

## Response to Comment Rebuttal for the Libby Adit Extension Project

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I have reviewed the response to comment in:

“Libby Exploration Project: Final Environmental Assessment”, USDA Forest Service, Northern Region, Kootenai National Forest, Lincoln County, MT, December 2024.

The agencies’ response to comment failed to adequately address several key comments on the potential impacts of mining on shallow groundwater systems within the Wilderness Area. The current Environmental Assessment does not adequately analyze or address the potential for adverse effects on the shallow groundwater system in the Wilderness Area. Critical factors that remain unaddressed are listed below.

1. There are no monitoring data for shallow groundwater within the wilderness, which significantly limits the ability to assess the potential impact to these areas (BCG, 2024). This fact was affirmed in the response to comment (EA Appendix E). This means that:
  - a. There is no suitable knowledge of baseline conditions at the site, making it very hard to assess changes to the system due to mining.
  - b. The groundwater model being used as a decision support tool, is completely uninformed and constrained by data in the shallow groundwater within the wilderness. Expecting a groundwater model to provide accurate enough predictions to rule out adverse effects for a sensitive area, when the model has no data to constrain its behavior in this area is not defensible.
  - c. Given the extreme amount of heterogeneity expected in fractured and faulted systems, it is hard to predict the exact extent of connection between the deep system and the shallow system without data from both systems.
2. The response to comments continually states that there is no connection between the shallow groundwater system in the wilderness and the deep system draining the mine adit. The existing model **does** show potential connection between the deep groundwater system drained by the adit and sensitive shallow groundwater areas within the wilderness area (EA figure 3-7, right hand panel). The 2-foot water table drawdown contour includes two and likely three groundwater dependent ecosystems (GDE1, GDE2, and likely GDE3), all the Libby Lakes and portions of the upper East Fork of Rock Creek (EA figure 3-7, right-hand panel).

- a. The response to comments further acknowledges this drawdown asserting that the drawdown in the shallow groundwater system will be limited to 4' or less.
  - b. The fact that drawdown exists at these sites indicates some degree of connection, thus the repeated response of zero connection between the shallow groundwater system in the wilderness are false.
  - c. Furthermore, no assessment of the impact of drawdown on groundwater systems is undertaken.
  - d. A 2-foot to 4-foot drop in the water table elevation cannot simply be brushed off as insignificant without further assessment. This magnitude of drawdown could absolutely have large impacts on both groundwater dependent ecosystems and surface water-groundwater interactions.
    - i. A groundwater dependent ecosystem is often dependent upon active groundwater discharge at the surface, which will only happen if the phreatic potentiometric surface (water table) is at or above the land surface. A drawdown of 2-feet-4-feet, means the water table could drop well below the land surface, potentially destroying the conditions required for the groundwater dependent ecosystem to exist.
    - ii. Groundwater surface water interactions, and the amount of groundwater discharge into surface water and/or loss of surface water to adjacent groundwater, are completely dependent upon the gradient (slope) of the water table near the surface water body. The gradients controlling groundwater surface water exchange are often very small, on the order of a few inches or less to over 10 feet. A 2-foot drop could represent a massive change in the hydraulic gradient, potentially causing significant reduction in groundwater discharge to surface water and or reversing the direction of flow causing loss of surface water to recharge the groundwater.
    - iii. Without an analysis of the groundwater conditions in the wilderness, it is impossible to know whether these changes in the shallow system are significant, and to assess their impact.
3. The model being used as a decision support tool is subject to significant uncertainty and error. At its very best, the calibrated model is only capable of reproducing heads to within a mean squared error of around 100 feet. These errors would be expected to be **significantly greater** in areas where the model has no data to constrain it, such as the shallow subsurface in the wilderness. It is not scientifically defensible to claim a 4' or less drawdown in these areas with no uncertainty bounds. Given the uncertainty of the model, a range of possibilities from no-effect,

to massive effects are within the model error. This model cannot be used to rule out effects larger than 4' drawdown.