Summer 7-25-2023

Butte Priority Soils Operable Unit (BPSOU) Draft Final Insufficiently Reclaimed Sites – Field Sampling Plan (FSP) BRES No. 66 – West Ruby Dump

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July 25, 2023

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Re: Butte Priority Soils Operable Unit (BPSOU) Draft Final Insufficiently Reclaimed Sites – Field Sampling Plan (FSP) BRES No. 66 – West Ruby 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. 66 – West Ruby Dump.

As described in Appendix D, Attachment C, Section 7.0 of the 2020 BPSOU Consent Decree (CD) (available at https://www.co.silverbow.mt.us/2161/ButtePriority-Soils-Operable-Unit-Consent-Decree), sites listed as IR Solid Media Sites within the BPSOU were reclaimed prior to the establishment of the Butte Hill Revegetation Specifications (BHRS), Appendix A of 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 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 *2023 Final Insufficiently Reclaimed Sites Quality Assurance Project Plan (QAPP)* (referred to herein as IR Sites QAPP). A link to the IR Sites QAPP is included in Attachment 1.

This FSP describes field evaluation of the IR Site BRES No. 66 – West Ruby Dump, focusing on the engineered cover of the reclaimed area. The sampling boundary and proposed soil sampling stations and deficiencies identified during previous BRES evaluations are shown on Figure 1.

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 2023. 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 *2023 Unreclaimed* (UR) *Sites QAPP* (referred to herein as UR Sites QAPP). A link to the UR Sites QAPP is included in Attachment 1.

If further remediation is recommended after the evaluation and sampling is 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.

	Reference Location		
Element	**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 (SOPs)		Section 3.2 Appendix B	Section 3.2 Appendix B
Sample Analysis Methods		Section 3.3	Section 3.3

Background

The West Ruby Dump (BRES No. 66) is approximately 0.37 acre located at the intersection of Ruby Street and North Montana Street, east of the Tullamore housing subdivision, adjacent to the

southeast corner of North Montana Street and the Butte-Anaconda and Pacific (B.A.&P.) walking trail.

As described in the BPSOU *Source Areas and Reclaimed Boundary Adjustments*[1], work on the West Ruby Dump was conducted in the summer and fall of 1995. The West Ruby Dump site consisted initially of two separate areas one block east of the intersection of Ruby Street and Montana Street. The area south of Ruby Street required a lime rock cap and a cover of riprap to match the adjoining landowner's rock garden. The original slope of this area (approximately 2 horizontal [H]:1 vertical [V]) would not retain the initially proposed riprap. Therefore, ARCO, U.S. Environmental Protection Agency, and the adjoining landowners agreed on the design of a parking bumper retaining wall to reduce the slope of the existing grade, and it was installed to help achieve an average slope of 3H:1V. Waste material from the north side of Ruby Street was placed behind the wall to provide a finished grade. The slope above the retaining wall then had lime rock placed at a rate of 350 tons per acre. Then a riprap cap, 4 to 6 inches deep, was placed as the final cover. After the necessary fill was removed from the north side of Ruby Street, this area was regraded to drain from the railroad tracks (north to south) to achieve a gentle slope. Lime rock was then applied as a final cover at a rate of 350 tons per acre. Also included at this site were two small areas south of West Ruby. The first area, just south of the retaining wall, was covered with 2 inches of lime rock. Also, two small mounds of waste rock in a vacant lot just south of the retaining wall were excavated and hauled to the Butte-Silver Bow (BSB) Mine Waste Repository. This area was then capped with approximately 2 inches of lime rock and covered with 18 inches of fill from the Wabash claim north of Walkerville. This small area was then hand-broadcast with EPA95 seed mixture described in the BPSOU *Solid Media Management Program Plan*[2], and hydro-mulched to add soil stability.

An adjusted boundary was proposed for BRES No. 66 –West Ruby Dump 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*[1], this was completed by using a high-resolution aerial image and visual comparisons to identify the areas of apparent remediation. Note that Agencies have not yet 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. The two portions of the original boundary south of Ruby Street were excluded in the proposed boundary update and can be seen on Figure 1.

Previous Evaluation Findings

As specified in the CD, information collected during previous site investigations was reviewed and incorporated into the proposed sampling design. Field verification of the site boundary was completed with BSB on August 4, 2017. The site was verified to include a gravel cap and was designated as an engineered cap. Given the date of remediation, the site should be investigated to ensure the engineered cover is adequate for operation and maintenance.

[1] Atlantic Richfield Company and Butte-Silver Bow, 2022. Draft Final Source Areas and Reclaimed Boundary Adjustments. Prepared by Pioneer Technical Services, Inc. April 4, 2022.
[2] Atlantic Richfield Company and Butte-Silver Bow, 2022. Revised Draft Final Solid Media Management Program Plan. Prepared by Pioneer Technical Services, Inc. August 1, 2022.

The site was evaluated in 2018 and 2022 during the recurring 4-year cycle of field evaluations of previously reclaimed sites within the BPSOU. The results of both field evaluations indicate several of the same issues throughout the site. A variety of non-desirable vegetation primarily including toadflax, knapweed, and cheat grass dominate the engineered cover. Vegetation is void along the south side of the walking trail on the north part of the site. A barren area containing rills and gullies, with stained and displaced rocks and possible exposed waste, was on the west side of site next to Montana Street. Material appearance below the storm water outlet suggests possible exposed waste and a barren area. The most southern section (removed from the new boundary) was also evaluated in 2022 and will not be evaluated in this FSP.

The private property located in the southwest portion of the site was previously sampled under the Residential Metals Abatement Program (RMAP) in 2014. Abatement was not conducted as the samples from the site did not exceed action levels. The private property on the east portion of the site has not been sampled and will follow outreach protocol under RMAP. Sample results will be included in the forthcoming evaluation summary report, if available.

Previous Sampling Efforts

The Geocortex web-based database at https://eis2.woodardcurran.com/Html5Viewer/index.html?viewer=BPButte.BPSOU contains the records for previous soil samples collected within the BPSOU. The approximate sample stations located on BRES No. 66 are included on Figure 1 with results provided in Table 1 below. Sample results highlighted below exceed 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.

Table 1: Previous Sampling Results from BPSOU Soil Sampling

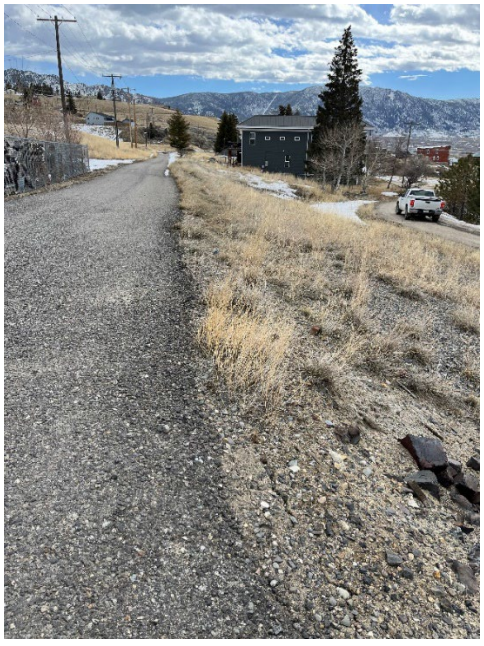
Contaminants of Concern	Sample ID: **BF-006**	Sample ID: **CON3-023O**	Sample ID: **038WA08-0**	Sample ID: **FSUA-24 (DU)**	Sample ID: **FSUA-24 (FD)**
Arsenic	283 mg/kg	105 mg/kg	144 mg/kg	127 mg/kg	123 mg/kg
Cadmium	18 mg/kg	5 mg/kg	0 mg/kg	0 mg/kg	0 mg/kg
Copper	1,200 mg/kg	643 mg/kg	687 mg/kg	584 mg/kg	593 mg/kg
Lead	1,330 mg/kg	1,360 mg/kg	184 mg/kg	438 mg/kg	407 mg/kg
Zinc	3,500 mg/kg	1,100 mg/kg	436 mg/kg	1,310 mg/kg	1,290 mg/kg
pH	6.66 S.U.	NS	3.29 S.U.	3.62 S.U.	3.63 S.U.

mg/kg: milligrams per kilogram. NS: Not sampled. S.U.: standard unit.

Preliminary Site Evaluation

A preliminary site evaluation was conducted during development of this sampling plan to inspect current site conditions and identify focus areas for further investigation. Photograph 1 through Photograph 8 show current site conditions. The investigation found the site to have a good, engineered cover taken over by weeds, low vegetation establishment near the walking trail, a barren area with surface staining and erosion, and sediment collection along site edges. The two southern areas were not evaluated due to the adjusted boundary area.

Photograph 1: West Ruby Dump site overview looking from the northwest.



Photograph 2: West Ruby Dump site overview looking east.

Photograph 3: Road sand accumulating south of site.

Snow was still present on the site during the original site visit in the spring of 2023. Road sand is accumulating on the north edge along the walking trail and on the south edge along Ruby Street as seen on Photograph 2 and Photograph 3 above. Stormwater runoff and sediment migrates from the north to the southeast of the site.

Photograph 4: Erosion and staining on the west side of site next to Montana Street looking west.

Photograph 5: Erosion and stained barren area looking south.

Photograph 6: Erosion next to Montana Street looking north.

The west side of the site, adjoining the east side of Montana Street, shows a significant amount of erosion, gullies, sediment migration, manganese staining, and a barren area. Photograph 4 through Photograph 6 highlight these issues.

Photograph 7: Storm water outlet looking north.

Photograph 8: Top of storm water outlet.

The condition of the storm water outlet on site is deteriorating. Weeds are growing inside the structure, and the metal cage is deformed and detached from the wooden structure. The base of the outlet structure facilitates site water and sediment ponding, as shown on Photograph 7.

Figure 1 illustrates the proposed sample stations as sited during the preliminary site evaluation. Adjusted boundary lines, previous sample locations, and other previous findings are included on Figure 1.

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 protocol described in the 2023 UR Sites QAPP. Samples obtained outside of the

original 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.

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 evaluated 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 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.

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.

Sample Station	Two Depth Intervals (inches)
IR-66-SS01	(1) 0-6, (2) 6-18
IR-66-SS02	(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.

Sample Station	Three Depth Intervals (inches)
IR-66-SS03	(3) 0-2, (4) 2-6, (5) 6-12
IR-66-SS04	(3) 0-2, (4) 2-6, (5) 6-12

This field work is anticipated to be completed in 2023, depending on site conditions.

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 CD.

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

Sincerely,

Mike McAnulty

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

Attachments:
Figure 1 – Insufficiently Reclaimed Sites BRES No. 66 – West Ruby Dump Proposed Sample Stations
Attachment 1 – Document Links
Attachment 2 – FSP Submittal List

Cc: Chris Greco / Atlantic Richfield – email
Josh Bryson / 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
Adam Cohen / DGS – email
Brianne McClafferty / Holland & Hart – email
David Shanight / CDM - email

Curt Coover / CDM - email
James Freeman / DOJ - email
Amy Steinmetz / DEQ - email
Dave Bowers / DEQ – email
Katie Garcin-Forba / DEQ – email
Carolina Balliew / DEQ - email
Jim Ford / NRDP - email
Pat Cunneen / NRDP - email
Katherine Hausrath / NRDP - email
Ted Duaime / 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
Julia Crain / BSB - email
Brandon Warner / BSB – email
Abigail Peltomaa / BSB - email
Eileen Joyce / BSB – email
Sean Peterson/BSB – email
Josh Vincent / WET - email
Scott Bradshaw / W&C – email
Emily Stoick / W&C – email
Pat Sampson / Pioneer – email
Andy Dare / Pioneer – email
Karen Helfrich / Pioneer – email
Randa Colling / Pioneer – email
Ian Magruder/ CTEC – email
CTEC of Butte – email
Scott Juskiewicz / Montana Tech – email

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

Figures

Figure 1 – Insufficiently Reclaimed Sites BRES No. 66 – West Ruby Dump Proposed Sample Stations

LEGEND

- HISTORIC SAMPLE STATIONS
- SAMPLE UNDER IR QAPP
- SAMPLE UNDER UR QAPP
- PROPERTY OWNERSHIP
- ACCESS PROPERTY OWNERSHIP
- BRES BOUNDARY (ORIGINAL)
- BRES BOUNDARY (PROPOSED ADJUSTMENT)
- BRES EVALUATION VEGETATIVE IMPROVEMENT
- BRES EVALUATION EXPOSED WASTE
- BRES EVALUATION BARREN AREA

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

N

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

0 20 40 80
Feet

FIGURE 1

INSUFFICIENTLY RECLAIMED
SITE BRES No.66 WEST RUBY DUMP

PIONEER TECHNICAL SERVICES, INC.

DATE: 4/28/2023

Path: Z:\Shared\Active Projects\ARCO\BPSOU\LandSupport\SolidMedia\Insufficiently_Unreclaimed\IR_Sampling\Sampling_2023\IR66_Fig_007_23.mxd

Attachment 1
Document Links

Document Links

Insufficiently Reclaimed Sites QAPP:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/EuRW3KcNuu9CqOHRiP3ENvsBOUc-dYqdITUbZZtCVROTAA[3]

Unreclaimed Sites QAPP:

https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/EtZbDgcepsdEie6VxUMdW88BbKopRVYj5ZsLN0sG3RKrhA[4]

[3] Please note that the link provided is valid for one year from the date of this submittal.
[4] Please note that 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	
BRES No. 31 – Waste Dump #5	7/25/2023	
BRES No. 48 – Old Glory West	7/25/2023	
BRES No. 66 – West Ruby Dump	7/25/2023	
BRES No. 134 – Star West Dump	7/25/2023	
BRES No. 174 – Buffalo South and Buffalo Ditch	7/25/2023	
BRES No. 84 – Mandan Park		