

Letter 3



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May 3, 2001
File No. EC 32.7
BLM 4-4

Memorandum

To: Field Manager, Bureau of Land Management, Battle Mountain Field Office,
Battle Mountain, Nevada (Attn: Pam Jarneke)

From: Field Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Draft Environmental Impact Statement-Phoenix Project, Lander County, Nevada

We have reviewed the Draft Environmental Impact Statement (DEIS) for the Phoenix Project. This DEIS analyzes impacts associated with a proposal to continue and expand mining operations in Copper Canyon located approximately 12 miles southwest of Battle Mountain, Nevada. The proposed action includes: 1) developing the Phoenix and Reona pits and expanding the existing Midas and Iron Canyon pits; 2) mining the ore deposits by excavating and processing low-grade gold ore stockpiles associated with previous mining operations; 3) processing of heap-leach-grade ore at the existing and proposed expansion of the Reona heap leach facility; 4) processing mill-grade ore at the proposed crushing, grinding, and milling facilities; 5) depositing tailings at a new lined tailings facility south of Copper Canyon; 6) closing and reclaiming previous copper heap leach facilities; 7) lining and isolating the previous copper tailings facility; and 8) backfilling three existing open pits. Expanding the project would result in about 4,295 acres of new disturbance of public and private lands in the Copper Canyon area and would extend the operational life up to 28 years followed by approximately 5 years of reclamation activities. The following comments and recommendations are provided for your consideration.

GENERAL COMMENTS

3-1 [The expansion of this mine has the potential to adversely impact the environment beyond that

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3-1 Comment noted. The BLM will coordinate with the U.S. Fish and Wildlife Service (USFWS) relative to monitoring and mitigation for biological resources.

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3-1 authorized in relation to ongoing operations, including potential adverse impacts to fish, wildlife, and their habitats. It is extremely important that monitoring and mitigation activities be carefully considered to prevent and offset adverse impacts. Some of our concerns in relation to the proposed project are: 1) the potential for generating acid rock drainage and subsequent mobilization of metals and other trace elements that could impact groundwater and surface water; 2) potential for contaminated ground water to come to the surface where exposure to fish and wildlife could occur as well as alter their habitats; 3) long-term monitoring of water resources may be deficient in determining environmental effects; and 4) contingency bonding for remediation of potential acid rock drainage that may develop from the proposed expansion project is not adequately addressed. Specific recommendations on this proposed expansion project are listed below with our Specific Comments. We ask to be included in any discussions and decisions on monitoring and mitigation where fish, wildlife, and their habitat may be potentially affected.

SPECIFIC COMMENTS

CHAPTER 2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

3-2 2.4.2 Waste Rock Facilities, pages 2-23 and 2-24. We are concerned with the placement of potentially acid generating waste rock in pits beneath the post-mining water table even though amendments will be used in an attempt to preclude acid generation. The long-term effectiveness of mixing lime or other neutralizing materials with acid generating materials is not known and acid generation may take years to form (National Research Council [NRC] 1999). Even with neutralization, we are concerned that some metals or trace element concentrations may still be elevated in drainage, both from waste rock placed in dumps and in backfilled pits. Currently Battle Mountain Gold (BMG) is experiencing acid rock drainage and degraded surface water quality events emanating from inactive waste rock facilities in Iron and Butte Canyon (Brown and Caldwell 2000) which contain perennial springs. If acid-generating waste rock is to be saved and backfilled into pits at a later time, what will be done to prevent acid generation and runoff from existing and proposed storage areas prior to backfilling (i.e., during the period of mine operation)?

3-3 The last sentence on page 2-24 indicates that "Considerable experience revegetating similar materials [i.e., growth media] has been gained by BMG at the Reona and Copper Basin areas nearby." Experience on this topic is certainly helpful. How successful have these efforts been to date?

3-4 2.4.5 Roads and Utility Corridor, page 2-25. If the project will involve the discharge of fill material into wetlands or waters of the United States, the U.S. Army Corps of Engineers (Corps) should be contacted. Such discharge is regulated by the Corps pursuant to section 404 of the Clean Water Act. We recommend that the project proponent contact the Reno Field Office of the Corps' Sacramento District [300 Booth Street, Room 2103, Reno Nevada 89509, (775) 784-5304], if such discharge is required.

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3-2 Please see the response to comment 1-11. The application rate for neutralizing amendments was calculated stoichiometrically from the sulfide content of the waste rock. In addition, the Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c) includes provisions for the monitoring and capture of affected ground water that may migrate beyond the waste rock storage areas. Concurrent reclamation would ensure that the exposure period of acid-generating waste rock is minimized.

As explained in the Draft EIS, Section 3.2.2.1, runoff water affected by sulfide oxidation products would be captured and managed in accordance with the Phoenix Storm Water Pollution Prevention Plan (Brown and Caldwell 2000g). In addition, Mitigation Measures WR-9 and WR-11 in the Final EIS specify procedures for final reclamation and closure procedures for the sediment basins, and modifications to the Water Resource Monitoring Plan to include additional water quality monitoring of runoff downgradient of the existing and proposed waste rock storage areas. Implementation of these storm water pollution prevention measures throughout the life of the project is expected to prevent impacts to surface water quality from the temporary storage of waste rock prior to pit backfilling.

3-3 A field review of reclamation in the Reona and Copper Basin areas during December 2000 revealed that desirable perennial vegetation cover of these areas typically ranges between 30 and 40 percent. There appear to be small areas that do not meet this level of revegetation success, but these exceptions are infrequent. In comparison, desirable perennial vegetation cover in native, undisturbed areas in the region appears to be below 20 percent.

3-4 The proposed project does not include the discharge of material into jurisdictional wetlands or other waters of the U.S. The U.S. Army Corps of Engineers has been contacted and has concurred with the jurisdictional delineation summarized in the EIS (U.S. Army Corps of Engineers 2000).

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- 3-5 [2.4.5 Roads and Utility Corridor, page 2-26. The second paragraph on this page indicates that temporary straw bale diversions may be used for best management practices. We strongly recommend that certified weed-free straw bales be used. This will assist in reducing the chance of introduction of weeds into the area.
- 3-6 [2.4.10 Neutralization, page 2-30. Please provide information on the level of weak acid dissociable (WAD) cyanide in the tailings that is considered safe to wildlife. We believe that a single concentration describing a safe concentration may not be adequate due to cyanide-metal complexes. Safety to wildlife should not be limited to information on lethal toxicity alone, but should also consider information on potential sublethal effects as well as possible delayed effects.
- 3-7 [2.4.21.7 Tailings Facilities Reclamation, page 2-44. The use of infiltration basins for fluid disposal from tailings following reclamation may result in risks to migratory birds unless exclusion devices are used. The tailings fluid would be expected to contain elevated concentrations of metals and trace elements that could be toxic to migratory birds. If exclusion devices on the basins are not used and aquatic communities also develop in the basins, including the presence of food items for birds, the risks to birds might become unacceptable.
- 3-8 [2.4.21.8 Heap Leach Facility Reclamation, page 2-44. What WAD cyanide-metal complexes might be removed from the circuit during this final phase of the operation? Please note our concerns for section 2.4.21.7 if infiltration basins are also to be used for final disposal of fluids from heap leach facilities.
- 3-9 [2.4.21.16 Monitoring of the Reclaimed Site, pages 2-47 and 2-48. We are concerned that monitoring of ground water would only occur until closure and reclamation are completed. Acid generation may take years to develop (NRC 1999); therefore, long-term monitoring should be required.
- 3-10 [The DEIS indicates that revegetation would be considered complete once revegetation has been established to one of the following levels: "perennial vegetative cover is as close as possible to 100 percent of selected comparison areas or perennial vegetative cover is as close as possible to 100 percent of the ecological or range site descriptive cover." We are concerned that arsenic toxicity may inhibit the development of vegetative cover. It would be unacceptable if the vegetative cover was, for example, only one-third of that found in reference areas, even though that might be considered "as close as possible" to the established standard.
- 3-11 [2.4.22 Contingent Long-term Ground Water Management, page 2-49. It would be helpful to provide information on how long post-closure water quality monitoring would be required and paid for by BMG.
- 3-12 [2.4.23 Environmental Protection of Wildlife, page 2-49. We are uncertain as to whether all potentially toxic metals and trace elements in tailings pond fluids could be adequately removed from solution by precipitating them out with the addition of lime or other materials. Would this method be effective for all metallic and non-metallic elements of concern?

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- 3-5 BMG's proposed best management practices include the use of weed-free straw bales. This information has been added to Section 2.4.5 of the Final EIS in response to this comment.
- 3-6 It is agreed that no single established concentration of WAD cyanide is adequate to prescribe safe levels for wildlife because of possible cyanide-metals complexes that may be harmful even at low levels of WAD cyanide. The fact that no safe level of cyanide in combination with other metals has been established is stated in Section 3.5.2.1 under Contaminated Water Sources. The Nevada Division of Wildlife (NDOW) Industrial Artificial Pond Permit requires operators to either treat artificial pond waters so they do not pose a hazard to wildlife or use appropriate exclusionary methods to preclude wildlife from potentially hazardous water sources. Exclusionary measures, along with mitigation measures WR-8 and WR-11, would be implemented to protect wildlife from potential deleterious effects of coming into contact with tailings pond fluids. Please also see the response to comment 3-11.
- 3-7 If infiltration ponds are created, the NDOW would require these ponds to be permitted under an Industrial Artificial Pond Permit. The permit requires operators to either treat artificial pond waters so they do not pose a hazard to wildlife or use appropriate exclusionary methods to preclude wildlife from potentially hazardous water sources. The Industrial Artificial Pond Permit also requires the operator to monitor ponds to ensure that safe water quality is maintained or that exclusionary methods are effective.
- 3-8 Empirical operating experience at the Reona Project has shown that several WAD cyanide-metals complexes may be present in the leachate solutions. Metals detected in solution at the Reona Project included silver, aluminum, gold, cobalt, copper, chromium, iron, mercury, magnesium, molybdenum, nickel, antimony, selenium, and titanium. Operating experience at the Reona Project also has shown that the activated carbon circuit planned for the Phoenix Project is an effective method for adsorbing these metals out of solution. Please also refer to the response to comment 3-7.
- 3-9 Long-term monitoring would be required by the BLM as described in mitigation measures WR-5 and WR-6 in Section 3.2.4 of the EIS.
- 3-10 The language regarding revegetation standards referenced in the Draft EIS was taken directly from the "final" guidelines (9/3/98) for determination of successful revegetation. The complete statement is as follows: "The revegetation release criteria for reclaimed mine sites will be to achieve as close to 100 percent of the perennial plant cover of selected comparison areas as possible." This document was jointly promulgated by the NDEP, BLM, and Forest Service for mining projects in Nevada, as agreed to in a Memorandum of Understanding (MOU) among these agencies. This MOU precludes final bond and liability release until the agency holding the bond is satisfied with revegetation efforts.
- Although the language allows subjective judgment, this judgment lies with the regulatory authorities. Although each mining company can offer its own revegetation bond release criteria for approval by the agencies, since promulgation in 1998, most, if not all, reclamation success evaluated has been held to a value of 100 percent of the comparison area (typically a reference area).
- 3-11 As stated in mitigation measure WR-6 in Section 3.2.4 of the EIS, "...monitoring required would continue until the potential risk of ground water contamination has shown to be minimal as determined by the BLM in coordination with other applicable agencies."

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- 3-12 The NDOW Industrial Artificial Pond Permit process would require waters in the tailings impoundment to be safe for consumption by wildlife or appropriate exclusionary measures would be required to exclude wildlife from the impoundment. As indicated in the response to comment 3-7, monitoring would be required in compliance with this permit.

Lime precipitation would be effective in treating most, but possibly not all, of the constituents potentially present in the decant tailings solution and supernatant pond. The monitoring specified in mitigation measure WR-8 (Section 3.2.4) in the EIS would be used to evaluate the water quality of any solution ponded on the tailings and the potential for wildlife impacts. The presence of potentially toxic constituents that could not be removed by lime precipitation would trigger other mitigation measures in accordance with the Phoenix Project water pollution control permit provisions. In addition, any solutions ponded in the tailings facilities would require compliance with the Industrial Artificial Pond Permit issued by the NDOW, which mandates no wildlife mortalities and requires operations to preclude wildlife exposure to any mine waters containing chemicals lethal to wildlife. If wildlife mortalities are documented at the tailings or process ponds, additional exclusion methods or process modification would be required by the Industrial Artificial Pond Permit. The combination of mitigation measure WR-8 and permit requirements should preclude impacts to wildlife.

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- 3-13 [2.5.2.1 Pit Lake/Backfill Alternatives, Drainage Conduit Alternative, page 2-50. Will the presence of an adit in the Fortitude/Phoenix pit adversely affect contamination of groundwater and its control with pit backfilling?
- 3-14 [2.7 Comparative Analysis of Alternatives, Table 2-9, Impact Summary and Alternatives Comparison, Water Resources and Geochemistry, page 2-61. For the monitoring/mitigation column for the heading "Waste rock storage areas; degradation of ground water," the current wording indicates that BMG *may* be required to provide funding for monitoring of ground water quality and long-term monitoring of ground water quality *may* be required. Due to the major risks of acid rock drainage at this site, we believe that funding and long-term monitoring *must* be required for an extended period (e.g., possibly more than 50 years).
- 3-15 [2.7 Comparative Analysis of Alternatives, Table 2-9, Impact Summary and Alternatives Comparison, Vegetation, page 2-63. Under the mitigation/monitoring column for the heading "Impact to vegetation communities", the statement "long-term increase in carrying capacity following successful reclamation" seems overly optimistic. The presence of contaminants in soils, with potential arsenic inhibition of plant growth, may preclude successful reclamation.
- 3-16 [We recommend that monitoring of wetland vegetation communities in areas of potential impacts be added to the mitigation/monitoring column for the heading "Impacts to wetlands, waters of the U.S., and riparian areas". Information on this topic may be needed in the appropriate section of Chapter 3.
- 3-17 [We recommend adding WR-3 to the monitoring/mitigation column for the heading "Impacts to wetlands, waters of the U.S., and riparian areas" and Wildlife and Fisheries Resources-Loss of Water Sources.
- 3-18 [2.7 Comparative Analysis of Alternatives, Table 2-9, Impact Summary and Alternatives Comparison, Wildlife and Fisheries Resources, pages 2-64 to 2-65. Indirect habitat loss or alterations associated with impacts to riparian vegetation related to flow reductions should be considered and addressed. For example, nesting and feeding habitats of migratory birds might be impacted.
- 3-19 [W-8 should be added under the mitigation/monitoring column for the heading "Disturbance to sage grouse".
- 3-20 [Under the impact column for the heading "Exposure to toxic water sources", the impact given seems overly optimistic. There appear to be multiple opportunities for exposure to such sources including the tailings pond, possible use of infiltration basins, potential seeps from waste rock dumps which would contain elevated concentrations of metals and trace elements, currently existing springs (e.g., from adits) containing contaminated waters, etc. In addition, WR-8 should be included under the mitigation/monitoring column for this heading.

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- 3-13 The drainage conduit alternative was eliminated from further consideration due to the high probability that poor quality water would be conveyed by the conduit. The current mine plan includes deeper mining in the Phoenix Pit than the drainage conduit alternative, and the existing adit that would have provided access to the drainage conduit from the pit would be excavated under the current plan.
- 3-14 The mitigation measures in the Draft EIS were considered preliminary pending agency and public review. The text for all mitigation measures in the Final EIS has been reviewed and revised as appropriate to indicate the measures would be required if the BLM approves the Proposed Action.
- 3-15 Over the past several decades, revegetation has frequently resulted in long-term increases in carrying capacity. This largely results from two factors. First, the break-up and redistribution of topsoil and/or growth media causes increased plant vigor and growth, in much the same manner as has been observed by farmers who plow their fields prior to planting. During the first several years following reseeded, production may increase as much as 50 percent. Second, the revegetated species typically have greater forage value than existing native plants. For example, a native area exhibiting 1,000 pounds of production per acre with 10 percent palatable forage would yield a total carrying capacity of 0.125 animal unit month (AUM) per acre. In contrast, a revegetated area exhibiting 1,000 pounds of production per acre with 80 percent palatable forage would yield a total carrying capacity of 1.0 AUM per acre.
- With regard to the potential inhibition of plant growth due to contaminants in the soils, please see the response to comment 1-35.
- 3-16 Monitoring of wetland vegetation communities to detect an impact would be redundant with the water resources monitoring program. Water is key to these systems, and water monitoring and mitigation are required by measures WR-1 and WR-3. Detected changes to water quantity and quality would require mitigation; therefore, impacts to wetland communities are not anticipated. Mitigation measure WR-3 has been added to the monitoring/mitigation for "Impacts to Wetlands, Waters of the U.S., and Riparian Areas" under Vegetation in Table 2-9 of the Final EIS, as suggested. These water resources mitigation measures are discussed in Section 3.4.4 of the EIS relative to impacts to riparian vegetation.
- 3-17 Mitigation measure WR-3 (expansion of the water resources monitoring plan to include additional springs and lower Willow Creek) has been added to Table 2-9 of the Final EIS for the suggested resources.
- 3-18 The text in Table 2-9 and in Section 3.5.2.1 of the Final EIS has been revised to include potential indirect impacts to riparian habitat.
- 3-19 Mitigation measure W-8 has been added under monitoring/mitigation for "Disturbance to sage grouse" in Table 2-9 of the Final EIS.
- 3-20 Wildlife exposure to potentially toxic waters in the tailings impoundment, infiltration basins, and process ponds is prohibited and regulated through NDOW's Industrial Artificial Pond Permit (also see the responses to comments 3-7 and 3-12). Any discharge of water from waste rock disposal areas would be monitored, and appropriate collection and management methods would be implemented as required by state water quality permits. There are currently no flowing adits within the Phoenix Project area. Measure WR-8 has been added under the Monitoring/Mitigation column for the "Exposure to toxic water sources" in Table 2-9 of the Final EIS.

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3-21 [2.7 Comparative Analysis of Alternatives, Table 2-9, Impact Summary and Alternatives Comparison, Range Resources, page 2-65. For the impact column for the heading "Reduced carrying capacity", the reduced carrying capacity may involve more than a short term loss because arsenic toxicity to vegetation may have deleterious impacts on successful revegetation of the area.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3-22 [3.1.2.1 Proposed Action, Geological Hazards and Geotechnical Considerations, Tailings Area #3, page 3.1-22. Risks of ground water contamination related to the use of this area seem great. We urge careful independent review of this proposal prior to proceeding. This concern appears to have been addressed in section 3.1.4.

3-23 [3.1.2.1 Proposed Action, Geological Hazards and Geotechnical Considerations, Reona Heap Leach Facility, page 3.1-24. It is unacceptable that the potential for catastrophic failure of this facility during a major seismic event is unknown. This concern appears to have been addressed in section 3.1.4.

3-24 [3.2.1.2 Surface Water, Flood Hydrology and Storm Water Management, page 3.2-12. Information in the last paragraph of this section indicates that the storm water system did not adequately handle a storm event. What changes have been made, if any, to handle future events of this type? Such information seems needed, in part, because of the length of operation of this mine.

3-25 [3.2.1.2 Surface Water, Surface Water Quality Standards, Table 3.2-3, page 3.2-14. Please include aquatic life standards in this table as they appear to be applicable to some areas under analysis. References to aquatic life standards are also needed in sections 2.4.21.15, 2.4.23, and 3.2.2.1.

3-26 [3.2.1.2 Surface Water, Surface Water Quality, page 3.2-18. In the second paragraph of this page, it would be helpful to provide more details on the concentrations of individual constituents in the DEIS instead of requiring the reader to obtain the supporting documentation on this serious issue.

3-27 [3.2.1.3 Ground Water, Ground Water Quality, Figure 3.2-12, page 3.2-33. The usefulness of this figure is extremely limited because the reader is unable to determine which metal is contributing to the total concentration. Water quality standards differ greatly among these metals. Detailed information on concentrations, perhaps in the appendix, would be helpful.

3-28 [3.2.4 Monitoring and Mitigation Measures, pages 3.2-82 to 3.2-88. Due to perceived risks of contaminated ground water impacting surface waters, we consider surface water quality monitoring, which would occur only twice a year and consist of only field measurements, to be inadequate. Laboratory analysis of samples should also be required. A specific time frame for

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3-21 Relative to the potential for long-term reduced carrying capacity of vegetation, please refer to the responses to comments 1-35, 3-10, and 3-15.

3-22 Comment noted. Mitigation measure G-1 in Section 3.1.4 of the EIS addresses concerns relative to the geotechnical stability of Tailings Area # 3.

3-23 Mitigation measure G-1 in Section 3.1.4 of the Draft EIS addressed concerns regarding potential impacts associated with deformation of the heap leach facility during major seismic events. After the Draft EIS was completed, BMG's geotechnical consultant Golder Associates, Inc. evaluated the postclosure seismic slope stability and deformation analyses for the Reona Heap Leach Facility, as recommended in mitigation measure G-1 of the Draft EIS. The results of these analyses are presented in Golder Associates, Inc. 2001a and 2001b and were incorporated into the Final EIS. In summary, the results of the stability and deformation analyses indicates that only minimal damage is expected to the Reona Heap Leach Facility in the postclosure period resulting from the Maximum Credible Earthquake design event. Therefore, this facility is not expected to fail catastrophically during the maximum anticipated seismic event that could affect the site in the future. As a result of this supplemental analyses, mitigation measure G-1 was revised to exclude reference to additional geotechnical analyses for the Reona Heap Leach Facility.

3-24 Additional text has been added (in Sections 3.2.1.2, Affected Environment - Surface Water - Flood Hydrology and Storm Water Management, and 3.2.2.1, Proposed Action - Water Quality Impacts - Storm Water Management) of the Final EIS to describe the additional measures used to control storm water runoff events, as requested.

3-25 Aquatic life standards have been added to Table 3.2-3 of the Final EIS. However, reference to these standards is not appropriate for Section 2.4.21.15 (Open Pit Reclamation) as pit backfilling would preclude any pit lakes from forming; or to Section 2.4.21.23 (Environmental Protection of Wildlife), since this section addresses protective measures associated with avian and terrestrial wildlife (not aquatic life); or to Section 3.2.2.1 (Environmental Consequences, Proposed Action), since water quality impacts to surface water resources with applicable aquatic life standards are not anticipated.

3-26 A summary of baseline surface water quality is found in Table 5-1 of the Baseline Water Quality Report for the Phoenix Project (PTI 1997a).

3-27 A summary of baseline ground water quality is found in Table A-1 of the Baseline Water Quality Report for the Phoenix Project (PTI 1997a).

3-28 According to the Water Resources Monitoring Plan (Brown and Caldwell 2000e), water monitoring locations Phx-1 to Phx-14 associated with storm water controls would be monitored for flow and water quality field parameters. Additional monitoring (including quarterly sampling, runoff event sampling, and laboratory analysis) would be required as specified in mitigation measure WR-11 in the Final EIS.

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- 3-28 continued monitoring during closure and into the post-reclamation period needs to be clearly established. Long-term monitoring should be required due to risks of acid rock drainage.
- 3-29 3.2.4 Water Resources and Geochemistry, page 3.2-87. In WR-3, item 2, we recommend a short time frame be indicated for the preparation of a site-specific mitigation plan and its implementation. In the description of WR-3, item 4, we recommend modifying the sentence to indicate if initial implementation were unsuccessful, Nevada Division of Water Resources or Bureau of Land Management (BLM) "would" rather than "may" require additional measures.
- 3-30 3.2.4 Monitoring and Mitigation Measures, page 3.2-87. WR-5 appears to focus primarily on groundwater monitoring. What are the potential impacts to surface water if ground water is degraded?
- 3-31 3.2.4 Monitoring and Mitigation Measures, page 3.2-88. Please see our comments above for section 2.4.23. Under WR-8, treatment may not adequately lower concentrations of all constituents of concern (e.g., non-metallic elements). Please address this potential more fully.
- 3-32 3.3.2.1 Proposed Action, Ecological Risk, pages 3.3-17 and 18. Is there a mechanism to evaluate risk to sage grouse due to its special status and consumption of sage? It seems unreasonable to assume (for all species) that exposure to metals and trace elements is only through consumption of food. There is also potential ingestion of contaminated water in the area from existing springs, from adits, and from potential future seeps from waste rock or other facilities, as well as limited exposure from ingestion of soil and through inhalation.
- 3-33 3.3.4 Monitoring and Mitigation, pages 3.3-20 and 3.3-21. Information provided in this section and elsewhere in the DEIS indicates that arsenic may cause adverse effects to plant growth and that some sensitive plant species may have difficulty in becoming established. Information is needed as to which species, if any, in the proposed reclamation seed mix to be used for reclamation are sensitive to arsenic. If problems are found, consideration should be given to adjustments in the seed mix, including changes in species composition. Mitigation measure S-4 deals with this issue; however, the second sentence of item 2 (top of page 3.3-21) should use stronger language that would require the activities described.
- 3-34 3.4.1.3 Vegetation, Special Status Plant Species, page 3.4-7. In the second paragraph, the doublet (*Dimersia howellii*) is mentioned. The document indicates that this species was located in the project area, but not whether the population will be impacted. We suggest that this be stated.
- 3-35 3.4.2 Environmental Consequences, page 3.4-10. An additional bullet should be added to the list with wording to the following effect: "Establishment of plants (that would receive significant use by livestock and/or wildlife) containing elevated concentrations of metals and/or trace elements that would cause unacceptable risk".

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- 3-29 Mitigation measure WR-3 (Section 3.2.4) was modified in the Final EIS to specify that the required site specific monitoring plan would be submitted to the BLM for review within 30 days after detection of impacts to surface water resources.
- 3-30 Implementation of the Contingent Long-term Groundwater Management Plan (Brown and Caldwell 2000c) included in the Proposed Action and modifications to the plan specified in mitigation measures WR-5 and WR-6 would mitigate potential long-term impacts to ground water quality resulting from infiltration through the waste rock facilities. Provided that all impacts to ground water quality are properly mitigated as discussed above, no impacts to ground water quality (or surface water quality controlled by the discharge of ground water) are anticipated downgradient of the waste rock facilities.
- 3-31 Please see the response to comment 3-12.
- 3-32 As described in the response to comment 1-35, a screening-level risk assessment is the initial phase of the risk assessment process and is designed to examine, on a broad basis, the likelihood that chemicals of potential concern associated with the proposed project would cause adverse effects to receptor organisms. Initial screening-level risk assessments often do not take into account site-specific risk factors or resident species. In that sense, the screening-level assessment that was completed was adequate to determine that there could be a potential risk to wildlife and livestock.
- Given the results of the screening-level risk assessment, particularly concern over the proposed cap material, the BLM has identified mitigation measure S-4 in Section 3.3.4 of the Final EIS requiring a site-specific risk assessment during the test plot phase of the project. The site-specific assessment would include more realistic assumptions of exposure, including environmental concentrations and exposure pathways, such as water and food consumption. Local species, such as the sage grouse, may be included in the site-specific risk assessment if data suggest they are of concern.
- 3-33 The BLM agrees. Mitigation measure S-4 in the EIS addresses this issue with site-specific trials during concurrent reclamation to establish the best seed mix for final reclamation activities. Mitigation measure S-4 has been modified in the Final EIS to address this issue.
- 3-34 The observed population of *Dimersia howellii* (doublet) is in an area at least 0.25 mile external to the proposed project perimeter fence and therefore would not be disturbed. The text has been revised accordingly.
- 3-35 In response to this comment, an additional significance criterion relating to the establishment of plants causing unacceptable ecological risks to livestock and/or wildlife has been added to Section 3.4.2 of the Final EIS.

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- 3-36 [3.4.2.1 Proposed Action, Plant Communities/Associations, page 3.4-10. Is it possible to make a prediction of the relative risk of fire within a given number of years that would have an adverse impact on the integrity of the waste rock caps? This is important because failure of the caps could lead to increased risks of acid rock drainage.
- 3-37 [3.4.2.1 Proposed Action, Vegetation, Jurisdictional Delineations (Wetland/Waters of the United States), page 3.4-11. The document indicates that mitigation for this resource would be WR-2. Should WR-1 also be included?
- 3-38 [3.4.4 Monitoring and Mitigation Measures, page 3.4-14. We strongly support mitigation measure V-1. However, the sentence of the paragraph following V-1 should be changed to read as follows: "Postmining annual monitoring efforts would include an evaluation of the plant tissue of revegetation species to determine if metals are bioaccumulating in revegetated plants." The original wording implies that the results are already known.
- 3-39 [3.5.1.4 Neotropical and Other Migratory Bird Species, page 3.5-4. The first paragraph indicates concern with mortalities related to exposure to contaminated water sources associated with mine operation. We suggest that as a result of this concern, monitoring and mitigation are warranted. Therefore, WR-8 should be included in Table 2-9, Impact Summary and Alternatives Comparison under Wildlife and Fisheries Resources- Exposure to toxic water sources. It should also be included in the Monitoring and Mitigation Measures section beginning on page 3.5-17 under Wildlife and Fisheries Resources and with an indication of what mitigation monitoring measures will be used.
- 3-40 [3.5.1.6 Special Status Species, page 3.5-4. The U.S. Fish and Wildlife Service has provided an updated species list to BLM dated March 5, 2001. We recommend updating this section accordingly. This list includes species that may be found in the area. If it is known that other species, listed or of concern, occur in the area they should be discussed as well.
- 3-41 [3.5.1.6 Special Status Species, Springsnails, page 3.5-10. The Service is becoming increasingly concerned about springsnails including impacts from mine dewatering activities. The document indicates that springsnails have been collected from four (Ref. Nos. 31-43-32-43; 31-43-8-33; 31-43-15-122; 31-43-3-34) of the eighty spring locales. It is unclear if these were the only locations where springsnails were found. More specific information should be provided on the species type and locations. We suggest that all 10 of the potentially impacted springs and seeps mentioned in Table 3.2-14 on page 3.2-49 be sampled for springsnails and an evaluation of any specimens collected be made to determine their uniqueness. This should be done before impacts occur to these systems.
- 3-42 [3.5.2 Environmental Consequences, page 3.5-11. Impacts to aquatic resources would also be significant if the Proposed Action or No Action alternative results in "Impacts to important habitat for springsnails because of dewatering or water quality changes resulting in direct toxicity or habitat degradation."

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- 3-36 A reliable estimate of the potential risk of fire within a given number of years would be little more than speculation. Nonetheless, measures to protect the integrity of perennial vegetation cover on waste rock caps would be integral to the planning process required in mitigation measure S-2: Grazing Management Plan. Furthermore, the project area is classified by the BLM as "wildland urban interface," which means that this area would receive priority for fire protection and rehabilitation.
- 3-37 The text in the section addressing Jurisdictional Delineations (Wetlands/Waters of the U.S.) in the Final EIS has been revised to include mitigation measures WR-1, WR-2, and WR-3.
- 3-38 The text of mitigation measure V-1 has been revised in the Final EIS, as suggested.
- 3-39 Mitigation measure WR-8 has been added to Table 2-9 of the Final EIS under "Exposure to toxic water sources." WR- 8 also is now referenced in Section 3.5.4 of the Final EIS. Mitigation and monitoring measures to be used are described under WR-8 in Section 3.2.4. Additional mitigation and monitoring measures would be developed, as necessary, if problems arise with maintaining water quality in the tailings impoundment.
- 3-40 Section 3.5.1.6 of the Final EIS has been revised based on the most recent (December 6, 2001) USFWS letter.
- 3-41 As indicated in Section 3.5.1.6 of the EIS under Springsnails, all 80 springs within the project area were surveyed for springsnails, and springsnails were located at only 4 springs. Because of difficulties in identifying springsnail species, springsnails were identified only to genus by the baseline surveys. The BLM would require collection and identification of springsnails by a springsnail expert at springs at risk prior to dewatering (see mitigation measure W-8 in Section 3.5.4).
- 3-42 Comment noted. Springsnails, a special status species, are addressed in the second and sixth significance criteria in Section 3.5.2 of the EIS, which relate to impacts to all special status species and their habitats and to seeps and springs.

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- 3-43 [3.5.2.1 Proposed Action, Direct Habitat Loss or Alteration, page 3.5-12. In the paragraph above the subheading Mule Deer, the statement should be expanded to include consumption of foods other than vegetation and other routes of exposure (e.g., drinking contaminated water).
- 3-44 [3.5.2.1 Proposed Action, Human Presence and Noise, page 3.5-15. Information should be included on wildlife mortality since 1995.
- 3-45 [3.5.2.1 Contaminated Water Sources, page 3.5-15. WAD cyanide concentrations below 40 ppm generally may not result in bird mortality; however, we are aware of two incidents where mortality occurred at 16 ppm. We also have concerns regarding the toxicity of cyanide-metal complexes, sublethal effects, and possible delayed mortality. Mortality of migratory birds from cyanide exposure would be considered a violation of the Migratory Bird Treaty Act (15U.S.C. 701-718h).
- 3-46 [The fourth paragraph in this section indicates that if wildlife mortalities are documented at tailings or heap leach facilities additional exclusion methods or process modifications would be required. We recommend indicating what possible additional measures or processes could be included as mitigation and list them under Monitoring and Mitigation Measures beginning on page 3.5-17.
- 3-47 [3.5.3 Cumulative Impacts, page 3.5-16. Information in the third paragraph should be corrected. It states that under the proposed action, disturbance would increase to a total of 7,073 acres or 50 percent of the cumulative effects area. This percentage should be changed to 5.0 percent.
- 3-48 [3.5.4 Monitoring and Mitigation Measures, pages 3.5-17 to 3.5.19. For mitigation/monitoring measure W-1, what will be done if burrowing owls are found to be present? It may not be adequate to merely resurvey suitable habitat.
- 3-49 [For mitigation measure W-4, it should be noted that more than just raptors are legally protected.
- 3-50 [For the paragraph on mitigation measures to minimize impacts to trout populations following W-8, it should be noted that "monitoring and reporting of flow changes" is not an mitigation measure for trout. The mitigation measures for trout should be described in detail and coordinated with Nevada Division of Wildlife and not be limited to only monitoring of streamflow.
- 3-51 [The paragraph on springsnails following W-8 indicates that "If these springsnail populations are determined to be a unique species, then additional mitigation measures may be needed...". There are a variety of endemic springsnail populations throughout the Great Basin which are intolerant of varying water quality conditions and the Service is increasingly concerned with effects due to potential changes in their environments. Therefore we request that the BLM and BMG coordinate with the Service on specific mitigation measures on springsnail populations that are determined to be unique in order to develop strategies for preventing and or reducing

Responses to Letter 3

- 3-43 Please refer to the responses to comments 1-35, 1-36, 3-6, and 3-20. Mitigation measure WR-8 (Section 3.2.4) would ensure that wildlife is not exposed to potentially toxic water sources in the tailings impoundment.
- 3-44 Additional data regarding wildlife mortalities have been obtained from the NDOW, and this information has been incorporated into Section 3.5.2.1 under Contaminated Water Sources in the Final EIS.
- 3-45 Comment noted. Please refer to the response to comment 3-6.
- 3-46 In response to this request, mitigation measure W-10 has been added to Section 3.5.4 of the Final EIS to identify possible mitigation for wildlife access to heap leach or tailings solutions.
- 3-47 The percentage has been changed to 5 percent.
- 3-48 Comment noted. Mitigation measure W-1 has been revised in Section 3.5.4 of the Final EIS to reflect the implementation of mitigation if active burrowing owl nest sites are identified during the surveys.
- 3-49 The text of mitigation measure W-4 in the Final EIS has been modified to delete the example of raptors as a legally protected species.
- 3-50 Mitigation measure W-8 in Section 3.5.4 of the Final EIS has been revised to include additional text regarding the monitoring and protection of stream habitat for trout.
- 3-51 Please see the response to comment 3-41. Also, if potentially impacted springsnail populations are determined to be unique, the BLM and BMG would consult with the USFWS regarding the need for specific mitigation measures.

Letter 3 Continued

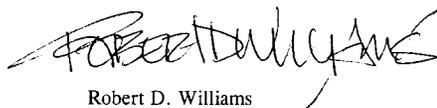
- 3-51 | impacts that may make them susceptible for listing under the Endangered Species Act.
- 3-52 | Under W-9, it is stated that if ground clearing occurred during the nesting season, mitigation for occupied nest sites would be determined on a case-by-case basis in consultation with BLM. We remind BLM that destruction of active bird nests or young of birds that breed in the area may be in violation of the Migratory Bird Treaty Act. The Migratory Bird Treaty Act does not allow for take. We suggest incorporating mitigation measures specifically mentioned in the second paragraph under the Neotropical and Other Migratory Bird Species section on page 3.5-13, into mitigation measure W-9.
- 3-53 | 3.6.2.1 Environmental Consequences, Proposed Action, page 3.6-6. Impacts to range resources should also be considered significant if the Proposed Action or No Action alternative resulted in toxicity to livestock from metals or trace elements in forage. Such a statement would be in agreement with information provided on page 3.3-18 which stated "...the risk to wildlife and livestock utilizing forage growing on reclaimed soils...is low to moderate." Even if metals or trace elements in forage were not high enough to cause toxicity to livestock, could bioaccumulation in livestock tissues (e.g., liver) be high enough to be detrimental to human consumers?
- 3-54 | 3.6.2.2 No Action Alternative, page 3.6-9. Are there current risks to cattle from drinking contaminated water flowing from mine adits?
- 3-55 | 3.6.5 Residual Adverse Effects, page 3.6-10. The potential for residual adverse effects from potential problems related to inadequate revegetation associated with arsenic toxicity to plants should be considered.
- 3-56 | 3.9.2.1 Proposed Action, page 3.9-11. Recent concern has arisen regarding mercury emissions from Nevada mines. Although no roasting of ore will occur at the Phoenix Project, are there other potential sources of mercury emissions (e.g., carbon regeneration kiln) and what are the estimated levels of releases?
- 3-57 | 3.14.2.1 Proposed Action, page 3.14-3. High levels of background noise are likely to interfere with the ability of wildlife, especially birds, to detect their mates, young, and predators. This in turn may reduce reproductive success and result in a decline of wildlife population numbers. Information on this subject should be provided in this section.
- 3-58 | 3.15.2 Environmental Consequences, page 3.15-1. An additional bullet should be added addressing potential adverse impacts to fish and wildlife. Footnote number 2 is missing from Table 3.15-2.

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- 3-52 | Comment noted. Mitigation measure W-9 in the Final EIS has been revised to incorporate the potential measures identified in Section 3.5.2.1.
- 3-53 | This issue is addressed in mitigation measures S-2 and V-1 as well as in the response to comment 3-35. The potential bioaccumulation of metals and/or trace elements would be determined as discussed in the response to comment 1-35.
- 3-54 | There are no mine adits exhibiting flowing water within the project area that are accessible to cattle.
- 3-55 | The issue of a potential reduction in forage amounts as a result of arsenic toxicity to plants is addressed in the vegetation significance criterion added to Section 3.4.2 of the Final EIS and in the response to comment 1-35.
- 3-56 | Please see the response to comment 1-33.
- 3-57 | Areas within the active mine operation that would exhibit noise at high enough levels to affect the ability of birds to detect their mates, young, and predators would be located within operations areas where there would be a total loss of existing natural habitats and a concomitant loss of wildlife populations in these areas. Therefore, high noise levels at these sites would not be expected to result in impacts to wildlife populations beyond that caused by habitat loss. Reduction in wildlife populations because of habitat loss is addressed in Section 3.5.2.1.
- 3-58 | Additional discussion regarding the potential for wildlife exposure to accidental discharge of transported process chemicals has been added to Section 3.5.2.1 in the Final EIS under Contaminated Water Sources. The eighth bullet (i.e., significance criterion) in Section 3.5.2 addresses this exposure to wildlife. Footnote 2 has been added to Table 3.15-2 of the Final EIS.

Letter 3 Continued

We appreciate the opportunity to provide comments on this DEIS. If you have questions or need clarification on our comments, please contact Stanley Wiemeyer or Damian Higgins in relation to general comments and environmental contaminant issues and Marcy Haworth in relation to wildlife and threatened and endangered species issues at (775) 861-6300.



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cc:

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Letter 3 Continued

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