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Butte Priority Soils Operable Unit (BPSOU) – Temporary Construction Surface Water Performance Standards Variance Request for FRESOW Projects

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TO: **Nikia Greene, Daryl Reed**
FROM: **Josh Bryson**
CC: **BPSOU Distribution List**
DATE: **December 7, 2022**
RE: **Butte Priority Soils Operable Unit (BPSOU) – Temporary Construction Surface Water Performance Standards Variance Request for FRESOW Projects**

Purpose

The purpose of this memorandum is to request a temporary variance of Montana's Circular DEQ-7's total recoverable concentration based numeric surface water compliance standards to the equivalent dissolved-phase federal ambient water quality criteria and for a temporary variance for arsenic, lead, and mercury to the aquatic life standard instead of the human health standard (hereinafter referred to as temporary variance performance standards), as allowed per the Butte Priority Soils Operable Unit Consent Decree Appendix D, Attachment B.1 Section 2.3.1.1 (EPA, 2020). This temporary variance will be effective upon Environmental Protection Agency's (EPA) approval, in consultation with Montana Department of Environmental Quality (DEQ), of the request and upon commencement of Further Remedial Element Scope of Work (FRESOW) remedial actions within the Blacktail and Silver Bow Creek corridor and terminate upon completion of the associated projects operational and functional period and commencement of the Compliance Determination Period.

Variance Basis

The Butte Priority Soils Operable Unit Consent Decree Appendix D, Attachment B.1 Section 2.3.1.1 (EPA, 2020) allows for,

> "protocols for management of construction water, including a temporary variance from compliance with in-stream Performance Standards, consistent with other CFR Basin projects and DEQ regulations, that supports the discharge of less-impacted construction water directly to surface water."

Consistent with the precedent set for the Milltown Reservoir/Clark Fork River NPL Site Milltown Reservoir Sediments Operable Unit (MRSOU) temporary surface water quality variance, the basis for this request is that exceedances of DEQ-7 total recoverable metals standards may be unavoidable during certain construction activities occurring within the Silver Bow and Blacktail Creek corridor. These exceedances may be unavoidable because of the following:

1) Existing BPSOU contaminant of concern (COC) concentrations within groundwater are elevated above adjacent surface water COC concentrations and the groundwater in this area has been deemed Technically Impracticable to remedy.

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2) The groundwater dewatering is necessary to create a workable construction surface to implement excavation remedies and this dewatering water will need to be discharged to surface water.
3) The only existing facility to treat to the dewatering water, the existing Butte Treatment Lagoons (BTL) operating plant, likely won't have sufficient hydraulic capacity to treat all of the construction dewatering water for all of the FRESOW projects.
4) The proposed temporary variance performance standards, as well as best management practices (BMP) as needed and where appropriate, will still provide protectiveness of uses.

The requested variance would be applicable to BPSOU surface water COCs during both normal and wet weather flow conditions. This temporary variance request is in addition to the previously provided wet weather copper and zinc waivers in the Record of Decision Amendment (RODA).

Proposed Variance of Performance Standards

The proposed temporary variance performance standards are generally consistent with federal water quality standards. The table below provides the proposed temporary variance performance standards and the basis for each COC.

CONTAMINANT	PROPOSED TEMPORARY VARIANCE PERFORMANCE STANDARD	BASIS
Aluminum	87 ug/L (Dis)	DEQ-7 (Chronic)
Arsenic	150 ug/l (Dis)	Federal Chronic Aquatic Life Standard instead of Human Health Standard
Cadmium	1.06 ug/l* (Dis at 160 mg/L hardness)	Federal Chronic Aquatic Life Standard instead of DEQ-7 Aquatic Life Standard
Copper	13.38 ug/l* (Dis at 160 mg/L hardness)	Federal Chronic Aquatic Life Standard instead of DEQ-7 Aquatic Life Standard
Iron	1000 ug/l (Dis)	Federal Chronic Aquatic Life Standard instead of DEQ-7 Aquatic Life Standard

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Lead	4.14 ug/l* (Dis at 160 mg/L hardness)	Federal Chronic Aquatic Life Standard instead of Human Health Standard
Mercury	0.6545 ug/l (Dis)	Federal Chronic Aquatic Life Standard instead of Human Health Standard
Silver	9.11 ug/L* (TR at 160 mg/L hardness)	Federal Acute Aquatic Life Standard
Zinc	174 ug/l* (Dis at 160 mg/L hardness)	Federal Chronic Aquatic Life Standard instead of DEQ-7 Aquatic Life Standard

*Standard is hardness dependent.

Dis = Dissolved

TR = Total Recoverable

mg/L = milligrams per liter

ug/L = micrograms per liter

The in-stream surface water performance standards for COC's, consistent with the Butte Priority Soils Operable Unit Consent Decree, as compared to the proposed temporary variance performance standards are shown in the table below.

CONTAMINANT	**BPSOU RODA In-Stream Surface Water Performance Standard (Chronic)**	**Proposed Temporary Variance Performance Standard**
Aluminum	87 ug/L (Dis)	No change
Arsenic	10 ug/l (TR)	150 ug/l (Dis)
Cadmium	1.15 ug/l* (TR at 160 mg/L hardness)	1.06 ug/l* (Dis at 160 mg/L hardness)
Copper	13.94 ug/l* (TR at 160 mg/L hardness)	13.38 ug/l* (Dis at 160 mg/L hardness)
Iron	1000 ug/l (TR)	1000 ug/l (Dis)

Lead	5.75 ug/l* (TR at 160 mg/L hardness)	4.14 ug/l* (Dis at 160 mg/L hardness)
Mercury	0.05 ug/L (TR)	0.6545 ug/l (Dis)
Silver	N/A	9.11 ug/L* (Dis at 160 mg/L hardness)
Zinc	178 ug/l* (TR at 160 mg/L hardness)	174 ug/l* (Dis at 160 mg/L hardness)

*Standard is hardness dependent.

Dis = Dissolved

TR = Total Recoverable

mg/L = milligrams per liter

ug/L = micrograms per liter

Site-Specific Evaluation

The potential for in-stream exceedance of the requested temporary variance performance standards will be evaluated for each of the individual FRESOW project sites (Grove Gulch, Buffalo Gulch, Diggings East, Butte Reduction Works, Northside Tailings, and the state's Blacktail Creek project) and submitted with the remedial design documentation for each.

The method for evaluating the expected probability of exceedances of the requested temporary variance performance standards is generally described below, and specific recommendations for each project will be made in each FRESOW project design report.

Each evaluation will use predicted in-stream concentrations derived from the expected combined loading calculations of contributing flows, including dewatering effluent and instream Blacktail or Silver Bow Creek flows. The predicted in-stream concentration of dissolved metals at the BPSOU proposed points of compliance (POCs) (i.e., SS-06G and SS-07) will be compared to the temporary variance performance standards, to determine if mixed concentrations are predicted to exceed the temporary variance performance standards.

Implementation of BMPs

If the conclusion of the project evaluation is that construction dewatering discharge is statistically unlikely to cause exceedance of the in-stream temporary variance performance standards, then the project will discharge construction dewatering to Blacktail or Silver Bow Creek and the proposed BPSOU in-stream POCs (i.e., SS-06G and SS-07) will be sampled on a schedule as described in the project Construction

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Quality Assurance Project Plan. If the conclusion of the project evaluation is that construction dewatering discharge is statistically likely to cause exceedance of the in-stream temporary variance performance standards, then the project will treat construction dewatering by a means described in the project Remedial Action Work Plan (RAWP) prior to discharging to Blacktail or Silver Bow Creek.

The treatment of construction dewatering effluent may include the use of on-site temporary dewatering sedimentation basins sized appropriate to the respective project, if necessary. Dewatered groundwater will be pumped to the temporary sedimentation basin for settling prior to being discharged to Blacktail or Silver Bow Creek. In the event the temporary variance performance standards are not being met, additional BMPs will be evaluated for implementation. Additional BMPs could include those mentioned in the Montana DEQ General Permit for Construction Dewatering: silt fencing and straw bales installed at outfall; commercial filtration materials installed at outfall like dirt bags, silt sacks, etc.; coagulation or flocculation; or throttling of dewatering effluent. Upon implementation of additional BMPs, if effluent does not meet temporary variance performance standards, effluent will be sent to the BTL for treatment prior to discharge to Blacktail or Silver Bow Creek. If BTL doesn't have the hydraulic capacity to treat the effluent discharge, a combination of effluent sent to BTL and additional BMPs will be implemented until effluent mixed with in-stream water is able to meet temporary variance performance standards. The below flow chart dictates the decision framework for implementation of additional BMPs and proposed monitoring of dewatering effluent and in-stream water quality.

Water Quality Monitoring

Water quality will be monitored at the outfall of the BMPs discharging to the stream as well as in-stream. Outfall monitoring will be conducted visually daily, per the Montana DEQ General Permit for Construction Dewatering requirements, for turbidity and oil/grease sheen. If visuals indicate sampling is required, a sample will be collected and compared to the Montana DEQ General Permit for Construction Dewatering daily allowances. If the daily allowance is exceeded, additional applicable BMPs will be implemented. If effluent does not meet temporary variance performance standards after BMP implementation, effluent may be discharged to the BTL for treatment prior to discharge to Blacktail or Silver Bow Creek.

For all FRESOW projects discharging above the confluence of Blacktail Creek and upper Silver Bow Creek, in-stream monitoring will occur twice weekly at SS-05 for BPSOU COCs and hydrocarbons. If sampling results are above 80% of temporary variance performance standards, additional BMPs will be implemented, and sampling frequency will be increased to daily. If effluent does not meet temporary variance performance standards after BMP implementation, effluent may be discharged to the BTL for treatment prior to discharge to Blacktail or Silver Bow Creek. The below flow chart dictates the decision framework for implementation of additional BMPs and proposed monitoring of dewatering effluent and in-stream water quality.

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SS-05 was chosen as a sampling site as it will allow for complete mixing of dewatering discharge with upper Silver Bow Creek and Blacktail Creek flows. A general rule is that the length a mixing zone needs to be 20 times the average width of the stream reach for complete mixing to occur (Hudson, 2002). The stream reach from the confluence of upper Silver Bow Creek and Blacktail Creek to SS-05 is about 400 feet, and the average width of that stream reach is about 20 feet, so it is assumed that samples taken at SS-05 will represent complete mixing of dewatering discharge, upper Silver Bow Creek flow, and Blacktail Creek flow.

For projects discharging below the confluence of Blacktail Creek and upper Silver Bow Creek, or if the SS-05 site becomes inaccessible, an appropriate site with adequate mixing zone length will be chosen (likely the already established site SS-06A).

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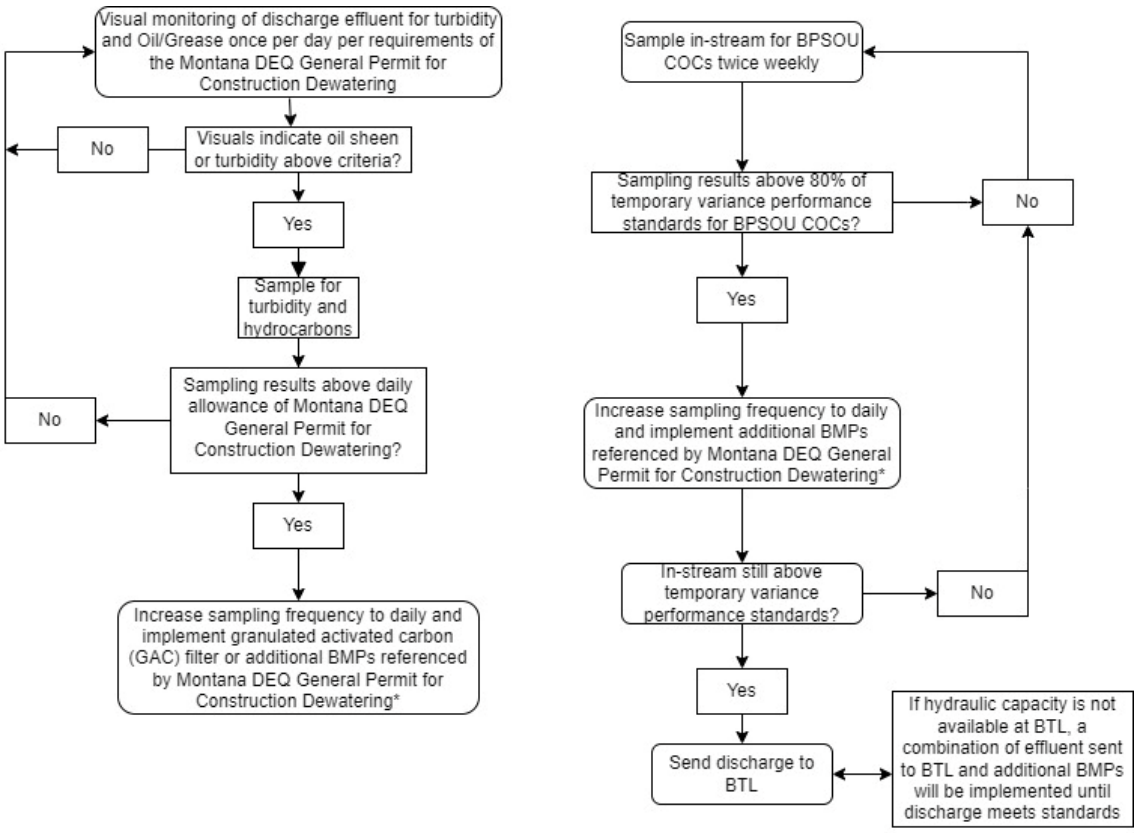

*Additional BMPs

--Settling basins including additional silt fencing or straw bales near outfall

--Commercial filtration materials installed at outfall like dirt bags, silt sacks, etc.

--Coagulation or flocculation

--Throttling of discharge

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References

EPA 2002. Butte Priority Soils Operable Unit Consent Decree. September 2020

Hudson, Robert O. and John Fraser. “Alternative methods of flow rating in small Coastal streams.” (2002).