May 1, 2017

Kevin Hurrell
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Battle Mountain District Office
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Electronic Submission: BLM_NV_BMDO_MLFO_DeepSouthEIS@blm.gov

Re: Scoping Comments for the Proposed Deep South Expansion Project

Dear Mr. Hurrell,

Great Basin Resource Watch (GBRW) appreciates the cooperation of BLM staff and Barrick staff is providing documents to GBRW prior to and as part of this scoping process.

Draft Environmental Impact Statement (DEIS) Comment Period

The Deep South Expansion (DSE) is a very large project proposal involving multiple operations in Crescent, Grass, and Pine Valleys and the Cortez Mountains. GBRW anticipates an especially large and complex environmental analysis, so we are strongly requesting that BLM allow at least 120 days for public review of the DEIS.

Water Issues

1. Mining water requirements and dewatering. According to the Plan of Operations (PoO) there will be multiple expansions and considerable deepening of existing pits and underground operations. The PoO does not indicate the increased extent of dewatering and only states dewatering will remain within existing permitted levels. Significant detail will be needed in the DEIS to assess changes in seeps, springs, and surface water from existing operations, and explore the affect of the increased dewatering. The analysis needs to include how the three valleys, Crescent, Pine and Grass Valleys will be affected by the deep draw down.

   The Final Supplemental Environmental Impact Statement for the Cortez Hills (FSEIS) project and did not adequately address protection of sources of springs. In the first place the FSEIS did not acknowledge the use of spring for cultural activities that has been discussed extensively by Western Shoshone. In fact the FSEIS actually cited the testimony of Bill Wilson, a non-native prospector, as a source as to whether Western Shoshone had conducted any cultural or religious practice at Shoshone Wells, or elsewhere. The DEIS needs to correct that assessment, or at the very least reevaluate the cultural importance of the springs in the region. Furthermore, the mitigation procedures discussed in the SFEIS do not provide protection of cultural value of springs, which require that the sources of the springs remain viable. GBRW
would like to see BLM take a hard look the use of reinjection wells to preserve the sources of springs with cultural value by preventing the dewatering cone of depression from damaging those sources. Attached is a technical memo from 2011 written by Dr. Tom Myers outlining this method.

Pit lake water represents a huge, and often unaccounted for deficit in the groundwater budget. The drawdown cone volume, that in the pores between the pre-mine water table and the water table that will exist at the end of mining, also represents an unaccounted for deficit. Filling these deficits will cause the effects on surface water resources to continue long after the mines stop operating. Also, the extent of the drawdown cone will continue to expand even as the maximum drawdown near the pits begins to recover. Therefore, a cumulative effect of dewatering needs to be discussed in terms of the regional water use and spring, seeps, and surface waters to fully realize the long term hydrologic impact.

A considerable volume of excess dewatering water is destined for infiltration basins and to be used in irrigation. These will also affect the water dynamics of the region and needs to be evaluated. The DEIS needs to analyze the recovery of the deep aquifer and the effectiveness of the infiltration basins and irrigation to return water to these deep aquifers from which it has been pumped. The DEIS should also include reinjection alternatives to maximize the return of water to the deep aquifer directly.

2. Hydrology. A complete characterization of the surface waters and springs and an understanding of groundwater movement appears to be available from an analysis dated January 2016 that compiled a four basin analysis. GBRW expects that existing data will be augmented with data taken since the last action to update the hydrological model. The existing water monitoring network needs to be reassessed to assure that the goals of the network will continue to be satisfied.

3. Geochemical analysis. The geochemical analysis of waste rock, heap leach and tailings materials must updated using data gathered since the last analysis for potential acid production, including crystallographic analysis to determine the extent of fracturing expected upon blasting. In this regard the full range of static and kinetic tests need to be performed: determine the NAPP and NAG values, for example. The DEIS should contain a plan to handle acid generation, or a contingency plan accounting for markedly varying acid generation capacity as the mining proceeds that is not expected from preliminary testing. In our experience, predictions are often far off the mark, so detailed plans are needed for public review to assure that the various operations will be able to mitigate in the event of acid generation.

4. Water Quality. GBRW remains concerned about the potential of the infiltration basins to degrade groundwater. The DEIS needs to examine how dissolved salts from the infiltration basin can be carried into the aquifer, and develop mitigation strategies to prevent this degradation. BLM should require groundwater monitoring data on existing infiltration basins in Crescent Valley to track whether salts are becoming dissolved and reaching groundwater. If monitoring wells do not exist to address this issue, then BLM needs to require that Barrick install the necessary wells to get the data needed.

A complete plan for handling and treatment of dewatered water is necessary as well, including the groundwater chemical analysis. According to the PoO a water treatment facility will be constructed to remove elevated levels of arsenic from the dewatering water. The PoO also
states, “The WTP sediment will be sent to either the Cortez or Pipeline tailings facilities,” (p. 2-10). The DEIS needs to analyze the potential affects to groundwater from the addition of arsenic in the event of tailing impoundment failure.

5. Pit Lakes. A complete discussion of the pit lakes that will result is needed, which includes expected water characteristics, and the nature of water migrations in and out of the pit lake. The consequences of groundwater contamination from the pit lake needs to be fully addressed. Procedures for improving the pit lake water need to be included in the analysis. Post mining reclamation of pit lakes needs to be discussed. BLM should not simply rely on existing data analysis, which may not take into account potential changes in geochemistry due to the expansion of pits and underground operations.

Wildlife Issues

1. Flora and Fauna. The impact to local flora and fauna due to changes in water dynamics needs to be examined; for example, potential loss of springs or changes in the water table. Analysis must address the potential loss of riparian areas, and whether the springs are on wildlife migratory routes, and, if so, how migrations will be affected.

2. Migratory species. An understanding of migratory routes needs to be discussed, and the impacts of the loss of these migratory routes from the various land disturbances should be addressed.

3. Sage Grouse. GBRW is concerned that sage grouse habitat will be destroyed in the region due to the cumulative effects of the various mining operations. The PoO states the following:

   “Cortez will implement restoration/enhancement measures within two years of the proposed disturbance-related activities. Completed measures will be reported in the annual disturbance report that is provided to the BLM and NDEP by April 15th each year. Impacts associated with the off-site mitigation areas were addressed in the corresponding EAs; therefore, no additional NEPA analysis will be required for this mitigation option” (p. 2-24)

GBRW does not agree that no further NEPA analysis is needed. The DEIS needs to evaluate the effectiveness of the sage grouse measures to date. If in fact a NEPA level analysis including cumulative impacts is up to date, then it needs to be included in the DEIS even if as a an appendix. The DEIS needs to make it clear what are the sage grouse protection measures. GBRW is concerned that the approached contained in the 2013 Memorandum of Understanding Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat mentioned in the PoO involves an unproven sage grouse preservation method. The DEIS needs to produce evidence of the effectiveness of the method as outlined in the MOU.

Air Issues

1. Mercury emissions. The DEIS needs to update the analysis of environmental impacts from expected mercury emissions is also needed including fugitive emissions. The Cortez-Pipeline operations were part of a fugitive emission study that was presented publically in November 2009 that indicated that fugitive emission are non trivial. 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. The DEIS needs to discuss mitigation strategies to minimize fugitive emissions as well as thermal stack emissions, which is controlled under the State of Nevada Mercury Control program.

2. **Hazardous Air Emissions.** Analysis and mitigation of other gaseous emissions (such as sulfur oxides, nitrogen oxides, etc.) from all mine facilities and vehicles is needed.

3. **Greenhouse Gases.** The DEIS should analyze the project’s contribution to carbon dioxide and other significant greenhouse gas emissions.

4. **Particulates.** The expected amount of airborne particles as dust or diesel vehicular emissions from all aspects of the project needs to be determined with concentrations for varying wind factors. Impacts of the “dust” should be evaluated for inhalation health impacts, visibility impairment, and resettling on surface water and vegetation. In the case of resettling on surface water there should be a chemical analysis of the dust to determine whether the dust could have an adverse effects on the chemistry of the water. In general, there needs to be a plan for dust control.

**Land Issues**

1. **Viewshed.** There also needs to be an analysis of whether the loss of scenic views will affect economic and ecological viability of the area. The visual aspects of the site should be returned as closely as possible to its natural existing appearance so as to restore the inviting quality that now exists.

2. **Open Pits.** A complete restoration plan for all aspects of the mine needs to be detailed. The DEIS should contain an alternative for backfilling of the open pits. A plan for restoring the landscape to as close as possible to the pre-mining appearance should be developed. Of particular relevance here would be to restore the region, especially the pediment area below Mt. Tenabo so that Western Shoshone cultural activities might be resumed. The reclamation plan should assume that people will at some point in the future will be in and around the open pit and thus they need to be at least reclaimed so they are not dangerous to human intrusion.

**Cultural Issues**

1. **Archeological.** The project area must be surveyed for historical and archeological artifacts, and mitigation plans must be developed for any of these sites.

2. **Native American Cultural.** In the American Indian Religious Freedom Act (AIRFA), Congress stated that “[i]t shall be the policy of the United States to protect and preserve for American Indians their inherent freedom to believe, express, and exercise the traditional religions.” 42 USC § 1996 (1982). The BLM must analyze the cumulative impact to the ability of Native Americans to fully practice the traditional religions within the study area. The analysis must include both known sacred and spiritual sites as well as traditional food and medicine gathering, important components of traditional practice.

The Cortez Hills operations have already severely negatively affected the cultural and religious quality in and around Mt Tenabo. Western Shoshone have used the Project site, especially Mt.
Tenabo, since time immemorial. Mt. Tenabo holds a special place in Western Shoshone religious life and is utilized as a central part of Western Shoshone religious practices. The site has been an integral part of Western Shoshone religious tradition and is currently and regularly visited by Western Shoshone for individual and communal prayer ceremonies, sweat ceremonies, vision quests, the gathering of sacred/spiritual plants and medicines, among other religious practices. The DEIS needs to discuss how existing operations have affected the special significance of Mt Tenabo as a spiritual and cultural center. To do so will require that BLM conduct interviews and sponsor site visits for Shoshone cultural leaders to relate the impact of the operations on the cultural and spiritual uses and values.

The discussion of impacts needs to include a wider area than the BLM-designated Properties of Cultural and Religious Importance (PCRIIs), defined in previous NEPA documents, as the top of the Mountain and in Horse Canyon. These PCRIIs, although of course important, are just a subset of the larger sacred lands and religious use areas on and around Mt. Tenabo. These areas include the larger Traditional Cultural Property (TCP) referenced in the EIS for Cortez Hills Expansion and ethnographic reports, as well as the sacred lands and waters noted in Western Shoshone Declarations. At a minimum, the area containing Western Shoshone sacred lands and religious uses that must be protected are encompassed by the TCP boundary shown in the January 2004 Rucks Ethnographic Study, at Figure 5, p. 48. See also Rucks Report Figure 3 (showing TCP boundary). This includes the whole of Mt. Tenabo as well as areas intricately tied to the spiritual/religious importance of Mt. Tenabo such as the “Shoshone Wells Ceremonial Site.”

Cumulative Issues
The EIS should also examine how the various impacts of this mine will add to the collective impacts of other ecosystem disturbing projects in the region. For example, could mercury emissions from the mine when taken together with other mercury sources in the region result in mercury exceedence according to the Clean Air Act. Or, does the mine disturbance further impair the regional ecosystem resulting in seriously threatening fauna and/or flora. The cumulative impact analysis needs to address cultural traditions as well, such as the pine nut harvest.

A cumulative impact is “the impact on the environment which results from incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” This definition is critical to determining the proper area to be studied in a cumulative impact assessment.

If you have any questions regarding any of our comments feel free to contact us.

Sincerely,

John Hadder, Great Basin Resource Watch
Larson bill, Western Shoshone Defense Project
Bob Fulkerson, Progressive Leadership Alliance of Nevada


v It should be noted, however, that religious practitioners do not place a boundary line on a map the lands outside of which do not contain religious significance. However, the TCP area boundary contained in the 2004 Rucks Ethnographic Report can be utilized for the purposes of delineating, at a minimum, religious use areas that need to be protected.

vi 40 CFR § 1508.7
**Alternative Mitigation Proposal**

The mitigation proposed in the DSEIS and FEIS and described by CGM and JBR (2010) is insufficient because replacing water just adds to the problem and the mitigation will be required essentially in perpetuity.

Preferably the BLM will require the mine to prevent the degradation of the springs from even occurring. The best way to prevent degradation is to return the dewatering water to the groundwater system in such a way that some of the worst and/or long-term effects of dewatering are prevented. The Pipeline Deposit mine uses rapid infiltration basins; the Cortez Hills mine will use the same basins. But the RIBs are too far from Cortez Hills to mitigate the deficit created in that mine; moving water to the RIBs creates a surplus there without mitigating the deficit near Cortez Hills. BLM should locate an area nearer to Cortez Hills and require properly-placed injection wells.

The drawdown contours (Figure 2) closely resemble the geology (Figure 1) indicating the different (modeled) hydrogeologic properties constrain the predicted drawdown to certain areas. Two areas of interest are considered here: Shoshone Wells and Horse Canyon. Other springs near Shoshone Wells would also respond to remedies to protect Shoshone Wells.

Shoshone Wells discharge from near the contact of carbonate (Ds) and tuff (Tt2) (Figure 1). Carbonate rock also underlies the conglomerate east of Shoshone Wells. The area is highly faulted with many offsets among the formations. Drawdown maps show that Shoshone Wells lie in a zone over which the drawdown increases rapidly over a short distance (Geomega, 2007, Figure 6.52 for example) – in other words, on the lip of the drawdown cone. The steep drawdown contours indicate the modeling simulated the faults and offsets primarily as flow barriers. Discharge from Shoshone Wells most likely is from the carbonate rock.

Geomega indicates many of the springs on the north end of the Toiyabe Range and the Cortez Hills area are on a hillside west of the pit. They suggest that precipitation further up the mountain recharges these springs. But Shoshone Wells and others of these springs lie in the 100- to 300-foot drawdown contours (Figure 2). The pre-mine depth to groundwater is high. There is much uncertainty as to the effect this drawdown will have on the springs. They will be monitored but it would be useful to understand the source of the water.

*The BLM should do isotope and other geochemical surveys of the springs to determine the source of recharge. Specifically, the springs would differ in character and chemistry if their origin is carbonate rock or if it is local perched water.*

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1 Note that the FEIS and Geomega refer to Mapped Cortez Spring (Geomega, 2007, Table 6-15 for example) meaning Shoshone Wells.
These springs have great ecologic and cultural significance. The BLM should be proactive in protecting them. Although the steep drawdown contours coincide with the faults on the east side of the bedrock, drawdown in excess of ten feet extends west into the bedrock and further into Crescent Valley. As noted by Geomega, the location of the springs may coincide with faults which provide conduits for flow to reach the surface and dam the downgradient flow.

The BLM should require that CGM inject dewatering water into the carbonate rock west and just north of west of Shoshone Wells. This would counter some of the projected drawdown and would help to keep the Shoshone Wells and remaining Toiyabe springs flowing.

Horse Canyon is east of the proposed Cortez Hills pit. The No Action alternative causes no drawdown in this area, so the project drawdown is due strictly to the Cortez Hills expansion. Geomega Table 6-15 shows that the maximum drawdown under these springs is as much as 106 feet, but also that more than 100 years is required for the maximum drawdown to occur. The slow development is due to the modeled low conductivity. Fractures present in the area may allow the effects to spread more quickly.

Horse Canyon is in an adjacent hydrographic basin, the Pine Valley basin (#53). The drawdown in this canyon is due to the dewatering drawing water from the adjacent basin, effectively establishing an interbasin flow. A large outcrop of Wenban limestone separates Horse Canyon from the mining area. Geomega calibrated this formation with horizontal and vertical conductivity equal to 0.13 and 0.127 ft/d, respectively; fracture limestone, the Roberts Formation, calibrated at 45.5 and 4.55 ft/d, respectively. FEIS Figure 3.1-3 shows multiple faults through this carbonate. Faulting in carbonate rock usually leads to high transmissivity. These factors all suggest that dewatering effects could extend in that direction faster than 100 years.

Geomega Figure 4-6 show the Cortez fault modeled as a “barrier sequence”. It lies between the mine and Horse Canyon. This may slow the expansion of dewatering effects in that direction. A question is whether the effects act through the fault or around the fault. Either way, faults limit the predicted Horse Canyon drawdown, which should be considered very uncertain. Proactive measures to protect the spring complexes in this area should be implemented.

BLM should require injection of dewatering water into the Wenban limestone upgradient from Horse Canyon. Alternatively, a RIB could be used but due to the topography this might be a greater impact than a well.

There are potential issues with this plan regarding the interbasin transfer of water. However, since it is for an environmental purpose, the Nevada State Engineer should permit it.
Figure 1: Snapshot of Figure 3-5 from Geomega, 2007). Shoshone Wells are shown SW of the center of the map. Green wells are completed in carbonate rock. The Roberts Thrust roughly corresponds with the narrow Qa formation northwest of Shoshone Wells. The pit area and the area of most drawdown (Figure 2) is between sections B and C and crossed by section A.

Figure 2: Snapshot of Figure 6-52 (Geomega, 2007) showing drawdown 100 years after dewatering ceases. Maps showing long-term drawdown are relative to the year 2004.
Objections to injection in other places should not cause concern at Cortez Hills.

Barrick had attempted injection in Boulder Flat to return dewatering water to the groundwater basin. This attempt was not considered successful because the injection was into volcanic rock. Contaminants leached from the rock and degraded the groundwater. That is not an issue here because the proposal would have water returned to carbonate rock fractures.

A common objection is that the mine will pump the water twice. The solution to this problem is to inject water outside the zone of drawdown as predicted by Geomega (2007). Injection upgradient of a fault that constrains the flow would slow the speed the water returns to the mine area. This problem is not a reason to not reinject because it can be accommodated.

References

