

Surface Water Technical Impracticability Evaluation

Overview: The Butte Priority Soils operable unit (BPSOU) Record of Decision (ROD) identifies in-stream performance standards for surface water within the BPSOU. This fact sheet discusses EPA and MDEQ initial findings regarding the potential need to waive and replace certain state surface water standards that prove to be technically impracticable to achieve at BPSOU. Any state aquatic life standard that is waived would be replaced with a federal surface water criterion promulgated under the Clean Water Act for the protection of aquatic life. A draft Technical Impracticability (TI) Evaluation document is being prepared which addresses these issues in more detail. The TI Evaluation and any Proposed Plan for a ROD Amendment will be released this summer and will be subject to public input and comment before final decisions are made by the agencies.

Further Information: The Butte Hill, often referred to as the 'richest hill on earth', is a source of minerals which contain arsenic, copper, silver, zinc, and other metals. Historic mining activities within the Butte area have released contaminants of concern (COCs) (aluminum, arsenic, cadmium, copper, iron, lead, mercury, silver, and zinc) into surface water and groundwater, severely impacting the quality of both in BPSOU.

One objective of the remedy which US EPA selected in its 2006 ROD is to attain compliance with surface water quality standards in BPSOU during all weather conditions, including wet weather conditions and normal flow conditions. To achieve that goal, the selected remedy for BPSOU includes implementation of a groundwater management program to intercept and treat contaminated groundwater before it reaches Silver Bow Creek. The selected remedy also includes a surface water management program that includes Best Management Practices (BMPs) to reduce the runoff and transport of contaminated rainwater and snowmelt to Silver Bow Creek during wet weather conditions.

Stormwater BMPs implemented to date in BPSOU have significantly reduced contaminant loadings to the creeks using stormwater catch basins, diversion of contaminated stormwater to the Berkeley Pit, curb and gutter construction, regular maintenance of the BSB stormwater system, installation of hydrodynamic devices, and reclamation of exposed areas of historic mining waste sources. These are some of 'the best management practices' that are used to prevent or reduce the amount of contaminated water and sediment that may otherwise flow into streams. Additional stormwater BMPs will further reduce the contaminant input during wet weather conditions.

Although the implemented remedial actions have significantly reduced the amount of contaminants that reach Silver Bow Creek, water quality still exceeds certain state standards for short term (acute) exposure to aquatic life during wet weather (which includes rain storms and snow melt), and exceeds certain state standards for longer term (chronic) exposure to aquatic life during normal flow.

Consequently, EPA and MDEQ are preparing a TI Evaluation to determine whether it is feasible to meet the state water quality standards, stated in the 2006 ROD, even with additional removal, groundwater capture and BMPs, and if not (if the standards are not technically practicable to achieve), whether to waive certain standards and replace with federal surface water quality criteria promulgated by EPA under the Clean Water Act. EPA issues these numeric criteria under the Clean



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Water Act as levels of contaminants which are protective of aquatic life. CERCLA law gives EPA the option to adopt replacement standards in such situations, and EPA and the State believe a determination could be made that remedial actions involving the replacement standards, if required, would be protective of the environment under CERCLA law.

Technical Impracticability Evaluation: Key remedy technology elements (TEs), such as the BMP stormwater basins, are being evaluated through computer modeling and other engineering analysis to help determine whether total recoverable performance standards for mining-related COCs could potentially be met during wet weather and normal flow events in Silver Bow Creek.

Initial TI Evaluation findings indicate that total recoverable copper is identified as the contaminant most likely to exceed standards. Therefore, the removal effectiveness of additional BMPs in wet weather conditions were evaluated only for total recoverable copper. Correlations were then derived between removal effectiveness of total recoverable copper and the other COCs, allowing the model results to be applied to the other COCs. This evaluation tool helps the agencies determine what potential benefits the TEs (evaluated BMPs) would have on improving water quality within the BPSOU. The BMPs and other remedial elements that are expected to be practicable would be constructed under the plans developed as part of any proposed modified remedy.

For stormwater and wet weather conditions, the construction and operation of stormwater basins have been modeled and are predicted to be effective in reducing in-stream COC concentrations during wet weather events. However, the modeling shows that copper and zinc concentrations during wet weather conditions are not predicted to consistently meet acute surface water quality performance standards even if additional, practicable BMPs are fully implemented. This means that if the proposed modified remedy is implemented (e.g., stormwater basin construction at Northside Tailings, Diggings East and Buffalo Gulch, sedimentation bay construction at Grove Gulch, required BMPs constructed in other Butte drainages, and reclamation of un-reclaimed and insufficiently reclaimed areas on the Butte Hill), meeting acute surface water quality performance standards for the copper and zinc COCs is still not expected. Therefore, the Proposed Plan would include an up-front waiver of the acute copper and zinc standards, replaced with the federal standard (surface water quality criteria, the replacement standards, measured as the dissolved fraction) during wet weather flow conditions. The TI Evaluation will likely recognize uncertainty with respect to the achievement of acute standards (measured as total recoverable) for cadmium, lead and silver, and uncertainty with achievement of the federal criterion for copper. Therefore, further waivers for these COCs would be considered after remedy implementation and subsequent monitoring.

Initial TI Evaluation findings indicate that the effectiveness of contaminated sediment removal and waste removal from the stream bed, stream banks and floodplain, in combination with improved contaminated groundwater control, may achieve surface water performance standards for most COCs under baseflow and normal high flow conditions (chronic conditions). Achievement of copper and lead chronic standards is less certain than for the other COCs. For this reason, EPA and MDEQ do not believe an up-front waiver of the chronic standard for any COC is supported at this time. However, if the copper and lead chronic standards are not met after implementation of remedial measures that address base and normal high flow conditions (e.g., removals, groundwater control), the total recoverable copper standard and the total recoverable lead standard for chronic conditions would be waived and alternative federal chronic copper and lead criteria would be considered. For arsenic and iron, which are affected by conditions upstream of the BPSOU, an upstream allowance accounts for off-site influences on surface water quality within the BPSOU.



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