July 8, 2024

Rev. August 5, 2024

Elliott Russell
Colorado Division of Reclamation, Mining, and Safety
1313 Sherman St, Rm 215
Denver, CO 80203

RE: London Mine, File No., M-2023-015
Buckskin EPA Material Testing Results

Mr. Russell

MineWater LLC has completed testing of material from the Environmental Protection Agency (EPA) managed piles near the historic Buckskin Joe mine. The results of the lab testing is summarized below, focusing on the synthetic potential leaching protocol (SPLP) and acid-neutralization potential of this waste material. SPLP measures the concentration of elements that would dissolve when the waste is exposed in an acid. Acid-neutralization potential measures the likelihood of acid being generated by the material upon its exposure to water. Acid-neutralization potential above +20 is not considered likely to generate acid-mine drainage. The complete lab results are attached: Non-Shot Material is the sample of material from Buckskin before it is run through the sorter; Sorted Material is the "waste stream" of material at the sorter output that will be used or placed onsite.

SPLP (mg/L) (Non-shot, then Sorted)								Acid Neutralization Potential (tons $CaCO_3$/kton)
Lead	Zinc	Copper	Cadmium	Manganese	Mercury	Silver	Vanadium	
0.01	0.02	<0.01	<0.01	0.48	<0.01	<0.01	<0.01	39.3
<0.01	0.05	<0.01	<0.01	0.26	<0.01	<0.01	<0.01	110.1

The lab results show that this waste material is inert and will not be a source of acid-mine drainage or heavy metals. While some metals do show as leachable in the Sorted Material SPLP results (manganese, for example), the very high neutralization potential means that the material is highly unlikely to generate acidic enough conditions to leach out the metals.

The material will be placed in permanent storage on-site according to the current mining and reclamation plan; no revisions to the permit are needed. Please see the approved mining and reclamation plans for the details of this waste placement.

Additional Information

Based on feedback from CDRMS, the following additional information and commitments are provided and made:

- A copy of the sampling procedure for the Buckskin material is attached.
- A second sample of the Non-shot and sorted material will be conducted once at least 70% of the material has been imported from the Buckskin site.
- Sorted waste produced by the ore-sorter from the Buckskin material will be stored in the Inert Waste area identified on Map C-2 prior to final placement.
- Crusher fines that do not pass through the ore sorter go to the mill in Gunnison with the ore sorter product. Crusher fines do not remain on site.
- All material handled from Buckskin will leave the London Mine within 180 days of arrival. This includes the Non-shot or raw material, the crusher fines, and the sorted product. Sorted material stored onsite will be deposited within the existing, approved, American Flats Waste Repository, also within 180 days of arrival.
- Total material handled from Buckskin is expected to be 4000 CY. All material from Buckskin is expected to be trucked onto the London Mine site, processed, and shipped off site by early October 2024.
- Roughly 50% of the material from Buckskin material is anticipated to become Sorted waste and the other 50% will be hauled offsite to the Gunnison mill as Sorted product, Crusher fines, and Screened fines.
- All materials smaller than 3-mm in diameter will be screened out of the sorter feed and shipped offsite to the mill for processing. This till typically happen within 72-hours.
- Additional bond in the amount of $72,000 will be submitted to cover the removal of an additional 1000 CY of material. This raises the maximum amount allowable onsite to 3000 CY.

Please feel free to contact my office with any further questions on this report and its associated technical revision.

Regards,

Ben Langenfeld, P.E.
Lewicki & Associates, PLLC
(720) 842-5321, ex. 1
benl@lewicki.biz

Attachments

Lab results.

Buckskin sampling procedure.

Analysis Report

June 26, 2024

MW Sorter LLC
9233 Park Meadows Drive
Suite 108
Lone Tree, CO 80124
USA

Client Sample ID:	Sorted Material	**Date Sampled :**	06/14/2024
Date Received:	06/14/2024	**Project Name/# :**	London Mine
Matrix:	Unknown	**Sample Taken By :**	E.L.

SGS Minerals Sample ID: 072-137412-001

Tests	Result	Unit	Method
Cyanide, Total	<0.1	mg/kg	SW9013A
Sulfide, S2-	0.95	%	Leco CS744

Carmalena Heussner, Branch Manager

SGS North America Inc. | Minerals Services Division
4665 Paris St Suite B-200 Denver CO 80239
t (303) 373-4772 f (303) 373-4791 www.sgs.com/minerals

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Date Received:	06/14/2024	**Project Name/# :**	London Mine
Matrix:	Unknown	**Sample Taken By :**	E.L.

SGS Minerals Sample ID: 072-137412-001

Tests	Result	Unit	Method
Trace Analysis Basis	Dry		ASTM D 6357 mod
Antimony	<1	ug/g	ASTM D 6357 mod
Barium	238	ug/g	ASTM D 6357 mod
Beryllium	1.4	ug/g	ASTM D 6357 mod
Cadmium	1.4	ug/g	ASTM D 6357 mod
Cobalt	19	ug/g	ASTM D 6357 mod
Chromium	17	ug/g	ASTM D 6357 mod
Copper	41	ug/g	ASTM D 6357 mod
Manganese	2175	ug/g	ASTM D 6357 mod
Nickel	4	ug/g	ASTM D 6357 mod
Lead	121	ug/g	ASTM D 6357 mod
Silver	2.4	ug/g	ASTM D 6357 mod
Thallium	<1	ug/g	ASTM D 6357 mod
Vanadium	23	ug/g	ASTM D 6357 mod
Zinc	253	ug/g	ASTM D 6357 mod
Arsenic	3.0	ug/g	ASTM D 6357 mod
Traces Basis	Dry		ASTM D 8213 Mod
Selenium	<1	ug/g	ASTM D 8213 Mod
Mercury, Dry	0.34	ug/g	ASTM D 6722
Neutralization Potential	110.0	t/1000t	EPA 600/2-78-054 (Sobek)
Chromium, Hexavalent	<0.10	ug/g	SW7196A Mod.
Aluminum - SPLP	<0.01	mg/L	EPA 1312
AA Basis	Dry		ASTM D 6357 mod
Antimony - SPLP	0.03	mg/L	EPA 1312
Aluminum	2.87	%	ASTM D 6357 mod
Arsenic - SPLP	0.01	mg/L	EPA 1312
Barium - SPLP	0.02	mg/L	EPA 1312
Cadmium - SPLP	<0.01	mg/L	EPA 1312
Chromium - SPLP	<0.01	mg/L	EPA 1312
Copper - SPLP	<0.01	mg/L	EPA 1312
Calcium	2.76	%	ASTM D 6357 mod

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Matrix:	Unknown	**Sample Taken By :**	E.L.

SGS Minerals Sample ID: 072-137412-001

Tests	Result	Unit	Method
Lead - SPLP	<0.01	mg/L	EPA 1312
Manganese - SPLP	0.26	mg/L	EPA 1312
Mercury - SPLP	<0.01	mg/L	EPA 1312
Molybdenum - SPLP	<0.01	mg/L	EPA 1312
Selenium - SPLP	<0.01	mg/L	EPA 1312
Zinc - SPLP	0.05	mg/L	EPA 1312
Vanadium - SPLP	<0.01	mg/L	EPA 1312
Beryllium - SPLP	<0.01	mg/L	EPA 1312
Calcium - SPLP	221.31	mg/L	EPA 1312
Magnesium	1.32	%	ASTM D 6357 mod
Cobalt - SPLP	<0.01	mg/L	EPA 1312
Magnesium - SPLP	22.65	mg/L	EPA 1312
Potassium - SPLP	18.12	mg/L	EPA 1312
Silver - SPLP	<0.01	mg/L	EPA 1312
Thallium - SPLP	<0.01	mg/L	EPA 1312
Sodium - SPLP	4.67	mg/L	EPA 1312
Potassium	1.62	%	ASTM D 6357 mod
Sodium	0.43	%	ASTM D 6357 mod

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Date Received:	06/14/2024	**Project Name/# :**	London Mine
Matrix:	Unknown	**Sample Taken By :**	E.L.

SGS Minerals Sample ID: 072-137412-002

Tests	Result	Unit	Method
Cyanide, Total	<0.1	mg/kg	SW9013A
Sulfide, S2-	0.50	%	Leco CS744

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Date Received:	06/14/2024	**Project Name/# :**	London Mine
Matrix:	Unknown	**Sample Taken By :**	E.L.

SGS Minerals Sample ID: 072-137412-002

Tests	Result	Unit	Method
Trace Analysis Basis	Dry		ASTM D 6357 mod
Antimony	2	ug/g	ASTM D 6357 mod
Barium	692	ug/g	ASTM D 6357 mod
Beryllium	1.9	ug/g	ASTM D 6357 mod
Cadmium	11.2	ug/g	ASTM D 6357 mod
Cobalt	13	ug/g	ASTM D 6357 mod
Chromium	33	ug/g	ASTM D 6357 mod
Copper	133	ug/g	ASTM D 6357 mod
Manganese	754	ug/g	ASTM D 6357 mod
Nickel	14	ug/g	ASTM D 6357 mod
Lead	885	ug/g	ASTM D 6357 mod
Silver	3.1	ug/g	ASTM D 6357 mod
Thallium	<1	ug/g	ASTM D 6357 mod
Vanadium	39	ug/g	ASTM D 6357 mod
Zinc	2309	ug/g	ASTM D 6357 mod
Arsenic	58	ug/g	ASTM D 6357 mod
Traces Basis	Dry		ASTM D 8213 Mod
Selenium	<1	ug/g	ASTM D 8213 Mod
Mercury, Dry	0.18	ug/g	ASTM D 6722
Neutralization Potential	39.3	t/1000t	EPA 600/2-78-054 (Sobek)
Chromium, Hexavalent	<0.10	ug/g	SW7196A Mod.
Aluminum - SPLP	<0.01	mg/L	EPA 1312
AA Basis	Dry		ASTM D 6357 mod
Antimony - SPLP	0.04	mg/L	EPA 1312
Aluminum	2.42	%	ASTM D 6357 mod
Arsenic - SPLP	0.02	mg/L	EPA 1312
Barium - SPLP	0.02	mg/L	EPA 1312
Cadmium - SPLP	<0.01	mg/L	EPA 1312
Chromium - SPLP	<0.01	mg/L	EPA 1312
Copper - SPLP	<0.01	mg/L	EPA 1312
Calcium	0.93	%	ASTM D 6357 mod

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Matrix:	Unknown	**Sample Taken By :**	E.L.

SGS Minerals Sample ID: 072-137412-002

Tests	Result	Unit	Method
Lead - SPLP	0.01	mg/L	EPA 1312
Manganese - SPLP	0.48	mg/L	EPA 1312
Mercury - SPLP	<0.01	mg/L	EPA 1312
Molybdenum - SPLP	<0.01	mg/L	EPA 1312
Selenium - SPLP	0.02	mg/L	EPA 1312
Zinc - SPLP	0.02	mg/L	EPA 1312
Vanadium - SPLP	<0.01	mg/L	EPA 1312
Beryllium - SPLP	<0.01	mg/L	EPA 1312
Calcium - SPLP	71.44	mg/L	EPA 1312
Magnesium	0.67	%	ASTM D 6357 mod
Cobalt - SPLP	<0.01	mg/L	EPA 1312
Magnesium - SPLP	13.45	mg/L	EPA 1312
Potassium - SPLP	15.29	mg/L	EPA 1312
Silver - SPLP	<0.01	mg/L	EPA 1312
Thallium - SPLP	<0.01	mg/L	EPA 1312
Sodium - SPLP	3.06	mg/L	EPA 1312
Potassium	1.29	%	ASTM D 6357 mod
Sodium	0.25	%	ASTM D 6357 mod

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Date Received:	06/14/2024	**Project Name/# :**	London Mine
Matrix:	Unknown	**Sample Taken By :**	E.L.

SGS Minerals Sample ID: 072-137412-001-01

Tests	Result	Unit	Method
Cyanide, Total	<0.01	mg/L	SW9013A
Chromium, Hexavalent	<0.005	mg/L	SW7196A Mod.

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Matrix:	Unknown	**Sample Taken By :**	E.L.

SGS Minerals Sample ID: 072-137412-002-01

Tests	Result	Unit	Method
Cyanide, Total	<0.01	mg/L	SW9013A
Chromium, Hexavalent	<0.005	mg/L	SW7196A Mod.

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U.S. EPA Region 8 Response Section Sampling & Analysis Plan			
Site Name	Buckskin Joe Data Management	SSID	A848
City, State	Alma, CO	Response Site	Buckskin Joe Data Management
On-Scene Coordinator	Todd DeGarmo	Contract TO/TD	2359-2405-12
Create Date	6/13/2024	Revised Date	N/A
Response Type	☐ OPA ☒ CERCLA ☐Stafford ☐ Other: [EXPLAIN]		
	☐ ER ☒ RSE ☐ TCRA ☐ NTCR ☐ Other: [EXPLAIN]		

The sampling and analysis plan (SAP) is implemented under the Region 8 Response Section Programmatic Quality Assurance Project Plan (PQAPP). The SAP will cover key components and supplemental information may be found in other site documentation, such as the site-specific data management plan, contracting documentation, and others. For programmatic documentation, please refer to Response.epa.gov/RECORDS, site specific response site, or ask the On-Scene Coordinator for more information.

Contents

1. SAP Approvals and Project Team

SAP Approvals Table		
Title	Name	Signature & Date
USEPA DAO (OSC/TOCOR)	Todd DeGarmo	
PROJECT QUALITY ASSURANCE OFFICER	Ellen McEntee	
ERRS RESPONSE MANAGER	Nathan Schwegel	
START PROJECT MANAGER	Joe Rudi	

2. Project Management and Background

2.1 Project Task & Organization

Organization	Title	Name & Contact	SAP Recipient
USEPA	OSC	Todd DeGarmo (degarmo.todd@epa.gov)	☒
ERRS	Response Manager	Nathan Schwegel (n.schwegel@erllc.com)	☒
START	Project Manager	Joe Rudi (joe.rudi@tetratech.com)	☒
	Field Team Lead	Brendan Deckelman (Brendan.deckelman@tetratech.com)	☒
	Data Manager	Suddha Graves (suddha.graves@tetratech.com)	☒
	Tetra Tech Quality Assurance Manager	Ellen McEntee (ellen.mcentee@tetratech.com)	☒

2.2. Site Description

Buckskin Joe, an abandoned mine tailings pile site, is located two miles northwest of Alma, CO along County Road 8. Remnants of industrial mining and milling operations and large tailing piles are present on the site, adjacent to Buckskin Creek.

Proposed Site Schedule			
Activity	Estimated Start Date	Estimated Completion Date	Comments
SAP Submittal/Approval	6/13/2024	9/26/2024	None
Data Review and Verification	Upon receipt of analytical data from laboratory	TBD	As needed throughout project
Mobilization	6/13/2024	6/13/2024	As needed throughout project
Demobilization	6/13/2024	6/13/2024	As needed throughout project

2.3 Site Map & Figure

Figures showing the site location and site layout include the following:

- Figure 1. Site Location
- Figure 2. Site Features

2.4 Project Definition Background

Work will be focused on erosion controls and removing waste rock and mine tailings from the creek and surrounding areas. This work will reduce the overall metals entering the creek and flowing downhill to the town of Alma. In 2023.

2.4.1 Project Problem Statement

The main objectives of this project are to determine the extent of tailings and to sample the tailings for total metals, Synthetic Precipitation Leaching Procedure (SPLP), and Acid Base Accounting (ABA) analysis.

2.4.2 Quality Objectives

Incident/Project Objectives	Data Quality Objectives	Data Category				Action Number
		Screening	Screening + Confirmation	Definitive	Other/Comments	
Collect soil samples for laboratory analysis	Lab results will be evaluated and validated to determine the concentration of potential concerns.	☐	☐	☒	Optional, at OSC's discretion	1
Document site activities	Site conditions and samples/sample locations will be documented.	☒	☐	☐		2
Communicate with public and/or stakeholders.	EPA will use the Experience Builder and OSC Response Website to provide updates to the public and/or stakeholders.	☒	☐	☐		3
Map relevant site features	Field Maps will be used to record site features such as work areas, tailings piles, etc.	☒	☐	☐		4

2.5 Site Specific Training – PQAPP and HASP will be Followed

Training will follow procedures described under the PQAPP and the site Health and Safety Plan (HASP).

3. Data Generation and Acquisition Elements

Site Specific data elements are identified below; standard practices and needs are described and outlined in the PQAPP. Any deviations from the information provided below will be noted through field documentation and included in the sampling report.

3.1 Sampling/Monitoring Process & Design

☒	Random Sampling	☐	Transect Sampling	☒	Biased/Judgement Sampling
☐	Systematic Random Sampling	☐	Search Sampling	☐	Systematic Grid
☐	Screening with Definitive Confirmation	☒	Definitive Sampling	☐	Screening w/o Definitive Confirmation
☐	Stratified Random Sampling	☐	Incremental Sampling	☐	Other
Sampling Narrative: Soil sample locations will be determined based on-site conditions and observations. All sampling location data will adhere to the site data management plan (SDMP) and be recorded in compliance with the SDMP.					

3.2 Analytical Sampling Methods

Obj #	Analysis	Number of Samples	Location	Matrix	Sampling Method/SOP	Analytical Method/SOP	Descriptor
1	TAL Metals	7	See Figure 2	Soil	SOP #005-5 Soil Sampling	EPA Method 6020B (SW-846)	
1	Metals SPLP	7	See Figure 2	Soil	SOP #005-5 Soil Sampling	SW-846 Test Method 1312: Synthetic Precipitation Leaching Procedure | US EPA	
1	ABA	7	See Figure 2	Soil	SOP #005-5 Soil Sampling	Acid Base Accounting	

Obj #	Analysis	Number of Samples	Location	Matrix	Sampling Method/SOP	Analytical Method/SOP	Descriptor
Region 8 primarily uses SOPs developed by ERT (https://response.epa.gov/sop) though any new Region 8 RS SOPs will be developed following EPA Guidance for Preparing Standard Operating Procedures QA/G-6 (EPA/600/B-07/001) and the Regional Overarching QAFA SOPs. Additional support with regard to sampling methods can be obtained from SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, or through Environmental Services.							

Analysis	Number of Containers	Field QC	Container Size and Type	Preservation	Hold Time	Additional Field Parameters Required
TAL Metals	1	Field Duplicate and MS/MSD	8 ounce	<6°C	6 months	N/A
SPLP	1	Field Duplicate and MS/MSD	8 ounce	<6°C	6 months	N/A
ABA	1	Field Duplicate and MS/MSD	8 ounce	<6°C	6 months	N/A

Notes: < = less than; N/A = Not applicable

3.3 Monitoring/Screening Methods

Obj #	Analyte/Parameter	Type	Location	Matrix	Instrument	Action Levels*	Action to be Taken
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Monitoring/screening will not be implemented as part of project work. N/A = Not applicable							

4. .Data Quality Indicators and Data Acceptability Criteria

Project goal(s) for Completeness:		100%			
Analyte / Parameter	Analytical Method/SOP	Precision	Accuracy	Sensitivity/Quantitation Limits	Other Requirements
TAL Metals	Target Analyte List Metals 6010D/6020B/7471B	Not applicable	Per analytical method (lab QC stated by method requirements); per PQAPP MS/MSD for metals	Not applicable	None
SPLP	SW-846 Test Method 1312: Synthetic Precipitation Leaching Procedure, EPA	Not applicable	Per analytical method (lab QC stated by method requirements); per PQAPP MS/MSD for metals	Not applicable	None
ABA	Acid Base Accounting (ABA)	Not applicable	Per analytical method (lab QC stated by method requirements); per PQAPP MS/MSD for metals	Not applicable	None

Notes: PQAPP = Programmatic Quality Assurance Project Plan; MS/MSD = Matrix Spike / Matrix Spike Duplicate; QC = Quality Control

5. Reconciliation with PQAPP

PQAPP Section	Deviation(s)
Not Applicable	Not Applicable

6. Document Revision History

Date	Version	Author(s)	Description of Change
6/12/2024	0	Joe Rudi	Not applicable