



*Working with Communities to Protect Their Land, Air, and Water*

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Re: comments on the *Draft Environmental Impact Statement for the Proposed Marigold Mining Company—Marigold Mine—Mackay Optimization Project Humboldt County, Nevada*

Great Basin Resource Watch (GBRW) was not able to fully review the *Draft Environmental Impact Statement for the Proposed Marigold Mining Company—Marigold Mine—Mackay Optimization Project* (DEIS). In general, BLM should provide more time for review of these complex proposals. Please accept these brief comments on the proposed expansion after the comment deadline date.

#### DEIS SCOPE

Overall, the DEIS lacks sufficient detail for the reader to fully understand how conclusions were drawn in the determination of impacts. The DEIS/EIS needs to be a stand-alone assessment that provides pertinent data and discusses how the data is used to draw conclusions. For example, the DEIS does not illustrate any of the data (ABA accounting, graphical plotting, humidity cell summary) used to determine the extent of potentially acid generating (PAG) waste rock and ore. This pattern is repeated throughout the DEIS requiring the reader to review numerous technical documents written by consultants for the mining company and generally not for public consumption. It is the DEIS and later the FEIS documents that are available online and at various libraries, and not supporting documents in general. Therefore, it is vital for the public record that the EIS be as complete as possible within reason.

This DEIS appears to be the result of the Trump Administration Executive Order 13766 on Expediting Environmental Reviews and Approvals for High Priority Infrastructure Projects. This policy as manifested in this DEIS does the public a disservice by decreasing transparency in federal decision making. In our view, the EO is inconsistent with the goals of the National Environmental Policy Act (NEPA) that seeks input from the public, and requires an environmental assessment that is intelligible and provides sufficient detail for the public to evaluate how the proposed action (and alternatives) are expected to affect the environment and surrounding communities. In order to satisfy this objective the DEIS would need to be almost double in length.

## MACKEY PIT LAKE

BLM should consider reclamation of the post mining pit lake. The Mackey pit lake will contribute another approximately 27,592 acre-feet to the eventual total inventory of water in pit lakes in Nevada, which is estimated by GBRW to be about 1.3 million acre-feet. Most of this water is within the Humboldt River hydrographic region. Collectively, this amount of water is effectively wasted in Nevada, since there is no beneficial use established for the water in these pits lakes. To avoid wasting water BLM should seek to establish a beneficial use for the pit lake water.

Water quality of the pit lake is considered acceptable by the DEIS (pp. 4.12 – 4.13) relative to NDEP Profile III reference values and through an ecological risk assessment. BLM needs to note that NDEP Profile III is not a promulgated water quality standard, but only an internal guideline use by the NDEP (Nevada Division of Environmental Protection). The DEIS is misrepresenting the use of Profile III. Furthermore, NEPA requires BLM needs to independently assess risk and not assume that NDEP Profile III represents a definitive water quality assessment.

Predictions of pit lake water quality are often highly uncertain, for example, the Lone Tree pit lake prediction. In the case of Lone Tree water quality predictions remained highly inaccurate even after the pit lake was filling and the pit lake model was updated; for example, amounts of lime additions needed were significantly underestimated. Even after, Newmont began adding trona to the pit lake to better determine acid loading in the pit lake, the modeling calculations still contained an arbitrary factor of 800. Thus, GBRW cautions that the predictions for the Mackey pit lake and should be considered potentially speculative. BLM needs to address the uncertainty in pit lake water quality. To do so would require bracketing calculations in an attempt to present the range of pit lake water quality and any actions needed to mitigate for the associated risk.

Policy guidance for setting environmental policy and making prediction in the earth sciences require that quantitative analyses “clearly articulate uncertainties” and provide a “quantitative analysis of uncertainty.”<sup>vi</sup> This policy guidance is unsurprising: realistic uncertainty assessment is a requirement of all scientific studies, and is thus required also for simulations supporting environmental policy modeling. Without some understanding of uncertainty, predicted values are of almost zero utility. In addition, the public is unaware of the range of outcomes and effects on the environment and their communities.

The DEIS states that, “The formation of the Mackay Pit Lake is an unavoidable impact from the Proposed Action...” (DEIS, p 4-65). GBRW disagrees that the impact is “unavoidable.” Marigold Mining Company could also backfill the Mackey pit to avoid a pit lake. The DEIS does not analyze this alternative. Given that backfill pore water will become degraded in other backfilled pits the same could occur if the Mackey pit is backfilled; however, there is no analysis of this.

## DEWATERING AND WATER USE

The DEIS uses the phrase “non-consumptive water rights” (DEIS, p. 2-8) without clearly explaining its meaning. Nevada water law does not define a non-consumptive water right. All water rights are connected to a beneficial use specified in the water rights application. The water rights must be for mining and milling, and some of the water is not consumptively used, i.e., proposed to be discharged to rapid infiltration basins.

Water accounting is not presented in the DEIS. There is no differentiation of how much of the total water rights for the Marigold Mine are consumptively used and how much is to be

discharged back into the hydrographic basins. Nor, does the DEIS show the total water rights from the three hydrographic basins from which dewatering will occur and how much excess water is returned to which basin. The reader is left unaware of how much of the perennial yield of each affected hydrographic basin is allocated to Marigold's operations.

The increase in groundwater pumping is very significant for the proposed action, up to 10, 718 gallons per minute (GPM) (~17,000 acre-feet per year, AFY), yet the DEIS concluded no significant impact. The recovery time for the groundwater basins as a result of the combined Marigold dewatering, the Mackey Pit lake, and the Lone Tree pit lake is on the order of 200 to 300 years, which is effectively a perpetual change in the groundwater dynamics, hardly insignificant.

#### DEIS Unreasonably Only Considers the Ten-foot Drawdown

The effects of drawdown on surface water resources are commonly shown as a risk to resources within a certain drawdown. In this DEIS, that is the ten-foot drawdown. Once the water table is drawn beneath a surface water resource dependent on the water table, it does not affect the surface resource any more to draw the water table down further. Therefore, it is reasonable to consider that a small drawdown can affect surface resources. A spring or seep that depends on the water table will go dry if the water table drops below that intersection of the water table with the surface. Therefore, it is unreasonable for the DEIS to only consider the ten-foot drawdown for its consideration of effects (DEIS, Figures 4.1-1 to 4.1-3); a spring is just as dry for a one-foot drawdown as for a ten-foot drawdown. Additionally, the discharge from a spring would be reduced if the gradient controlling the discharge reduces without regard to there being any actual drawdown at the spring.

The DEIS offers no justification for using a 10-foot drawdown. Many other EISs for mining projects have used a much lower drawdown for the consideration of impacts. The following is a small sample of those documents drawn from different states:

Copper Flat Copper Mine: Draft Environmental Impact Statement, Sierra County, New Mexico, BLM/NM/ES-16-02-1793 – 2015. The DEIS considers drawdown to 1 foot.  
<https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=112704>

Donlin Gold Project, Final Environmental Impact Statement, Alaska, 2015. This EIS considers drawdown to 0.1 feet due to the nearby wetlands that could be dried.  
<https://cdxnodengn.epa.gov/cdx-enepa-II/public/action/eis/details?eisId=247774>

Haile Gold Mine Project, Final Environmental Impact Statement, 2014, SAC 1992-24122-41A  
The FEIS considers drawdown to 1 foot.  
<https://docplayer.net/54614426-Volume-i-final-eis-final-environmental-impact-statement-for-the-haile-gold-mine-project-sac-ia-july-2014.html>

The DEIS therefore errs in not considering drawdown less than ten feet. Consideration of drawdown to one-foot would account for some variability in the estimate intended to be accommodated by the one-mile buffer zone. The DEIS clearly underestimates the potential effects of drawdown on surface water resources.

### DEIS likely Underestimates the Effect on the Humboldt River

The cumulative draw down clearly intercepts the Humboldt River (DEIS, Figures 4.1-1 to 4.1-3) and should be expected to affect river flow. But, the DEIS states, “the predicted impacts to the Humboldt River from the Marigold Mine dewatering were so small that they could not be distinguished from noise in the model results” (DEIS, 4-10), and “Simulations indicated that the stage and depth of the Humboldt River would not change during the Marigold Mine dewatering and impacts to the streamflow would be less than one percent (Geomega 2018a)” (DEIS, p 4-11). GBRW contests these conclusions. An independent analysis<sup>ii</sup> from 2016 on the affect of the Lone Tree pit lake filling (after dewatering) on the Humboldt River determined an 8 percent decrease in total flow. In this report, Dr. Myers makes the following conclusion,

“Mine dewatering at the Lone Tree Mine affected flow in the Humboldt River by drawing water from the river. Double mass analysis indicated that 217 Mm<sup>3</sup> [8% loss, id.] was lost in eight years. Groundwater level recovery indicates that alluvial water drawn into the bedrock causes much of the lost river flow. However, the loss became apparent only after dewatering ceased and the pit lake began to fill because much of the dewatered water was discharged to the river, which would have replaced water lost from the river to groundwater. The double mass curve showed that almost no net water was lost to the study reach between 1997 and 2006. After 2006, the loss rate in the study reach was almost twice the loss rate that occurred prior to dewatering. River flow losses to dewatering will continue long after dewatering ceases. When this occurs, the river flow will both lose the dewatering water discharged to the river and flow drawn into groundwater to replenish the groundwater deficit. The lost flow is groundwater discharge, or river baseflow, which is the primary flow in the river during late summer and fall. Losses will continue into the future but most likely at a lower rate as the gradient drawing water to the recovering pit lake decreases.”

BLM should reassess how dewatering will affect the Humboldt River. Assuming that Dr. Myers analysis is correct, then the DEIS should identify at the very least the cumulative affect on the river, which would be at least 8 percent of total flow. GBRW submits that the analysis used from which the DEIS draws its conclusion is not sophisticated enough to elucidate the full effect on the river. Therefore, the no impact conclusion is likely to be invalid.

### DEIS Failed to Adequately Analyze the Affect of Dewatering on Public Water Reserves

There appears to be no analysis of Public Water Reserves (PWR) in the DEIS. BLM needs to independently assess the presence of PWRs. The failure to fully analyze all of the PWRs violates NEPA, whereas the failure to fully protect all PWRs (and withdrawn lands associated with the PWRs) violates BLM’s duties under the PWR itself as well as BLM’s FLPMA/UUD duties.

### WASTE ROCK ANALYSIS

According to the DEIS, “MMC has chosen to treat all material from the proposed Mackay North and 5-North pits as potentially acid generating (PAG) rather than perform kinetic testing (humidity cell testing [HCT]) as part of the baseline studies” (DEIS p. 2-10). GBRW recommends that MMC conduct the HCT for the Mackay North and 5-North pits to fully understand the nature of the waste rock, which can only aid in better management.

Seepage from waste rock facilities is likely to require capture and treatment for an indefinite period of time. According to the DEIS, “Leaching for certain constituents can still occur even in the absence of acid drainage. The MWMP results for rocks associated with mineralization at the mine have identified aluminum, antimony, arsenic, chloride, fluoride, lead, mercury, selenium,

sulfate, nitrate, and total dissolved solids as constituents that could potentially occur in concentrations exceeding Nevada water quality standards” (DEIS, p 3-24). In addition, “approximately 74 percent classify as “uncertain” based on the net neutralization potential” (DEIS, p 3-24), which GBRW presumes based on the text is from the Mackey pit. Thus, there is sufficient evidence that seepage from waste rock dumps has an actionable potential to degrade groundwater and will constitute toxic discharge requiring treatment. BLM need to require a mitigation/treatment plan for this potential outcome.

### LONG-TERM MANAGEMNT

The DEIS notes that evapotranspiration cells are to be created to management long-term drain down for various mine facilities with a 30 time timeline. However, final closure date remains unclear with adaptive management to be used to determine permanent closure. GBRW interprets this phrasing to mean that closure is indefinite and that there exists a high potential that long-term active management will be needed, effectively requiring perpetual care. BLM needs to clarify to the public whether perpetual management is anticipated and seek to secure a long-term funding mechanism to cover these costs.

### BACKFILL PORE WATER CHEMISTRY

The DEIS does acknowledges that infiltration through the backfill can degrade groundwater, “Long-term backfill pore water chemistry is predicted to exceed NDEP Profile I reference values for cadmium, mercury, antimony, and thallium, as well as pH (too high) ... if the predictions hold, these constituents could migrate downgradient and potentially impact the groundwater system” (DEIS, p 4-16). However, there is no proposed mitigation, only groundwater monitoring, for degrading groundwater, rather the DEIS suggests that, “outflowing constituents contact the pit wall, adsorption reactions could occur that diminish the concentrations and therefore impacts to downgradient groundwater” (DEIS, p 4-16). This assessment is speculative and it should not be assumed to be effective. BLM needs to require a specific mitigation to prevent groundwater degradation and violations of Nevada Law and an assessment of the effectiveness of the mitigation.

### AIR QUALITY ANALYSIS

There does not appear to be a fugitive mercury emission analysis off of heap leach, tailings, and waste rock facilities, which is needed for this site with its historically high native mercury levels in the rock and ore. Work publicly presented in November 2009, measured these mercury emissions determining that they are not insignificant.<sup>iii</sup> Two mines were used in the study, Twin Creeks (Newmont) and Cortez-Pipeline (Barrick), where it was estimated that the fugitive emissions accounted for 19% (12 to 21%) and 17% (15 to 31%) of total at Twin Creeks and Cortez-Pipeline respectively. Thus, according to this analysis the increase in emissions due to fugitive emissions was calculated at 23% (13 to 27%) and 20% (17 to 46%) for the mines respectively.

GBRW does not accept any argument that these fugitive mercury emissions cannot be estimated and are therefore unknowable. The toxicity of mercury alone demands that every attempt be made to determine the extent of all possible sources and pathways into the environment. In fact the Final Supplementary EIS for the Cortez Hills Expansion Project did provide an estimate of fugitive mercury emissions.<sup>iv</sup>

### WILDLIFE

The DEIS states that there are unavoidable impacts of wildlife including greater sage grouse. For sage grouse, “permanent loss of those areas not subject to reclamation that overlap PHMA,

GHMA, and OHMA mapped habitat” (DEIS, p 4-68). There is no suggested mitigation and the cumulative analysis is inadequate typically citing the percent of disturbed area relative to the CESA (cumulative effects study area). The affects of the mine on wildlife are well outside the disturbed boundary. Especially in the case of sensitive species such as sage grouse the DEIS needs to evaluate how the loss of yet more habitat will affect the overall populations in the region.

The CESA should be expanded to allow for a wider evaluation on species like sage grouse whose populations are in jeopardy. This project needs to be examined in a wider context of species survival.

### CUMULATIVE IMPACTS

The DEIS does not fully explore cumulative water quantity and water quality. The Lone Tree Final EIS is over 20 years old and predicted no water quality problems involving the pit lake. There has been no NEPA analysis of the impacts of the toxic Lone Tree Pit Lake. BLM needs to include the significant new information that has arisen since the 1996 Lone Tree EIS. For example, according to the Final EIS on the Lone Tree mine:<sup>v</sup>

“Water in the pit lake would be subject to natural buffering by groundwater and adsorptive removal of metals by precipitating AFH (PTI 1995). Pit lake water is predicted to be alkaline (pH =8.7-9.1) at all times during pit lake development.”

This conclusion was wildly incorrect. The Lone Tree Mine, only a mile from the Humboldt River, ceased pumping groundwater (dewatering) in 2006, and the pit lake has been developing rapidly. Late in 2007 the lake acidity began to increase (pH dropping) to a point so severe that corrective action was required since it was a risk to wildlife.<sup>vi</sup> Currently, the acidity of the lake has been kept in check with continual additions of lime and trona, ~74,000 tons and ~10,000 tons respectively as of the end of 2016.<sup>vii</sup> At this time it is unclear how long treatment will be needed with the possibility of treatment in perpetuity. **The impact of the pit lake and the potential for future groundwater contamination has never been analyzed in a NEPA process.**

A simple inclusion of the overall area in a generalized cumulative impacts map does not satisfy the “hard look” requirement of NEPA. Indeed, as the Ninth Circuit has held in striking down BLM cumulative impacts analysis, for such an analysis to be sufficient under NEPA, it must contain a “quantified assessment of their [other projects] combined environmental impacts,” and “objective quantification of the impacts” from other existing and proposed operations in the region. *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 972 (9th Cir. 2006). “[W]e have recently noted two critical features of a cumulative effects analysis. First, cumulative impacts analysis must not only describe related projects but also enumerate the environmental effects of those projects...Second, it must consider the interaction of multiple activities and cannot focus exclusively on the environmental impacts of an individual project.” *ONRC Fund v. Brong*, 492 F.3d 1120, 1133 (9th Cir. 2007). *See also Te-Moak Tribe v. U.S. Dep’t of Interior*, 608 F.3d 592, 603 (9th Cir. 2010)(requiring EA to analyze other nearby mining operations).

### CONCLUSION

Over GBRW finds the DEIS inadequate in many ways, and we have serious concerns that many conclusions reached are invalid. At this time GBRW cannot support the proposed action.

Thank you for the opportunity to submit these comments. Please feel free to contact John Hadder if you have any questions or concerns.

Sincerely,

A handwritten signature in black ink that reads "John Hadder". The signature is written in a cursive, flowing style with a large initial "J" and "H".

John Hadder

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<sup>i</sup> Pielke, R.A., Sarewitz, D., Byerly, R., and Jamieson, D., “Prediction in the earth sciences and environmental policy making,” *EOS*, Vol. 80, No. 28, 1999, pp. 309–313.

<sup>ii</sup> Myers, Tom, “Effect of Open Pit Mine Dewatering and Cessation on Semi-arid River Flows,” Technical Memo to Great Basin Resource Watch, 2016.

<sup>iii</sup> C.S. Eckley, M. Gustin, F. Marsik, M.B. Miller, “Measurement of surface mercury fluxes at active industrial gold mines in Nevada (USA),” *Science of the Total Environment* 409 (2011) 514–522.

<sup>iv</sup> BLM, *Cortez Hills Expansion Project Final Supplemental Environmental Impact Statement*, January 2011. pp. 3-34 to 3-35.

<sup>v</sup> United States Department of the Interior Bureau of Land Management, *FINAL Environmental Impact Statement Lone Tree Mine Expansion Project*, September 1996. Pg. 3-31.

<sup>vi</sup> In 2008 Newmont Mining Corp received approval from NDEP to add ~1,900 tons of caustic soda (sodium hydroxide – lye). None of this has been reviewed under NEPA.

<sup>vii</sup> Newmont, “Lone Tree Pit Lake 2016 Trona Test Update,” Presentation to GBRW and NDEP, November 2, 2016.