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Summer 7-22-2024

**Butte Priority Soils Operable Unit (BPSOU) Draft Final Insufficiently Reclaimed Sites Field Sampling Plan (FSP) BRES No. 120 – Bonanza Dump.**

Mike McAnulty

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July 22, 2024

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**Re: Butte Priority Soils Operable Unit (BPSOU) Draft Final Insufficiently Reclaimed Sites Field Sampling Plan (FSP) BRES No. 120 – Bonanza Dump.**

Dear Agency Representatives:

I am writing to you on behalf of Atlantic Richfield Company (Atlantic Richfield) to submit the Butte Priority Soils Operable Unit (BPSOU) Draft Final Insufficiently Reclaimed (IR) Sites – Field Sampling and Investigation Plan (FSP) Butte Remediation Evaluation System (BRES) No. 120 – Bonanza Dump.

As described in Appendix D, Attachment C, Section 7.0 of 2020 BPSOU Consent Decree (BPSOU CD) (available at [BPSOU CD](#)), sites within the BPSOU reclaimed prior to the establishment of the Butte Hill Revegetation Specifications (BHRS), Appendix A of the BPSOU CD, are listed as IR Solid Media Sites. Since additional reclamation work may be required to bring the sites into compliance with the BHRS, the sites will be evaluated to assess past actions and to identify any site-specific conditions that fail to meet the BHRS.

The site evaluation will include a review of available BRES field evaluations and site construction completion reports along with on-site evaluation and sampling within the existing site boundary performed according to the Atlantic Richfield *2024 Final Insufficiently Reclaimed Sites Quality Assurance Project Plan (QAPP)* (referred to herein as IR Sites QAPP). A link to the IR Sites QAPP is provided in Attachment 1.

The sampling boundary and proposed soil sampling stations and deficiencies identified during previous BRES evaluations are shown on Figure 1, and a list of approved FSPs is provided in Attachment 2.

Field sampling within the existing boundary will be performed to determine whether contaminants are present, whether the existing cap and supported growth media are sufficiently protective of human health and the environment, how observed site conditions compare to the BHRS, and whether there are previously unidentified conditions contributing to site deficiencies.

The site evaluation is anticipated to be completed in 2024. A site summary and declaration will be prepared to present all available site data and describe which, if any, BHRS criteria are not met. The site will be evaluated following the recreational land use soil action levels for human health, soil screening criteria, and cover soil chemical suitability criteria provided in the IR Sites QAPP. Samples obtained outside of the existing reclaimed area will be evaluated following the soil action levels for human health and soil screening criteria for waste identification in the Atlantic Richfield 2024 *Unreclaimed (UR) Sites QAPP* (referred to herein as UR Sites QAPP). A link to the UR Sites QAPP is provided in Attachment 1.

If further remediation is recommended after the evaluation and sampling are complete, a remedial action work plan (RAWP) describing actions that will be implemented at the site will be provided for Agency review and approval.

The crosswalk list provided below references where pertinent field sample collection and documentation elements are discussed.

Element	Reference Location		
	FSP	IR Sites QAPP	UR Sites QAPP
Title Page and Approval Authority	Approval Letter	Page i	Page i
Site Introduction and Appropriate Agency-Approved QAPP Reference	Page 1, Page 2		
Data Quality Objectives		Section 2.5	Section 2.5
Site and Sampling Objectives	Figure 1	Section 3.0	Section 3.0
Proposed Schedule for Site Field Work	Page 2		
Site Figure	Figure 1		
Sampling Procedures and Standard Operating Procedures		Section 3.2 Appendix B	Section 3.2 Appendix B
Sample Analysis Methods		Section 3.3	Section 3.3

## 1.0 Background

The Bonanza Dump site (BRES No. 120 and BRES No. 120E) is approximately 2.72 acres located near the intersection of South Excelsior Avenue and the Interstate 90 West access and shares a border with the UR-09 site. The Bonanza Dump (BRES No 120) and Bonanza Dump East (BRES No. 120E) were combined into a contiguous site. The area is at the bottom of the Missoula Gulch drainage and

has a storm channel traversing the eastern side of the property. Storm water surface drainage is collected to the south within Catch Basin 8. The site contains the capped shaft of the Bonanza mine. The area is fenced on the north, south, and west sides, with no fencing on the east side adjacent to Excelsior Street.

An adjusted boundary was proposed for the BRES No. 120, Bonanza Dump, site to accurately represent the reclaimed area and align site boundaries with completed site remediation efforts. As described in the BPSOU *Source Areas and Reclaimed Boundary Adjustments*<sup>1</sup>, this was completed by using a high-resolution aerial image and visual comparisons to identify the areas of apparent remediation. Note that the Agencies have not approved the proposed adjusted boundary. To verify the proposed boundary adjustment, samples will be collected in areas that are included in the proposed boundary area, but just outside of the original boundary area. Butte-Silver Bow proposed two additional areas for evaluation. The two proposed areas are shown on Figure 1 and are included in the proposed adjusted boundary discussed above.

## **2.0 Previous Evaluation Findings**

As specified in the BPSOU CD, information collected during previous site investigations has been reviewed and incorporated into the proposed sampling design. Given the date of remediation, the site should be investigated to ensure the cap is adequate for operation and maintenance.

The site was evaluated in 2015 and 2019 during the recurring 4-year cycle of field evaluations of previously reclaimed sites within the BPSOU. The results from both BRES field evaluation summary and technical recommendation reports indicate the site suffers from a variety of non-desirable vegetation, plant litter, erosion, and a barren area. Erosion issues are prevalent throughout the site including pedestaling, surface rock movement, and flow patterns. Increased weeds and erosion are present along site edges.

## **3.0 Previous Sampling Efforts**

The BPSOU OneMap database contains the records for previous soil samples collected within the BPSOU. The approximate sample stations located on the BRES No. 120 – Bonanza Dump site are included on Figure 1. with results provided in Table 1 below. Highlighted sample results exceed the BPSOU CD solid media soil screening criteria. The BPSOU soil action levels and screening criteria are listed in Table 1 and Table 2, respectively, in Section 2.5 of the IR Sites QAPP.

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<sup>1</sup> Atlantic Richfield Company and Butte-Silver Bow, 2022. Draft Final Source Areas and Boundary Adjustments. Prepared by Pioneer Technical Services, Inc. April 4, 2022.

**Table 1: Previous Sampling  
Results from BPSOU Soil Sampling**

<b>COCs</b>	<b>Sample ID: WD-057</b>	<b>Sample ID: FSUA-47</b>
Arsenic	170 mg/kg	398 mg/kg
Cadmium	4 mg/kg	0 mg/kg
Copper	349 mg/kg	2,250 mg/kg
Lead	184 mg/kg	930 mg/kg
Zinc	377 mg/kg	4,830 mg/kg
pH	6.73 S.U.	3.78 S.U.

COC: Contaminant of concern. mg/kg: milligrams per kilogram. S.U.: standard unit.

Previous surface soil samples were collected from the UR-09 site on November 30, 2016, following the *Final Bonanza Site Sampling Work Plan*<sup>2</sup>; however, two sample locations were collected on the BRES No. 120 site proposed boundary adjustment area and one sample was collected near the capped shaft. Additional site sampling occurred on October 31, 2018, through November 1, 2018, on the UR-09 site. Sample locations from the 2016 surface soil sampling event were reevaluated in the 2018 sampling event; therefore, two sample locations were collected on the BRES No. 120 site proposed boundary adjustment area, and one sample was collected near the capped shaft. Data from the 2018 sampling event are available in the 2018 UR Sites Sampling UR-09 Site Evaluation Summary Report<sup>3</sup>. Sample locations from 2018 are provided on Figure 1 to illustrate previous samples collected on site.

#### **4.0 Preliminary Field Visit**

A preliminary field visit occurred during the development of this sampling plan to qualify current site conditions and identify focus areas for further investigation. Sampling locations were determined by a preliminary field visit to determine site conditions, satellite imagery, and using BRES evaluations from Butte-Silver Bow. A site evaluation will be conducted immediately prior to field activities to confirm the site sample locations. Photograph 1 through Photograph 4, taken during the field visit, show the site overview.

<sup>2</sup> Atlantic Richfield Company, 2016. Final Bonanza Site Sampling Work Plan. Prepared by Pioneer Technical Services for Atlantic Richfield Company. November 28, 2016.

<sup>3</sup> Atlantic Richfield Company, 2018. Final 2018 Unreclaimed Sites Sampling UR-09 Site Evaluation Summary Report. Prepared by Pioneer Technical Services, Inc. for Atlantic Richfield Company. June 9, 2023.



Photograph 1. Overview of BRES No. 120 Bonanza Shaft.



Photograph 2. Overview of BRES No. 120 facing south.



Photograph 3. Overview of additional proposed area.



Photograph 4. Overview of the east side of the site.

The area will be further investigated during site sampling for potential opportunistic sample location(s). Adjusted boundary lines, proposed sample locations and other previous findings are included on Figure 1.

## 5.0 Site Characterization Plan

Per the IR Sites QAPP, the site will be sampled at two depth intervals [(1) 0 to 6 inches and (2) 6 to 18 inches] to determine whether waste is present and/or confirm the depth of previous reclamation efforts. Opportunistic samples may be obtained in the field at the discretion of field sampling personnel or Agency oversight representative(s). The field team leader will be responsible for determining the appropriate number and depth of samples as dictated by field conditions.

Samples collected within the approved BRES boundary will be sampled following procedures in the IR Sites QAPP using a systematic procedure to determine the extent of waste present, previous reclamation, and transient material. Samples collected outside of the original BRES boundary will be collected following the protocol described in the 2024 UR Sites QAPP. Samples obtained outside of the original boundary will be obtained from three depth intervals [(3) 0 to 2 inches, (4) 2 to 6 inches, and (5) 6 to 12 inches] per the UR Sites QAPP sampling protocol.

Field and laboratory analytical results will be used to prepare the site declaration and prescribe site remedial improvements.

Existing site grading and drainages will be visually evaluated per the data sheet provided in Attachment 3 to determine storm water flow patterns and identify if additional storm water controls will help prevent sediment migration. Contributing sources of storm water upgradient and adjacent to the site will also be investigated.

At minimum, items identified below, but not specifically detailed in the QAPP, may be visually evaluated to determine adequacy and to identify if additional remedial measures are necessary. Additional items also may be identified during the remedial design process.

- Evaluate relative percent vegetative cover (as needed).
  - Coordinate and confirm plant species with biology/plant ecologist or related subject matter expert (as needed).
- Evaluate the performance of existing storm water controls to mitigate run-on/runoff.
- Evaluate location and condition of existing storm water controls.
- Identify potential remedial improvements to mitigate site erosion and vegetative areas to meet the BHRS.
- Identify necessary maintenance for successful long-term operation.
- Evaluate steep slopes for erosion of possible mining waste and potential for regrading.

The final remedial cap configuration (i.e., vegetative or engineered) will be coordinated with the landowner's end usage. A final RAWP will be provided for Agency review and approval prior to implementation.



## 6.0 Sampling Procedure

All soil sampling and characterization activities and procedures within the existing site boundary will follow the IR Sites QAPP. Samples will be obtained from the sample stations listed below. The IR Sites QAPP describes the quality assurance/quality control policies and procedures that will be used during sample collection and analyses.

<b>Sample Station</b>	<b>Two Depth Intervals (inches)</b>
IR-120-SS01	(1) 0-6, (2) 6-18
IR-120-SS02	(1) 0-6, (2) 6-18
IR-120-SS03	(1) 0-6, (2) 6-18
IR-120-SS04	(1) 0-6, (2) 6-18
IR-120-SS05	(1) 0-6, (2) 6-18
IR-120-SS06	(1) 0-6, (2) 6-18
IR-120-SS07	(1) 0-6, (2) 6-18
IR-120-SS08	(1) 0-6, (2) 6-18
IR-120-SS09	(1) 0-6, (2) 6-18

All soil sampling and characterization activities and procedures outside of the existing site boundary will follow the UR Sites QAPP. Samples will be obtained from the sample stations listed below.

<b>Sample Station</b>	<b>Three Depth Intervals (inches)</b>
IR-120-SS10	(3) 0-2, (4) 2-6, (5) 6-12
IR-120-SS11	(3) 0-2, (4) 2-6, (5) 6-12
IR-120-SS12	(3) 0-2, (4) 2-6, (5) 6-12
IR-120-SS13	(3) 0-2, (4) 2-6, (5) 6-12
IR-120-SS14	(3) 0-2, (4) 2-6, (5) 6-12
IR-120-SS15	(3) 0-2, (4) 2-6, (5) 6-12
IR-120-SS16	(3) 0-2, (4) 2-6, (5) 6-12

## 7.0 Site Summary Report and Declaration

After the site evaluation and data collection activities are complete, a site evaluation summary report will be prepared and submitted to Agencies for review and approval. The report will include a summary of all available site sampling data and a site declaration specifying any deficient criteria as specified in the BPSOU CD.

If you have questions or comments, please do not hesitate to call me at (907) 355-3914.

Sincerely,

*Mike McNulty*

Mike Mc Anulty  
Liability Manager  
Remediation Management Services Company  
An affiliate of **Atlantic Richfield Company**

Attachments:

Figures  
Attachment 1– Document Links  
Attachment 2– FSP Submittal List  
Attachment 3– Field Data Sheet

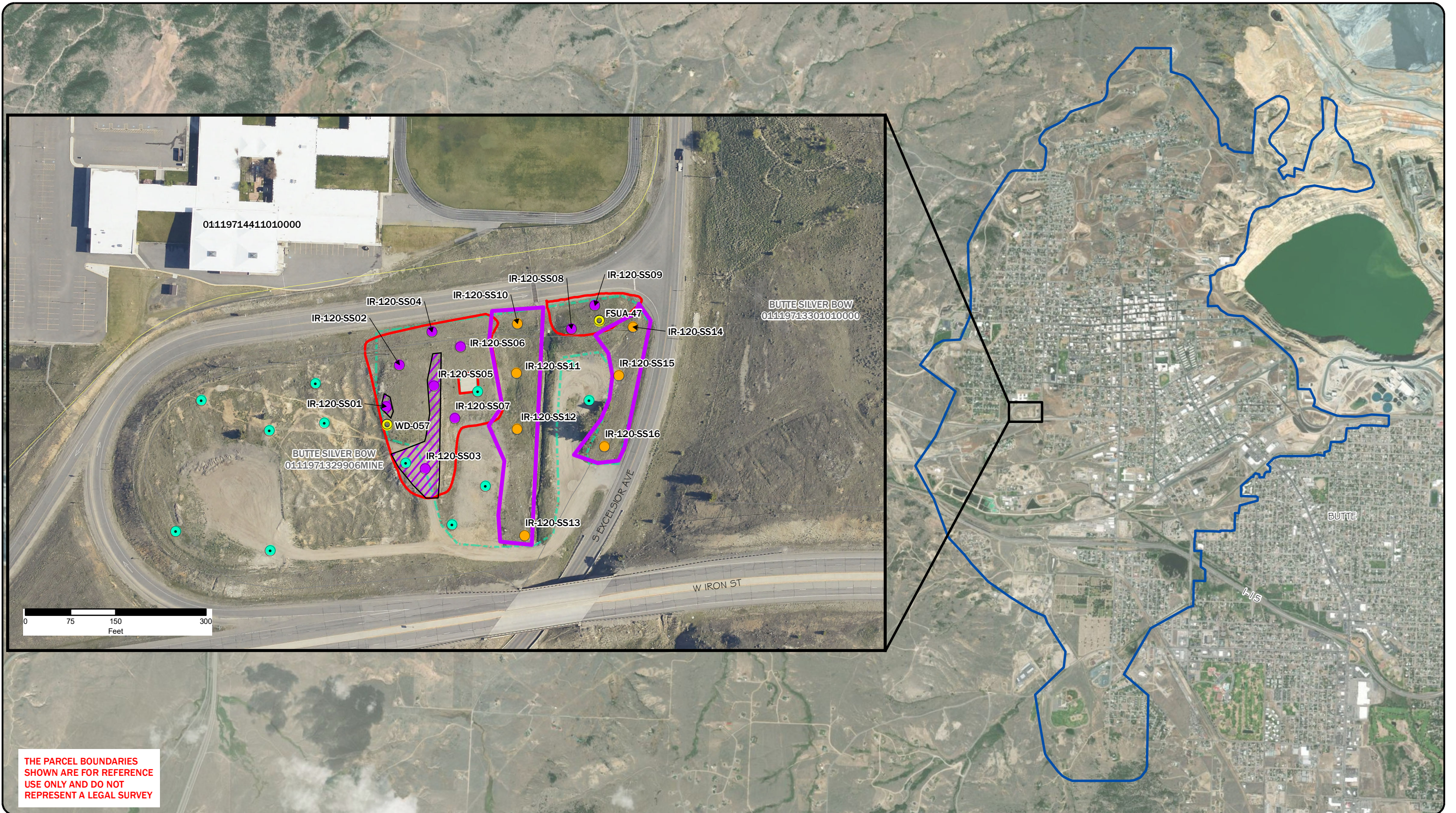
Cc: Chris Greco / Atlantic Richfield – email  
Josh Bryson / Atlantic Richfield – email  
Tim Hilmo / Atlantic Richfield – email  
Loren Burmeister / Atlantic Richfield – email  
Dave Griffis / Atlantic Richfield – email  
Jean Martin / Atlantic Richfield – email  
Irene Montero / Atlantic Richfield – email  
David A. Gratson / Environmental Standards – email  
Mave Gasaway / DGS – email  
Adam Cohen / DGS – email  
Lucas Satterlee / DGS – email  
Brianna McClafferty / Holland & Hart – email  
Carolina Balliew / EPA – email  
Emma Rott / EPA – email  
David Shanight / CDM - email  
Curt Coover / CDM - email  
James Freeman / DOJ - email  
Amy Steinmetz / DEQ - email  
Logan Dudding / DEQ – email  
Katie Garcin-Forba / DEQ – email  
Doug Martin / NRDP – email  
Jim Ford / NRDP - email  
Pat Cunneen / NRDP - email  
Katherine Hausrath / NRDP - email  
Ted Duaine / MBMG - email

Gary Icopini / MBMG - email  
Becky Summerville / MR - email  
John DeJong / UP - email  
Robert Bylsma / UP - email  
John Gilmour / Kelley Drye - email  
Leo Berry / BNSF - email  
Robert Lowry / BNSF - email  
Brooke Kuhl / BNSF – email  
Lauren Knickrehm / BNSF – email  
Doug Brannan / Kennedy Jenks – email  
Matthew Mavrinac / RARUS – email  
Harrison Roughton / RARUS - email  
Brad Gordon / RARUS - email  
Mark Neary / BSB - email  
Eric Hassler / BSB - email  
Brandon Warner / BSB – email  
Abigail Peltomaa / BSB - email  
Aaron Rains / BSB – email  
Sean Peterson/BSB – email  
Josh Vincent / WET – email  
Kevin Bethke / W&C – email  
Scott Bradshaw / W&C – email  
Emily Evans / W&C – email  
Paddy Stoy / W&C – email  
Joe McElroy / Pioneer – email  
Mark Meyer / Pioneer – email  
Pat Sampson / Pioneer – email  
Troy Colvin / Pioneer – email  
Karen Helfrich / Pioneer – email  
Brad Hollamon / Pioneer – email  
Randa Colling / Pioneer – email  
Rich Keeland / Aspect – email  
Andy White / Aspect – email  
Ian Magruder/ CTEC – email  
CTEC of Butte – email  
Scott Juskiewicz / Montana Tech – email

File: RMO – upload  
BPSOU SharePoint - upload

## Figures

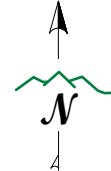
Figure 1 - Insufficiently Reclaimed Sites BRES No. 120 – Bonanza Dump Proposed Sample Stations



THE PARCEL BOUNDARIES SHOWN ARE FOR REFERENCE USE ONLY AND DO NOT REPRESENT A LEGAL SURVEY

**LEGEND**

- UR COMPOSITE SAMPLING LOCATIONS (2016 & 2018 SAMPLED STATIONS)
- SAMPLE UNDER IR QAPP
- SAMPLE UNDER UR QAPP
- HISTORIC SAMPLE STATIONS
- PROPERTY OWNERSHIP
- ACCESS PROPERTY OWNERSHIP
- BRES BOUNDARY (ORIGINAL)
- BRES BOUNDARY (PROPOSED ADJUSTMENT)
- BRES EVALUATION BARREN AREA
- ADDITIONAL UR SAMPLES TO CONSIDER



DISPLAYED AS: \_\_\_\_\_  
 PROJECTION/ZONE: MSP  
 DATUM: NAD 83  
 UNITS: INT'L FT  
 SOURCE: PIONEER/BSB/AR/QSI 2020

**FIGURE 1**

**INSUFFICIENTLY RECLAIMED  
 SITE BRES No. 120  
 BONANZA DUMP**

DATE: 7/10/2024

**Attachment 1**  
**Document Links**

## Document Links

### Insufficiently Reclaimed Sites QAPP:

<https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/EgFGt85OFQ1PvQBtqf9SGUUBNNdYWCCnanpJ65EAzKWTkQ><sup>4</sup>

### Unreclaimed Sites QAPP:

[https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Et\\_1BMEBLsNEkaqxoNGVhYcBuEQp5yOd59cHuRba79Tt1w](https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Et_1BMEBLsNEkaqxoNGVhYcBuEQp5yOd59cHuRba79Tt1w)<sup>5</sup>

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<sup>4</sup> Please note the link provided is valid for one year from the date of this submittal. This link will be updated on approval of the 2024 IR Sites QAPP.

<sup>5</sup> Please note the link provided is valid for one year from the date of this submittal.

**Attachment 2**  
**FSPs Submittal List**



Site	Submittal Date	Approval Date
BRES No. 104 – Colorado Dump Shaft	9/29/2021	11/5/2021
BRES No. 104 – Colorado Dump Shaft, Final Revised	12/2/2021	12/6/2021
BRES No. 154 – Clark Mill Tailings NE	12/1/2021	12/6/2021
BRES No. 30 – Atlantic-1	1/12/2022	2/22/2022
BRES No. 16 – Curry	1/12/2022	2/22/2022
BRES No. 8 – Belle of Butte	3/11/2022	9/26/2022
BRES No. 38 – Sister Dump	6/16/2022	9/26/2022
BRES No. 32 – Corra 2 Dump	6/20/2022	6/30/2022
BRES No. 158 – Waste Rock Dump	6/20/2022	7/11/2022
BRES No. 50 Zelia	6/22/2022	6/30/2022
BRES No. 93 – Soudan Dump	6/23/2022	6/30/2022
BRES No. 96 Washoe Dump	6/23/2022	7/11/2022
BRES No. 133 – Dexter Mill	7/14/2022	7/26/2022
BRES No. 37 – Josephine Shaft	7/20/2022	7/26/2022
BRES No. 34 – Eveline Dump	7/22/2022	8/2/2022
BRES No. 17 – Paymaster	7/25/2023	8/10/2023
BRES No. 31 – Waste Dump #5	7/25/2023	8/10/2023
BRES No. 48 – Old Glory West	7/25/2023	8/10/2023
BRES No. 66 – West Ruby Dump	7/25/2023	8/10/2023
BRES No. 68 – Little Mina-2	7/25/2023	8/10/2023
BRES No. 174 – Buffalo South and Buffalo Ditch	7/25/2023	8/10/2023
BRES No. 84 – Mandan Park	7/25/2023	8/2/2023
BRES No. 125 – Child Harold-2 Dump	5/7/2024	6/28/2024
BRES No. 121 – Travona Dump	5/7/2024	6/28/2024
BRES No. 34E – Eveline Dump East	5/7/2024	
BRES No. 45 – Garfield	5/7/2024	
BRES No. 49 – Old Glory	5/7/2024	6/28/2024
BRES No. 52 – Moscow	5/7/2024	
BRES No. 74 – West Gagnon Dump	5/7/2024	6/28/2024
BRES No. 78 – Original Mine	5/7/2024	
BRES No. 181 – Mountain Con-3 Dump	6/19/2024	
BRES No. 120 – Bonanza Dump	7/22/2024	

**Attachment 3**  
**Field Data Sheet**

Site:

Date:

Personnel:

Are rills present? If yes, describe.

Areas of flow present? Is sediment being deposited? Describe.

Describe any flow patterns from above/on to site.

Describe any flow patterns below/off-site.

Identify stormwater infrastructure on/adjacent to the Site. Describe the condition (ie. new construction, heavily sedimented, etc.)

General Site Observations (Presence/type/condition of cap, Vegetation, Soil staining, Structures on Site, etc.)