Response to Public Comments on

2020 Butte Area One Restoration Plan Amendment

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November 24, 2020

Response to Public Comments on

2020 Butte Area One Restoration Plan Amendment

Table of Contents

Section I. Introduction 3
Section II. Comment Summary and Response by Category 3
Category A. Revegetation—Clarification of Funding 3
Category B. Revegetation—Additional Funding 4
Category C. Stream Restoration—Funding Structure 5
Category D. Small Projects—Concurrence with proposed allocation 5
Category E. Butte Area One Site Background and Injury Overview Section 1.2.1 6
Category F. Citizens Technical Environmental Committee Comments 8
Appendix A. Public Comments
List of Comments
Public Comment Letters
Appendix B. Revised 2020 Amendment to the BAO Restoration Plan

Section I. Introduction

On October 5, 2020, the State of Montana, Department of Justice, Natural Resource Damage Program (NRDP), released for public comment a 2020 proposed amendment to the Butte Area One (BAO) Restoration Plan for public comment. This amendment would tier to prior amendments to the 2012 Butte Area One—Final Restoration Plan. Public comment on the draft document closed on November 5, 2020.

For outreach on this public comment period, NRDP sent notices of this opportunity for public comment to approximately 235 individuals/entities on its mailing list and issued a press release to the Montana Standard, Missoulian, Anaconda Leader, Silver State Post, Philipsburg Mail, and the Independent Record. NRDP received two comment letters—one from Butte Silver-Bow County (BSB), and another from the Environmental Protection Agency (EPA)—during the public comment period. See Appendix A for copies of these comment letters.

This document summarizes the comments received, with similar comments grouped together by category, and provides the responses organized by these categories. The comment letters included information that is addressed in multiple categories.

Section II. Comment Summary and Response by Category

Category A. Revegetation—Clarification of Funding

Comment: BSB indicated that Table 2 Waste Area Improvement/ Restoration Funding Summary did not accurately reflect the fund balance after the 2019 and 2020 amendments and as a result did not provide an accurate category fund balance.

> Response: NRDP agrees with BSB's analysis of Table 2 and will incorporate a revised table in the final 2020 BAO Amendment. Table 2 as shown in the October 5th draft amendment accurately provides the original allocation, effects of the 2019 amendment on the original allocation and where the proposed 5% reimbursement (ultimately a 15% reimbursement based on BNRC recommendation) would be allocated, but the table did not show the current budget balances for the four funded Ideas and the actual category balance as of fall 2020.
>
> BSB, Landscapes of Montana, and Montana Tech have all spent funds since 2013. NRDP proposes to revise Table 2 as shown below to include the 2020 balances for the funded Ideas as well as the impacts of the amendments on this category. The total funds remaining to be expended by BSB, Landscapes of Montana, and Montana Tech are approximately $1,978,905, not $3,144,559 as provided in the October 5th draft amendment.

Revised Table 2. Waste Area Improvement/Revegetation Funding Summary

Ideas	Original Allocation	2019 Amendment	2019 Balance	2020 Balance	2020 Balance Amendment Proposal
Butte Area One DCRP: soil amendment, placement, and seeding (100 acres)	$2,714,000	$1.8M to Parrot Project and $914,000 to MTech	$0.00	$0.00	$0.00
Butte-Silver Bow soil testing and placement, tree, and shrub planting	$2,080,000	$500,000 to Parrot Project	$1,024,559	$1,024,559	$1,024,559
Public idea #50, revegetate Parrot Mine area	$206,000	$0.00	$40,346	$40,346	$40,346
Public idea #56, Montana Tech forb and shrub project	$1,000,000	$0.00	$914,000 (from Soil Amendment Idea); $52,933	$914,000	$914,000
General Waste Area Improvement/Revegetation	$0.00	$0.00	$0.00	$0.00	15% of reimbursed funds
Total	**$6,000,000**	**$3,214,000**	**$2,031,838**	**$1,978,575**	**$1,978,575 (plus 15% of reimbursed funds)**

Category B. Revegetation—Additional Funding

Comment: BSB recommends increasing the reimbursement from the consent decree (CD) account for Waste Area Improvements/Restoration Funding from 5% to at least 15% of reimbursed funds.

Response:

The BNRC discussed this comment at their November 19, 2020 meeting and agreed to recommend an increase of the allocation of future reimbursements (should they occur) from 5% to 15%. Under this recommendation, the Upper SBC Corridor and Stream Restoration categories would both be reduced by 5%--to 30% and 35% of any reimbursement, respectively.

Comment: BSB requests the BNRC consider—to the extent reimbursed funds are not necessary and used for Upper Silver Bow Creek integrated waste removal—these funds be allocated to the Waste Area Improvements/Revegetation category.

Response: Since projects associated with Upper Silver Bow Creek integrated waste removal will likely not be completed for at least 5 years, NRDP recommends the allocation of unspent funding, regardless of category, be made in the future once projects are completed and project priorities are known.

The BNRC also discussed this BSB comment at the November 19, 2020 meeting. They agreed with NRDP's response and did not recommend dedication of unspent funds to the Waste Area Improvements/Revegetation category. When and if those funds are available, they can be allocated as most appropriate.

Category C. Stream Restoration—Funding Structure

Comment: *Stream Restoration*

"Stream restoration funds have the potential to positively impact area streams, in particular Blacktail Creek. It is Butte-Silver Bow's position that stream restoration projects upstream of Father Sheehan Park should be funded from the Aquatic and Terrestrial funds, and projects from Father Sheehan downstream to the confluence should be funded through the Butte Area One stream restoration allocation. There are many opportunities for stream restoration projects in this area including investments in stream rehabilitation from Lexington Avenue to Oregon Avenue and improvements to storm water outfalls to prevent non-BPSOU sediments from potentially contributing to metals loading or turbidity that impairs fish habitat among others." –BSB, November 5, 2020

Response: This comment proposes to amend where BAO Stream Restoration category funds can be spent within the Upper Silver Bow Creek corridor. The 2020 BAO Amendment does not propose to modify the BAO Restoration Plans Stream Restoration Category discussion, the 2019 BAO Amendment, or the Upper Clark Fork River Basin Aquatic and Terrestrial Resources Restoration Plans. NRDP does not recommend any revisions to the 2020 Amendment to address this comment. NRDP concurs there are many opportunities for stream restoration downstream of Father Sheehan Park, however, all portions of Blacktail Creek and Silver Bow Creek within the Butte Priority Soils Operable Unit (BPSOU) are being addressed in one form or another under remedial requirements detailed in the BPSOU CD. NRDP is committed to work with BP-AR during development of these remedial elements to learn if there are any opportunities to implement restoration above and beyond the remedial and end land use requirements.

Blacktail Creek and Basin Creek upstream of BPSOU (i.e., upstream of Lexington Avenue) have funding allocated from the 2019 BAO Amendment and the Upper Clark Fork River Basin Aquatic and Terrestrial Resources Restoration Plans. All these plans and amendments have the flexibility to coordinate funding to maximize the natural resource benefits to these creeks. It should be noted that parts of Blacktail and Basin Creeks fall within the Westside Soils OU, where EPA has yet to identify water quality-based remedial actions.

Category D. Small Projects—Concurrence with proposed allocation

Comment:

"*Butte-Silver Bow concurs with the recommendations to complete existing small projects, preserve approved funding for the Moulton Reservoir and Bonanza Dump projects, and to reallocate $50,000 of unallocated Small Project funds to the recreation category for Butte-Silver Bow Parks & Recreation's completion of trail planning in and around BAO. The latter allocation will allow Butte-Silver Bow the opportunity to determine the feasibility and understand obstacles to achieve broad connectivity across the trail segments throughout BAO*

and the Butte Hill. This work will ensure the various replacement projects made possible through NRDP investment serve our community and are sustained in the long term."

Response: BNRC and NRDP look forward to implementing these important projects in cooperation with BSB.

Category E. Butte Area One Site Background and Injury Overview Section 1.2.1

Comment: EPA's comments from Parrot CSM were not addressed and NRDP's conclusions in the CSM were inaccurate.

"*In August of 2020, EPA submitted comments on the Montana NRD Program's Draft Final Butte Area Parrot Performance Monitoring Program Conceptual Site Model Report dated May 2020. Many of the same findings and conclusions from that report are contained in the 2020 BAO Plan Amendment, and EPA's comments do not appear to have been addressed. The Environmental Protection Agency is re-submitting those comments, which are attached to this letter, for further consideration by the Montana NRD Program as it prepares a final 2020 BAO Plan Amendment*." –EPA, November 5, 2020

Response: This comment addresses the DRAFT FINAL - Butte Area One Parrot Performance Monitoring Program Conceptual Site Model Report (CSM Report) which was provided to EPA on July 1, 2020. NRDP has not finalized this report and is still reviewing comments on it and incorporating comments as appropriate.

To provide context for response to this comment, NRDP provides the following information. Although EPA and BP-AR in the past disagreed with the State (NRDP and DEQ) that contaminated groundwater is, and has been, discharging to and contaminating Blacktail and Silver Bow creeks' instream sediments and surface water—all parties agreed in the recently finalized BPSOU CD this contaminated groundwater pathway needs to be addressed by BP-AR within the BPSOU CD remedial framework.

EPA and BP-AR agreed in the BPSOU CD to capture additional contaminated groundwater that is not captured by the BPSOU subdrain and currently discharges to Blacktail Creek and the confluence area with Silver Bow Creek. BP-AR and EPA also agreed to capture all contaminated groundwater wherever it impacts surface water quality or instream sediments within the BPSOU—when it exceeds trigger values for surface water and instream sediments. Contaminated groundwater impacts to instream sediments and surface water can be seen at the Butte Reduction Works Smelter Site, which Silver Bow Creek runs through, and along Blacktail Creek. Both are areas that will be addressed under the remedy within the BPSOU CD.

The CSM report was based on two years of extensive groundwater, subdrain, and surface water data. The PMP monitoring plan, which is the basis of the CSM report includes 26 new critically located monitoring wells. These new monitoring wells and an extensive monitoring network specifically designed to quantify the groundwater quality leaving the Parrot site and the down-gradient flow regime, are essential to accurately determine the current flow regime and contaminant distribution. The two years (8 quarters) of data provide more than enough information to establish the baseline groundwater geochemical and hydrological conditions prior to the start of the waste removal from the Parrot site.

In conclusion, NRDP has reviewed and carefully considered the comments related to the conclusions in the report and determined that the comments do not provide a basis to change the conclusions in the CSM report. The conclusions and information in the report are based on actual measured site data and are scientifically defensible. NRDP will not substantively revise the conclusion that the Parrot is the primary source of historic mine waste contamination to the groundwater and that contaminated groundwater is discharging to and contaminating the creeks surface water and instream sediments. However, to address the comment, we have removed the restatement of parts of the CSM in Attachment A and have simply referenced the entire report instead. Please see the revised Attachment A to the 2020 BAO Amendment (Appendix B), which shows the revisions to Section 1.2.1 in redline.

Comment: BSB asserts conclusions from initial monitoring work at the Parrot Tailings site should not be included due to technical disagreement.

"*BSB has reviewed the information presented in Section 1.2.1: Butte Area One Background an Injury Overview Parrot Tailings Waste Removal Project and concurs with the proposed addition… However, there remains technical disagreement on interpretations of the first year of data, and given that disagreement, it seems premature to include the conclusions … at this time.*" –BSB, November 5, 2020

Response: NRDP has reviewed and carefully considered all technical and non-technical comments related to the conclusions in the CMS report and determined the comments do not fundamentally change the conclusions in the report. Simply put, not all contaminated waters are being captured by the subdrain and the Parrot Tailings remain the most significant source of contaminants in Upper Silver Bow Creek. However, as noted above, we have modified our language in the 2020 BAO Restoration Plan, Attachment A, section 1.2.1 Parrot Tailings to read:

Parrot Tailings Waste Removal Project

In 2015, the Governor, as trustee, determined it was appropriate to implement the Parrot Tailings Waste Removal Project ('Parrot Tailings Project'), which includes substantial mine waste removal and mine waste capping where appropriate. To support the development of the project, NRDP completed a data gap investigation and detailed design for the project. The data gap investigation was completed in 2015, and removal design activities were completed from 2016-2018. The first phase of waste removal was finished in December 2018. The second phase of waste removal and the construction of an evapotranspiration cover system is scheduled for completion in 2022-2023.

A Parrot Tailings Performance Monitoring Program (PMP) was developed and implemented by NRDP in 2017 to establish baseline groundwater conditions adjacent to and downgradient of the Parrot Tailings Project and monitor post-project groundwater conditions over time. That report is incorporated here by reference; the information and conclusions within this report are significant and the reader is directed to the DRAFT FINAL - Butte Area One Parrot Performance Monitoring Program Conceptual Site Model Report, which is available at https://dojmt.gov/lands/butte-area-one/

Category F. Citizens Technical Environmental Committee Comments

Comment: "*EPA also urges the Montana NRDP Program to consider and address the thoughtful comments on the Citizen's Environmental Technical Committee on the draft 2020 BAO Plan Amendment.*" –EPA, November 5, 2020

Response: CTEC did not submit comments on the draft 2020 BAO Plan Amendment, but did submit comments on October 27, 2020, on the DRAFT FINAL - Butte Area One Parrot Performance Monitoring Program Conceptual Site Model Report (CSM Report).

NRDP has not finalized this report and is still reviewing comments on it and incorporating them as appropriate. However, a number of the comments from CTEC recommend additional data collection and analysis of the Remedy components and contaminated groundwater fate and transport—along with its impacts to Blacktail and Silver Bow Creeks. We include these here.

The State is not responsible for the contaminated groundwater in the BPSOU alluvial aquifer, nor its documented impacts on Blacktail and Silver Bow Creek surface water and sediment quality. These are thoughtful recommendations from CTEC for additional data collection and analysis, and NRDP appreciates the work CTEC has put into these analyses. We believe they deserve to be delivered to the appropriate Superfund parties, as discussed below.

Contaminated groundwater within BPSOU is the responsibility of BP-AR, with EPA as the lead agency under Superfund. NRDP agrees and supports the following CTEC recommendations and appreciates EPA's acknowledgement of the importance of CTEC's comments. NRDP would like to reiterate its support for EPA requiring BP-AR to collect all the necessary and appropriate data and conduct the appropriate analyses requested by CTEC. For the public's understanding, NRDP will quote the specific recommendations CTEC provided to NRDP which relate to the remedy and not to proposed revisions to the CSM. The specific CTEC recommendations that NRDP supports include:

CTEC Recommendation 2.

> "*The analysis should include surface water contaminant concentrations and trends and discuss what this shows about the effectiveness of existing remedy elements.*
>
> *This recent surface water monitoring data should be used to present a contemporary analysis of contaminant concentrations and locations where contaminant loading to surface water are problematic. The report should also evaluate trends in surface water quality following installation and optimization of the subdrain, using the entire surface water quality dataset and discuss what that data demonstrates as to the effectiveness of existing remedy elements.*
>
> *The most recently published analysis regarding surface water compliance is now quite dated, EPA's 2008 to 2013 Surface Water Characterization Report (EPA 2017). In that report and EPA's Surface Water Technical Impracticability Evaluation Report (EPA 2019), EPA evaluates compliance with surface water standards and discusses improvements in compliance as various remedy contaminant controls have been implemented. Those EPA reports also discuss*

continuing contaminant issues which cause noncompliance with standards. Compliance data has not been compiled and reported for the last seven years. The NRDP report would greatly benefit from using the new data from PMP monitoring and other sources to evaluate trends in water quality using the recent and historical data."

CTEC Recommendation 6.

"*The source of high arsenic measured in wells near the lower part of the subdrain should be explained. Figure 22A shows the highest Arsenic concentrations in the UAU are located near the bottom of the subdrain in wells BPS07-21 and BPS07-23. Arsenic is 0.53 mg/L in well BPS07-21 which is significant. The cause of this area of high arsenic should be explained if data allows or the report should recommend additional analysis if warranted."*

CTEC Recommendation 7.

"*However, the current flow field in the MAU (figures 13B, 14B, 15B) indicate that contaminated groundwater in the MAU would not be flowing south in the Diggings East area. This discrepancy should be explained.*

There are also limited monitoring wells to characterize the southern boundary of these contaminant plumes. The southern side of the contaminant plumes are delineated by using data from a single monitoring well GS-31D (shown circled in attachment 1). It should be investigated whether well GS-31D is reflective of water quality over a significant area of the MAU. Additional monitoring wells in the area south and east of GS-31D would help to understand the southern extent of the Parrott plume and whether groundwater controls are needed in this area to intercept the plume."

CTEC Recommendation 9.

"*The evaluation of hydraulic properties for Blacktail and Silver Bow Creek needs to be expanded. The evaluation of hydraulic connection between the alluvial aquifer and Blacktail and Silver Bow Creeks would benefit from expanded field data. A better understanding of the time varying hydraulic connection between groundwater and surface water along the creek channels is needed.*

We recommend that several paired wells or nested piezometers, installed in a line perpendicular and adjacent to Blacktail and Silver Bow Creeks to provide high resolution piezometric cross-sections that would demonstrate hydraulic connectivity between the creeks and groundwater and hydraulic gradient in three dimensions. Gradients likely reverse seasonally during high stream stage periods. The piezometers should be installed at depths to compare hyporheic water pressure head to shallow alluvial groundwater. The nested wells data available currently is too highly focused on describing the difference in head between the UAU and MAU and as such is not as useful for describing where shallow groundwater interacts with the creeks and the temporal variability of that interaction. Piezometers should be instrumented with digital pressure transducers to provide a continuous record to show the seasonality of the hydraulic gradient.

These piezometers if installed will also be useful to evaluate the performance of hydraulic controls once the further remedial elements are constructed, although some may need to be removed and replace during removal and restoration of Blacktail Creek. We have made this recommendation to the CD remedial element design team as well."

CTEC Recommendation 14.

"*Given the complex heterogeneous character of the Upper Silver Bow Creek alluvial aquifer, as shown in the cross-sections in the report, the 2D potentiometric maps may not elucidate 3-dimensional components of groundwater flow and contaminant transport. Further evaluation of the 3D flow field is needed to better understand subdrain efficiency for capturing MAU water. The 3D flow field should be better resolved prior to remedy design of Further Remedial Element hydraulic controls and capture wells required by the CD."*

Appendix A

List of Comments

No.	Individual/Association	City/Area
1	Environmental Protection Agency (EPA)	Butte, MT
2	Butte Silver-Bow (BSB)	Butte, MT

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

Comment 1

Ref: 8MO

November 5, 2020

Montana Natural Resource Damage Program
1720 9th Avenue
Helena, MT 59620-1425

RE: Public Comment: BAO Restoration Plan 2020 Amendment

NRDP Representatives:

Thank you for providing the opportunity to comment on the draft Butte Area One Restoration Plan Amendment.

In August of 2020, EPA submitted comments on the Montana NRD Program's Draft Final Butte Area One Parrot Performance Monitoring Program Conceptual Site Model Report dated May 2020. Many of the same findings and conclusions from that report are contained in the 2020 BAO Plan Amendment, and EPA's comments do not appear to have been addressed. The Environmental Protection Agency is re-submitting those comments, which are attached to this letter, for further consideration by the Montana NRD Program as it prepares a final 2020 BAO Plan Amendment.

EPA also urges the Montana NRD Program to consider and address the thoughtful comments on the Citizen's Environmental Technical Committee on the draft 2020 BAO Plan Amendment.

Sincerely,
NIKIA GREENE
Digitally signed by NIKIA GREENE
Date: 2020.11.05 12:13:13 -07'00'

Nikia Greene
Remedial Project Manager
Butte Priority Soils Operable Unit

cc:
David Williams, CTEC
Joe Vranka, EPA
Henry Elsen, EPA
Betsy Smidinger, EPA
Aaron Urdiales, EPA
Daryl Reed, MDEQ
Jon Morgan, MDEQ
Jenny Chambers, MDEQ

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Ref: 8MO

August 4, 2020

Mr. Jim Ford
NRDP/DOJ
P.O. Box 201425
Helena, MT 59620-1425

Re: EPA comment letter for: NRDP's Draft Final Butte Area One Parrot Performance Monitoring Program Conceptual Site Model Report (dated May 2020)

Dear Jim:

The U. S. Environmental Protection Agency (EPA), is providing an initial response/comments to the Natural Resource Damage Program's (NRDP) *Draft Final Butte Area One Parrot Performance Monitoring Program Conceptual Site Model Report (dated May 2020).*

EPA notes that the issues raised by this document – including the effectiveness of the existing Butte Priority Soils Operable Unit (BPSOU) Subdrain and the potential need for improvements, the potential need for additional contaminated groundwater capture in the Butte Reduction Works and Blacktail Creek areas, and the required response to long term sediment and surface water monitoring showing the addition of mine waste contaminants to the BPSOU surface water and sediments – are all addressed in the proposed BPSOU Consent Decree (CD). EPA has received assurances from the State of Montana, including the NRDP, that the processes addressing these issues found in the proposed Consent Decree will be used by all parties to the CD, including the State of Montana, to examine and address these issues, if the CD is entered. If the CD is entered, the EPA is anxious to tackle these issues under those CD provisions, in cooperation with the NRDP and the Montana Department of Environmental Quality, as well as the Settling Defendants.

Following are general and specific comments on the draft report.

General Comments

General comment 1: EPA disagrees with most all conclusions of the report based on the fact that they are not adequately supported by data and analysis.

General comment 2: Although not specifically mentioned in the Work Plan, a mass flux analysis to determine the baseline mass discharge and mass centroid of the Parrot Plumes would be helpful for comparison of post-action data. Appendix F is a start at this effort, but the report's mass flux calculation

as currently presented is flawed because it is limited to a single cross-section.

General comment 3: The report makes a broad, general assumption on which to base much of the discussion: which is, the Parrot tailings are the only source of metals contamination in the area. Although a conclusion is that "*The Parrot Tailings are the most significant source of contamination…*", there is no quantification of any other sources, nor does it present any data or evaluation to support that conclusion. Additional sources are mentioned in Section 7.3.1, but the rest of the report makes little use of this information. It is important to distinguish between sources and plumes where possible since the purpose of the report is to provide a baseline of conditions prior to the Parrot Tailings removal, not the removal of these other sources. Revise as needed to delineate the Parrot tailings plumes. Specific delineation of the other various source areas and likely plume extents may or may not be necessary to delineate the Parrot tailings plumes, but they must at least be recognized and quantified to some extent.

General comment 4: The Work Plan specified that rare earth elements would be included in the groundwater and surface water analyses. These elements are also listed in Table 3 of the CSM report. An evaluation of these data may be useful for characterizing sources and plumes. The current use of pH and COC metals does not allow for discerning different sources and plumes. The rare earth elements may or may not be helpful, but an analysis should be conducted to determine if they are or are not.

General comment 5: The report does not make full use of the large amount of data and reports which have been prepared for the BPSOU Site. For instance, the conclusion that the subdrain is only capturing 24% of the copper and 28% of the zinc is based only on a flawed mass balance calculation that does not take into account attenuation. Conclusions should be based on multiple lines of evidence, not one or two pieces of information. The report should use data such as the pore water studies, surface water loading, groundwater concentrations near the subdrain, pumping test results, changes in pore water metals concentrations in response to storm events, local tailings sources, and changes to groundwater and surface water concentrations before and after installation of the subdrain in any revision to the report.

General comment 6: Conceptual Site Model Report was one of several reports to be completed as a part of the Butte Area One Parrot Performance Monitoring Program. The Parrot Tailings Waste Removal Performance Monitoring Work Plan (NRDP September 18, 2017) (Work Plan) includes the goal of the CSM as: "Develop a hydrogeological conceptual site model (CSM) that characterizes existing conditions and will be used to evaluate the effectiveness of removal." The QAPP attached to the Work Plan includes this Data Quality Objective: "Establish a hydrologic conceptual site model (CSM) that defines baseline conditions" The work plan further describes the content of the report:

"The primary focus of this effort will include, but is not limited to the following:

- Characterize the horizontal and vertical boundary conditions of the Summit Valley alluvial aquifer system within the corridor, and its important hydrologic features
- Delineate the Parrot Tailings plumes within the alluvial aquifer;
- Create a baseline of existing conditions from which performance can be evaluated;
- Characterize horizontal and vertical groundwater gradients;
- Establish accurate potentiometric surface maps and flow regimes;
- Establish statistical trend analysis of groundwater and surface water levels and quality; and
- Establish monitoring points and data visualization tools to evaluate Parrot removal effectiveness."

The CSM report does some of these things, but the conclusions of the report are focused solely on the effectiveness of the BPSOU subdrain, which is clearly not within the scope of the Work Plan. Regarding the seven bulleted topics of the CSM report listed above:

- The second bulleted topic was not adequately completed as it was incorrectly portrayed in the report that all contamination in the area was attributable to the Parrot tailings. Revise by delineating the plumes associated with the Parrot tailings.
- The sixth bullet was not limited to water levels, and trends of water quality were not addressed at all. A baseline report must present baseline conditions and often relies heavily on statistical summaries. Revise to address this bulleted requirement.
- Any commentary or information not related to the stated data quality objectives and goals are unnecessary and should be removed from the report.

Specific Comments

1. Executive Summary, Groundwater Characterization, page 3, 1st paragraph – This paragraph on the geochemical processes which result in elevated CoC concentrations in groundwater and the attenuation which occurs down-gradient is overly simplistic, misleading, and in some areas inaccurate. For instance, the word "super-saturated" is misused in the sentence "When the impacted groundwater encounters this environment, super-saturated contaminants in the groundwater precipitate out in the alluvial pores or adhere to fine grained materials in the alluvial aquifer." Contaminants cannot be supersaturated. Supersaturation refers to minerals. What minerals are supersaturated? What metals adsorb to sediment and which form minerals? Refer to the EPA *Groundwater/Surface Water Interaction Report* (Section 6) and AR's *2015 Metro Storm Drain Geochemistry Report Technical Memorandum* for a comprehensive description of the CoC fate and transport at the site. Understanding the fate and transport mechanisms is important when characterizing the plumes.
2. Executive Summary, Groundwater Characterization, page 3, 2nd paragraph – The sentence "The PMP data defines a contaminated groundwater plume that extends from the Parrot Tailings Site west/southwest and intersects with Silver Bow Creek and Blacktail Creek." is unsupported by data and does not comply with the bulleted requirement in the Work Plan to "Delineate the Parrot Tailings plumes within the alluvial aquifer". There is no evidence that the Parrot plumes intersect with surface water. This sentence should be deleted from the document.
3. Executive Summary, page 4, 1st Full Paragraph, 1st sentence – The report should either provide the evidence for the statement "…deeper groundwater flow in the middle alluvial aquifer (MAU) appears to bypass the Subdrain" or delete the sentence.
4. Executive Summary, page 4, 1st Full Paragraph, last sentence – The report provides no evidence to support statements that Parrot groundwater discharges to surface water and sediment. The EPA's pore water study (BPSOU Groundwater and Surface Water Interaction Report, EPA, December 12, 2018) and NRD's pore water sampling (Data Gap Investigation – Silver Bow Creek and Blacktail Creek Corridors, NRDP, July 21, 2016) , both conducted in 2016, do not support this conclusion. The report should either discuss the pore water studies as evidence of local sources or delete this paragraph entirely.

5. Executive Summary, pages 4 and 5; Tables ES-1 and ES-2: The discussion of "*collection efficiency*" relies on comparison of mass flux at cross-section F-F' to the mass load collected in the subdrain. This comparison ignores attenuation of contaminants which is likely the largest influence on the fate of metals in the aquifer. The mass balance cannot be logically discussed without this essential factor. This section is written to imply that the plume is largely not being collected by the subdrain. A more accurate prediction of groundwater capture should be performed using conservative parameters. Actually, the plume is being attenuated and this is the largest fate of the contaminants. Discharge to surface water should not be implied as there is no evidence in support of this fate. In addition, if 76% of the copper is bypassing the subdrain and passing into the stream, why is the mass flux not showing up in the stream along a broad reach of the stream as would be expected for a distant source such as the Parrot? The EPA Groundwater/Surface Water Interaction Report contains a pore water study and includes both banks of Silver Bow Creek and Blacktail Creek. Each of the locations where CoCs are present in important concentrations can be tied to a known local source. The report should be revised to include the pore water study results when formulating your interpretation.
6. Executive Summary, Table ES-2 – The table does not present a mass balance and should be renamed. The report should also provide an explanation for the different flow rates for each metal.
7. Executive Summary, page 4, last paragraph and Table ES-3 – This paragraph and table omit the most important fate of the contaminants: attenuation in the aquifer. With this omission, a reader may jump to the conclusion that 70% of the contamination is somehow escaping, perhaps discharging to surface water. This omission is a fatal flaw of this analysis and is misleading. This flawed analysis should be deleted as it is incorrect and out of scope of the Work Plan.
8. Executive Summary, conclusions, page 5: See the comments on Section 8. EPA recommends that the conclusions section in the executive summary be deleted.
9. Section 1, page 1, second paragraph – Replace the first sentence of this paragraph with the actual goal or objective of the CSM as presented in the Work Plan and its QAPP. Presenting the correct goal or objective in the introduction helps to set the stage for the report. Use either: "Develop a hydrogeological conceptual site model (CSM) that characterizes existing conditions and will be used to evaluate the effectiveness of removal." or "Establish a hydrologic conceptual site model (CSM) that defines baseline conditions" as the first sentence.
10. Section 1, page 1: EPA has not been provided with the quarterly data reports and requests them from NRDP, including any more recent reports.
11. Section 1, pages 1 and 2 – According to Section 5.1, Phase IIA was completed in December 2018. It does not describe when construction began, but this is vital information for a baseline data report that is intended to provide data collected prior to conducting the removal action. Based on the NRDP Parrot Tailings Waste Removal Project Update Issue #2, September 2018, construction started August 7, 2018. On this basis, the October 2018 and January 2019 data do not represent baseline conditions and should not be included in the baseline CSM report.
12. Section 2.6, page 6: The aquifer test data were also analyzed by Pioneer Technical Service, on behalf of the Atlantic Richfield Company, in an extensive report (2010 Metro Storm Drain (MSD) Mid-Level Aquifer Pumping Test Technical Memorandum, December 8, 2010), and reviewed by EPA. A common result was that the derived transmissivity increased with distance from the pumping well. EPA believes that this is an artifact of the analysis and not a physical phenomenon. According to EPA review transmissivity appears to increase with distance from the pumped well. One possible explanation is that the two solutions assume an underlying aquiclude while the actual condition was

an underlying aquitard. This is expected to overestimate transmissivity and the error may be greater at greater distances." Additionally, the transmissivity values derived in EPA's review for each well were lower than those derived by MBMG or Pioneer in nearly all cases (see Pioneer report for the comparison). Based on these two factors, the transmissivity values are likely biased high, and the range should use lower values. EPA recommends 3,500 ft^2/day for the middle gravel unit near the Civic Center until additional data or analysis is presented. Atlantic Richfield will be conducting additional aquifer tests in the coming months and the results are expected to be useful for further characterization of the aquifer.

13. Section 2.7, Page 7, second paragraph – The structure formerly known as the "Metro Storm Drain" was a Works Progress Administration (WPA) project which was planned and slated to be implemented in the winter of 1938-39. The project was designed to be a permanent solution to the seasonal flooding and blockage of sewer outlets which took place due to the very high sediment load in the creek (mainly tailings) (Montana Standard, Sep 13, 1938, Page 14). The project involved not only straightening of the creek to increase stream velocity and the ability of the stream to carry sediment, but also concrete lining of the channel to prevent erosion. The report text should be revised to accurately represent historical information.
14. Section 3.0, Page 8, 1st full paragraph – The report should use consistent units (ppb vs µg/L).
15. Section 4.2, pg. 13, last paragraph in section – The statement that in the Groundwater Surface Water Interaction Report (Report) "A number of hypotheses are put forth, but none are conclusive or fully supported" is incorrect. The Report and its conclusions and findings are based on multiple lines of evidence, including an extensive pore water study on both banks of Silver Bow and Blacktail Creeks, surface water metals loading data, comparison of total vs dissolved metals concentrations, batch studies, electron microprobe analyses of the stream sediment, geochemical modeling, groundwater analyses, seasonal trends in surface water quality, and more. Each and every piece of information was used to develop the geochemical interpretation in Section 6 of the Report. The hypotheses introduced at the beginning of the Report were abandoned based on the data. The Report presented an interpretation to explain the large amount of data and did not present "hypotheses." Hypotheses are interpretations made on very limited data as a starting point for an investigation. The Groundwater and Surface Water Interaction Report made interpretations based on a large amount of data. Disagreeing with the interpretations found in the Report is fine and we welcome your interpretations for further discussion, but saying the interpretation presented in the Report is "not fully supported" is incorrect and misleading. Either present your interpretation of the data presented in the groundwater/surface water study or delete this sentence.
16. Section 6.4, page 21 – As previously commented, construction began in August 2018 and any data collected after this data is not baseline data and does not belong in the baseline CSM report. This section should be revised accordingly.
17. Section 7.2, page 25 – There are no results presented in this report or the data summary report dated July 2020 that have a copper concentration of 3%. NRDP should provide the data or revise this section to match the data presented in the CSM report.
18. Section 7.3.2: Resuspension is a surface water phenomenon but is insignificant in groundwater due to very low flow velocities. Dissolution and desorption are critically important mechanisms that need to be recognized. This section should be revise accordingly.
19. Section 7.3.2: Secondary sources of groundwater contamination include, CoC-bearing iron oxyhydroxide, zinc/copper phyllosilicates, copper-bearing manganese oxides, and adsorbed

cadmium. Refer to AR's *2015 Metro Storm Drain Geochemistry Report Technical Memorandum* for a list of secondary sources to groundwater.

20. Section 7.4.1, page 27 – Tributaries do exist in this reach and provide some input; however, groundwater gain is still evident. This section should be revised for accuracy.
21. Section 7.5.2, page 31-32: There is more than one source of contamination and more than one plume (e.g., Diggings East plume, Northside Tailings plume, etc.) of very similar composition. The stiff diagram analysis does not contain sufficient information to discern the different plumes or combinations of plumes. A "characteristic calcium/sulfate shift of the Parrot Tailings plume" is not limited to the Parrot tailings plume but is characteristic of nearly any sulfide oxidation plume. While the stiff diagram analysis is worth looking at, there is nothing conclusive that can't be derived from a single constituent analysis such as sulfate or copper. This analysis might have value if used with constituents not directly related to the contaminant plume or controlled by pH. This section should be revised to remove any conclusions or statements of plume or source based on the stiff diagram analysis.
22. Section 7.5.2, page 32: What is meant by "…higher percentage of contaminants…"? None of the wells have contaminants in groundwater measured in the percentage range.
23. Section 7.5.2, page 32: What is meant by "Stiff diagrams for this cross-section indicate lower meq/L percentages of the major minerals…"? Piper diagrams use percentages, but stiff diagrams use concentrations.
24. Section 7.5.2, page 32: The sentence "BPS07-23 is located several hundred feet downgradient of the end of the subdrain and may indicate bypass groundwater that does not get collected." is unsupported and should be removed from the document. This well is located in an area containing tailings and the groundwater contamination there likely represents contamination from the local tailings source.
25. Section 7.5.2, page 32: The sentence "AMW-13A may represent a preferential flow path of contaminated groundwater near Blacktail Creek." is unsupported and should be removed from the document. This well is located in an area containing tailings and the groundwater contamination that most likely is from the local tailings source.
26. Section 7.5.2, page 32: The statement "…the organic silt/clay layer that is continuous throughout this portion of the basin." is not accurate. Replace "continuous" with "common".
27. Section 7.5.2, page 32 and Figure 12: This figure and discussion lacks data from GS-11R, GS-09R, and GS-08R. These wells indicate worse water quality in the shallow aquifer instead of the middle aquifer which illustrates that more than one plume is responsible for the distribution of contamination in the groundwater. These data should be included, and the figure and discussion revised accordingly.
28. Section 7.5.2, page 32, and Table 1: What is the basis for categorizing BPS11-11A1 and PMP-08A as being completed in a perched aquifer? What is the implication of this category?
29. Section 7.5.3, page 35: There is no evidence of mounding near the subdrain. Flow monitoring in the subdrain shows gaining flow throughout its length indicating that water flows to the subdrain, not away from the subdrain. Clearly, water elevations increase prior to jetting, but this is not mounding or evidence of lack of inflow. "Mounding conditions" should be changed to "increases in groundwater levels" to accurately reflect the data.

30. Section 7.5.3, page 35: Delete the sentence "When this occurs, contaminated water is not being effectively captured." No capture analysis has been presented and insufficient data are discussed to conclude that the capture is not effective.
31. Section 7.5.3, page 36: The statements "Groundwater flow parallel to the subdrain, that may not be captured by the subdrain, is indicated on MAU maps and to a limited extent on the UAU maps", and "The bypass is particularly noticeable on both sides of Lexington Avenue, north of the interstate in the MAU." are largely based on the 5450 contour on three figures which is drawn incorrectly. See the comments on Figures 13B, 14B, and 15B. With the contours corrected, the figures indicate that groundwater flows toward the subdrain in the area nears the subdrain alignment and gradually becomes less influenced by the subdrain and flows parallel to Blacktail Creek farther away from the subdrain. The importance of which water may be captured, and which may not be captured, is controlled by the metals concentrations in the groundwater. It appears that the groundwater with the highest metals concentration flows toward the subdrain while groundwater with the lowest concentrations flows parallel. The statement regarding bypass should be deleted or edited to reflect correct contours and the importance of metals concentrations.
32. Section 7.5.4, pages 38 through 40: This section focuses on the contaminant plume emanating from the Parrot tailings area but should also recognize other sources that are evident including the Diggings East and Northside Tailings areas which affect the shallow aquifer. The Diggings East plume is clearly evident on Figures 17A, 18A, 19A, 20A, and 21A being centered around GS-11 and extending southwest. The Northside Tailings plume is not distinct on these figures except on Figure 18A but is evident on historical isoconcentrations maps. These other sources should be included in the descriptions in this section.
33. Section 7.5.4, page 38, pH: See the comment on Figure 16A. The statement "…while another follows the subdrain, southwest of the Parrot Tailings Site and moves out into the aquifer east of Lexington Avenue, possibly defining another contaminant flow path." is contrary to the corrected potentiometric contours to be shown on revised Figures 13A, 14A, and 15A which do not indicate a direction of flow to the south. This statement should be revised to note the configuration of pH values, but without the description of a flow path not supported by the hydrologic data.
34. Section 7.5.4, page 40: The statement "…highly contaminated groundwater originating from the Parrot Tailings Site has migrated southwest in a multi-contaminant plume that have traveled to and intersect with Silver Bow Creek and Blacktail Creek." is speculative and unsupported by the data presented in the report. Primarily, the report ignores the several other sources and overlapping plumes in the area including plumes associated with the Diggings East, the Northside Tailings, the streamside tailings at the Visitor's Center, the relict plume south of the Parrot Smelter (MBMG theory), etc; as well as the role that attenuation plays in the fate and transport of the groundwater contamination. Delete this sentence from the report. The summary section must recognize the multiple sources and multiple overlapping plumes of similar composition and the associated uncertainty with defining plume extents resulting from distinct sources.
35. Section 7.5.5, page 41: While the piper diagrams are worth looking at, they are dominated by the concentrations of sulfate which is a measure of the contamination at each location. This analysis might have value if limited to constituents not directly related to the contaminant plume or controlled by pH. The statement "…has chemistry very similar to that in Blacktail Creek." is to be expected given that the watershed including and upstream of BPSOU is dominated by the Butte Granite and most wells have a similar common ion composition. This similarly is not proof of and

should not be used to imply that water from the Parrot tailings area flows to and/or is measurable in in Blacktail Creek. The hydrology is a better indicator than the common in chemistry. This should be corrected and revised accordingly.

36. Section 7.5.5, page 41: "Groundwater geochemistry" should include much more than a discussion of Piper and Stiff diagrams. So much has been written on groundwater geochemistry that is not mentioned in the NRDP report. For instance, AR prepared a very detailed Geochemistry Report (Draft Final Revised Metro Storm Drain Geochemistry Report Technical Memorandum , Atlantic Richfield, September 24, 2015) which is based on a huge amount of data, including over 400 batches, column studies, electron microprobe analyses, soil properties, groundwater analyses, etc. Evaluations should include a summary of the previous report findings either here or in Section 4.
37. Section 7.5.6, page 42: The statement "…copper and zinc are assumed to be conservative solutes…" is an incorrect assumption and negates the basis for the entire analysis. The report should be revised to recognize that these metals are not conservative solutes.
38. Section 7.5.6, page 42: Appendix F does not contain a description of a mass balance methodology. Appendix F presents the mass flux at one cross-section. See the comments on Appendix F.
39. Table 7-2: For accuracy, The title should be changed to "*Mass Flux for Copper and Zinc at PMP Cross-Section B-B'*"
40. Section 8.0, pages 43 to 44: The NRDP Work Plan describes the goal and contents of the Conceptual Site Model report and this draft accomplishes this goal by presentation of baseline data prior to initiation of the Phase 1 Parrot removal. However, the report strays beyond the Work Plan by presenting analyses on fate of contaminants from the Parrot tailings. This was not the stated goal of the report and detracts from the presentation of baseline data. Overall, the report would be much improved if it met the goal of the Work Plan by presenting baseline data and nothing more. Additionally, EPA is advising NRDP to consider and/or use other/all pertinent historic data when determining a baseline and/or interpreting the groundwater plumes rather than limiting the data set to only those data that support the state's desired conclusions.

    Most of this section is not required by the Work Plan. The specific goal as stated in the Work Plan was "Develop a hydrogeological conceptual site model (CSM) that characterizes existing conditions and will be used to evaluate the effectiveness of the removal." The Work Plan reiterated "In order to properly evaluate performance of waste removal, the formulation of a hydrogeological Conceptual Site Model (CSM) will for a baseline characterization of existing conditions, and model for comparative purposes." Although this is presented in the early sections of the report, Section 8 has a focus on "…the conclusion that the most significant source of contamination in the study area is the Parrot Tailings." This was not a goal of the CSM per the Work Plan and the CSM should be limited to that goal since there is no data presented to support that conclusion. Section 8 should be deleted in its entirety as it is inconsistent with the stated goal.

    Although this section should be deleted, the following comments are presented to demonstrate the inaccuracy or misleading nature of the content in Section 8.

41. Section 8, page 43, first paragraph – This entire paragraph is an incorrect interpretation of the data and does not support many of the statements made. Examples include:

    "In Section 7.5.4, groundwater chemistry data define the contaminant impacts to groundwater from

the Parrot Tailings and show less contaminated groundwater both upgradient and downgradient of the Parrot Tailings and with depth in the aquifer, indicating the Parrot Tailings as the source." There are clearly several sources in the area including, but not limited to plumes associated with the Northside Tailings, the Diggings East tailings, the Blacktail berm area, the WL-12 area, the streamside tailings at the Visitor's Center, the streamside tailings at the confluence of Silver Bow Creek and Blacktail Creek, etc. These multiple sources have each produced contaminated groundwater that is very similar in composition due to similarity in sources of the waste. This is not a line of evidence in support of indicating Parrot tailings as the source of the entire plume.

The statement "Multiple contaminant plume maps for discrete monitoring periods trace the plume migration down basin." ignores sources and associated plumes not associated with the Parrot tailings. The situation is much more complex than is portrayed as a single source and single plume. This is a critical omission which overstates the importance of the Parrot tailings plumes at the site.

"Section 7.5.5 illustrates that the monitoring wells near the Parrot Tailings show a characteristic calcium/sulfate "shift," which dissipates with distant both laterally and in depth below the Parrot Tailings, again indicating the Parrot Tailings as the source of the plume." Again, this ignores other sources and overstates the Parrot tailings as a source. The "characteristic calcium/sulfate shift" is not unique to the Parrot tailings but is typical of many plumes where the source materials contain sulfide minerals. This cannot be used to identify the Parrot tailings as the source for the entire area.

"Additionally, groundwater potentiometric maps in the UAU and MAU indicate flow paths that bypass the Subdrain…" The subdrain does not capture all groundwater. Flow lines that appear to not be captured include groundwater that is low in metals concentrations that need not be captured. The statement regarding bypass of the subdrain is misleading. The subdrain does not, and was not intended to, collect the entre aquifer; bypass is by design. The goal of the subdrain is to collect contaminated groundwater at a sufficient rate to meet surface water quality standards. It was never intended to collect all water or all contaminated groundwater.

"…Piper diagrams further identify a flow path in the MAU from the Parrot Tailings that bypasses the Subdrain." The piper diagrams are not diagnostic of the Parrot plume and cannot be used to delineate any single plume.

42. Section 8.0, page 43, 1st paragraph in section: The analysis performed in Section 7, which is referred to here (i.e. Stiff and Piper diagrams) is way too simplistic to draw any conclusions. Much more sophisticated groundwater and surface water "fingerprinting" has been attempted by AR with only limited success. The reference should be deleted to section 7 in support of the Parrot plume extending down-basin.
43. Section 8, page 43, first bullet: The first sentence is unsubstantiated because no sources other than the Parrot tailings were considered, evaluated, or even recognized. While the highest concentration of some metals occurs within the Parrot tailings area, "significance" has not been defined. Is this measured by loading? By concentrations? This sentence draws a conclusion without analysis to support it. This conclusion should be modified and limited to what is supported by the analysis presented. The second sentence indicates that the plume is advancing toward the creeks but provides no evidence presented to support this. The various plumes in the area seem to be stable and not migrating or advancing. This sentence should be modified to reflect only what is supported by the analysis presented in the report. The third sentence is vague and seems to be based on the incorrect

conclusion the only one plume is present. This bulleted text should be deleted or supported with evidence.

44. Section 8, page 43, second bullet: This paragraph is flawed by comparing a flux calculation at one cross-section to the load being captured in the subdrain and concluding that some is not captured and discharges to surface water. Attenuation of contaminants in the aquifer is a fundamental element of any contaminant plume analysis and this analysis was omitted, resulting in a flawed analysis. No data or analysis are presented to support discharge of metals to surface water. The Parrot Tailings Removal PMP Work Plan included surface water stations on Blacktail Creek. Analysis of these data could add information regarding loading to surface water, but no analysis or data are provided. Unless further data and analysis are included or referenced, the conclusions in this bullet item regarding discharge to surface water are unsupported and should be deleted or revised. The other part of this conclusion regarding attenuation is an essential part of characterization and should be emphasized. Refer to the geochemistry report for descriptions of the processes involved in attenuation in this aquifer.
45. Section 8, page 44, third bullet in this section: The surface water groundwater interaction report (BPSOU Groundwater and Surface Water Interaction Report, EPA, December 12, 2018) discussed contaminant loading from groundwater to surface water extensively; - far more than the NRDP and MBMG reports. Refer to this report for a better description. An important conclusion was that the source of metals was far more likely to be local than distant. Delete or revise this paragraph accordingly.
46. Section 8, page 44, fourth bullet in this section: Nothing in the document addresses plume migration. Other evaluations of groundwater data have indicated that the plume is stable with metals concentrations in most wells displaying a lack of trends. Delete the phrase ", while increasing groundwater plume migration" or delete the entire bulleted text.
47. Section 8, page 44, fifth bullet in this section: No data or analysis in this report supports a pathway from the Parrot tailings area to Blacktail Creek. The groundwater contours include apparent pathways from the Parrot tailings area toward the subdrain. Review Figure 20B for isoconcentration lines which clearly indicate a flow path from the Parrot tailings area to Diggings East area and terminating at the pump vault. Although this may include multiple sources, it delineates a pathway to the subdrain and not to Blacktail Creek. This conclusion is not supported and should be deleted.
48. Section 8, page 44, seventh bullet in this section: No data are presented regarding capture of contamination in this well. The only information provided is regarding an apparent hydraulic connection between the pumping well and a monitoring well. According to the most recently available data, this irrigation well has concentrations of arsenic, cadmium, copper, lead and zinc below DEQ-7 human health standards and federal MCLs. Therefore, there is no concern over exposure to this water. Revise or delete this bulleted text.
49. Figure 13A: Contour 5445 should be closer to AMW-13A than to BPS11-19A2. The 5440 contour should be a closed loop around MH-MSD106 and should be corrected.
50. Figure 13B: While there are a number of ways to contour data, simplest is usually the best. The 5450 contour has a large lobe extending west with no apparent data controlling its placement. Based on the data presented on the Figure, the contour should be an arc running roughly north-south. The 5460 contour seems to have some unnecessary and unsupported sinuosity. The data support a simpler arc shape. If additional data are available to support the configurations, this should be added to the map; otherwise, the contours should be simplified.

51. Figure 14A: The 5440 contour should be a closed loop around MH-MSD106 and should be corrected.
52. Figure 14B: The 5450 contour is unsupported by data and should be simplified.
53. Figure 15A: The 5440 contour should be a closed loop around MH-MSD106 and should be corrected.
54. Figure 15B: The 5450 contour is unsupported by data and should be simplified. The south end of the 5445 contour should be much closer to AMW-13B3. The north end of the 5445 contour should be south of PMP-09B. These should be corrected.
55. Figure 16A: The 6.0 contour should stop after GS-11R and the isolated value at BT-98-02 can be enclosed with an island loop and should be revised. BS07-22 was damaged in 2011 and is not routinely sampled. Older data indicate that the pH is normally between 6 and 7 s.u. The low pH value reported for this well needs to be checked.
56. Figures 13A through 16C: The data shown on these figures should also be presented in a data table. Add a table or reference where it can be found.
57. Figure 17A: The 3000 contour should be limited to the Parrot area and not extend downstream. The isolated values over 3000 at PMP-05A and MH-MSD116 can be left uncontoured at this scale. This figure should be revised accordingly.
58. Figure 19A: In the northeast corner, move the 10 contour to encompass AMW-20.
59. Figure 22A: Simple is best. Remove the unsupported long lobe extending to BPS07-01A and draw an isolated loop instead.
60. Figure 22B: Simple is best. Remove the unsupported long lobe extending to BPS07-01B and draw an isolated loop instead.
61. Figure 22C: There are not enough data to develop contours. Accordingly, all contours should be removed from this figure.
62. Appendix E: None of the links work. Working links should to the files.
63. Appendix F Mass Balance Summary: This appendix does not present a mass balance and should be renamed to Mass Flux Summary at Cross-Section F-F'. This analysis relies on average aquifer parameters from the MBMG report which includes wells from the Parrot tailings area to Columbus Plaza. The aquifer test data were also analyzed by Pioneer Technical Services, on behalf of AR, in an extensive report, and EPA, in a brief memo. One result common to all reports was that the derived transmissivity increased with distance from the pumping well. EPA feels that this is an artifact of the analysis and not a physical phenomenon. According to the EPA memo, "*One possible explanation is that the two solutions assume an underlying aquiclude while the actual condition was an underlying aquitard. This is expected to overestimate transmissivity and the error may be greater at greater distances.*" Additionally, the transmissivity values derived by EPA for each well were lower than those derived by MBMG or Pioneer in nearly all cases (see Pioneer Technical Service's report for the comparison). Based on these two factors, the transmissivity values used in this memo are likely biased high and the memo should be revised to include a range including lower values.
64. Appendix F: This appendix refers to a transmissivity obtained from an "AR Report" but does not include such a report in a references section or in the list of primary sources presented in the second paragraph of the appendix. The EPA memo on the 2011 aquifer test used a water table aquifer transmissivity of 333 ft^2/day. This is based on a geometric mean of four observation well results for an aquifer test at PW-02 presented on Table 1 of Appendix B7 of the BPSOU Phase 2 Remedial Investigation Report. The single well test at PW-01 produced a very low transmissivity value and

was considered to be unrepresentative of the upper part of the alluvium. Appendix F should provide the basis for the shallow aquifer transmissivity or use 333 ft²/day based on the aquifer test at PW-02.

One flux calculation was spot-checked by using the MassFluxToolKit and entering a hydraulic conductivity of 233 ft/day based on a transmissivity of 3,500 ft²/day and the concentrations at wells as presented on Figure A-2. The MassFluxToolKit generated a mass flux of 23 lb./day which is less than that presented in the Appendix reflecting the difference in transmissivity. It is anticipated that if the calculations in Appendix A were completed using the lower transmissivity values, a similar mass flux would be calculated.

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

Sincerely,

NIKIA GREENE Digitally signed by NIKIA GREENE Date: 2020.08.04 17:20:05 -06'00'

Nikia Greene
Remedial Project Manager

cc: (email only)
BNRC Board
Media
CTEC
BSB Commissioners
AR Stakeholders
BSB Stakeholders
State Stakeholders
Interested Community

THE CITY-COUNTY OF
Butte-Silver Bow

November 5, 2020

Ray Vinkey, Environmental Science Specialist
Butte Natural Resource Damage Program
65 E. Broadway
Butte, MT 59701

RE: Butte-Silver Bow Comments Butte Area One Restoration Plan 2020 Amendments

Dear Mr. Vinkey,

On behalf of the City and County of Butte-Silver Bow Public Works, Parks & Recreation, Community Development and Superfund Departments, we present the following comments on the Natural Resource Damage Program's *Butte Area One Restoration Plan 2020 Amendments.* We appreciate the opportunity to present these comments.

The proposed amendments to the Butte Area One Plan are important in the context of the recently approved Butte Priority Soils Operable Unit Consent Decree which is a long-awaited milestone to complete the final remedial work necessary in Butte. The proposed BAO Amendments support the long-term goal of complementing remedial activities with critical restoration investments in the Silver Bow and Blacktail Creek tributaries of the Upper Clark Fork River.

Butte-Silver Bow is excited to move past the decision-making process and into the implementation phase to complete projects that will achieve restoration goals for Butte Area One and the headwaters in Butte. The following comments concentrate on opportunities for integrating restoration with remedial work, restoring reaches of stream throughout BAO, connecting the many replacement projects NRDP funds have made possible, and supporting the long-term maintenance of these investments.

Waste Area Improvement/Revegetation Funding Summary
Since BNRC first granted funds to Butte-Silver Bow for revegetation projects to mitigate stormwater impacts to Silver Bow Creek, Butte-Silver Bow has worked to develop a program that integrates restoration initiatives with the remedial maintenance performed across the Butte Hill. Through collaboration with the Montana Tech Restoration Ecology Program led by Dr. Robert Pal our programs have successfully integrated restoration planting techniques with remedial work to enhance native plant survival and mitigate erosion. The Scrap H Road remedial and restoration project in Walkerville is an excellent example of integrating restoration planting techniques such as the "rough and loose" soil placement strategy to capture stormwater and support native plant survival. Innovations such as this would not be possible without BAO Waste Area Improvement and Revegetation Funding. As we move forward with further work on the Hill, BAO funding for similar projects will be critical to achieving restoration goals in lockstep with remedial activity.

BSB has analyzed *Table 2. Waste Area Improvement/Restoration Funding Summary* of the BAO 2020 Amendment. This summary lists the four projects dedicated to vegetation enhancement across the Butte Hill. The category was originally funded with $6M and in 2019 $2.3M was transferred to the Parrot Project. Table 2 indicates $3.1M is available for future vegetation enhancement projects, which reflects

the approximately $555,000 of expenditures made by the BSB Tree Program since 2012. However, Table 2 does not reflect the expenditures of approximately $1,206,000 associated with Public Idea No. 50, Norm DeNeal's planting effort, or Public Idea No. 56, the Montana Tech Native Plant project. Once those spent funds are deducted, there is $1,938,559 for future Waste Area Improvements and Revegetation investments. This amount coupled with potentially 5% of the reimbursed funds from the CD account (estimated at $270,000) would leave just over $2M for vegetation enhancement in perpetuity. However, based on the results, experience and expenditures for the first eight years of projects in this BAO funding category, the amount will likely be insufficient to sustain efforts and achieve restoration goals commensurate with remedial investments over the next 100 years.

For this reason, Butte-Silver Bow recommends increasing the reimbursement from the CD account for Waste Area Improvements/Restoration Funding from 5% to at least 15% of reimbursed funds. And, to the extent reimbursed funds are not necessary and used for Upper Silver Bow Creek integrated waste removal, Butte-Silver Bow requests BNRC consider allocating remaining funds to the Waste Area Improvement and Revegetation category as well. Montana Tech and Butte-Silver Bow have initiated a successful collaborative effort and these funds could support the continuation of restoration initiatives as cleanup takes place on the Butte Hill and in the riparian zones of Silver Bow and Blacktail Creek.

Stream Restoration

Stream restoration funds have the potential to positively impact area streams, in particular Blacktail Creek. It is Butte-Silver Bow's position that stream restoration projects upstream of Father Sheehan Park should be funded from the Aquatic and Terrestrial funds, and projects from Father Sheehan downstream to the confluence should be funded through the Butte Area One stream restoration allocation. There are many opportunities for stream restoration projects in this area including investments in stream rehabilitation from Lexington Avenue to Oregon Avenue and improvements to stormwater outfalls to prevent non-BPSOU sediments from potentially contributing to metals loading or turbidity that impairs fish habitat among others.

Small Projects

Butte-Silver Bow concurs with the recommendations to complete existing small projects, preserve approved funding for the Moulton Reservoir and Bonanza Dump projects, and to reallocate $50,000 of unallocated Small Project funds to the recreation category for Butte-Silver Bow Parks & Recreation's completion of trail planning in and around BAO. The latter allocation will allow Butte-Silver Bow the opportunity to determine the feasibility and understand obstacles to achieve broad connectivity across the trail segments throughout BAO and the Butte Hill. This work will ensure the various replacement projects made possible through NRDP investment serve our community and are sustained in the long term.

Administrative

BSB has reviewed the information presented in *Section 1.2.1: Butte Area One Background an Injury Overview Parrot Tailings Waste Removal Project* and concurs with the proposed addition of the first two paragraphs describing the history of the Parrot Project and the performance monitoring plan. However, there remains technical disagreement on interpretations of the first year of data, and given that disagreement, it seems premature to include the conclusions (please see page 2 of Attachment A of the *Proposed 2020 Restoration Plan Amendment*) at this time.

Thank you for the opportunity to submit these comments. We are committed to working with all stakeholders to contribute to the overall success of restoration efforts in the Butte area.

Sincerely,

Mark Neary, Director
Butte-Silver Bow Public Works

J.P. Gallagher, Director
Butte-Silver Bow Parks & Recreation

Eric Hassler, Operations Manager
Butte-Silver Bow Superfund Department

Karen Byrnes, Director
Butte-Silver Bow Community Development

APPENDIX B

MEMORANDUM

TO: Members of the Public

FROM: BNRC and NRDP

DATE: Nov. 19, 2020

SUBJECT: Revised Proposed 2020 Butte Area One Restoration Plan Amendment

1. Purpose and Background

By this memorandum, the Butte Natural Resource Damage Restoration Council (BNRC) and the Natural Resource Damage Program (NRDP) submit for public comment an amendment (2020 BAO Amendment) to the 2012 Butte Area One Restoration Plan (BAO Plan), as amended by a July 2014 amendment that involved the small projects category of the BAO Plan, the Butte Area One Restoration Plan Amendment – Parrot Tailings Waste Removal, approved in December 2016 (2016 BAO Parrot Amendment), and the 2019 Butte Area One Restoration Plan Amendment, approved September 20, 2019 (2019 BAO Amendment).

This 2020 BAO Plan Amendment revises the allocation of reimbursed funds to the BAO Fund, allocates unspent Small Projects funds, and makes updates and clerical corrections to the BAO Plan and its amendments. It is proposed in view of the BPSOU Consent Decree Scope of Work (Appendix D to the Consent Decree). The BPSOU Consent Decree was entered by the federal court on September 16, 2020.

As background, the BNRC incorporates by reference the discussion in Section 1 of the July 23, 2019, Proposed Butte Area One Restoration Plan Amendment. Following the receipt of Public Comment on the proposed 2019 BAO Plan Amendments, the Trustee responded to those comments on September 17, 2019, and on September 20, 2019 executed the "Trustee's Modifications to Plan Amendments. Based on Public Comment, and Approval of Plan Amendments as Modified." This final Trustee version concurrently amended the *Upper Clark Fork River Basin Aquatic and Terrestrial Resources Restoration Plans* (UCFRB Plans) and the *UCFRB Restoration Fund/Butte Groundwater Restoration Plan* (BSB Groundwater Plan). Again, much of the pertinent background and substance as to those prior actions were set out in those documents, and thus will not be repeated or characterized here. The reader is directed to those publicly available documents for the history and context of this 2020 BAO Amendment.

The BPSOU Consent Decree did two things specifically relevant to the amendments proposed in this memo. First, it specifies with more clarity the remedial work obligation of the Settling Defendants, specifically British Petroleum - Atlantic Richfield (BP-AR). At the time the 2012 BAO Plan was adopted, the scope and substance of those remedial activities were not known, and the 2012 BAO Plan accordingly allocated restoration funds to various categories based on assumptions of what that future remedial work would be. Now that the remedial work is known,

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the BNRC believes it is appropriate to revisit and, if appropriate, reallocate BAO Restoration Funds to reflect this new information.

Second, and in specific reference to the issues addressed in this 2020 BAO Amendment, Paragraph 20 of the BPSOU Consent Decree establishes a "BPSOU Account" into which Settling Defendant BP-AR will deposit $20.5 million to be used for the purposes and under the limitations set forth in that paragraph and elsewhere in the BPSOU Consent Decree. As provided in Paragraph 21 of the BPSOU Consent Decree, if funds are left over after DEQ completes the Blacktail Creek construction work, such funds can be used for other State restoration actions coordinated with the remedy (i.e., restoration in BPSOU) and as support for the creek channel identified in the SOW [Attachment C, Addendum 1 (Further Remedial Elements Scope of Work – End Land Use Additions)]. At the time of the 2019 BAO Amendment, the existence and anticipated use of the BPSOU Account was generally known to the BNRC, but the exact amount and parameters around its use was not. Accordingly, in the 2019 BAO Amendment, the BNRC and the Trustee explained as follows:

> *It is anticipated that some of the funds transferred to the NRDP Parrot Tailings Removal Fund from the BAO Restoration Fund under this BAO Amendment could be reimbursed from proceeds of a future settlement between the State of Montana and Atlantic Richfield, if such a settlement is finalized through a BPSOU consent decree, and pursuant to that consent decree, the funds are not required for the Montana Department of Environmental Quality to complete the Blacktail Creek and Confluence portions of the BPSOU remedy.[1] The funds would be reimbursed from such a future settlement in the same proportions as the funds are expended. That is, 26% of any future settlement would reimburse the UCFRB Restoration Fund/Butte Groundwater Restoration; 31% from any future settlement would reimburse the BAO Restoration Fund; and 43% of any future settlement would reimburse the UCFRB Restoration Plan Reserves.*

In the future, the remaining funds from the BPSOU Account will be allocated to each of the BAO, UCFRB Restoration Fund, and UCFRB – Butte Groundwater funds in accordance with how much each fund loaned money to pay for the Parrot Tailings Waste Removal Project ("Parrot Project"). (The Parrot Project had to borrow money from the BAO Fund and UCFRB Restoration Fund in the 2019 BAO Amendments in order to have cash in hand to conduct the BSB Shops and Phase II waste removal and evapotranspiration cover system construction portions of the Parrot Project.) Repaying the funds used to pay for the Parrot Project meets the requirements of Paragraph 21 that the remaining funds be spent on restoration coordinated with the BPSOU remedy. In his September 20, 2019, decision approving the 2019 BAO Amendment, the Trustee increased the percentage of a potential reimbursement to the BAO Restoration Fund to 35%. That reimbursement percentage, and the amounts to be reimbursed to the UCFRB Restoration Fund and the UCFRB – Butte Groundwater Plan from the BPSOU Account, are not part of this proposed amendment. This amendment specifically proposes how these reimbursed funds would be allocated to the restoration categories within the BAO Plan.

[1] The State retains and reserves all rights and authorities, consistent with state and federal law and all final consent decrees.

Now that the scope and substance of BP-AR's remediation work is better defined, the BNRC can better assess the areas where restoration work will most effectively integrate with remedy work, or where restoration funds may be needed to accomplish work that remedy will not do. The BNRC wishes to build upon this refined information to assure that the limited amount of natural resource damage dollars available are put to the highest priority uses in Butte Area One.

As specified in greater detail in Section 3 of this Memorandum, the main areas where the BNRC would like to propose changes to the BAO Plan fall into the following categories:

A. Technical and administrative updates/revisions.

B. Revisions to the allocation of future Streamside Tailings Operable Unit (SSTOU) Remediation Excess Funds to BAO Restoration Plan categories.

C. Revision of the allocation of any reimbursements received by the BAO Fund in the future to specific BAO Plan categories, including revisions and clarification of the treatment of any funds already transferred to the NRDP Parrot Fund that are not needed for the Parrot Project.

D. Elimination of the Small Projects category and allocation of remaining funds to specific projects.

Under the federal Superfund law, natural resource damage (NRD) settlement funds can only be spent to restore, replace, or acquire the equivalent of injured natural resources, and natural resource trustees must complete a restoration plan and consider public input before NRD settlement funds can be spent.[2] The restoration plan must specify how funds will be spent and include an evaluation of various restoration alternatives according to criteria specified in federal NRD regulations.[3] The 2012 Butte Area One Restoration Plan and the 2016 BAO Parrot Amendment meet the above requirements.

2. Review and Approval Processes, and Public Participation

This draft 2020 BAO Amendment was presented by NRDP to the BNRC at a meeting via Teams conference platform on October 1, 2020. The BNRC recommended these amendments be made available for public consideration for a 30-day public comment period. The amendments are available on the NRDP website, https://dojmt.gov/lands/notices-of-public-comment/ and will be sent to NRDP's mailing lists for the BAO Plan. Considering of public input, the BNRC and Trustee Restoration Council will make a recommendation at meetings to be scheduled in mid-November and early December 2020. The Trustee will make the final decision on this 2020 BAO Amendment prior to December 31, 2020.

Public comment on this 2020 BAO Amendment can be submitted in writing during a public comment period scheduled for October 7, 2020 through November 5, 2020. Written comments may be submitted to NRDP at nrdp@mt.gov, or by mail (postmarked on or before November 5,

[2] 42 U.S.C. §9607 and §9611
[3] 43 CFR §11.82

2020) to: NRDP, 1720 9th Avenue, Helena, MT 59620-1425. The subject line must read "Public Comment: BAO Restoration Plan 2020 Amendment".

3. Amendments to the BAO Restoration Plan

A. Technical and Administrative Revisions

NRDP proposes various administrative updates to the 2012 Restoration Plan as shown in Attachment A.

B. Revisions to the Allocation of Future SSTOU Remediation Excess

This proposed revision changes the allocation of any future SSTOU Remediation Excess received.

Original Reimbursement:

The 2019 BAO Amendment specified:

$2.5 million of [the SSTOU Remediation Excess] transferred funds would be allocated to the BAO Restoration Plan for priority stream restoration and riparian habitat restoration in Upper Silver Bow Creek, Blacktail Creek, Basin Creek, and tributaries. These funds would be used for projects that contribute to the water quality and quantity in Silver Bow Creek and improve trout populations in the reach of Silver Bow Creek within BAO and its tributaries. Actions that would be prioritized would include: improving fish passage, decreasing fish entrainment, improving water quantity, and improving woody vegetation where insufficient riparian habitat currently exists. These restoration actions would be coordinated with waste removal and other restoration activities in the Silver Bow Creek corridor and would be implemented consistent with the BAO Restoration Plan.

Proposed Revised Allocation:

The BNRC and NRDP propose $500,000 of the $2.5 million SSTOU Remediation Excess to be transferred to the BAO Stream Restoration Category be allocated to the Upper Silver Bow Creek Corridor Category (Table 1). These funds would be spent per Section 6.0 of the BAO Plan to investigate opportunities to integrate restoration funding with remedial actions implemented by others. In accordance with Section 6.0 of the BAO Plan, the BNRC requests NRDP provide prior consultation with the BNRC for any expenditure from that fund beyond $50,000. The $2.0 million remaining within the Stream Restoration Category would be spent per the 2019 BAO Amendment.

C. Revision to the Allocation of Any Future Reimbursements to the BAO Fund

This proposed revision would clarify the reimbursement percentages to specific BAO Plan categories and includes funds transferred to the NRDP Parrot Fund that are not needed for the Parrot Project and future BPSOU Account Consent Decree remainder funds.

Original Reimbursement Allocation:

The 2019 BAO Amendment specified that the $5.3 million which came from the BAO Fund was "comprised of $3.0 million from the Stream Restoration category [57%], and $2.3 million [43%] from the Mine Waste Area Restoration/Revegetation category." Any money repaid to the BAO Fund would "reimburse the Stream Restoration and Mine Cap Improvements/Revegetation categories."

Proposed Revised Allocation:

The BNRC and NRDP propose all reimbursements to the BAO Fund be allocated by the following percentages to these BAO Restoration Plan categories (Table 1):

- 30~~5~~% to Upper Silver Bow Creek Corridor to be spent per Section 3.2.1 of the BAO Restoration Plan. Specifically, these funds would be spent on integrated waste removal at Diggings East, North Side Tailings, and Butte Reduction Works to protect Silver Bow Creek.
- 15% to Waste Area Improvements/Revegetation to be spent per Section 3.2.2 of the BAO Restoration Plan on projects to be determined later. (See Table 2 for existing and proposed allocations.)
- ~~40~~35% to Stream Restoration to be spent per the 2019 BAO Amendment discussion of the SSTOU Remediation Excess.
- 20% to Recreation to be spent per Section 3.2.6 of the BAO Restoration Plan.

Table 1. Reimbursements by Category and Year—2019 and Proposed 2020

	2019 Amendment		**Proposed 2020 Amendment**	
BAO Categories	**Reimbursement** (%)	**SSTOU Remediation Excess** ($2.5 million)	**Allocation** (%)	**SSTOU Remediation Excess** ($2.5 million)
Restoration of the Upper Silver Bow Creek Corridor	0%		30~~5~~%	$0.5M
Waste Area Improvements / Revegetation	43%		15~~5~~%	
Stream Restoration	57%	$2.5M	35~~40~~%	$2.0M
Recreation	0%		20%	
Small Projects	0%		0%	

Table 2. Waste Area Improvement/Revegetation Funding Summary

~~Ideas~~	~~Original Allocation~~	~~2019 Amendment~~	~~2020 Amendment~~
~~Butte Area One DCRP: soil amendment, placement, and seeding (100 acres)~~	~~$2,714,000~~	~~$914,000 (1.8M to PP)~~	~~$914,000~~
~~Butte-Silver Bow soil testing and placement, tree and shrub planting~~	~~$2,080,000~~	~~$1,024,559 (500K to Parrot Project)~~	~~$1,024,559~~
~~Public idea #50, revegetate Parrot Mine area~~	~~$206,000~~	~~$206,000~~	~~$206,000~~
~~Public idea #56, Montana Tech forb and shrub project~~	~~$1,000,000~~	~~$1,000,000~~	~~$1,000,000~~
~~**Total**~~	~~**$6,000,000**~~	~~**$3,144,559**~~	~~**$3,144,559 (plus 5%)**~~

Ideas	**Original Allocation**	**2019 Amendment**	**2019 Balance**	**2020 Balance**	**2020 Balance Amendment Proposal**
Butte Area One DCRP: soil amendment, placement, and seeding (100 acres)	$2,714,000	$1.8M to Parrot Project and $914,000 to MTech	$0.00	$0.00	$0.00
Butte-Silver Bow soil testing and placement, tree and shrub planting	$2,080,000	$500,000 to Parrot Project	$1,024,559	$1,024,559	$1,024,559
Public idea #50, revegetate Parrot Mine area	$206,000	$0.00	$40,346	$40,346	$40,346
Public idea #56, Montana Tech forb and shrub project	$1,000,000 spent	$0.00	$914,000 (from Soil Amendment Idea); $52,933	$914,000	$914,000
General Waste Area Improvement/Revegetation	$0.00	$0.00	$0.00	$0.00	15% of reimbursed funds
Total	**$6,000,000**	**$3,214,000**	**$2,031,838**	**$1,978,575**	**$1,978,575 (plus 15% of reimbursed funds)**

D. Small Projects Category Allocation of Remaining Funds

The BNRC and NRDP propose to complete the existing Small Projects currently contracted with NRDP and preserve approved funding, $100,000 each, for the Moulton Reservoir Recreation Development and Bonanza Dump BMX Bike Park projects. Annual updates to the BNRC on the

status of these projects is required. BNRC may propose a recommendation to allocate these funds to another restoration category if funds are not contracted by 2023.

The BNRC and NRDP propose to allocate $50,000 of unallocated Small Project funds to the Recreation Category to assist with trail planning in and around the BAO area. The Butte Silver Bow Parks and Recreation Department will implement this planning process upon BNRC and NRDP approval of the scope of work and schedule. This funding is to be spent by December 31, 2021, including a presentation of the final planning report findings to the BNRC.

The BNRC and NRDP propose to allocate $193,305 of unallocated Small Project funds to the Stream Restoration Category to be spent per the 2019 BAO Amendment. (Table 3)

Table 3. Stream Restoration Project Funding Summary

Proposed Funding Component	2019 Amendment	Proposed 2020 Amendment
Upper Silver Bow Creek and tributaries restoration and Riparian habitat improvements	$3,500,000	$3,000,000 (plus ~~40~~35%)
Small Project Allocation	--	$193,305
Total	**$3,500,000**	**$3,193,305 (plus 35%)**

Table 4 shows the original allocation of BAO restoration funds compared to the results of the 2019 BAO Amendment and the proposed 2020 amendment.

Table 4. Funding Allocation Summary 2012 - 2020

BAO Plan Categories	Original Allocation	2019 Amendment	Proposed 2020 Amendment
Restoration of the Upper Silver Bow Creek Corridor	$10,000,000	$0	$500,000 (plus 30~~5~~% from remainders)
Mine Waste Area Restoration/Revegetation	$6,000,000	$3,144,559	$1,978,575 (plus 15%)
Stream Restoration	$4,000,000	$3,500,000	$3,193,305 (plus 35~~40~~%)
Municipal Water System Improvements	$10,000,000	$0	$0
Storm Water	$0	$0	$0
Recreation	$1,000,000	$1,000,000	$1,050,000 (plus 20%)
Small/Miscellaneous Projects	$1,000,000	$443,305	$200,000
Total	**$32,000,000**	**$8,087,864**	**$6,921,880**

2020 BAO Restoration Plan Amendment – Revised Attachment A: Administrative Updates to 2012 Butte Area One Restoration Plan

(Redlines indicate text regarding the Parrot Performance Monitoring Program that has changed in response to public comment.)

NRDP proposes the following administrative updates/revisions to the 2012 BAO Restoration Plan which are necessary to make it consistent with its amendments (2016, 2019 and 2020).

Executive Summary (pp. 2, add paragraph at end of section). A summary of the 2016, 2019 and 2020 amendments is necessary. NRDP proposes to insert the following paragraph:

> *Revisions to this 2012 BAO Plan were recommended by the BNRC and approved by the Governor in 2016, 2019 and 2020. The 2016 amendment provided for the tailings removal (Butte Area One—Restoration Plan Amendment. Parrott Tailings Waste Removal. 2016). Additional funds to pay for the removal of these tailings were allocated in 2019 (Parrott Amendment 2019). A 2020 Amendment to the Butte Area One Restoration Plan is designed to re-allocate remaining funds in restoration categories, direct a $2.5 million remainder from the SSTOU and direct the expenditure of potential remainders from the Parrott project and Butte Consent Decree.*

Section 1.2.1: Butte Area One Site Background and Injury Overview (pp. 4)

Since the original BAO Restoration Plan was approved in 2012, NRDP has completed additional investigation of the Parrot Tailings and committed restoration funds to remove the tailings.

NRDP proposes to add the following information which details the findings of this additional investigation and how the Parrott Tailings contribute to the injury of Butte's groundwater.

> ***Parrot Tailings Waste Removal Project***
>
> *In 2015, the Governor, as trustee, determined it was appropriate to implement the Parrot Tailings Waste Removal Project ('Parrot Tailings Project'), which includes substantial mine waste removal and mine waste capping where appropriate. To support the development of the project, NRDP completed a data gap investigation and detailed design for the project. The data gap investigation was completed in 2015, and removal design activities were completed from 2016-2018. The first phase of waste removal was finished in December 2018. The second phase of waste removal and the construction of an evapotranspiration cover system is scheduled for completion in 2022-2023.*

A Parrot Tailings Performance Monitoring Program (PMP) was developed and implemented by NRDP in 2017 to establish baseline groundwater conditions adjacent to and downgradient of the Parrot Tailings Project and monitor post-project groundwater conditions over time. *That report is incorporated here by reference; the information and conclusions within this report are significant and the reader is directed to the DRAFT FINAL - Butte Area One Parrot Performance Monitoring Program Conceptual Site Model Report,* which is available at https://dojmt.gov/lands/butte-area-one/ ~~*The PMP monitoring network consists of 25 new monitoring wells and 52 existing wells that are part of the BPSOU and/or BMFOU groundwater monitoring programs. New wells were located and designed to fill long-existing data gaps and provide additional critical insight into the hydraulic flow system and lithology of the alluvial aquifer—directly adjacent to the existing Subdrain—at the bedrock interface, and at groundwater discharge areas near the confluence of Blacktail and Silver Bow Creeks.*~~

~~*Based on an evaluation of data collected as part of the Parrot PMP, the following conclusions can be drawn:*~~

~~*The Parrot Tailings are the most significant source of contamination in BAO alluvial groundwater.*~~

~~*Groundwater contamination plumes emanating from the Parrot Tailings Project Site have migrated downgradient and intersect with and discharge to Blacktail and Silver Bow Creeks.*~~

~~*The majority (72-76%) of contaminated groundwater leaving the Parrot Tailings Project Site is not being captured by the Subdrain; as a result, contaminated groundwater is partitioning to the aquifer matrix and/or discharging to Blacktail Creek and the Blacktail/Silver Bow Creek confluence area which is the only other discharge point for groundwater. (British Petroleum Atlantic Richfield (BP-AR) reported capture of 94-97% of all contaminated groundwater in the alluvial aquifer with the Subdrain.)*~~

~~*Lithologic, hydraulic, and geochemical data indicates a groundwater flow path from the Parrot Tailings Project area towards Blacktail Creek, bypassing the Subdrain.*~~

Section 3.2.2: Waste Area Improvements/Revegetation (pp 30, paragraph 2)

NRDP proposes to add the following information directing readers to appropriate amendments.

In the 2019 and 2020 Amendments to the BAO Plan, changes were made to funding for waste area improvements and revegetation. See Section 3—Amendments to the BAO Restoration Plan in the 2020 BAO Amendments for detail.

Section 3.2.2: Waste Area improvements/Revegetation. (pp 30, Table 1)

NRDP proposes to add the following information directing readers to appropriate amendments.

> *The 2020 BAO Amendment updates funding recommendations for the Waste Area Improvement and Revegetation category. See Table 1—Reimbursements by Category and Year, and Table 2—Waste Area Improvement/Revegetation Funding Summary in the 2020 BAO Amendment for proposed funding allocations.*

Section 3.2.3: Stream Restoration. (pp 31, Table 2)

NRDP proposes to add the following information directing readers to appropriate amendments.

> *The 2020 BAO Amendment updates funding recommendations for Stream Restoration category. See Table 1—Reimbursements by Category and Year, and Table 3—Stream Restoration Project Funding Summary in the 2020 BAO Amendment.*

Section 3.2.4: Municipal Water System Improvements. (pp. 31, paragraph 5)

Replace with the following paragraph to reflect the Basin Creek Water Treatment Plant completion in 2016:

> *The BNRC recommendation allocated $10 million to Butte-Silver Bow for the construction of a new Basin Creek Reservoir water treatment plant as proposed by the Butte-Silver Bow Chief Executive. Using these funds as well as approximately $20 million from the UCFRB Restoration Fund, the plant was successfully constructed and operable in 2016. Water from this new facility at the Basin Creek Reservoir is now the predominate water source for the municipality.*

Section 3.2.6: Recreation (pp. 32, paragraph 3)

Delete last sentence, "*The funds dedicated to this category should be spent or allocated to specific recreational projects no later than the end of 2016.*" As of 2020 there are funds remaining and left to be allocated.

Section 3.2.7: Small/Miscellaneous Projects (pp. 32, paragraph 4)

Replace with the following paragraph which indicates 2020 BAO Plan direction:

> *The BNRC Restoration Recommendation allocated $1 million to implement future small/miscellaneous projects. The maximum amount of funding for any small project was $100,000. Beginning Spring 2013, the BNRC requested project ideas from the public which were evaluated by the BNRC and NRDP*

staff. Consistent with guidance in this 2020 Amendment, $100,000 of small project funds dedicated to the Moulton Reservoir and $100,000 dedicated to the BMX Park will remain committed to those projects. Trail system planning in Butte would be allocated $50,000 to the Recreation category and the remaining approximately $193,000 would be directed to stream restoration.

Section 3.2.8: BNRC Restoration Recommendation Cost Summary (pp. 33, paragraph 2)

Reference to Table 4 is incorrect. Table 3 should have been referenced instead.

Replace with the following paragraph:

As of December 31, 2011, the approximate balance of the Butte Area One Restoration Fund was $32,050,000. Table 3 provides a summary of how the available funding should be allocated to projects proposed under the BNRC Restoration Recommendation.