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**Butte Priority Soils Operable Unit (BPSOU) Final Insufficiently Reclaimed Sites - Field Sampling and Investigation Plan (FSP)
BRES No. 8 – Belle of Butte**

Mike McAnulty

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October 20, 2022

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Re: Butte Priority Soils Operable Unit (BPSOU) Final Insufficiently Reclaimed Sites - Field Sampling and Investigation Plan (FSP) BRES No. 8 – Belle of Butte

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. 08 – Belle of Butte per the Agency approval letter dated September 26, 2022. The Agency approval letter can be accessed at the following link:

<https://pioneertechnicalservices.sharepoint.com/:b:/s/submitted/EZbaJ7FxUxhAqqhgGsQsrZ4Blyik0H-1oNsLeFSjoo5igQ>¹.

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 the BPSOU were reclaimed prior to 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. Additional reclamation work may be required to bring the sites into compliance with the BHRS. Therefore, 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 as well as an on-site evaluation. The site evaluation will include additional sampling performed according to the Atlantic Richfield

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

Company 2022 Final Insufficiently Reclaimed Areas Quality Assurance Project Plan (QAPP) (referred to as IR Sites QAPP) available at the following link:

<https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Eid2SfSSinhOsfQXY5CXGEOBe5IIlf5IQO01hBO43ZROggg>².

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 2022 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/Ev1dhUeMuUdLjU8tnuV5RioBvJZRyC2HpgEjM9KzT-PpjQ>³.

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 making the final site declaration.

This FSP provides details related to field evaluation of the Insufficiently Reclaimed Site BRES No. 08 – Belle of Butte. Proposed soil sampling stations and areas of known deficiencies are shown on Figure 1.

The site evaluation is anticipated to be completed in 2022, pending approval and site conditions. A site summary and declaration will be prepared to present all available site data and describe which BHRS criteria, if any, are not met. The site will be evaluated following the Recreational Land Use for Insufficiently Reclaimed samples and Residential Land Use for Unreclaimed samples to evaluate waste identification and action level criteria provided in the IR Sites and Unreclaimed Sites QAPPs. A remedial action work plan (RAWP) describing actions that need to be implemented at the site will be provided for Agency review and approval.

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

Submittal	Site	Submittal Date	Approval Date
1	BRES No. 104 – Colorado Dump Shaft	9/29/2021	11/5/2021

² Please note the link provided is valid for one year from the date of this submittal.

³ Please note the link provided is valid for one year from the date of this submittal.

Submittal	Site	Submittal Date	Approval Date
1R	BRES No. 104 – Colorado Dump Shaft, Final Revised	12/2/2021	12/6/2021
2	BRES No. 154 – Clark Mill Tailings NE	12/1/2021	12/6/2021
3	BRES No. 30 – Atlantic-1	1/12/2022	3/7/2022
4	BRES No. 16 – Curry	1/12/2022	3/7/2022
5	BRES No. 8 – Belle of Butte	2/7/2022	9/26/2022
6	BRES No. 38 – Sister Dump	6/16/2022	9/26/2022
7	BRES No. 32 – Corra 2 Dumps	6/20/2022	6/30/2022
8	BRES No. 158 – Waste Rock Dump	6/20/2022	7/11/2022
9	BRES No. 50 – Zelia	6/22/2022	6/30/2022
10	BRES No. 93 – Soudan Dump	6/23/2022	6/30/2022
11	BRES No. 96 – Washoe Dump	6/23/2022	7/11/2022
12	BRES No. 133 – Dexter Mill	7/14/2022	7/26/2022
13	BRES No. 37 – Josephine Shaft	7/20/2022	7/26/2022
14	BRES No. 34 - Eveline	7/22/2022	8/2/2022

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

Element	Reference Location		
	FSP	IR Sites 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 2.4, Section 3.2	Section 2.4, Section 3.2
Proposed schedule for field work.	X		
Site figure including sampling locations, number and depth of samples to be collected, and sample field identification.	X	Section 3.2.1	Section 3.2.1
Field activity methods and procedures, standard operating procedures.		Section 3.2, Table 4	Section 3.2, Table 4
Sample labeling and shipping.		Section 3.2.5, Appendix C	Section 3.2.5, Appendix C
Sample analysis specifying X-ray fluorescence (XRF) vs. laboratory analysis and laboratory name.		Section 3.3	Section 3.3
Figure showing the site and/or area represented by a sample, sample ID, and aliquot locations for composite samples.	X		

Background

Belle of Butte (BRES No. 8) is approximately 0.35 acre located between Dunn Street and East Clark Street in Walkerville, Montana. The shaft was capped in 1987 by Montana Department of State Lands (MDSL). Reclamation was then completed by ARCO in 1995 and consisted of recontouring the slope above the concrete shaft cap to 4 horizontal:1 vertical (H:V). The site was then capped and revegetated. Lime rock was applied at a rate of 350 tons per acre (tons/acre) and 18 inches of clean fill material was placed over the lime rock. Fertilizer was applied to achieve soil concentrations of 60 pounds per acre (lbs/acre) of nitrogen, 80 lbs/acre of phosphorus pentoxide (P₂O₅) and 150 lbs/per acre of potassium oxide (K₂O). A chisel plow was used to mix the fertilizer into the soil. A double-disc drill seeder was used to plant 17.25 lbs/acre of the pre-1997 seed mixture, Butte Seed Mix (BSBSEEBM). Straw mulch was crimped into the surface at a rate of 2 tons/acre.

Previous Evaluation Findings

The site was evaluated in 2016 during the recurring BRES site evaluation process. A review of previous site evaluations will be incorporated into the upcoming site evaluation, sampling, and remedial action. A preliminary review of the evaluation findings indicates issues with vegetation, erosion, site edges, exposed waste, barren areas, and gullies. Material that appeared to be slag with a pH of 6.00 to 7.00 standard units (S.U.) was actively eroding from outside the site boundaries into a gully located on the eastern portion of the site. Eroding barren areas were located on the eastern and western boundaries, and sediment had been transported across the concrete shaft into nearby parcels.

Previous Sampling Efforts

Data obtained from the Geocortex web-based database at <https://eis2.woodardcurran.com/Html5Viewer/index.html?viewer=BPButte.BPSOU> contain the records for previous soil samples collected near BRES No. 8 – Belle of Butte. The approximate sample stations are included on Figure 1 with results provided in Table 1 below. Sample results highlighted below exceed ROD Solid Media soil screening criteria. The BPSOU action levels are listed in Table 1 and Table 2 of the IR Sites QAPP Section 2.4.

Table 1: Previous Sampling Results from BPSOU Soil Sampling

COCs	Sample ID: PSERA9304	Sample ID: 12-01
Arsenic	52 mg/kg	115 mg/kg
Cadmium	2 mg/kg	5 mg/kg
Copper	32 mg/kg	196 mg/kg
Lead	672 mg/kg	2,530 mg/kg
Zinc	302 mg/kg	1,810 mg/kg
pH	4.64 S.U.	4.22 S.U.
COC: contaminant of concern. mg/kg: milligram per kilogram. S.U.: standard unit.		

Sample locations from the 2021 UR sampling effort at UR-39 are shown on Figure 1 to accurately represent the previous sampling efforts. The sample locations are provided to show the extent of the previous sampling surrounding the Insufficiently Reclaimed site boundary. Data from the 2021 UR sampling effort will be reported in the Final UR-39 Site Evaluation Summary Report.

Preliminary Site Evaluation

A preliminary site visit was conducted to qualify existing site conditions and identify areas of focus for additional evaluation. Site photographs were taken during the preliminary site evaluation to capture site conditions. The photographs are included in this section for reference. The site appears to be well vegetated along the north and northeast portions of the site. There are active erosion areas along the western boundary and through the middle of the site. Barren areas are present and subject to erosion at the south toe of the shaft.



**Photograph 1: Barren Areas with Erosion
Toward North Main Street.**



**Photograph 2: Barren Area Near Shaft
with Manganese Staining.**



Photograph 3: Erosion onto North Edge of Shaft.



**Photograph 4: Barren Area South of Shaft,
Active Erosion.**



Photograph 5: Well Vegetated Area on North Boundary.



**Photograph 6: Well Vegetated Area on East Boundary,
Bare Area to the South.**

Site Characterization Plan

Per the IR Sites QAPP, the site will be sampled at 2 depth intervals [(1) 0 to 6 inches and (2) 6 to 18 inches] to determine whether mining related waste is present 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 stations. 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 IR Sites 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 prepare the final site declaration.

Existing site grading and drainages will be evaluated to determine storm water flow patterns and identify whether additional storm water controls are necessary to prevent sediment migration. The location and condition of existing storm water features will be field-verified and recorded to implement appropriate corrective actions. Upgradient and adjacent contributing sources of storm water 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 the minimum of site characterization items to consider. Additional items may be identified during the remedial design process.

- Evaluate plant species cover to BHRS seed mix specifications.
 - Coordinate and confirm plant species with biology/plant ecologist or related subject matter expert.
- Evaluate site storm water controls to mitigate run-on/runoff.
- Identify remedial improvements to mitigate site erosion and improve vegetative areas to meet BHRS.
- Identify maintenance items for successful long-term operation.

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 IR Sites QAPP. The IR Sites 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.

Sample Station	2 Depth Intervals (inches)
IR-08-SS01	(1) 0-6, (2) 6-18
IR-08-SS02	(1) 0-6, (2) 6-18
IR-08-SS03	(1) 0-6, (2) 6-18
IR-08-SS04	(1) 0-6, (2) 6-18
IR-08-SS05	(1) 0-6, (2) 6-18
IR-08-SS06	(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.

Sample Station	3 Depth Intervals (inches)
IR-08-SS07	(3) 0-2, (4) 2-6, and (5) 6-12
IR-08-SS08	(3) 0-2, (4) 2-6, and (5) 6-12
IR-08-SS09	(3) 0-2, (4) 2-6, and (5) 6-12
IR-08-SS10	(3) 0-2, (4) 2-6, and (5) 6-12

Fieldwork is anticipated to begin in 2022.

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 IR-08 Belle of Butte Proposed Sample Stations
- Figure 2 – Belle of Butte Evaluation Areas
- Attachment 1 - Document Links

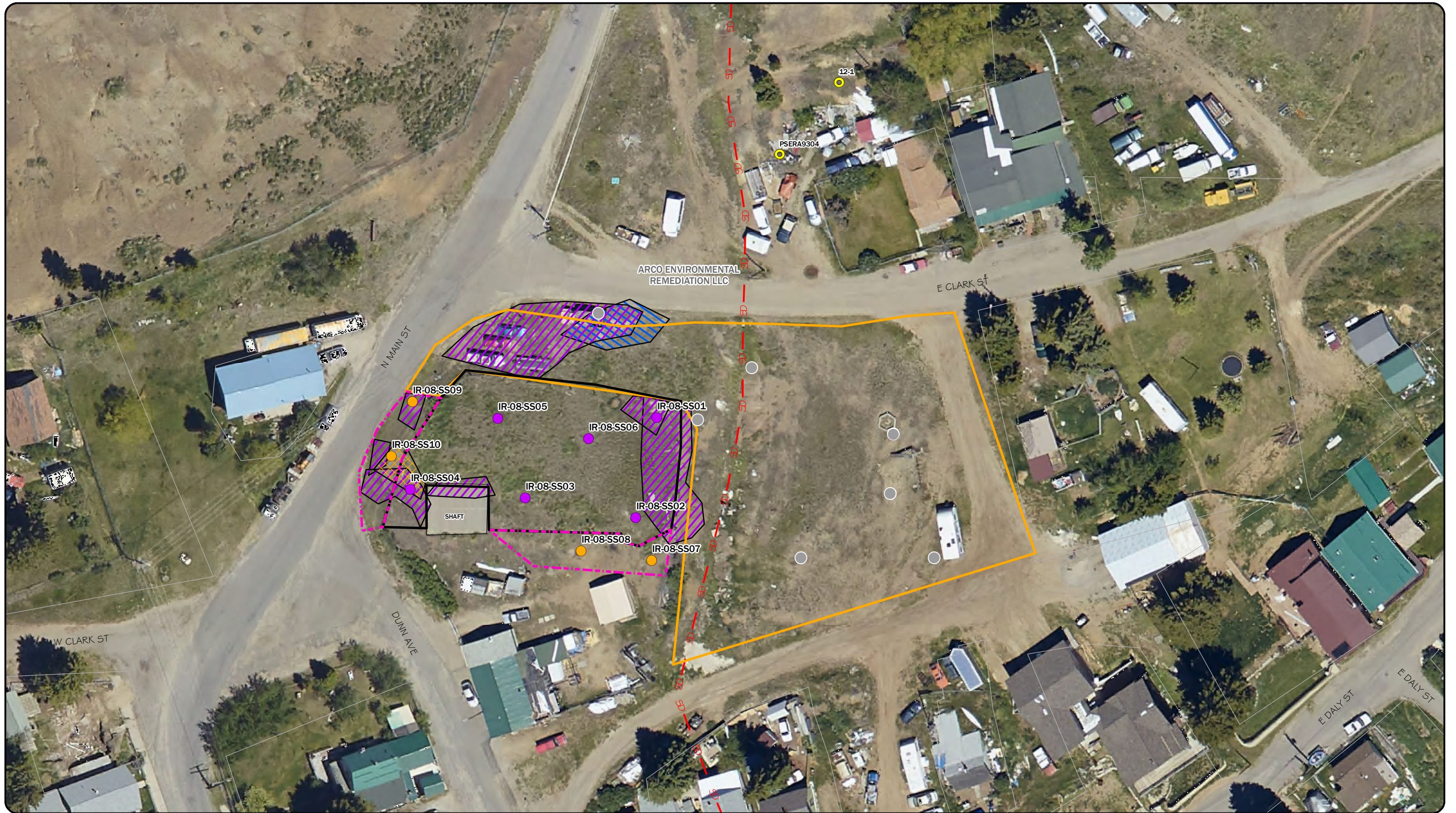
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Chris Greco / Atlantic Richfield – email
Josh Bryson / Atlantic Richfield – email
Loren Burmeister / Atlantic Richfield – email
Dave Griffis / Atlantic Richfield - email
Jean Martin / Atlantic Richfield - email
Irene Montero / Atlantic Richfield - email
David A. Gratson / Environmental Standards - email
Mave Gasaway / DGS - email
Brienne McClafferty / Holland & Hart - email
Joe Vranka / EPA - email
David Shanight / CDM - email
Curt Coover / CDM - email
James Freeman / DOJ - email
John Sither / DOJ - email
Amy Steinmetz / DEQ – email
Dave Bowers / DEQ - email
Carolina Balliew / DEQ - email
Matthew Dorrington / DEQ – email
Wil George / DEQ – email
Jim Ford / NRDP - email
Pat Cunneen / 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
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
Jeremie Maehr / Kennedy Jenks - 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
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Chad Anderson / BSB - email
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Abigail Peltomaa / BSB - email

Eileen Joyce / BSB – email
Sean Peterson / BSB - email
Gordon Hart / BSB – email
Dan Janosko / BSB – email
Karen Maloughney / BSB – email
Josh Vincent / WET - email
Craig Deeney / TREC - email
Scott Bradshaw / TREC - email
Brad Archibald / Pioneer - email
Pat Sampson / Pioneer - email
Joe McElroy / Pioneer – email
Andy Dare / Pioneer – email
Karen Helfrich / Pioneer - email
Leesla Jonart / 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

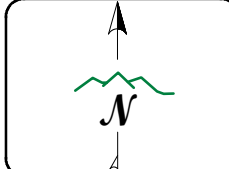
Figures

Figure 1. Insufficiently Reclaimed Sites IR-08 Belle of Butte Proposed Sample Stations
Figure 2. Belle of Butte Evaluation Areas



LEGEND			
	SAMPLE UNDER IR QAPP		PROPOSED IR BOUNDARY CHANGES
	SAMPLE UNDER UR QAPP		INSUFFICIENTLY RECLAIMED AREA
	2021 UR SAMPLED STATIONS		UNRECLAIMED SITES
	HISTORIC SAMPLE STATIONS		PROPERTY OWNERSHIP
	BRES EVALUATION VEGETATIVE IMPROVEMENT		STORM WATER LINE
	BRES EVALUATION EXPOSED WASTE		
	BRES EVALUATION BARREN AREA		

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



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

FIGURE 1
INSUFFICIENTLY RECLAIMED SITES BRES No. 08 BELLE OF BUTTE PROPOSED SAMPLE STATIONS

DATE: 3/4/2022

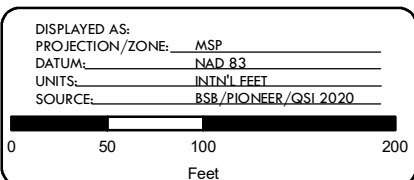
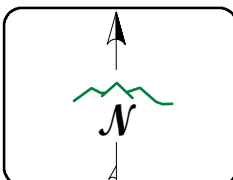
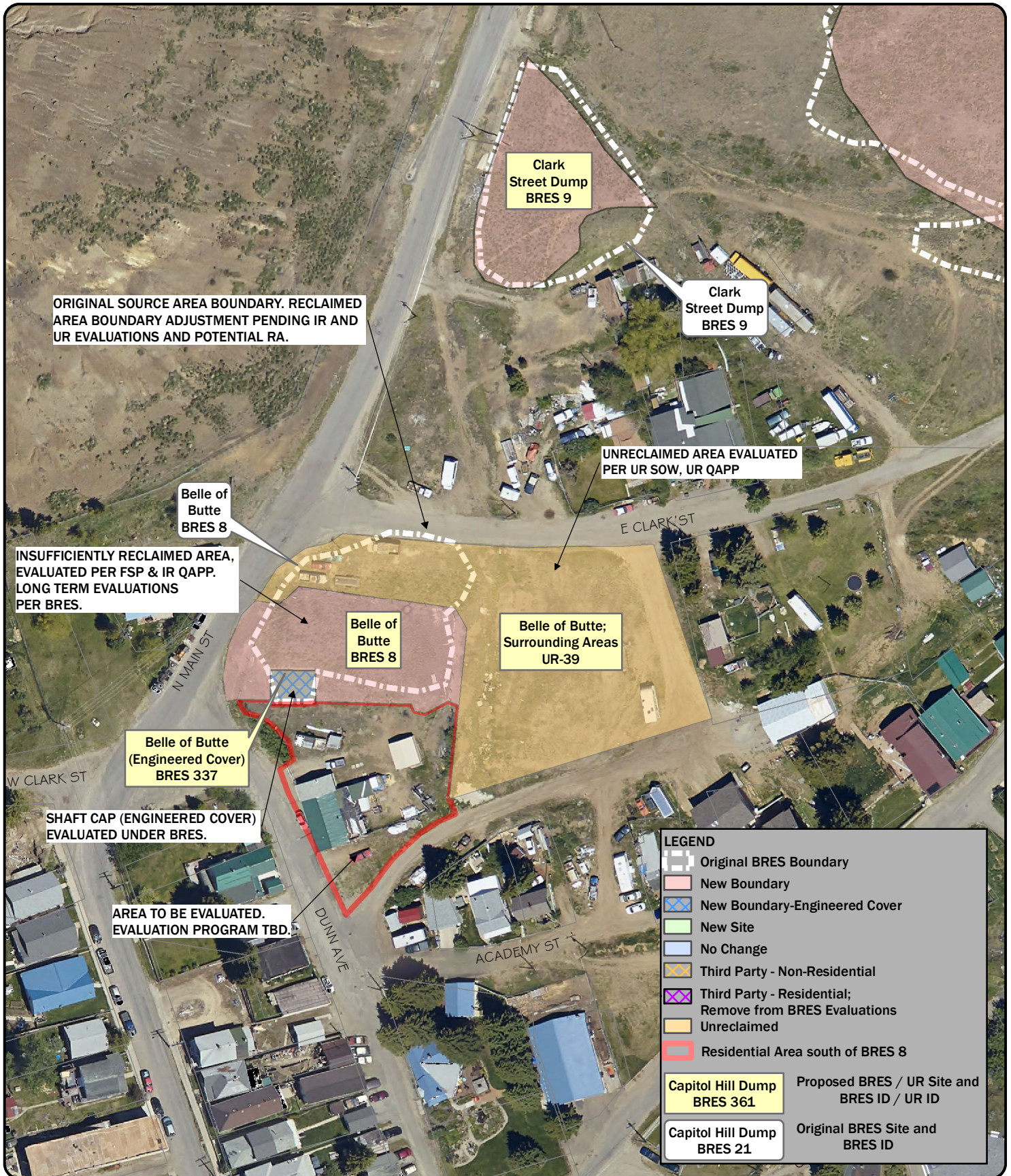


FIGURE 2

BELLE OF BUTTE EVALUATION AREAS

DATE: 10/17/2022

Attachment 1
Document Links

Document Links

Insufficiently Reclaimed Sites QAPP:

<https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Eid2SfSSinhOsfQXY5CXGEOBe5Ilf5IQO01hBO43ZROggg>⁴.

Unreclaimed Sites QAPP:

<https://pioneertechnicalservices.sharepoint.com/:f:/s/submitted/Ev1dhUeMuUdLjU8tnuV5RioBvJZRyc2HpgEjM9KzT-PpjQ>.⁵

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