjustments made.			

BGI PQ200 TSP Sampler – Monthly Calibration Checks			
Date: 10/31/2023	Time: 1055 – 1110, 1300-1330 MST	Sampler Serial Number: 90129	
Performed By: Steve Heck		Location (field or lab): Walnut St	
Ref Standard & S/N: 1) Delta Cal SN 1293 (CAE Rental)		Certification Date: 1) 09-23-2023	
Barometric Pressure Sensor Verification			
Reading (mm Hg)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 10)
Ambient Pressure	629 mm Hg	628.5 mmHg	+0.5
Temperature Sensor Verification			
Reading (degrees Celsius)	Sampler (a)	Reference Standard (b)	Difference (a - b) (must be ≤ ± 2ºC)
Ambient Temperature	1.0 C	1.9 C	-0.9 C
Filter Temperature	2.8 C	3.8 C	-1.0 C
Leak Check			
Vacuum Readings (mm Hg)	Start 130	End 127	Pass ~~Fail~~
Flow Rate Verification			
Reading (liters per minute)	Sampler (a)	Reference Standard (b)	% Difference 100*(a – b)/b (must be ≤ ± 4%)
Operating flow rate check	16.7	16.51	+1.2%
Reading (liters per minute)	Reference Standard (b)	Design Flow Rate Standard (c)	% Difference 100*(b–16.7)/16.7 (must be ≤ ± 5%)
Design flow rate calculation	16.51	16.7	-1.1%
No adjustments made.			

APPENDIX F: CALIBRATION STANDARD CERTIFICATION SHEETS

Mesa Labs 12100 W. 6th Ave
Lakewood, CO 80228
NIST Traceable Calibration Facility

CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

Calibration Report #: 1288-20092022
DeltaCal Serial Number: 1288
Calibration Technician: Zabdiel Pimentel
Date: 20-Sep-2022
Recommended Recal Date: 20-Sep-2023

Critical Venturi Flow Meter

Max Uncertainty = 0.346%

TE20004	6 - 30.00 LPM	Calibration Due:	11-Jul-2023
TE20006	1.40 - 6.0 LPM	Calibration Due:	11-Jul-2023

Room Temperature: +- 0.03°C from -5°C - 70°C **Room Temperature:** 21.90 °C

Brand: Eutechnics
TE Number: TE12306 **Serial Number:** 308304
Std Cal Date: 8-Apr-22 **Std Cal Due Date:** 8-Apr-23

Ambient Temperature (set): 21.9 °C
Aux (filter) Temperature (set): 21.9 °C

Barometric and Absolute Pressure

Vaisala Model PTB330 (50-1100) Digital Accuracy: 0.03371%

TE Number: TE20204 **Serial Number:** U1220935
Std Cal Date: 21-Apr-22 **Std Cal Due Date:** 21-Apr-23

DeltaCal:
Barometric pressure (set): 620.5 mmHg

Results of Venturi Calibration

Flow Rate (Q) vs. Pressure Drop (ΔP). Where: Q=Lpm, ΔP= Cm of H2O

Venturi

TE20004	Q= 4.02226	ΔP ^	0.51536	Overall Uncertainty: 0.35%
TE20006	Q= 3.95205	ΔP ^	0.52799	Overall Uncertainty: 0.35%

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Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228
NIST Traceable Calibration Facility

As Shipped Calibration Data for DeltaCal

Unit Type:	DC 1
Flow Range:	1.5-19.5 LPM
Serial No. :	1288
Firmware Version:	4.00P

Date	Technician
20Sep2022	Zabdiel Pimentel

Ambient Pressure:	620.5	mmHg
Ambient Temperature:	21.9	°C

Range 1

Venturi	TE20004
Type	1A
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	135.35	620.5	6.529	6.507	-0.337
2	206.14	620.5	10.037	10.001	-0.359
3	268.17	620.5	13.111	13.050	-0.465
4	308.39	620.5	15.104	15.041	-0.417
5	349.07	620.5	17.120	17.036	-0.491
6	396.15	620.5	19.453	19.381	-0.370
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.406
				Result	PASS

Range 2

Venturi	TE20006
Type	2A
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	158.39	620.5	2.179	2.185	0.275
2	220.42	620.5	3.061	3.067	0.196
3	268.19	620.5	3.740	3.764	0.642
4	326.20	620.5	4.564	4.544	-0.438
5	365.29	620.5	5.122	5.113	-0.176
6	424.33	620.5	5.961	5.967	0.101
	Maximum allowable error at any flow rate is 0.75%.			Average	0.100
				Result	PASS

Performed By: Zabdiel Pimentel **Date:** 20-Sep-2022

Approved By: Casey Reitz **Date:** 20Sep2022

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Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228
NIST Traceable Calibration Facility

As-Found data for DeltaCal

Unit Type:	DC 1
Flow Range:	1.5-19.5 LPM
Serial No. :	1288
Firmware Version:	4.00P

Date	Technician
20Sep2022	Zabdiel Pimentel

Ambient Pressure:	620.5	mmHg
Ambient Temperature:	21.9	°C

	As Received Temp. Press. Calibration				As Shipped Temp. Press. Calibration			
	DUT	Standard	Diff	+/- 1 mmHg	DUT	Standard	Diff	+/-1 mmHg
$Pres_{AMB}$ mmHg	618.5	620.5	-2	Fail	620.5	620.5	0	Pass
	DUT	Standard	Diff	+/- 1 °C	DUT	Standard	Diff	+/- 1 °C
$Temp_{AMB}$ °C	21.8	21.9	-0.1	Pass	21.9	21.9	0	Pass
$Temp_{Filter}$ °C	21.8	21.9	-0.1	Pass	21.9	21.9	0	Pass

	Offset	New Offset
PresAMB	1	3
TempAMB	0	0.1
Temp Filter	-0.05	0.05

Range 1

Venturi	TE20004
Type	1A
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	135.35	620.5	6.529	6.507	-0.337
2	206.14	620.5	10.037	10.001	-0.359
3	268.17	620.5	13.111	13.050	-0.465
4	308.39	620.5	15.104	15.041	-0.417
5	349.07	620.5	17.120	17.036	-0.491
6	396.15	620.5	19.453	19.381	-0.370
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.406
				Result	PASS

Range 2

Venturi	TE20006
Type	2A
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	158.39	620.5	2.179	2.185	0.275
2	220.42	620.5	3.061	3.067	0.196
3	268.19	620.5	3.740	3.764	0.642
4	326.20	620.5	4.564	4.544	-0.438
5	365.29	620.5	5.122	5.113	-0.176
6	424.33	620.5	5.961	5.967	0.101
	Maximum allowable error at any flow rate is 0.75%.			Average	0.100
				Result	PASS

Mesa Labs 12100 W. 6th Ave
Lakewood, CO 80228
NIST Traceable Calibration Facility

CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

Calibration Report #: 149645-28072022
TetraCal Serial Number: 149645
Calibration Technician: Zabdiel Pimentel
Date: 28-Jul-2022
Recommended Recal Date: 28-Jul-2023

Critical Venturi Flow Meter

Max Uncertainty = 0.346%

TE20008	0.40 - 1.20 LPM	Calibration Due:	11-Jul-2023
TE20006	1.40 - 6.0 LPM	Calibration Due:	11-Jul-2023
TE20004	6 - 30.00 LPM	Calibration Due:	11-Jul-2023

Room Temperature: +- 0.03°C from -5°C - 70°C **Room Temperature:** 21.30 °C
Brand: Eutechnics

TE Number:	TE12306	**Serial Number:**	308304
Std Cal Date:	8-Apr-22	**Std Cal Due Date:**	8-Apr-23

Ambient Temperature (set): 21.2 °C
Aux (filter) Temperature (set): 21.2 °C

Barometric and Absolute Pressure

Vaisala Model PTB330 (50-1100) Digital Accuracy: 0.03371%

TE Number:	TE20204	**Serial Number:**	U1220935
Std Cal Date:	21-Apr-22	**Std Cal Due Date:**	21-Apr-23

TetraCal:

Barometric pressure (set): 624.0 mmHg

Results of Venturi Calibration

Flow Rate (Q) vs. Pressure Drop (ΔP). Where: Q=Lpm, ΔP= Cm of H2O

Venturi				
TE20008	Q1 = 0.21591	ΔP ^	0.52858	Overall Uncertainty: 0.35%
TE20006	Q2 = 1.15476	ΔP ^	0.53155	Overall Uncertainty: 0.35%
TE20004	Q3 = 5.40292	ΔP ^	0.51990	Overall Uncertainty: 0.35%

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Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228
NIST Traceable Calibration Facility

As Shipped Calibration Data for TetraCal

Unit Type: TetraCal TC12 (Legacy)	Date	Technician	
Flow Range: 0.40 -30.00 LPM	28Jul2022	Zabdiel Pimentel	
Serial No. : 149645	Ambient Pressure:	624.0	mmHg
Firmware Version: 3.41P	Ambient Temperature:	21.3	°C

Range 1: 0.40 - 1.20 LPM

Venturi	TE20008
Type	3A
Flow range	0.40 - 1.20 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	232.86	624.0	0.524	0.524	0.000
2	365.39	624.0	0.840	0.835	-0.595
3	509.97	624.0	1.184	1.185	0.084
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.170
				Result	PASS

Range 2: 1.4 - 6.00 LPM

Venturi	TE20006
Type	2A
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	123.70	624.0	1.676	1.671	-0.298
2	246.33	624.0	3.410	3.393	-0.499
3	425.61	624.0	5.944	5.960	0.269
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.176
				Result	PASS

Range 3: 6.00 - 30.0 LPM

Venturi	TE20004
Type	1A
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	126.00	624.0	6.022	6.023	0.017
2	372.14	624.5	18.122	18.024	-0.541
3	601.27	624.5	29.389	29.568	0.609
	Maximum allowable error at any flow rate is 0.75%.			Average	0.028
				Result	PASS

Performed By: Zabdiel Pimentel **Date:** 28-Jul-2022

Approved By: Casey Reitz **Date:** 28Jul2022

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Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228

NIST Traceable Calibration Facility

As-Found data for TetraCal

Unit Type: TetraCal TC12 (Legacy)		Date	Technician
Flow Range: 0.40 -30.00 LPM		28Jul2022	Zabdiel Pimentel
Serial No. : 149645		Ambient Pressure:	624.0 mmHg
Firmware Version:	3.41P	Ambient Temperature:	21.3 °C

	As Received Temp. Press. Calibration				As Shipped Temp. Press. Calibration			
	DUT	**Standard**	**Diff**	**+/- 1 mmHg**	**DUT**	**Standard**	**Diff**	**+/-1 mmHg**
$Pres_{AMB}$ mmHg	669.0	624.0	45	Fail	624.0	624.0	0	Pass
	DUT	**Standard**	**Diff**	**+/- 1 °C**	**DUT**	**Standard**	**Diff**	**+/- 1 °C**
$Temp_{AMB}$ °C	21.4	21.3	0.1	Pass	21.2	21.2	0	Pass
Temp $_{Filter}$ °C	21.5	21.3	0.2	Pass	21.2	21.2	0	Pass

	Offset	New Offset
PresAMB	-2	-47
TempAMB	0.35	0.25
Temp Filter	0.35	0.15

Range 1: 0.40 - 1.20 LPM

Venturi	TE20008
Type	3A
Flow range	0.40 - 1.20 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	238.68	624.0	0.538	0.534	-0.743
2	368.77	624.0	0.848	0.837	-1.297
3	516.54	624.0	1.199	1.193	-0.500
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.847
				Result	FAIL

Range 2: 1.4 - 6.00 LPM

Venturi	TE20006
Type	2A
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	120.69	624.0	1.632	1.607	-1.532
2	254.23	624.0	3.518	3.372	-4.150
3	428.42	624.0	5.982	5.713	-4.497
	Maximum allowable error at any flow rate is 0.75%.			Average	-3.393
				Result	FAIL

Range 3: 6.00 - 30.0 LPM

Venturi	TE20004
Type	1A
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	128.88	624.0	6.163	6.248	1.379
2	370.85	624.0	18.067	18.049	-0.100
3	601.02	624.0	29.390	29.650	0.885
	Maximum allowable error at any flow rate is 0.75%.			Average	0.721
				Result	FAIL

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Mesa Labs 12100 W. 6th Ave
Lakewood, CO 80228
NIST Traceable Calibration Facility

CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

Calibration Report #: 1293-30092023
DeltaCal Serial Number: 1293
Calibration Technician: Elsy Lasky
Date: 30-Sep-2023
Recommended Recal Date: 30-Sep-2024

CleanAir
This certification corresponds to CleanAir asset # **209234**

Critical Venturi Flow Meter

Max Uncertainty = 0.346%

TE20007	1.40 - 6.0 LPM	Calibration Due:	2-Aug-2024
TE20005	6 - 30.00 LPM	Calibration Due:	1-Aug-2024

Room Temperature: +- 0.03°C from -5°C - 70°C **Room Temperature:** 22.90 °C

Brand: Eutechnics
TE Number: TE12242 **Serial Number:** A11441
Std Cal Date: 5-Oct-22 **Std Cal Due Date:** 5-Oct-23

Ambient Temperature (set): 23.0 °C
Aux (filter) Temperature (set): 23.0 °C

Barometric and Absolute Pressure

Vaisala Model PTB330 (50-1100) Digital Accuracy: 0.03371%

TE Number: TE12311 **Serial Number:** H0850001
Std Cal Date: 6-Feb-23 **Std Cal Due Date:** 6-Feb-24

DeltaCal:

Barometric pressure (set): 617.00 mmHg

Results of Venturi Calibration

Flow Rate (Q) vs. Pressure Drop (ΔP). Where: Q=Lpm, ΔP= Cm of H2O

Venturi

TE20007	Q= 3.87511	ΔP ^	0.52547	Overall Uncertainty: 0.35%
TE20005	Q= 3.83179	ΔP ^	0.52078	Overall Uncertainty: 0.35%

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Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228
NIST Traceable Calibration Facility

As Shipped Calibration Data for DeltaCal

Unit Type:	DC 1
Flow Range:	1.5-19.5 LPM
Serial No. :	1293
Firmware Version:	4.00P

Date	Technician
30Sep2023	Elsy Lasky

Ambient Pressure:	617	mmHg
Ambient Temperature:	22.9	°C

Range 1

Venturi	TE20007
Type	2B
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	137.88	616.5	1.914	1.921	0.366
2	209.21	616.5	2.935	2.942	0.239
3	266.44	616.5	3.754	3.779	0.666
4	322.57	616.5	4.558	4.592	0.746
5	372.08	616.5	5.266	5.291	0.475
6	411.32	616.5	5.828	5.869	0.704
	Maximum allowable error at any flow rate is 0.75%.			Average	0.532
				Result	PASS

Range 2

Venturi	TE20005
Type	1B
Flow range	6 - 30.00 LPM

CleanAir®
This certification corresponds to CleanAir asset # **209234**

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	134.01	616.5	6.497	6.527	0.462
2	203.26	616.5	9.933	9.879	-0.544
3	265.22	616.5	13.007	12.919	-0.677
4	326.25	616.5	16.035	15.947	-0.549
5	364.74	616.5	17.945	17.861	-0.468
6	406.24	616.5	20.004	19.864	-0.700
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.413
				Result	PASS

Performed By: Elsy Lasky **Date:** 30-Sep-2023

Approved By: Leonard Reinert, Quality Specialist **Date:** 03 OCT 2023

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Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228

NIST Traceable Calibration Facility

As-Found data for DeltaCal

Unit Type:	DC 1
Flow Range:	1.5-19.5 LPM
Serial No. :	1293
Firmware Version:	4.00P

Date	Technician
30Sep2023	Elsy Lasky

Ambient Pressure:	617	mmHg
Ambient Temperature:	22.9	°C

	As Received Temp. Press. Calibration				As Shipped Temp. Press. Calibration			
	DUT	Standard	Diff	+/- 1 mmHg	DUT	Standard	Diff	+/-1 mmHg
$Pres_{AMB}$ mmHg	617	617.3	-0.3	Pass	616.5	616.8	-0.3	Pass
	DUT	Standard	Diff	+/- 1 °C	DUT	Standard	Diff	+/- 1 °C
$Temp_{AMB}$ °C	22.8	22.7	0.1	Pass	23	22.9	0.1	Pass
$Temp_{Filter}$ °C	22.8	22.7	0.1	Pass	23	22.9	0.1	Pass

	Offset	New Offset
PresAMB		0.3
TempAMB		-0.1
Temp Filter		-0.1

Range 1

Venturi	TE20007
Type	2B
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	141.56	617.0	1.964	1.945	-0.967
2	216.23	617.0	3.032	2.986	-1.517
3	271.79	617.0	3.826	3.778	-1.255
4	324.28	617.0	4.577	4.503	-1.617
5	381.40	617.0	5.394	5.287	-1.984
6	430.87	617.0	6.101	5.982	-1.950
Maximum allowable error at any flow rate is 0.75%.				Average	-1.548
				Result	FAIL

CleanAir®
This certification corresponds to CleanAir asset # **209234**

Range 2

Venturi	TE20005
Type	1B
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	136.11	617.0	6.592	6.450	-2.154
2	204.48	617.0	9.979	9.844	-1.353
3	266.17	617.0	13.035	12.866	-1.297
4	328.04	617.0	16.105	15.921	-1.143
5	369.17	617.0	18.138	17.943	-1.075
6	406.38	617.0	19.981	19.820	-0.806
Maximum allowable error at any flow rate is 0.75%.				Average	-1.304
				Result	FAIL