Montana Department of Environmental Quality

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December 18, 2014

Dear Reader,

In May of 2010, Butte Highlands Joint Venture (BHJV) filed an application for an operating permit under the Metal Mine Reclamation Act. BHJV proposed constructing an underground gold mine approximately 14 miles south of Butte, Montana. The new underground mine would be located near the historic Highland Mine adit at the head of Basin Creek. The proposed reclamation plan for the new mine would require the plugging of the historic Highland Mine adit, from which water currently discharges at a rate of approximately 105 gallons per minute (gpm) into Basin Creek. The Department has recently completed a Final Environmental Impact Statement for the proposed mine, which can be viewed at http://deq.mt.gov/eis.mcpx

Under the Montana Water Quality Act, the Department may not permit an activity that would cause significant degradation of high quality water unless the Department has issued an authorization to degrade. The act does not define significance. Instead, it mandates that the Board adopt criteria for determining what level of degradation is significant. To meet this requirement, the Board of Health and Environmental Sciences in 1994 adopted a rule, which is codified as ARM 17.30.715, setting criteria for the non-significance determination. Under this rule, there is a two-step process for determining whether an activity would cause significant degradation. The first step is contained in ARM 17.30.715(1). As applied to changes in flow, subsection (1) provides that a change in flow is non-significant if the change is less than 15% of the mean monthly flow and less than 10% of the lowest stream flow for seven consecutive days that would be expected to occur once in ten years (7Q10).

If an increase or a decrease in flow exceeds either of these criteria, the Department may review the significance under ARM 17.30.715(3). It provides that the Department may evaluate the flow change under criteria set out in Section 75-5-301(5)(c), MCA, and, based on those criteria, determine a change to be nonsignificant. Those criteria are: (1) potential harm to human health, beneficial use, or the environment; (2) the quantity and strength of the pollutant; (3) the length of time the degradation will occur; and (4) character of the pollutant, giving greater significance to carcinogens and toxins that bioaccumulate or biomagnify. Based on these criteria and the discussion set forth below, DEQ is proposing to determine that the change in flow in Basin Creek as a result of BJHJV's plugging of the historic Highland Mine adit is nonsignificant under ARM 17.30.715(3).

Proposed Basin Creek Stream Flow Alteration Proposed Nonsignificance Determination

Basin Creek is a tributary to Blacktail Creek, which in turn is a tributary to Silverbow Creek. Its headwaters lie within the Highland Mountains. The Basin Creek watershed contains two reservoirs which serve as a water supply source for the city of Butte. For this reason, Basin Creek is classified as A-Closed, which precludes any degradation of water quality. This classification indicates the water is to be maintained suitable for drinking, culinary, and food processing and other purposes after simple disinfection (ARM 17.30.607 and 621).

The Basin Creek watershed above the Upper Reservoir consists of five tributary streams, the southernmost of which originates near the Continental Divide and the historic Highland Mine adit, which provides a source of perennial flow. Other springs and wetlands contribute to perennial stream flow approximately 0.3 miles downstream from the adit. Approximately 1.7 miles below the adit, this stream is joined by another tributary having flow substantially augmented by discharge from the Emerald Lake Aqueduct, which transfers water from the Fish Creek Basin into Basin Creek for storage in the reservoirs and use within the Butte area.

The Highland Mine was developed during the 1930s and presently discharges water into the Basin Creek watershed at an average annual rate of approximately 105 gallons per minute. This discharge has formed a steep gradient channel for approximately 0.5 mile prior to entering the valley bottom containing upper Basin Creek. Below this point, a series of wetlands and ponds exist. Prior to development of the mine, perennial stream flow in upper Basin Creek likely did not begin until 0.2 to 0.4 mile downhill from the mine portal, and this initial high gradient stream reach below the portal provides only marginal aquatic habitat. The adit contributes an annual average flow of 105 gallons per minute (gpm) to upper Basin Creek, with a seasonal range between 70 and 160 gpm. At the downstream reach of this tributary, prior to its confluence with the Emerald Lake diversion, base flows are in the 300 to 350 gpm range.

The Butte Highlands Joint Venture (BHJV) owns patented mining claims near the historic Highland Mine and has constructed an exploration adit having a portal in the Moose Creek drainage just south of the historic adit. BHJV proposes to develop an underground gold mine with workings that would intercept the historic workings of the previous mining operation. To prevent a direct discharge of water from the new mine workings into Basin Creek after closure of the proposed mine, BHJV proposes to install a hydraulic plug underground to seal off the upper end of the historic Highland Mine adit to isolate it from modern mine workings and also from the historic workings which currently are the source of the majority of water that discharges from the portal. Therefore, a decrease in flow in upper Basin Creek is expected, and the decrease is expected to be a permanent change.

After mining and mine dewatering ceases, it is likely that flows may be reduced in upper Basin Creek by approximately 105 gpm on average until the groundwater level recovers to the elevation of the historic Highland Mine adit. The interim period between cessation of mine dewatering and recovery of groundwater levels to their present levels is projected to last between 7 and 8 years. However, after groundwater level recovery, some renewed inflow of shallow groundwater into the adit is expected

below the plug, which would result in renewed discharge from the collapsed portal, projected to be 22 gpm or greater.

As the mine floods to an elevation higher than the historic Highland Mine adit, historic springs and seeps could be reestablished. The position of the mine beneath Nevin Hill, a triple divide between the Basin Creek, Fish Creek, and Moose Creek watersheds, complicates predicting where the groundwater would discharge after the adit is plugged and groundwater levels fully recovered. The water table is projected to re-establish approximately 125 feet above the elevation of the proposed plug in the historic Highland Mine adit. This would restore the groundwater flow regime to a state similar to that which existed prior to development of the mine during the 1930s. Although the pre-mining groundwater flow patterns cannot be predicted with certainty, geologic data and hydrogeologic modeling indicate that the 105 gpm that currently discharges from the Highland adit would be redistributed into the Fish Creek, Basin Creek, and Moose Creek watersheds, with Fish Creek likely to receive the greater amount of additional flow and Moose Creek the least.

Considering the renewed discharge from the adit and the reestablishment of springs and seeps in the Basin Creek drainage, long-term flow reduction in upper Basin Creek would likely be in the 60 to 80 gpm range on average. These flow reductions may result in decreased fish habitat within this tributary to upper Basin Creek above the Upper Reservoir. A small streamside wetland area located downslope from the historic Highland Mine adit would receive less water than it presently does and may become reduced in area.

Existing stream flow depletion in upper Fish Creek, likely a result of development of the historic Highland Mine, would be reversed by the proposed closure plan and would likely benefit the fishery in Fish Creek. The anticipated reduction in stream flow in the upper Basin Creek watershed that would result from cessation of the mine discharge is substantially less in volume than the ongoing stream flow augmentation which results from the diversion of water into Basin Creek from Fish Creek via the Emerald Lake Aqueduct.

Plugging of historic adits to re-establish groundwater levels and prevent direct discharges of mine drainage into surface water is an important method of remediating the impacts of historic mining and is generally not considered by DEQ to constitute significant degradation, regardless of the resultant redistribution of groundwater discharges that support stream base flows. Restoration to pre-mining condition is usually of greater benefit to the environment than maintaining the non-natural flow redistribution.

To compensate for potential flow reductions in Basin Creek after mining ceases, BHJV would be required to replace three culverts and improve sediment control at two other culverts along Roosevelt Drive (Figure 2.8-1), These improvements would benefit aquatic organism passage and reduce sediment impacts to Blacktail Creek, of which Basin Creek is a tributary. The culvert replacements and road improvements would have long-term positive benefits for the fishery in Blacktail Creek.

BHJV holds historic water rights on the Highland Mine adit discharge dating from the era of the original mine's activity. If these water rights are still valid, then the change in flow resulting from plugging of the

adit may be exempt from nondegradation review. Regardless, due to the mitigations proposed/required and the anticipated beneficial restoration of base flow in Fish Creek, DEQ concludes that the impact of reduced stream flow in upper Basin Creek that would result from plugging of the historic Highland Mine adit does not constitute significant degradation. While the decreased flow in Basin Creek would exceed the criteria in ARM 17.30.715(1), the decreased flow would not harm human health, beneficial use, or the environment. Therefore, the decreased flow is not significant under the first and third criteria of ARM 17.30.715(1). Decreased flow is not a pollutant and, therefore, the second and fourth criteria do not indicate significance. Based on this analysis, the Department proposes to determine that the flow decrease would not cause significant degradation and that an authorization to degrade is not required.

DEQ will accept public comments on this proposed non-significance determination. The comment period will last for 30 days and will end on January 17, 2015. Comments can be sent to:

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Sincerely,

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