Fall 9-14-2021

SILVER BOW CREEK/BUTTE AREA NPL SITE BUTTE PRIORITY SOILS OPERABLE UNIT

Pioneer Technical Services, Inc.

SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

2021

Final

Reclaimed Areas
Maintenance and Monitoring
Quality Assurance Project Plan (QAPP)

Butte Silver Bow

and

Atlantic Richfield Company

September 2021

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 West 15TH Street, Suite 3200
Helena, MT 59626-0096
Phone 866-457-2690
www.epa.gov/region8

Ref: 8MO

September 7, 2021

Mr. Mike McAnulty
Liability Manager
Atlantic Richfield Company
317 Anaconda Road
Butte, Montana 59701

Eric Hassler
Superfund Program Manager
Butte-Silver Bow
155 W. Granite St., Room 108
Butte, Montana 59701

Re: Comment letter for the Butte Priority Soils Operable Unit (BPSOU) 2021 Final Reclaimed Areas Maintenance and Monitoring Quality Assurance Project Plan (QAPP) (dated June 25, 2021)

Dear Mike and Eric:

The U. S. Environmental Protection Agency (EPA), in consultation with the Montana Department of Environmental Quality (DEQ), is providing comments on the *Final Reclaimed Areas Maintenance and Monitoring Quality Assurance Project Plan (QAPP)*. Please see comments provided on the attached crosswalk and incorporate these comments and submit the final version of the plan for review.

If you have any questions or concerns, please call me at (406) 457-5019.

Sincerely,

NIKIA GREENE
Digitally signed by NIKIA GREENE
Date: 2021.09.07 10:30:41 -06'00'

Nikia Greene
Remedial Project Manager

cc: (email only)
Butte File
Jenny Chambers; DEQ
Matt Dorrington, DEQ

Daryl Reed; DEQ
Jon Morgan; DEQ counsel
Carolina Balliew; DEQ
Harley Harris; NRDP
Katherine Hausrath; NRDP
Jim Ford; NRDP
Ray Vinkey; NRDP
John Gallagher; BSBC
Eileen Joyce; BSBC
Sean Peterson; BSBC
Eric Hassler; BSBC
Brandon Warner; BSBC
Chad Anderson; BSBC
Karen Sullivan; BSBC
Julia Crain; BSBC
Abby Peltomaa; BSBC
Jeremy Grotbo; BSBC
Anne Walsh; UP
Robert Bylsma; UP counsel
Leo Berry; BNSF and UP counsel
Mark Engdahl; BNSF
Brooke Kuhl; BNSF counsel
Jeremie Maehr; Kennedy Jenks for BNSF and UP
Annika Silverman; Kennedy Jenks for BNSF and UP
Bob Andreoli; Patroit/RARUS
Becky Summerville; counsel for Inland Properties Inc.
Robert Lowry, BNSF counsel
Loren Burmeister; AR
Josh Bryson; AR
Mike Mcanulty; AR
Dave Griffis; AR
Jean Martin; Counsel AR
Mave Gasaway; attorney for AR
Adam Cohen; Counsel for AR
Pat Sampson; Pioneer for AR
Scott Bradshaw; TREC
Mike Borduin; Pioneer for AR
Karen Helfrich; Pioneer for AR
Andy Dare; Pioneer for AR
Scott Sampson; Pioneer for AR
Brad Archibald; Pioneer for AR
Andy Dare; Pioneer for AR
Tina Donovan; Woodardcurran for AR
Don Booth; AR consultant
Ted Duaime; MBMG
Gary Icopini; MBMG
David Shanight, CDM Smith

Curt Coover, CDM Smith
Chapin Storrar; CDM Smith
Erin Agee, EPA
Joe Vranka; EPA
Chris Wardell; EPA
Dana Barnicoat; EPA
Charlie Partridge; EPA
Jean Belille; EPA
Ian Magruder; CTEC (Tech Advisor)
Janice Hogan; CTEC
Kristi Carroll; Montana Tech Library

EPA REGION 8 QA DOCUMENT REVIEW CROSSWALK

QAPP/FSP/SAP for: *(check appropriate box)* ☐ **GRANTEE** ☐ **CONTRACTOR** ☐ **EPA** ☐ **Other**	**Entity** *(grantee, contract, EPA AO, EPA Program, Other)* AR and BSB County	**Regulatory Authority and/or Funding Mechanism**	___ **2 CFR 1500 for Grantee/Cooperative Agreements** ___ **48 CFR 46 for Contracts** ___ **Interagency Agreement (FFA, USGS,)** ___ **EPA/Court Order** ___ **EPA Program Funding** ___ **EPA Program Regulation** ___ **EPA CIO 2105**
Document Title *[Note: Title will be repeated in Header]*	BPSOU Final Reclaimed Areas Maintenance and Monitoring QAPP - 2021		
QAPP/FSP/SAP Preparer	AR and BSB County		
Period of Performance *(of **QAPP**/FSP/SAP)*	**2021-2022**	**Date Submitted for Review**	6/25/2021
EPA Project Officer **EPA Project Manager**	Nikia Greene	**PO Phone #** **PM Phone #**	
QA Program Reviewer or Approving Official	Nikia Greene	**Date of Review**	8/16/2021

Documents Submitted for QAPP Review (QA Reviewer must complete):

1. QA Document(s) submitted for review:

QA Document	Document Date	Document Stand-alone	Document with QAPP
QAPP	**6/25/2021**	**Yes** / No	
FSP		Yes / No	Yes / No
SAP		Yes / No	Yes / No
SOP(s)	**(attached)**		**Yes** / No

2. WP/SOW/TO/PP/RP Date _____
WP/SOW/TO/RP Performance Period _____

3. QA document consistent with the:
WP/SOW/PP for grants? Yes / No
SOW/TO for contracts? Yes / No

4. QARF signed by R8 QAM Yes / No / NA
Funding Mechanism IA / contract / grant / NA
Amount _____

Notes for Document Submittals:

1. A QAPP written by a Grantee, EPA, or Federal Partner must include for review: Work Plan(WP) / Statement of Work (SOW) / Program Plan (PP) / Research Proposal (RP) and funding mechanism
2. A QAPP written by Contractor must include for review:
   - **a)** Copy of Task Order Work Assignment/SOW
   - **b)** Reference to a hard or electronic copy of the contractor's approved QMP
   - **c)** Copy of Contract SOW if no QMP has been approved
   - **d)** Copy of EPA/Court Order, if applicable
   - **e)** The QA Review must determine (with the EPA CO or PO) if a QARF was completed for the environmental data activity described in the QAPP.
3. **a**. Field Sampling Plan (FSP) and/or Sampling & Analyses Plan (SAP) must include the Project QAPP ***or*** must be a stand-alone QA document that contain all QAPP required elements (Project Management, Data Generation/Acquisition, Assessment and Oversight, and Data Validation and Usability).
   b. SOPs must be submitted with a QA document that contains all QAPP required elements.

Summary of Comments *(highlight significant concerns/issues)*:

1. **The** AR and BSB County **must address the comments in the Summary of Comments, as well as those identified in the Comment section(s) that includes a "Response (date)" and Resolved (date)".**

2. AR and BSB submitted an older version of the QAPP crosswalk, therefore this crosswalk was revised to include the most updated version (Update #6 7-2017).
3. Please provide a clear reference for the BPSOU Monitoring and Maintenance Plan (M&M Plan) referred to in Section 1.0 Introduction and where the document is located.
   Some Page/Section location references were revised to include correct locations of required text/information.

Element	Acceptable *Yes/No/NA*	Page/ Section	Comments
A. Project Management			
A1. Title and Approval Sheet			
a. Contains project title	Yes	Title page and page i	EPA: No comments
b. Date and revision number line (for when needed)	Yes	Title page and page i	EPA: No comments
c. Indicates organization's name	Yes	Title page	EPA: No comments
d. Date and signature line for organization's project manager	Yes	Page i	EPA: No comments
e. Date and signature line for organization's QA manager	No	Page i	EPA: 2018 Crosswalk lists an EPA comment stating to add "Quality Assurance Approval Official" to Nikia Greene's signature line. For this 2021 QAPP please add "Delegated Approving Officer" to the signature line. **Atlantic Richfield Response: The requested text has been added.**
f. Other date and signatures lines, as needed	Yes	Page i	EPA: No comments
A2. Table of Contents			
a. Lists QA Project Plan information sections	Yes	Pages v to vii	EPA: No comments
b. Document control information indicated	Yes	Page vii	EPA: No comments
A3. Distribution List			
Includes all individuals who are to receive a copy of the QA Project Plan and identifies their organization	Yes	Pages ii to iv	EPA: No comments
A4. Project/Task Organization			
a. Identifies key individuals involved in all major aspects of the project, including contractors	Yes	Sections 2.0 through 2.3	EPA: No comments
b. Discusses their responsibilities	Yes	Sections 2.0 through 2.3	EPA: No comments
c. Project QA Manager position indicates independence from unit generating data	Yes	Section 2.2, Figure 2	EPA: No comments
d. Identifies individual responsible for maintaining the official, approved QA Project Plan	Yes	Section 2.3	EPA: No comments

e. Organizational chart shows lines of authority and reporting responsibilities	No	Figure 2	EPA: Please add text "Figure 2" to BPSOU Reclaimed Areas Program Organization and Communication Structure **Atlantic Richfield Response: The requested text has been added.**
A5. Problem Definition/Background			
a. States decision(s) to be made, actions to be taken, or outcomes expected from the information to be obtained	Yes	Sections 1.0 and 2.4	EPA: No comments
b. Clearly explains the reason (site background or historical context) for initiating this project	Yes	Sections 2.4 and 2.5	EPA: No comments
c. Identifies regulatory information, applicable criteria, action limits, etc. necessary to the project	Yes	Sections 2.4 and 2.5	EPA: No comments
A6. Project/Task Description			
a. Summarizes work to be performed, for example, measurements to be made, data files to be obtained, etc., that support the project=s goals	Yes	Section 2.5	EPA: No comments
b. Provides work schedule indicating critical project points, e.g., start and completion dates for activities such as sampling, analysis, data or file reviews, and assessments	Yes	Section 2.5	EPA: No comments
c. Details geographical locations to be studied, including maps where possible	Yes	Section 2.5	EPA: No comments
d. Discusses resource and time constraints, if applicable	Yes	Section 2.5	EPA: No comments
A7. Quality Objectives and Criteria			
a. Identifies - performance/measurement criteria for all information to be collected and acceptance criteria for information obtained from previous studies, - including project action limits and laboratory detection limits and - range of anticipated concentrations of each parameter of interest	Yes	Section 2.6	EPA: No comments
b. Discusses precision	Yes	Section 2.6.2	EPA: No comments
c. Addresses bias	Yes	Section 2.6.2	EPA: No comments
d. Discusses representativeness	Yes	Section 2.6.2	EPA: No comments
e. Identifies the need for completeness	Yes	Section 2.6.2	EPA: No comments
f. Describes the need for comparability	Yes	Section 2.6.2	EPA: No comments
g. Discusses desired method sensitivity	Yes	Section 2.6.2	EPA: No comments

A8. Special Training/Certifications			
a. Identifies any project personnel specialized training or certifications	Yes	Section 2.7	EPA: No comments
b. Discusses how this training will be provided	Yes	Section 2.7	EPA: No comments
c. Indicates personnel responsible for assuring training/certifications are satisfied	Yes	Section 2.7	EPA: No comments
d. identifies where this information is documented	Yes	Section 2.7	EPA: No comments
A9. Documentation and Records			
a. Identifies report format and summarizes all data report package information	Yes	Section 2.8	EPA: No comments
b. Lists all other project documents, records, and electronic files that will be produced	Yes	Section 2.8	EPA: No comments
c. Identifies where project information should be kept and for how long	Yes	Section 2.8	EPA: No comments
d. Discusses back up plans for records stored electronically	Yes	Section 2.8	EPA: No comments
e. States how individuals identified in A3 will receive the most current copy of the approved QA Project Plan, identifying the individual responsible for this	Yes	Section 2.8	EPA: No comments
B. Data Generation/Acquisition			
B1. Sampling Process Design (Experimental Design)			
a. Describes and justifies design strategy, indicating size of the area, volume, or time period to be represented by a sample	Yes	Section 3.3	EPA: No comments
b. Details the type and total number of sample types/matrix or test runs/trials expected and needed	Yes	Section 3.3	EPA: No comments
c. Indicates where samples should be taken, how sites will be identified/located	Yes	Section 3.3.1, Attachment 1	EPA: No comments
d. Discusses what to do if sampling sites become inaccessible	NA	NA	EPA: This is not an anticipated issue.
e. Identifies project activity schedules such as each sampling event, times samples should be sent to the laboratory, etc.	Yes	Section 2.5.1 and 2.5.2.1	EPA: No comments
f. Specifies what information is critical and what is for informational purposes only	Yes	Section 3.2	EPA: No comments
g. Identifies sources of variability and how this variability should be reconciled with project information	Yes	Step 6	EPA: No comments
B2. Sampling Methods			

a. Identifies all sampling SOPs by number, date, and regulatory citation, indicating sampling options or modifications to be taken	Yes	Section 3.3	EPA: No comments
b. Indicates how each sample/matrix type should be collected	Yes	Section 3.3.1	EPA: No comments
c. If in situ monitoring, indicates how instruments should be deployed and operated to avoid contamination and ensure maintenance of proper data	NA	NA	EPA: No in-situ instruments will be deployed
d. If continuous monitoring, indicates averaging time and how instruments should store and maintain raw data, or data averages	NA	NA	EPA: No continuous monitoring instruments will be deployed
e. Indicates how samples are to be homogenized, composited, split, or filtered, if needed	Yes	Section 3.4.1	EPA: No comments
f. Indicates what sample containers and sample volumes should be used	Yes	Section 3.3.1 and 3.6.1	EPA: No comments
g. Identifies whether samples should be preserved and indicates methods that should be followed	Yes	Section 3.3.1	EPA: No comments
h. Indicates whether sampling equipment and samplers should be cleaned and/or decontaminated, identifying how this should be done and by-products disposed of	Yes	Section 3.4.41	EPA: No comments
i. Identifies any equipment and support facilities needed	Yes	Section 3.5.1	EPA: No comments
j. Addresses actions to be taken when problems occur, identifying individual(s) responsible for corrective action and how this should be documented	Yes	Section 3.11	EPA: No comments
B3. Sample Handling and Custody			
a. States maximum holding times allowed from sample collection to extraction and/or analysis for each sample type and, for in-situ or continuous monitoring, the maximum time before retrieval of information	Yes	Section 3.4.2	EPA: No comments
b. Identifies how samples or information should be physically handled, transported, and then received and held in the laboratory or office (including temperature upon receipt)	Yes	Section 3.4.2	EPA: No comments
c. Indicates how sample or information handling and custody information should be documented, such as in field notebooks and forms, identifying individual responsible	Yes	Section 3.4.2	EPA: No comments

d. Discusses system for identifying samples, for example, numbering system, sample tags and labels, and attaches forms to the plan	Yes	Section 3.4	EPA: No comments
e. Identifies chain-of-custody procedures and includes form to track custody	Yes	Section 3.4.2	EPA: No comments
B4. Analytical Methods			
a. Identifies all analytical SOPs (field, laboratory and/or office) that should be followed by number, date, and regulatory citation, indicating options or modifications to be taken, such as sub-sampling and extraction procedures	Yes	Section 3.3.1 and 3.5	EPA: No comments
b. Identifies equipment or instrumentation needed	Yes	Section 3.3.2	EPA: No comments
c. Specifies any specific method performance criteria	Yes	Section ~~3.4.3 and~~ 3.5	EPA: No comments
d. Identifies procedures to follow when failures occur, identifying individual responsible for corrective action and appropriate documentation	Yes	Section 3.5	EPA: No comments
e. Identifies sample disposal procedures	Yes	Section 3.4.3	EPA: No comments
f. Specifies laboratory turnaround times needed	Yes	Section 3.5	EPA: No comments
g. Provides method validation information and SOPs for nonstandard methods	Yes	Section 5.0	EPA: No comments
B5. Quality Control			
a. For each type of sampling, analysis, or measurement technique, identifies QC activities which should be used, for example, blanks, spikes, duplicates, etc., and at what frequency	Yes	Section 3.3.1 and 3.7	EPA: No comments
b. Details what should be done when control limits are exceeded, and how effectiveness of control actions will be determined and documented	Yes	Section 3.7.2	EPA: No comments
c. Identifies procedures and formulas for calculating applicable QC statistics, for example, for precision, bias, outliers and missing data	Yes	Section 2.8.7	EPA: No comments
B6. Instrument/Equipment Testing, Inspection, and Maintenance			
a. Identifies field and laboratory equipment needing periodic maintenance, and the schedule for this	Yes	Section 3.8	EPA: No comments
b. Identifies testing criteria	Yes	Section 3.8	EPA: No comments
c. Notes availability and location of spare parts	Yes	Section 3.8	EPA: No comments

d. Indicates procedures in place for inspecting equipment before usage	Yes	Section 3.8	EPA: No comments
e. Identifies individual(s) responsible for testing, inspection and maintenance	Yes	Section 3.8	EPA: No comments
f. Indicates how deficiencies found should be resolved, re-inspections performed, and effectiveness of corrective action determined and documented	Yes	Section 3.8	EPA: No comments
B7. Instrument/Equipment Calibration and Frequency			
a. Identifies equipment, tools, and instruments that should be calibrated and the frequency for this calibration	Yes	Section 3.7.5	EPA: No comments
b. Describes how calibrations should be performed and documented, indicating test criteria and standards or certified equipment	Yes	Section 3.7	EPA: No comments
c. Identifies how deficiencies should be resolved and documented	Yes	Section 3.7.2	EPA: No comments
B8. Inspection/Acceptance for Supplies and Consumables			
a. Identifies critical supplies and consumables for field and laboratory, noting supply source, acceptance criteria, and procedures for tracking, storing and retrieving these materials	Yes	Section 3.9	EPA: No comments
b. Identifies the individual(s) responsible for this	Yes	Section 3.9	EPA: No comments
B9. Use of Existing Data (Non-direct Measurements)			
a. Identifies data sources, for example, computer databases or literature files, or models that should be accessed and used	Yes	Section 3.10	EPA: No comments
b. Describes the intended use of this information and the rationale for their selection, i.e., its relevance to project	Yes	Section 3.10	EPA: No comments
c. Indicates the acceptance criteria for these data sources and/or models	Yes	Section 3.10	EPA: No comments
d. Identifies key resources/support facilities needed	Yes	Section 3.10	EPA: No comments
e. Describes how limits to validity and operating conditions should be determined, for example, internal checks of the program and Beta testing	Yes	Section 3.10	EPA: No comments
B10. Data Management			
a. Describes data management scheme from field to final use and storage	Yes	Section 3.11	EPA: No comments

b. Discusses standard record-keeping and tracking practices, and the document control system or cites other written documentation such as SOPs	Yes	Section 3.11, Attachment 3.51	EPA: No comments
c. Identifies data handling equipment/procedures that should be used to process, compile, analyze, and transmit data reliably and accurately	Yes	Section 3.11, Attachment 3.51	EPA: No comments
d. Identifies individual(s) responsible for this	Yes	Section 3.11	EPA: No comments
e. Describes the process for data archival and retrieval	Yes	Section 3.11, Attachment 3.51	EPA: No comments
f. Describes procedures to demonstrate acceptability of hardware and software configurations	Yes	Section 3.11	EPA: No comments
g. Attaches checklists and forms that should be used	Yes	Section 3.11, Attachment 3.51	EPA: No comments
C. Assessment and Oversight			
C1. Assessments and Response Actions			
a. Lists the number, frequency, and type of assessment activities that should be conducted, with the approximate dates	Yes	Section 4.0	EPA: No comments
b. Identifies individual(s) responsible for conducting assessments, indicating their authority to issue stop work orders, and any other possible participants in the assessment process	Yes	Section 4.0	EPA: No comments
c. Describes how and to whom assessment information should be reported	Yes	Section 4.1 and 4.2	EPA: No comments
d. Identifies how corrective actions should be addressed and by whom, and how they should be verified and documented	Yes	Section 4.1 and 4.2	EPA: No comments
C2. Reports to Management			
a. Identifies what project QA status reports are needed and how frequently	Yes	Section 4.3	EPA: No comments
b. Identifies who should write these reports and who should receive this information	Yes	Section 4.3	EPA: No comments
D. Data Validation and Usability			
D1. Data Review, Verification, and Validation			
Describes criteria that should be used for accepting, rejecting, or qualifying project data	Yes	Section 5.0	EPA: No comments

D2. Verification and Validation Methods			
a. Describes process for data verification and validation, providing SOPs and indicating what data validation software should be used, if any	No	Section 5.0	EPA: Please correct reference for the *National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA, 2016b).* The most current version should be dated as November 2020. **Atlantic Richfield Response: The requested update has been made.**
b. Identifies who is responsible for verifying and validating different components of the project data/information, for example, chain-of-custody forms, receipt logs, calibration information, etc.	Yes	Section 5.0	EPA: No comments
c. Identifies issue resolution process, and method and individual responsible for conveying these results to data users	Yes	Section 5.0	EPA: No comments
d. Attaches checklists, forms, and calculations	Yes	Section 5.0	EPA: No comments
D3. Reconciliation with User Requirements			
a. Describes procedures to evaluate the uncertainty of the validated data	Yes	Section 5.0	EPA: No comments
b. Describes how limitations on data use should be reported to the data users	Yes	Section 5.0	EPA: No comments

SILVER BOW CREEK/BUTTE AREA NPL SITE
BUTTE PRIORITY SOILS OPERABLE UNIT

2021

Final

Reclaimed Areas
Maintenance and Monitoring
Quality Assurance Project Plan (QAPP)

Prepared for:

Butte Silver Bow
Superfund Division
155 W. Granite
Butte, MT 59701

and

Atlantic Richfield Company
317 Anaconda Road
Butte, Montana 59701

Prepared by:

Pioneer Technical Services, Inc.
1101 S. Montana Street
Butte, Montana 59701

September 2021

APPROVAL PAGE

BPSOU Reclaimed Areas Maintenance and Monitoring
Quality Assurance Project Plan
Butte Area NPL Site

Approved: _____ Date: _____
Nikia Greene, Delegated Approval Officer, EPA, Region 8

Approved: _____ Date: _____
Daryl Reed, Project Officer, Montana DEQ

Approved: Mike McAnulty Date: 9/14/2021
Mike Mc Anulty, Liability Manager
Atlantic Richfield Company

Approved: Laura Moon Date: 9/14/2021

Laura Moon, Quality Assurance Manager
Pioneer Technical Services
for Atlantic Richfield Company

2021
Plan is effective on date of approval.

DOCUMENT REVISION SUMMARY

Revision No.	Author	Description	Date
	Pioneer Technical Services, Inc.	Annual Update	September 2021

1.0 INTRODUCTION

To ensure performance standards achieved through remedial action are upheld, reclaimed areas (shown in Figure 1 and listed in Attachment 1) are monitored according to the Butte Reclamation Evaluation System (BRES), which is attached to the U.S. Environmental Protection Agency (EPA) Record of Decision (ROD) as Appendix E (EPA, 2006a), and referred to in this document as BRES; and maintained as described in the Butte Priority Soils Operable Unit (BPSOU) Butte Reclaimed Areas Maintenance and Monitoring (M&M) Plan (M&M Plan) (Atlantic Richfield, 2018a)[1]. The BRES is the governing guidance document that all reclaimed areas in the BPSOU must follow as described in the EPA ROD. The BRES sets the methodology for evaluating the reclaimed areas and provides guidelines for corrective actions. The M&M Plan details the means and methods necessary to maintain reclaimed areas consistently to ensure the stability and integrity of those areas. Standard maintenance procedures (SMPs) provided in the M&M Plan provide assurance that maintenance performed on reclaimed areas is completed to a sufficient level that will continue to protect human health and the environment over the long term.

Individual site monitoring is performed by an independent third party in accordance with BRES, and the corresponding report provided to Butte-Silver Bow (BSB) (Appendix E) for review. As appropriate, BSB will initiate corrective action if necessary. Institutional control programs related to remedial activities are described in the latest version of the Atlantic Richfield BPSOU *Institutional Controls Implementation and Assurance Plan* (Atlantic Richfield, 2019).

1.1 Purpose

The BPSOU *Quality Management Plan* (QMP) (Atlantic Richfield, 2016) provides the overarching guidance to ensure collection of environmental data for the BPSOU meets requirements mandated by the EPA. This Quality Assurance Project Plan (QAPP) provides guidance for monitoring and maintenance activities and limited sampling and analyses and describes the quality assurance/quality control (QA/QC) policies and procedures to be implemented during routine data collection and analyses specific to BRES evaluations and maintenance of reclaimed areas. This QAPP has been developed in accordance with the EPA Requirements for QAPPs, EPA QA/R-5 (EPA, 2001), and the *Guidance on Systematic Planning Using the Data Quality Objectives (DQO) Process*, EPA QA/G4 (EPA, 2006b). This QAPP includes the following four key elements:

- Program management and objectives (Section 2.0).
- Measurement and data acquisition (Section 3.0).
- Assessment and oversight (Section 4.0). and
- Data review and usability (Section 5.0).

The sections below describe these key elements and detail any required planning, monitoring, sampling, and analyses. Sections in this QAPP expand on or reference information in other site-wide documents to comply with the Uniform Federal Policy for QAPPs (EPA, 2005) and to present project-specific requirements.

[1] A Revised Draft Final Butte Reclaimed Areas Maintenance and Monitoring Plan is scheduled to be submitted as an appendix to the Solid Media Management Program Plan in 2021.

1.2 Databases

Within the program, there are a variety of databases that store reclaimed area information, Geographical Information System (GIS) locations, soil sample results, and other project data. Various individuals, from field personnel to operations personnel to data administrators, enter and manage the data (details are listed in sections 3-6). The database names used in this report are generalized as the program or project database, GIS database, reclamation database, or soils database. For specific information on the databases, refer to the current BPSOU Data Management Plan (DMP) (Atlantic Richfield, 2018b), referred to in this report as the BPSOU DMP.

2.0 PROGRAM MANAGEMENT

This section addresses the BPSOU reclaimed areas program (Program) and project administrative functions as well as project background, objectives, and documentation requirements for maintenance, monitoring, sampling, and analysis activities on each project site. Figure 2 shows the program organization and communication structure.

2.1 Agency Oversight

The EPA and Montana Department of Environmental Quality (DEQ) (the *Agencies*) are responsible for project oversight, review, and approval of site-specific remediation plans. The Agencies also review sampling results and review and approve project reports described in Section 2.5.3.

2.2 Atlantic Richfield Company

Atlantic Richfield Company (Atlantic Richfield) confirms conformance to the BRES and Reclaimed Areas M&M Plan (Figure 2).

Atlantic Richfield Operations Liability Manager
The Atlantic Richfield Liability Manager, Mike Mc Anulty, monitors the performance of the contractor(s), consults with the Contractor Project Manager(s) and QA officer(s) on deficiencies and aids in finalizing resolution actions, and reviews all reclamation activities under the Program. An Atlantic Richfield project representative, or designated alternate, can perform a site walk-through and assist with preparation of a site-specific work plan prior to implementation, or provide confirmation of all reclamation performed.

Atlantic Richfield Operations Quality Assurance Manager
The Atlantic Richfield QA Manager, David Gratson, (QAM) interfaces with the Liability Manager on company policies regarding quality. The QAM has the authority and responsibility to approve specific QA documents including this QAPP.

Step 7: Optimize the Design - *The purpose of this step is to develop an optimized plan to complete the task.*

The site evaluation and data collection scheme are designed to ensure that the information will be of sufficient quality to appropriately assess the condition of the site and identify trigger items. Site data will be maintained in and accessed through a secure database to ensure field personnel have current site data (boundaries, imagery, forms, etc.) (refer to BPSOU DMP).

2.6.2 Measurement Performance Criteria for Data

Measurement performance criteria are established by defining acceptance criteria and quantitative or qualitative goals (e.g., control limits) for accuracy, precision, representativeness, comparability, and completeness of measurement data. The definitions of precision, accuracy, representativeness, comparability, and completeness are provided below along with any acceptance criteria for data collected.

Precision

Precision related to site boundaries is the degree to which readings can be made. Field personnel are able to track site boundaries by physically walking along an established path and comparing what they see to site boundaries shown on aerial imagery.

Precision related to sampling is the amount of scatter or variance that occurs in repeated measurements of a particular analyte. Acceptance or rejection of precision measurements is based on the relative percent difference (RPD) of the laboratory and field duplicates. For example, perfect precision would be a 0% RPD between duplicate samples (both samples have the same analytical result). For soils analysis, acceptable precision is an RPD of plus or minus 35% in soil samples. This precision requirement is derived from the Contract Laboratory Program (CLP) Statement of Work (SOW) (EPA, 2016).

Precision related to BRES evaluations will be provided by ensuring all personnel complete training prior to conducting evaluations. Training will be provided through an annual standard BRES training program. Training will include classroom instruction related to procedures and evaluation principles along with field exercises to apply classroom training to provide reproducible data. Additional information regarding BRES evaluation training is in Section 2.7.

The mandatory annual training session will include vegetative cover identification, vegetative cover estimation method, erosional assessment, trigger item identification, and using field-compatible tablet devices to record and report data. Field evaluation teams will be trained to visually estimate vegetation cover using a modified point intercept method that uses frames of 0.25 square meters (m^2) with a 10-point grid system to quantitatively measure cover. Laser pointers will be used in conjunction with a grid of 10 points on a frame. The type of material intercepted by the lasers will be identified and recorded to determine percent live plant cover, litter, rocks, and bare ground. The field team's experience will be tested; the field team will make a visual estimate of cover on an area, then quantitatively measure cover on the same area.

according to the appropriate SOPs (Attachment 3). If ICP-MS methods are necessary, a laboratory complying with EPA CLP protocol (EPA, 2016) will conduct the analysis in accordance with EPA test methods for evaluating Solid Waste, Physical/Chemical Methods, also known as SW-846, 6020A, Metals Analysis by ICP-MS. This method is typically able to provide analytical results within 10 working days of sample receipt at the laboratory. Laboratories will provide analytical results within 28 working days from receipt of samples.

3.6 Additional Analyses Methods

The subsections below describe the analytical methods an approved laboratory must use to analyze the soils for non-metals analysis. Non-metals analysis may be deployed to characterize sites or areas that require VI. Analysis must be completed prior to expiration of a 28-day sample holding time.

3.6.1 Non-Metals Analyses Methods for Soils

All soil samples submitted for non-metals analysis will be obtained from a 0-6 inch depth and will be analyzed by an approved laboratory for the following parameters: texture class and particle size, pH, saturation percent, EC in millimhos per centimeter (mmhos/cm), organic matter percent, nitrogen (NO_3), available phosphorus (P), and available potassium (K). The above parameters will be analyzed using U.S. Department of Agriculture (USDA) classification and test methods as described in the American Society of Agronomy (ASA)/Soil Science Society of America (SSSA) Monograph No. 9, Methods of Soil Analysis, Parts 1-2, most recent edition (ASA/SSSA, 1982, 1986). Approximately 500 to 800 grams of material will be collected in a single resealable (ZipLoc® type), quart-sized plastic bag (as described in Section 3.3.1 Steps 1-4, 7-8) and placed in a cooler with ice to maintain a 4-degrees Celsius (°C) temperature.

3.6.2 Cover Soil Analyses

All proposed cover soil sources must be approved by Atlantic Richfield and the Agencies prior to placement activities and the sources must meet Butte Hill Cover Soil specifications (EPA, 2006a). Cover soil approval requires submitting samples of the cover soil to an approved laboratory for analysis according to the conditions below.

- Three soil samples from the source site location will be submitted to the laboratory along with details on the area and depth to be excavated at the source site location.
- Each of the three soil samples will be analyzed by the approved laboratory for the following parameters to meet the requirements of the Butte Hill Cover Soil specifications:
    - Texture class and particle size.
    - pH.
    - Saturation percent.
    - EC in mmhos/cm.
    - Organic matter percent.
    - Nitrogen (NO_3), available phosphorus, and available potassium.
    - Analysis for soil metals parameters will include arsenic, cadmium, copper, lead, and zinc.

5.1.4 Laboratory Data Reporting Requirements

The laboratory will prepare hard copy data packages for transmittal of results. At a minimum, the data packages will include the case narrative, sample results, units, and QC sample results. Standard data packages will be transmitted to BSB within 14 days of laboratory sample receipt.

The laboratory will prepare electronic data packages for transmittal of results and associated QC information to Atlantic Richfield, or their designee, in general accordance with the EPA CLP SOW (EPA, 2016). Deviations from these specifications may be acceptable provided the report presents all the requested types of information in an organized, consistent and readily reviewable format.

An additional responsibility of the BSB Data Management Division Manager will be to determine whether the DQOs have been met and determine the data completeness for the project.

The data quality review, to determine if the data meet project-specific DQOs, will include verification of the following:

- Proper sample collection and handling procedures.
- Field QC results.
- Laboratory blank analysis.
- Detection limits.
- Laboratory duplicates.
- Laboratory data package.
- Data completeness and format
- Data qualifiers assigned by the laboratory.

Qualifiers that may be applied to the data include the following:

U The analyte was analyzed for but was not detected above the reporting limit.

J The analyte was positively identified; the associated numerical value is an estimate of the concentration of the analyte in the sample.

5.2 Data Validation

Analytical data will be validated by an independent third-party person not involved with the data generation or sample collection and the validation will follow EPA National Functional Guidelines (EPA, 2020). Level 2 validation packages will be provided at a rate of 1 data package per every 10 data packages received. Field data will be reviewed and validated using the Level A/B validation checklist (Attachment 3).

6.0 REFERENCES

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Figure 2. BPSOU Reclaimed Areas
Program Organization and Communication Structure