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**Butte Priority Soils Operable Unit (BPSOU) Insufficiently  
Reclaimed Sites - Field Sampling and Investigation Plan (FSP)  
BRES No. 104 - Colorado Dump – Final, Revision 1**

Mike McAnulty

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**December 1, 2021**

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**Re: Butte Priority Soils Operable Unit (BPSOU) Insufficiently Reclaimed Sites - Field Sampling and Investigation Plan (FSP) BRES No. 104 - Colorado Dump – Final, Revision 1**

Dear Agency Representatives:

I am writing to you on behalf of Atlantic Richfield Company to submit the Butte Priority Soils Operable Unit (BPSOU) Final Insufficiently Reclaimed Sites - Field Sampling and Investigation Plan (FSP) BRES No. 104 - Colorado Dump, Revision 1. The Plan has been revised to incorporate Unreclaimed Sites Quality Assurance Project Plan (QAPP) protocol for sample locations outside of the existing site boundary.

As described in Appendix D, Attachment C to the 2020 BPSOU Consent Decree (CD) (available at <https://www.co.silverbow.mt.us/2161/ButtePriority-Soils-Operable-Unit-Conse>), sites listed as Insufficiently Reclaimed Solid Media Sites within BPSOU were reclaimed prior to the establishment of the Butte Hill Revegetation Specifications (BHRS), which is Appendix B of Appendix E to the U.S. Environmental Protection Agency (EPA) 2006 Record of Decision (ROD) contained in the CD. 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 previous Butte Reclamation Evaluation System (BRES) field evaluations and site construction completion reports along with on-site evaluation and sampling. The site evaluation will include sampling within the existing site boundary performed according to the Atlantic Richfield Company *2021-2022 Final Reclaimed Areas Maintenance and Monitoring (M&M) Quality Assurance Project Plan (QAPP)* (referred to as Reclaimed Areas M&M QAPP), which is a component of the BPSOU Solid Media Management Project Plan. The Reclaimed Areas M&M QAPP is available at the following link:



[https://pioneertechnicalservices.sharepoint.com/:b:/s/submitted/Ebj\\_4MWC5ENErHdG89yMF6QBlvjK5T1dpsi483fuVSAQWg](https://pioneertechnicalservices.sharepoint.com/:b:/s/submitted/Ebj_4MWC5ENErHdG89yMF6QBlvjK5T1dpsi483fuVSAQWg)<sup>1</sup>.

Field sampling within the existing boundary will be performed to determine whether contaminants are present, if growth media is adequate, and if there are previously unidentified sources contributing to site deficiencies.

Additional sampling performed in adjacent areas outside of the existing site boundary to characterize gap zones where site characterization may be unknown or incomplete will be conducted according to the Atlantic Richfield Company *Final Unreclaimed Sites Quality Assurance Project Plan (QAPP)* (referred to as the Unreclaimed Sites QAPP) which also is a component of the BPSOU Solid Media Management Project Plan available at the following link:

<https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/EjBNYNYtQgpMv3YyC7R1-ZkBvRWHYn7u2JNU41VnChLuEA>.<sup>2</sup>

Sample results in the areas outside of the existing site boundary will be evaluated to determine if contaminants are present beyond the site boundary at concentrations exceeding action levels listed in Table 1 or Table 2 in the Unreclaimed Sites QAPP. Final sampling data will be used to assist in determining the final site declaration.

This FSP provides details related to field evaluation of the Insufficiently Reclaimed Site BRES No. 104 - Colorado Dump. Proposed soil sampling locations and areas of known deficiencies are shown on Figure 1.

The site evaluation is anticipated to be completed in December 2021. A site summary and declaration will be prepared to present all available site data and describe which BHRS criteria are not met (if any). A remedial action work plan (RAWP) describing actions to be implemented at the site will be provided for Agency review and approval.

A list of FSPs for the respective Insufficiently Reclaimed Sites, provided below, will be updated to record the status and progress related to FSP submittals.

<b>Submittal</b>	<b>Site</b>	<b>Submittal Date</b>	<b>Approval Date</b>
1	BRES No. 104 – Colorado Dump	9/29/2021	11/5/2021
1, R1	BRES No. 104 – Colorado Dump, Rev. 1	12/1/2021	
2	BRES No. 154 – Clark Tailings NE	12/1/2021	

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

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<sup>1</sup> Please note the link provided is valid for one year from the date of this submittal.

<sup>2</sup> Please note that this link is active until June 2022.

Element	Reference Location		
	FSP	Reclaimed Areas M&M QAPP	Unreclaimed Sites QAPP
Title page and approval authority.		Page i	Page i
Introduction and appropriate Agency-approved QAPP reference.	X		
Goals and objectives of sampling.		Section 2.6	Section 2.4, Section 3.2
Proposed schedule for field work.	X	Section 2.5.1	
Site figure including sampling locations, number, and depth of samples to be collected, and sample field identification.	X		Section 3.2.1
Field activity methods and procedures, standard operating procedures.		Section 3.3	Section 3.2, Table 4
Sample labeling and shipping.		Section 3.4.2	Section 3.2.5, Appendix C
Sample analysis specifying X-ray fluorescence (XRF) vs. laboratory analysis and laboratory name.		Section 2.7	Section 3.3
Figure showing the site and/or area represented by a sample, sample ID, and aliquot locations for composite samples.	X		

**Background**

The BRES No. 104 Colorado Dump is approximately 1.7 acres and is located north of AWARE daycare center and east of Sparky’s Restaurant on East Park Street in Butte, Montana, 59701. Reclamation was initially conducted in 1986 by Montana Department of State Lands (MDSL). The work consisted of removing waste dumps, placing crushed lime rock in areas uncovered by waste dump removal, and laying 5 to 30 tons per acre of Trident Cement Plant flue dust and 300 pounds per acre of fertilizer before seeding with Walkerville EPA (WEPA) seed mixture at 20 pounds per acre.

Commercial development of the area also led to additional remediation and construction of engineered cover areas throughout the northern portion of the site. In 2001, a daycare facility was constructed consisting of a commercial building, sodded areas, and asphalt parking areas. Note that this portion of the site is being evaluated under a separate sampling program and is excluded from this evaluation.

**Previous Evaluation Findings**

The site was determined to be an insufficiently reclaimed area and therefore was not evaluated per the recent BRES field evaluations.

## Previous Sampling Efforts

Data obtained from the Geocortex web-based database at <https://eis2.woodardcurran.com/Html5Viewer/index.html?viewer=BPButte.BPSOU> contains the records for previous soil samples collected near the BRES No. 104 – Colorado Dump. The approximate sample locations are shown on Figure 1 with results provided in Table 1. Sample results highlighted below exceed Record of Decision (ROD) Solid Media soil screening criteria. The BPSOU action levels are listed in Table 3 (Section 2.6.1) of the Reclaimed Areas M&M QAPP.

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

COCs	Sample ID: WD-083	Sample ID: WD-084	Sample ID: FSUA-36
Arsenic	2,430 mg/kg	445 mg/kg	61 mg/kg
Cadmium	30 mg/kg	23 mg/kg	0 mg/kg
Copper	3,580 mg/kg	6,210 mg/kg	723 mg/kg
Lead	818 mg/kg	1,280 mg/kg	457 mg/kg
Zinc	9,390 mg/kg	8,860 mg/kg	1,000 mg/kg
pH	-	-	2.91 S.U.

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

## Preliminary Site Evaluation

A preliminary site visit was conducted to better qualify existing site conditions and identify areas of focus for additional evaluation. The site consisted of a decomposing engineered cap that appears to have mine waste leaching through the rock cap, as shown in Photograph 1.



**Photograph 1. Possible Mining Waste Leaching Through Rock Cap**

Storm water flows causing sediment conveyance into the site boundary are suspected to be originating from the adjacent property located on the corner of Park and Main Street. As seen in Photograph 2, flows are causing rills to develop that transport materials to the south end of the alleyway.



**Photograph 2. Storm Water Flows Causing Rills that Transport Material to the South End of the Alleyway.**

An adjacent property owner is currently building a new parking lot that is predicted to increase flows and sediment deposition during high storm water events. There are potential measures to divert water to a manhole location (SWC AB-M-2201) located 10 feet north of the concrete foundation (shown in Photograph 3). Additional evaluation of the storm water structure is warranted.



**Photograph 3. Manhole AB-M-2201 Located North of Concrete Foundation**

## **Site Characterization Plan**

Per the Reclaimed Areas M&M QAPP, the site will be sampled at 2 depth intervals [(1) 0 to 6 inches and (2) 6 to 18 inches] to determine the presence of waste and/or confirm the depth of previous reclamation efforts. Additional samples obtained outside of the existing site boundary will be obtained from 3 depth intervals [(3) 0 to 2 inches, (4) 2 to 6 inches, and (5) 6 to 12 inches] per the Unreclaimed Sites QAPP sampling protocol. Figure 1 illustrates the proposed sample locations. 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 sampling protocol as dictated by the location of the opportunistic sample(s).

Results will be used to prepare the site declaration and prescribe site remedial improvements. The overall site will be sampled following procedures in the Reclaimed Areas M&M QAPP using a systematic procedure to determine spatial characterization of waste, parameters of previous reclamation, and extent of transient material. Sampling performed outside of the existing boundary will be used to determine if waste extends beyond the existing boundary at concentrations which exceed levels listed in Table 1 or Table 2 of the Unreclaimed Sites QAPP and will be applied to the determination of the final site declaration.

Existing site grading and drainages will be evaluated to determine storm water flow patterns and identify potential additional storm water controls to prevent sediment migration. The location and

condition of existing storm water features will be field verified and recorded to implement appropriate corrective actions. The contributing sources of storm water upgradient and adjacent to the site will also be investigated.

Items identified below will be evaluated to determine whether they are adequate and to identify additional remedial measures. The following provides minimum potential site characterization items to consider. Additional items may be identified during the remedial design process.

- Evaluate two concrete shaft caps.
- Coordinate remedy and end land use with landowner(s).
- Remove existing engineered (rock) cap.
- Evaluate adequacy of existing storm water control structures to determine if they are adequate for a 25-year, 24-hour, Soil Conservation Service (SCS) Type I storm event.
- Evaluate whether additional storm water controls designed for a 25-year, 24-hour, SCS Type I storm event should be installed.
- Evaluate site storm water controls to mitigate run-on/runoff.
- Identify remedial improvements to mitigate site erosion and vegetative areas to meet BHRS.

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.

## Sampling Procedure

All soil sampling and characterization activities and procedures within the existing site boundary will follow the Reclaimed Areas M&M QAPP. The Reclaimed Areas M&M QAPP also describes the quality assurance/quality control policies and procedures that will be used during sample collection and analysis. Samples will be obtained from the sample stations listed below following the Reclaimed Areas M&M QAPP.

<b>Sample Station</b>	<b>2 Depth Intervals (inches)</b>
IR-104-SS01	(1) 0-6, (2) 6-18
IR-104-SS02	(1) 0-6, (2) 6-18
IR-104-SS03	(1) 0-6, (2) 6-18
IR-104-SS04	(1) 0-6, (2) 6-18
IR-104-SS05	(1) 0-6, (2) 6-18
IR-104-SS06	(1) 0-6, (2) 6-18
IR-104-SS08	(1) 0-6, (2) 6-18
IR-104-SS09	(1) 0-6, (2) 6-18

All soil sampling and characterization activities beyond the existing site boundary at sample stations listed below will follow the Unreclaimed Sites QAPP.



<b>Sample Station</b>	<b>3 Depth Intervals (inches)</b>
IR-104-SS07	(3) 0-2, (4) 2-6, and (5) 6-12
IR-104-SS10	(3) 0-2, (4) 2-6, and (5) 6-12
IR-104-SS11	(3) 0-2, (4) 2-6, and (5) 6-12
IR-104-SS12	(3) 0-2, (4) 2-6, and (5) 6-12
IR-104-SS13	(3) 0-2, (4) 2-6, and (5) 6-12
IR-104-SS14	(3) 0-2, (4) 2-6, and (5) 6-12

## Site Summary Report and Declaration

After the site evaluation and data collection activities have been completed, a 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 BHRS criteria.

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:

Figure 1 – Insufficiently Reclaimed Sites BRES-104 Colorado Dump Proposed Sample Locations

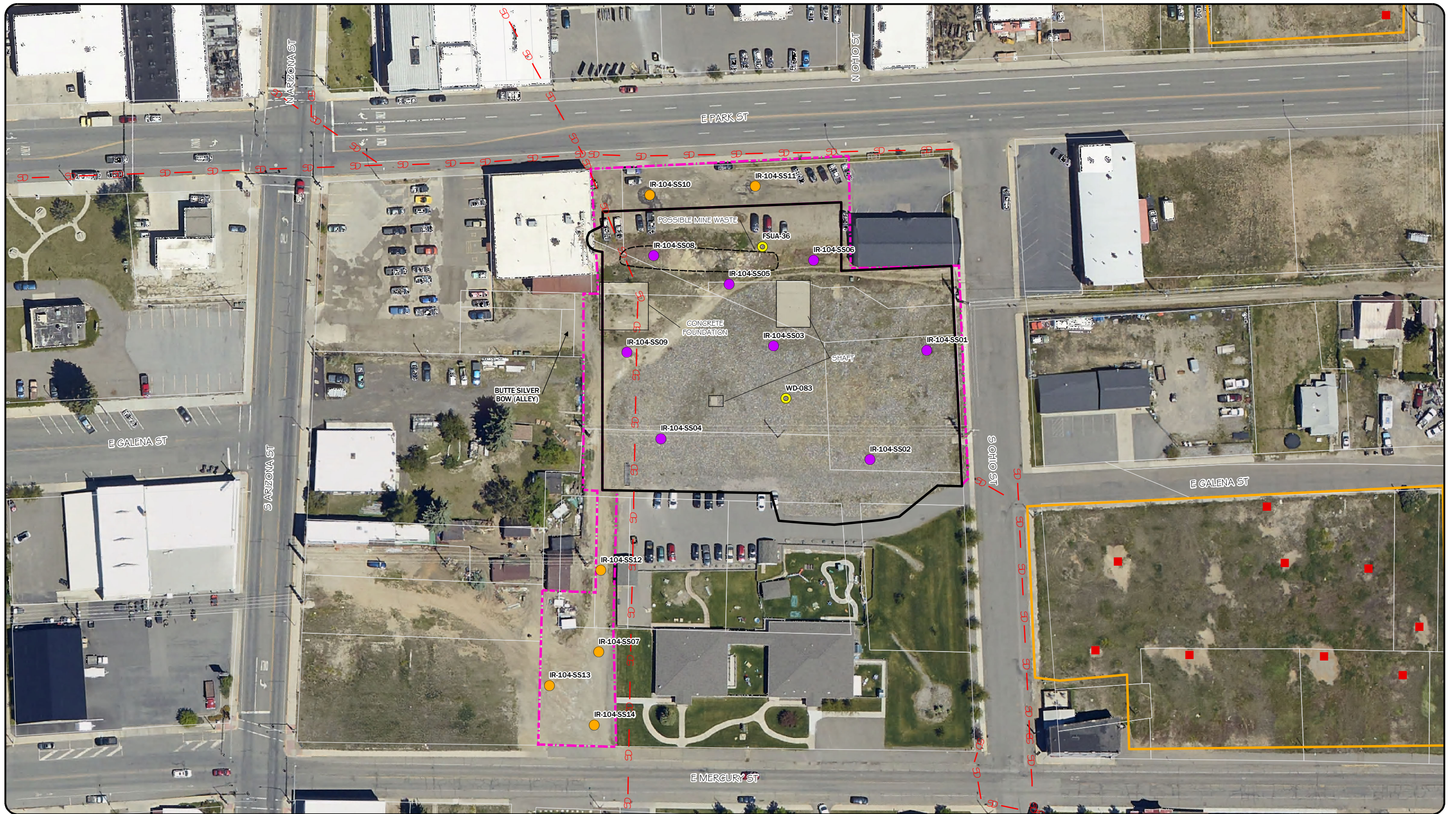
Cc: Patricia Gallery / Atlantic Richfield - email  
 Chris Greco / Atlantic Richfield – email  
 Mike Mc Anulty / Atlantic Richfield - email  
 Loren Burmeister / Atlantic Richfield – email  
 Dave Griffis / Atlantic Richfield - email  
 Jean Martin / Atlantic Richfield - email  
 Irene Montero / Atlantic Richfield - email  
 David A. Gratson / Environmental Standards / email  
 Mave Gasaway / DGS - email  
 John Davis / PRR - email  
 Joe Vranka / EPA - email  
 David Shanight / CDM - email  
 Curt Coover / CDM - email  
 James Freeman / DOJ - email  
 John Sither / DOJ - email

Jenny Chambers / DEQ - email  
Dave Bowers / DEQ - email  
Carolina Balliew / DEQ - email  
Matthew Dorrington / DEQ - email  
Jim Ford / NRDP - email  
Ray Vinkey / NRDP - email  
Harley Harris / NRDP - email  
Katherine Hausrath / NRDP - email  
Meranda Flugge / NRDP - email  
Ted Duaine / MBMG - email  
Gary Icopini / MBMG - email  
Becky Summerville / MR - email  
Kristen Stevens / UP - email  
Robert Bylsma / UP - email  
John Gilmour / Kelley Drye - email  
Leo Berry / BNSF - email  
Robert Lowry / BNSF - email  
Brooke Kuhl / BNSF – email  
Mark Engdahl / BNSF - email  
Jeremie Maehr / Kennedy Jenks - email  
Annika Silverman / Kennedy Jenks - email  
Matthew Mavrinac / RARUS - email  
Harrison Roughton / RARUS - email  
Brad Gordon / RARUS - email  
Mark Neary / BSB - email  
Eric Hassler / BSB - email  
Julia Crain / BSB - email  
Chad Anderson / BSB - email  
Brandon Warner / BSB – email  
Abigail Peltomaa / BSB - email  
Eileen Joyce / BSB – email  
Sean Peterson/BSB – email  
Gordon Hart / BSB – email  
Jeremy Grotbo / BSB – email  
Josh Vincent / WET - email  
Craig Deeney / TREC - email  
Scott Bradshaw / TREC - email  
Brad Archibald / Pioneer - email  
Pat Sampson / Pioneer - email  
Mike Borduin / Pioneer - email  
Joe McElroy / Pioneer – email  
Andy Dare / Pioneer – email  
Karen Helfrich / Pioneer - email  
Leesla Jonart / Pioneer - email  
Connie Logan/ Pioneer – email  
Ian Magruder/ CTEC- email

CTEC of Butte / email  
Scott Juskiewicz / Montana Tech – email

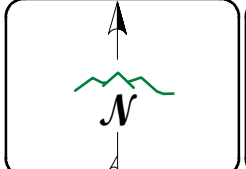
File: MiningSharePoint@bp.com - email  
BPSOU SharePoint - upload

Figure 1  
Proposed Sample Locations



**LEGEND**

- Sample Under IR QAPP
- Sample Under UR QAPP
- Historic Sample Location
- Historic Sampling Locations / UR Sites
- Proposed UR Sample Locations 2021
- Insufficiently Reclaimed Areas
- Proposed IR Boundary Changes
- Un reclaimed Sites
- Stormwater
- Possible Mine Waste
- Site Features



DISPLAYED AS:  
 PROJECTION/ZONE: MSP  
 DATUM: NA  
 UNITS: INTL FT  
 SOURCE: PIONEER/QSI2020

0 40 80 160  
 Feet

**FIGURE 1**

**INSUFFICIENTLY RECLAIMED SITES BRES-104 COLORADO DUMP PROPOSED SAMPLE LOCATIONS**

DATE: 12/1/2021