

Topics to be addressed

1. State's legal interpretation of the BPSOU Consent Decree backfill requirements and what that means
2. What is the waste criteria for the Parrot Project? What are the BPSOU CD waste requirements?
3. How did NRDP ensure that all wastes were removed, and all backfill was clean and met the backfill criteria at the Parrot Project?
4. Could procedures and decision processes used at the Parrot be used at other sites?

Commissioner Shea's Request

“[W]e have heard that the state of Montana has a significant legal disagreement with the EPA on the retention of the “dirty dirt” or “on site material” from the Silver Bow Creek corridor. ... Even though EPA is the lead on the cleanup, we would like to have NRDP provide our Council with a full explanation of the state’s legal position as advanced to the EPA.”

Katherine Hausrath, Esq., NRDP

Three Components of Legal Issue

1. Contaminant levels in the fill v. waste;
2. Paragraph 27 CD modification process;
3. Location restrictions for use of backfill (CD, EPA's position paper).

What is the Legal Issue?

TABLE 2: BACKFILL MATERIAL SUITABILITY CRITERIA

| PARAMETER | CRITERIA A ¹ RIPARIAN, WETLAND AND SUB-IRRIGATED GROWTH MEDIA | CRITERIA B ^{2,3} GENERAL FILL | CRITERIA C ⁴ ON-STREAM SEDIMENT REPLACEMENT MEDIA |
|--------------------------------------|--|--|---|
| Soil Texture | | | |
| USDA Texture | Not Sa, LoSa or Cl | Not clay soils | TBD during design phase |
| Sand | 20-70% | | |
| Silt | 10-60% | | |
| Clay | 5-30% | | |
| Coarse Fraction (%>2mm) | <35%, Maximum fragment size = 3 inches | <60%, Maximum fragment size = 18 inches | |
| pH | | 5.5 to 8.5 S.U. | |
| EC/Salinity | <4.0 mmho/cm | <6.0 mmho/cm | TBD during design phase |
| SAR | <12 | | |
| Soil Saturation Percentage | Between 25% and | 85% | |
| Metals | | | |
| Arsenic | <30 mg/kg | <200 mg/kg | <30 mg/kg |
| Cadmium | <4 mg/kg | <20 mg/kg | <4 mg/kg |
| Copper | <100 mg/kg | <1,000 mg/kg | <100 mg/kg |
| Lead | <100 mg/kg | <1,000 mg/kg | <100 mg/kg |
| Mercury | <5 mg/kg | <10 mg/kg | <5 mg/kg |
| Zinc | <250 mg/kg | <1,000 mg/kg | <250 mg/kg |
| Nutrients | | | |
| Phosphorous (P) | P, K, and NO ₃ will be used to verify fertilizer rates | Not Applicable (NA) | NA |
| Potassium (K) | | | |
| Nitrate + Nitrite (NO ₃) | | | |
| Organic Matter | 3% minimum organic matter on a dry weight basis in the upper 6 inches of cover soil | | |
| Vegetation | Vegetation shall consist of native species appropriate to the riparian, wetland, or sub-irrigated setting to the extent practicable. Final revegetation shall be determined as part of remedial design activities. | Not for use in Engineered Caps. This material can only be placed >18 inches below ground surface for structural needs. | NA |

TABLE 1: WASTE IDENTIFICATION CRITERIA

If three of the six contaminant criteria listed are exceeded or any one contaminant is above 5,000 mg/kg then, the material is considered tailings, waste, or contaminated soil.

| | |
|--------------------------------------|-------------|
| Arsenic | 200 mg/kg |
| Cadmium | 20 mg/kg |
| Copper | 1,000 mg/kg |
| Lead | 1,000 mg/kg |
| Mercury | 10 mg/kg |
| Zinc | 1,000 mg/kg |
| Any single analyte above 5,000 mg/kg | |

| Parameter | General Fill (Table 2, Criteria B) | Waste (Table 1) |
|----------------------------|---|---|
| Soil Texture | Not clay | -- |
| Coarse fraction (%>2mm) | <60%, Maximum fragment size = 18 inches | -- |
| pH | 5.5 – 8.5 su | -- |
| EC/Salinity | < 6.0 mmho/cm | -- |
| SAR | < 12 | -- |
| Soil Saturation Percentage | Between 25% and 85% | -- |
| Arsenic | < 200 mg/kg | 200 mg/kg |
| Cadmium | < 20 mg/kg | 20 mg/kg |
| Copper | < 1,000 mg/kg | 1,000 mg/kg |
| Lead | < 1,000 mg/kg | 1,000 mg/kg |
| Mercury | < 10 mg/kg | 10 mg/kg |
| Zinc | < 1,000 mg/kg | 1,000 mg/kg |
| Vegetation | Not for use in Engineered Caps. This material can only be placed > 18 inches below ground surface for structural needs. | -- |
| Notes | Structural fill below DE and BG stormwater basins (including inlet and outlet structures), GG and NST sedimentation basins (inlet and outlet structures as appropriate). Not for use in-stream or in floodplains. | Any three contaminants exceeding criteria or any single contaminant over 5,000 mg/kg ⁵ |

Consent Decree Interpretation

- State Supports CD we signed
- Court found that the CD “...*comports with purposes of CERCLA*”
- Any ambiguity must be resolved consistent with CERCLA, e.g., in favor of protectiveness
 - If contaminant levels are necessary to be protective in a location, the source of the backfill doesn't matter

The Difference of Legal Opinion

Location Restrictions

- “If onsite materials do not exceed the Waste Identification Criteria in Table 1 of Appendix 1, the material may be used onsite as general fill provided it meets all other requirements for general fill in Table 2 of Appendix 1 (e.g., texture, pH).”*

| PARAMETER | CRITERIA B – GENERAL FILL |
|-----------------------------------|---|
| Soil Texture | |
| USDA Texture | Not clay |
| Sand | |
| Silt | |
| Clay | |
| Coarse Fraction (%>2mm) | <60%, Maximum fragment size = 18 inches |
| pH | 5.5 – 8.5 SU |
| EC/Salinity | <6.0 mmho/cm |
| SAR | < 12 |
| Soil Saturation Percentage | Between 25% and 85% |
| Metals | |
| Arsenic | <200 mg/kg |
| Cadmium | <20 mg/kg |
| Copper | <1,000 mg/kg |
| Lead | <1,000 mg/kg |
| Mercury | <10 mg/kg |
| Zinc | <1,000 mg/kg |
| Nutrients | |
| Phosphorus (P) | Not Applicable (NA) |
| Potassium (K) | |
| Nitrate + Nitrite (NO3) | |
| Organic Matter | |
| Vegetation | Not for use in Engineered Caps. This material can only be placed > 18 inches below ground surface for structural needs. |

CD Par 27 has Process for Modifications

*“If EPA, in consultation with DEQ, determines that it is necessary to modify the work specified in the SOW and/or in deliverables developed under the SOW in order to achieve and/or maintain the Performance Standards or to carry out and maintain the effectiveness of the RA, and **such modification is consistent with the scope of the remedy set forth in Paragraph 1.3 of the SOW (Scope of the Remedy)**, then EPA may notify Settling Defendants of such modification.”*

- Requires a protectiveness analysis
- EPA did not agree it was a modification requiring this process

Where can General Fill be used?

(Attachment C, Table 2, Note 2)

- General fill can only be used under Diggings East, Buffalo Gulch, Grove Gulch, and Northside Tailings basins
 - *“Criteria B applies to structural fill below DE and BG stormwater basins (including associated inlet and outlet structures), GG and NST sedimentation basins (including inlet and outlet structures as appropriate). Not for use in-stream or in floodplains.”*
- EPA’s current position proposes using higher contamination fill in locations other than allowed for “General Fill”
- Using “General Fill” in additional locations is CD change that requires Par. 27 protectiveness analysis

Current Status

- State agreed to disagree with EPA on legal analysis
- NRDP focused on:
 - Protectiveness evaluation;
 - Par. 27 Process;
 - Concerns with locations (leaching to groundwater); E.g., NRDP's 9/8/2023, Position Paper Comments);



Parrot Tailings Waste Removal Project

JIM FORD, NRDP

Requested issues to be addressed

- What is the waste criteria for the Parrot Project? What are the BPSOU CD waste requirements?

The criteria that defines waste for the BPSOU CD and the Parrot Project are different. The CD criteria were negotiated with EPA while NRDP set the criteria for the Parrot Project that protects groundwater and vegetation and allows BSB unencumbered use of the site.

- How did NRDP ensure that all wastes were removed, and all backfill was clean and met the backfill criteria at the Parrot Project?

Primarily achieved by using real-time contaminant analysis of all onsite and off-site materials used in building the project.

- Could procedures and decision processes used at the Parrot be used at other sites?

Yes. We believe that the methodologies and processes developed and utilized for the Parrot Project resulted in a protective cleanup, allows the site to be used unencumbered, and resulted in substantial cost savings.

Waste Criteria Comparison

BPSOU CD Waste Criteria and the Parrot Project Waste Criteria

(mg/kg dry weight)

| Contaminants | Parrot Project Waste Criteria (June 2017) | BPSOU Waste Criteria (January 2018) |
|--------------|--|--|
| Arsenic | 200 | 200 |
| Cadmium | 20 | 20 |
| Copper | 1,000 | 1,000 |
| Lead | 1,000 | 1,000 |
| Mercury | 10 | 10 |
| Zinc | 1,000 | 1,000 |

BPSOU CD Table 1 *"If three of the six contaminant criteria listed are exceeded or any one contaminant is above 5,000 mg/kg then, the material is considered tailings, waste or contaminated soils."* (i.e., Waste)

Comparison of Fill Criteria

Comparison of the BPSOU CD Existing and Proposed Fill Criteria to the Parrot Project Fill Criteria (mg/kg dry weight)

| Contaminants | Parrot Project Fill Criteria (June 2017) | Existing BPSOU CD Table 2 Fill Criteria B (January 2018) | Example of EPA's Newly Proposed Fill Criteria* (August 2023) |
|--------------|--|--|--|
| Arsenic | 200 | 200 | 200 |
| Cadmium | 20 | 20 | 20 |
| Copper | 1,000 | 1,000 | 5,000 |
| Lead | 1,000 | 1,000 | 5,000 |
| Mercury | 10 | 10 | 10 |
| Zinc | 1,000 | 1,000 | 1,000 |

*One example of material that would be allowed as General Fill under EPA's proposal.

Parrot Waste/Fill Identification

- Modeling was used in design phase for estimating initial volumes, grades, and removal elevations for planning and bidding purposes.
- During construction lithology and contaminant concentrations often differ considerably from the initial model.
- A materials (waste/fill) screening procedure was developed for the Parrot Project to ensure all appropriate waste was removed and only clean overburden, not cross-contaminated during construction activities, was used.

Parrot Project waste/fill characterization



Geospatial Surveys

- Surveys to document soil sample locations
- LiDAR surveys to document the extent of waste removal

Parrot Project waste/fill and offsite fill source sampling frequency

How did NRDP ensure that all wastes were removed, and all backfill was clean and met the backfill criteria at the Parrot Project?

- **Onsite materials (waste or fill)**: 100-ft by 50-ft (5,000 ft²) excavation areas which required an 8-point composed sample, equates to a sample frequency of one composite sample for every 400 cubic yards (CY) excavated. The eight sub-samples within the 5,000 ft² excavation component matches the 625 ft² per subsample EPA guidance requirement and what is performed in Anaconda.
- **MR active mine area fill (potentially impacted fill)**: One 8-point composite/1,000 CY
- **Ueland's Browns Gulch Ranch fill (unimpacted fill)**: One 8-point composite/5,000 CY

NOTE: A subset of all field XRF samples are submitted for independent laboratory XRF analysis to ensure field instruments are operating within the parameters defined in the Parrot Project QAPP.

Hand-held X-Ray Fluorescence Spectrometer ("XRF")



The Parrot moved ~1,400,000cy of waste and fill
 $1.4\text{M}/400\text{cy} = 3,500$ 8-point composite samples =
28,000 individual sample locations

Documents that more fully explain the Parrot Project sampling process

January 2019

Issue #3



PROJECT UPDATE

PARROT TAILINGS WASTE REMOVAL PROJECT

SITE CHARACTERIZATION

In the summer of 2009, the Montana Natural Resource Damage Program (NRDP) and the Montana Bureau of Mines and Geology (MBMG) conducted a drilling/groundwater analysis investigation to determine the nature and extent of the contamination in and around the old Parrot Smelter site. This study provided valuable information about the waste types (slag, tailings, original soil horizon, alluvium, and groundwater). These results were published in MBMG Open File Report No. 590.



This MBMG investigation provided State scientists with enough information for them to conclude that the Parrot wastes would continue to contaminate groundwater for many hundreds of years if not removed or contained. Not only are these waste sources a significant and ongoing contaminant



Technical Solutions for a Complex World

To: Jim Ford, Natural Resource Damage Program

From: Josh Vincent, PE, Water & Environmental Technologies
John Trudnowski, PE, Water & Environmental Technologies

Date: September 22, 2021

Re: **Parrot Tailings Waste Removal Project, Waste Identification Criteria and Implementation**

Parrot Tailings Waste Removal Project - Background

Past and ongoing studies have identified the Parrot Tailings Waste Removal Project (Parrot Project) as the primary source of arsenic, cadmium, copper, lead, and zinc to Butte's alluvial groundwater. Left in place, these historic mine wastes allow ongoing releases of contamination to Butte's alluvial groundwater, which is a source of drinking water for the city of Butte. Silica, Dioxin, and Blacktail

Questions



Table 2: Backfill Material Suitability Criteria

| PARAMETER | CRITERIA A ¹ RIPARIAN, WETLAND AND SUB-IRRIGATED GROWTH MEDIA | CRITERIA B ^{2,3} GENERAL FILL | CRITERIA C ⁴ IN-STREAM SEDIMENT REPLACEMENT MEDIA |
|--------------------------------------|--|--|---|
| Soil Texture | | | |
| USDA Texture | Not Sa, LoSa or Cl | Not clay soils | TBD during design phase |
| Sand | 20-70% | | |
| Silt | 10-60% | | |
| Clay | 5-30% | | |
| Coarse Fraction (%>2mm) | <35%, Maximum fragment size = 3 inches | | |
| pH | 5.5 to 8.5 S.U. | | TBD during design phase |
| EC/Salinity | <4.0 mmho/cm | <6.0 mmho/cm | |
| SAR | <12 | | |
| Soil Saturation Percentage | Between 25% and 85% | | |
| Metals | | | |
| Arsenic | <30 mg/kg | <200 mg/kg | <30 mg/kg |
| Cadmium | <4 mg/kg | <20 mg/kg | <4 mg/kg |
| Copper | <100 mg/kg | <1,000 mg/kg | <100 mg/kg |
| Lead | <100 mg/kg | <1,000 mg/kg | <100 mg/kg |
| Mercury | <5 mg/kg | <10 mg/kg | <5 mg/kg |
| Zinc | <250 mg/kg | <1,000 mg/kg | <250 mg/kg |
| Nutrients | | | |
| Phosphorous (P) | P, K, and NO ₃ , will be used to verify fertilizer rates | Not Applicable (NA) | NA |
| Potassium (K) | | | |
| Nitrate + Nitrite (NO ₃) | | | |
| Organic Matter | 3% minimum organic matter on a dry weight basis in the upper 6 inches of cover soil | | |
| Vegetation | Vegetation shall consist of native species appropriate to the riparian, wetland, or sub-irrigated setting to the extent practicable. Final revegetation shall be determined as part of remedial design activities. | Not for use in Engineered Caps. This material can only be placed >18 inches below ground surface for structural needs. | NA |

1 - Criteria A, from the SSTOU soil suitability requirements, applies to all replacement soils in:

a. All areas of BTC and BRW; and

b. BG, GG, NST and DE materials for the stormwater basin inlet and outlet channels, vegetated swales and bypass areas, and above the stormwater liner systems.

2 - Criteria B applies to structural fill below DE and BG stormwater basins (including associated inlet and outlet structures), GG and NST sedimentation basins (including inlet and outlet structures as appropriate). Not for use in-stream or in floodplains.

3 - Inert solid wastes and construction debris includes only unpainted masonry brick, dirt, rock, and concrete, and shall meet metals criteria in Table 2. Concrete size shall not exceed 3 feet by 3 feet.

4 - Criteria C applies to all materials placed in Blacktail, Silver Bow Creek below the confluence with Blacktail Creek and Confluence Area channel and riparian areas including the Blacktail Creek wetlands.