FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Betze Pit Expansion Project

BLM

Elko District Office - Nevada

March 2009

INT-FES-09-03

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Photo by S. Duncan May 22, 2007

United States Department of the Interior

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In Reply Refer To:
3809 (NV-013)
NVN-070708

March 27, 2009

Dear Reader:

Enclosed for your review is the Betze Pit Expansion Project Final Supplemental Environmental Impact Statement (SEIS) prepared by the Bureau of Land Management (BLM), Elko District Office. The SEIS analyzes the direct, indirect, and cumulative impacts associated with the proposed extended mining and processing activities at Barrick Goldstrike Mines Inc.'s Goldstrike Mine in Eureka and Elko counties, Nevada.

The Final SEIS has been prepared in an abbreviated format and must be used in conjunction with the Draft SEIS issued in August 2008. The Draft and Final SEIS constitute the complete SEIS. The Final SEIS includes responses to comments received during the public review period on the Draft SEIS and revisions to the Draft SEIS.

Following a 30-day Final SEIS availability period, a Record of Decision (ROD) will be published. The decision reached in the ROD is subject to appeal to the Interior Board of Land Appeals. The 30-day appeal period starts with the publication of the ROD, and implementation of the Plan of Operations Amendment will not begin until the ROD has been issued.

Your interest in the management of public lands is appreciated. If you have any questions, please contact Kirk Laird, SEIS Project Manager at (775)-753-0272.

Sincerely,

Kenneth E. Miller
District Manager

FINAL
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT (SEIS)
BETZE PIT EXPANSION PROJECT

Lead Agency:	U.S. Department of the Interior Bureau of Land Management Elko District Office
Cooperating Agencies:	Nevada Department of Wildlife Elko County
Project Location:	Elko and Eureka counties, Nevada
Correspondence on this SEIS Should be Directed to:	Kirk Laird, SEIS Project Manager Bureau of Land Management Elko District Office 3900 East Idaho Street Elko, NV 89801-0611 (775) 753-0200

ABSTRACT

Barrick Goldstrike Mines Inc. (BGMI), a wholly owned subsidiary of Barrick Gold Corporation, proposes to construct and operate the Betze Pit Expansion Project (Proposed Action), which would include the development of new facilities and expansion of existing open-pit gold mining and processing operations at the Goldstrike Mine located in north-central Nevada, approximately 25 miles northwest of Carlin in Eureka and Elko counties. The Proposed Action would include expansion of the existing Betze Pit, construction of the Clydesdale Waste Rock Facility and haul road, construction and operation of the Goldstrike No. 3 Tailings Facility, and extension of employment at the Goldstrike Mine for an additional 4 years. The Proposed Action would utilize some of the existing primary facilities, including ore processing facilities and ancillary support facilities.

The Proposed Action would result in surface disturbance on a total of 1,180 acres, of which 494 acres are public lands administered by the Bureau of Land Management and 686 acres are private land owned by BGMI. If approved, the anticipated mine life would be extended approximately 4 years through 2015, followed by an estimated 15 years for ongoing ore processing from stockpiles, and an additional 4 years for site closure and reclamation.

The Supplemental Environmental Impact Statement (SEIS) analyzes the environmental effects of the Proposed Action, one Alternative, and the No Action Alternative.

Responsible Official for SEIS:	Kenneth E. Miller District Manager Elko District Office

Executive Summary

Barrick Goldstrike Mines Inc. (BGMI), a wholly owned subsidiary of Barrick Gold Corporation, proposes to construct and operate the Betze Pit Expansion Project (Proposed Action), which would include development of new facilities and expansion of existing open-pit gold mining and processing operations at the Goldstrike Mine located in north-central Nevada, approximately 25 miles northwest of Carlin in Eureka and Elko counties. The Proposed Action would include expansion of the existing open pit (Betze Pit), construction of the Clydesdale Waste Rock Facility and haul road, construction and operation of the Goldstrike No. 3 Tailings Facility, and extension of employment at the Goldstrike Mine for 4 additional years. The Proposed Action would utilize many of the existing Goldstrike Mine facilities, including ore processing facilities and ancillary support facilities.

The Proposed Action would result in surface disturbance on a total of 1,180 acres, of which 494 acres are public lands administered by the Bureau of Land Management (BLM), and 686 acres are private land owned by BGMI. If approved, the anticipated mine life would be extended approximately 4 years through 2015, followed by an estimated 15 years for ongoing ore processing from stockpiles. The Proposed Action would accelerate reclamation of the existing Bazza Waste Rock Facility by 7 years compared with the No Action Alternative; reclamation of the Bazza Waste Rock Facility would be substantially completed by the end of 2011.

Under the Bazza Waste Rock Facility Alternative, the Clydesdale Waste Rock Facility and haul road would not be constructed, resulting in 572 fewer acres disturbed. The existing Bazza Waste Rock Facility would continue to be used and not fully reclaimed until 2018 (except for several existing ore stockpiles and an access road). All other aspects of the Bazza Waste Rock Facility Alternative would be the same as the Proposed Action.

Under the No Action Alternative, the proposed facilities that comprise the Betze Pit Expansion Project would not be constructed. BGMI would continue to recover gold at the existing facilities as currently authorized by the BLM and State of Nevada. Groundwater pumping in the area of the Betze Pit will continue through 2015 to maintain groundwater levels below the Meikle underground mine. BGMI personnel will be on site until 2045.

Under all alternatives, Rodeo Creek would be diverted from its existing channel alignment north of the Betze Pit to a new alignment south of the pit to accommodate expansion of mining under current authorizations. The diversion to a new channel is a permitted and necessary part of permitted and ongoing operations. Also under all alternatives, Rodeo Creek may be diverted into the Betze Pit at the end of mining as a closure option, if the diversion is approved by the State of Nevada.

Summary of Impacts Associated with the Proposed Action and Alternatives

The Proposed Action does not require dewatering of the Betze Pit; therefore, there are no resource impacts from dewatering under the Proposed Action. Pit dewatering impacts were addressed in the Betze Project Supplemental Environmental Impact Statement (SEIS) through year 2011. The potential impacts associated with dewatering operations for an additional 4 years, through 2015, from current State of Nevada authorizations for the Meikle underground mine are analyzed under the No Action Alternative. It is important to note that mine dewatering operations will occur regardless of the alternative selected.

Geology and Minerals

Under the No Action Alternative, the Betze Pit Expansion Project would not be developed, and impacts due to mineral extraction to geologic and mineral resources would not occur. Ore would be left in the ground. Potentially, that ore could become permanently uneconomical to mine due to the rebounding water levels and other economic factors.

Direct impacts of the Proposed Action on geologic and mineral resources would include the generation and disposal of approximately 315 million tons of waste rock and 12.44 million tons of tailings; the removal of

0.5 million tons of Carlin Formation material suitable for reclamation use; and the extraction of 12.44 million tons of ore. Mined ore would be permanently removed from existing reserves. The Proposed Action would result in an extension of the permanent alteration of the landscape and disturbance of approximately 1,180 acres. This disturbance would include unreclaimed areas disturbed by the Betze Pit and reclaimed waste rock disposal areas and a tailings impoundment that would permanently alter the natural topographic and geomorphic features in the area. There is a low probability that ground motion would present a hazard at the site. There are no identified geologic conditions that would be exacerbated by project activities and result in geologic hazards. The proposed waste rock and tailings facilities are not located in areas that have been susceptible to subsidence.

The Bazza Waste Rock Facility Alternative would result in similar impacts to the Proposed Action with the following exceptions. The Bazza Facility capacity would be increased by 350 million tons to 2,280 million tons and have a maximum height of 800 feet above the original topography (100 feet higher than the facility under the Proposed Action) and 572 acres of disturbance associated with the proposed Clydesdale Waste Rock Facility and haul road construction would not occur.

Groundwater Resources and Geochemistry

The Betze Pit would not be expanded beyond current authorizations under the No Action Alternative. Groundwater pumping and dewatering of the pit prior to the cessation of mining would continue for an additional 4 years beyond 2011, as analyzed in the 2000/2003 Betze Project SEIS. Groundwater modeling results have shown that the additional 4 years of dewatering under the No Action Alternative to maintain water levels for the Meikle underground mine would not result in any new impacts to water resources beyond those that were discussed and covered by mitigation in the 2000/2003 Betze Project SEIS.

A pit lake would begin to form approximately 14 years after the end of dewatering and eventually behave as a groundwater sink. Hydrochemical modeling of pit lake water quality was used to evaluate potential impacts to the Betze Pit Lake water quality with and without diversion of Rodeo Creek into the pit at mine closure. Under the No Action Alternative, predicted pit lake water quality at equilibrium (year 400) would have an alkaline pH (7.7) and the following representative constituent concentrations: total dissolved solids (less than 2,000 mg/L), sulfates (1,017 mg/L), arsenic (0.051 mg/L), nickel (1.23 mg/L), cadmium (0.037 mg/L), and selenium (0.007 mg/L) without diversion of Rodeo Creek into the pit at mine closure. Diversion of Rodeo Creek into the pit at closure would result in slightly improved water quality compared with no diversion of the creek into the pit. Some water quality standards (e.g., drinking water standards) are predicted to be exceeded in the pit lake at equilibrium under both closure options for the No Action Alternative. The predicted water quality would meet Nevada wildlife propagation standards under both closure options. The Betze Pit lake at equilibrium is predicted to have a surface area of 803 acres under the No Action Alternative.

For the Proposed Action following the completion of mining and the associated dewatering operations, groundwater elevations would rebound and eventually result in the development of a lake in the expanded Betze Pit. The pit lake is predicted to start forming approximately 14 years after the end of dewatering and to ultimately behave as a groundwater sink with no throughflow to the groundwater system. The development of the pit lake is predicted to be similar to the development of the pit lake described for the currently permitted pit under the No Action Alternative.

Regardless of the closure option, the water quality of the expanded Betze Pit lake for the Proposed Action is predicted to be similar to the pit lake analyzed in the 2000/2003 Betze Project SEIS at steady state (approximately year 400). The Proposed Action pit lake would have slightly higher concentrations of some constituents, including total dissolved solids, sulfates, and trace metals. Diversion of Rodeo Creek into the Betze Pit at closure would result in slightly improved water quality compared with no diversion of the creek into the pit. The expanded pit lake has predicted water chemistries that exceed some water quality standards (e.g., drinking water standards) under both closure options. The predicted water quality would meet Nevada wildlife propagation standards under both closure options. For the Proposed Action, the Betze pit lake at

equilibrium is predicted to have a surface area of 927 acres, approximately 15 percent greater than the pit lake under the No Action Alternative. As discussed above, this pit lake is predicted to be a terminal pit lake.

Based on the geochemical tests conducted on potential waste rock from the proposed pit expansion area, the low percentage of potentially acid-generating (PAG) rock that would be placed in the Clydesdale Waste Rock Facility, the method of encapsulation of PAG rock within the facility, the cover design, and the proposed reclamation methods, acidic or metals-laden seeps are not expected from the proposed waste rock facility.

Construction design of the proposed Clydesdale Waste Rock Facility would be similar to the previously approved Bazza Waste Rock Facility. This design, including isolation of PAG cells and an evapotranspiration cover, limits the potential for seepage. Field observations and monitoring of the Bazza Waste Rock Facility over the past 15 years have shown no evidence of seepage. Therefore, surface water and underlying groundwater resources are unlikely to be affected by construction of the Clydesdale Waste Rock Facility.

The Bazza Waste Rock Facility Alternative would result in the same impacts to groundwater resources as the Proposed Action.

Surface Water Resources

If Rodeo Creek is diverted into the Betze Pit at the end of mining there would be no measurable impact on surface water quantity or quality because most runoff in Rodeo Creek is lost to seepage and evapotranspiration in Boulder Valley. The overall loss of contributing watershed (24 square miles) in the Boulder Flat Basin (560 square miles) represents approximately 4.3 percent of the basin. Since flows originating in the Rodeo Creek watershed do not contribute to downstream flows, the rerouting of Rodeo Creek into the Betze Pit would not cause a loss of surface water in Boulder Valley or the Humboldt River.

The extended 4 years of dewatering under the No Action Alternative would result in no additional surface water impacts that were not previously identified as impacts and mitigated for in the 2000/2003 Betze Project SEIS. Part of Rodeo Creek will be diverted southward around the Betze Pit in 2009 to expand mining of the pit to the northwest under current NDEP authorizations. No impacts to streamflow magnitudes or surface water quality in Rodeo Creek are anticipated as a result of the diversion.

The Proposed Action is not expected to have any impact on perennial streams since they are not present in the immediate project area. No impacts to seeps or springs are expected from the proposed mine expansion activities.

No impacts to surface water quality are anticipated in association with the proposed waste rock disposal facility, haul road, or tailings facility based on the proposed Storm Water Pollution Prevention Plan, facility designs, reclamation procedures that would be implemented, and the 100-foot setback from Bell and Rodeo creeks. Implementation of runoff, erosion, and sedimentation best management practices (page 2-15 in the Draft SEIS) would reduce these impacts to negligible levels during construction.

The Bazza Waste Rock Facility Alternative would result in surface water resource impacts similar to the Proposed Action except that the potential impacts from the Clydesdale Waste Rock Facility and associated haul road would not occur.

Soils and Reclamation

The proposed expansion of the Goldstrike Mine would not occur under the No Action Alternative and associated impacts to soils would not occur. Permitted mining activities including an already permitted expansion of the pit, on private land, would continue.

Approximately 1,180 acres of soil would be disturbed as a result of the proposed project development. Suitable topsoil material and growth media (Carlin material from alluvial deposits) in the proposed disturbance areas would be salvaged for subsequent use in reclamation. Expedited reclamation and improved success would be

associated with the Proposed Action because the Bazza Waste Rock Facility would be reclaimed sooner. A permanent loss of soil productivity would occur on approximately 129 of the 1,180 acres in association with the expanded pit and perimeter buffer, which would not be reclaimed.

The impacts associated with the Bazza Waste Rock Facility Alternative would be similar to the Proposed Action except soil disturbance would be approximately 572 acres less because the Clydesdale Waste Rock Facility and haul road associated with the facility would not be constructed. Reclamation on the Bazza Waste Rock Facility would occur approximately 7 years later than the Proposed Action. This would result in extended storage of the reclamation material such as Carlin material (fine-grained clayey silt) and soil growth media. Long-term and increased storage of Carlin material has proven difficult due to slope stability issues, safety, and low soil strength when wet. Much of the Carlin material from the pit alluvium would be disposed of in the Bazza facility due to poor storage ability and would be unavailable for reclamation use. Reclamation studies at the Goldstrike Mine have shown that Carlin material is generally superior to top soil as a growth medium.

Vegetation Resources

For the No Action Alternative, groundwater modeling results have shown that the extended 4 years of mine dewatering through 2015 would result in no new impacts to vegetation, including wetlands and riparian areas beyond those that were discussed and covered by mitigation in the 2000/2003 Betze Project SEIS.

The Proposed Action would remove or disturb approximately 1,180 acres of vegetation, the majority of which (approximately 1,051 acres) subsequently would be reclaimed. Project-related activities would result in the conversion of primarily shrub-dominated communities to grass/forb-dominated communities in the short term. Over the long term, shrubs would become re-established and increase in abundance within the majority of the disturbed areas as a result of reclamation and natural colonization. Reclamation would be completed on all mine disturbance areas except the 129 acres associated with the pit expansion. No wetland/riparian vegetation or special status plant species would be removed, disturbed, or affected as a result of the proposed project. Continuation of BGMI's weed control program in conjunction with the reclamation plan substantially would reduce the potential for noxious weed establishment in the proposed disturbance areas.

Under the Bazza Waste Rock Facility Alternative, surface disturbance–related impacts to vegetation resources would be approximately 565 acres less than under the Proposed Action since the Clydesdale facility and haul road would not be constructed.

Construction of the Rodeo Creek diversion to the south of the Betze Pit would result in disturbance to existing vegetation primarily on previously disturbed land. This action will occur regardless of the alternative selected as the diversion is a permitted and necessary part of ongoing operations.

Aquatic Resources/Special Status Aquatic Species

Groundwater modeling results indicate that continued mine dewatering through 2015 under the No Action Alternative would not result in any new impacts to aquatic resources beyond those that were addressed by mitigation in the 2000/2003 Betze Project SEIS.

For the Proposed Action, no project-related disturbance would occur within perennial stream habitat. Surface disturbance would occur during haul road construction across an intermittent/ephemeral segment of one creek; however, this area does not provide fisheries habitat on a consistent basis. No impacts to special status aquatic species are anticipated as a result of the proposed project.

The Bazza Waste Rock Facility Alternative would result in the same impacts to aquatic resources as described for the Proposed Action.

The Rodeo Creek diversion to the south of the Betze Pit would replace an existing approximately 3.8-mile channel segment with a similar 2.3-mile channel segment of ephemeral/intermittent aquatic habitat.

Wildlife Resources

Under the No Action Alternative, the Betze Pit Expansion Project would not be developed, and no additional habitat would be disturbed or wildlife species impacted beyond current permitted activities. There would be no additional impacts to wildlife resources from the extended 4 years of mine dewatering that were not previously identified as direct, indirect, or cumulative impacts in the 2000/2003 Betze Project SEIS.

Under the No Action Alternative, there would be no additional impacts to special status species or their habitat including selected bat species; pygmy rabbits; Preble's shrew; Fletcher dark kangaroo mouse; sensitive bird species such as bald eagle, golden eagle, Swainson's hawk, prairie falcon, peregrine falcon, ferruginous hawk, greater sage grouse, short-eared owl, long-eared owl, and burrowing owl; smaller bird species such as loggerhead shrike, vesper sparrow, and yellow breasted chat.

Under the Proposed Action, impacts are categorized by wildlife resources and described below.

Wildlife Habitat. Approximately 943 acres of native wildlife habitat would be disturbed as a result of the proposed project. Approximately 129 acres of terrestrial habitat associated with the pit expansion would not be reclaimed. Development of a post-mining pit lake, which is projected to be within Nevada wildlife propagation standards, potentially would result in an increase in habitat for waterfowl and aquatic species.

Big Game. Approximately 943 acres of low-density mule deer range consisting primarily of sagebrush shrubland habitat would be disturbed as a result of mine expansion-related activities. Approximately 101 acres of this disturbance would be associated with the pit expansion and would not be reclaimed. The construction of the proposed Clydesdale Waste Rock Facility would decrease the width of an important existing big game migration corridor located along Bell Creek and further fragment mule deer habitat. Direct impacts include the incremental long-term reduction of approximately 66 acres of summer range and 360 acres of crucial winter range for pronghorn.

Small Game. Direct impacts to small game species would include the temporary reduction of approximately 943 acres of potentially suitable habitat until vegetation is re-established, and the permanent loss of approximately 101 acres of potential habitat.

Impacts to Breeding Birds. Direct impacts to bird species as a result of the proposed project would include the temporary loss of approximately 943 acres and the permanent loss of approximately 101 acres of potentially suitable breeding, roosting, and foraging habitat. Potential direct impacts to breeding birds (i.e., loss of nests, eggs, or young) would be minimized through the clearing of vegetation outside of the breeding season, to the extent possible, and the implementation of breeding bird surveys and appropriate mitigation as needed in coordination with the BLM and Nevada Department of Wildlife.

Human Presence and Noise. Increased noise, traffic, and human presence associated with mine expansion and operation is expected to result in negligible to low impacts to wildlife species.

Potential for Hazardous Materials Spill Effects to Wildlife. The potential for impacts to wildlife in the event of a hazardous materials spill would be the same as the No Action Alternative, but extended for 4 additional years.

Potential Impacts to Wildlife Associated with Pit Lake Water Quality. An ecological risk assessment (ERA) was conducted to evaluate potential impacts to wildlife, livestock, and fish as a result of exposure to pit lake water. The ERA followed U.S. Environmental Protection Agency (USEPA) guidelines for conducting risk assessments as well as Nevada BLM ERA guidance. Predicted pit lake water metal constituents at Year 50 without the Rodeo Creek Diversion were used for the analysis because constituent of potential concern (COPC) concentrations were used for the ERA in order to predict the impacts to wildlife using the

most conservative model. The evaluation indicated that the predicted pit lake water quality would not pose unacceptable risks to wildlife, fish, or livestock.

Bats. Direct impacts would include the long-term disturbance of foraging habitat, including approximately 867 acres of sagebrush shrubland habitat. Impacts also would result in the permanent loss of approximately 101 acres of sagebrush shrubland habitat from the development of the proposed facilities.

Preble's Shrew and Fletcher Dark Kangaroo Mouse. Direct impacts would result in the long-term reduction of approximately 943 acres and permanent loss of approximately 101 acres of potentially suitable habitat for these species. This impact would be considered low, considering the large amount of suitable habitat located within the study area. Project construction likely would result in the direct mortality of individuals, if present. The loss of individuals would not result in population-level effects.

Pygmy Rabbit. Direct impacts would result in the long-term reduction of approximately 867 acres and permanent loss of approximately 101 acres of potentially suitable sagebrush habitat (big sagebrush-dominated habitats) for this species. This impact would be considered low to moderate, considering that potentially suitable habitat is located within the study area, but no rabbits have been documented in a recent study. Project construction likely would result in the direct mortality of individual rabbits, if present. The loss of individual pygmy rabbits would not result in population-level effects.

Bald Eagle, Golden Eagle, Swainson's Hawk and Ferruginous Hawk, Prairie Falcon, and Peregrine Falcon. No direct impacts to bald eagles, golden eagles, nesting Swainson's or ferruginous hawks, prairie falcons, and peregrine falcons would be anticipated from project construction due to the lack of breeding habitat and nest sites within the project boundary. Occurrence of these species would be limited to migrating and dispersing individuals. Impacts would include the long-term reduction of approximately 943 acres of potential foraging habitat until reclamation has been completed and vegetation has been re-established. The permanent loss of approximately 101 acres of potential foraging habitat associated with development of the proposed facilities would occur. Indirect impacts associated with mine-related noise and human presence currently occur at the site and would continue under the proposed project. Based on implementation of BGMI's committed environmental protection measures, the lack of existing nest sites within the project boundary, and the existing level of mining activity at the site, potential impacts to these species as a result of the Proposed Action would be considered low.

Greater Sage-grouse. No impacts to breeding greater sage-grouse would be anticipated from project activities. Although greater sage-grouse could nest in upland habitats within the project boundary, it is anticipated that brooding activity would be low, due to the limited availability of surface water and riparian vegetation in the study area. Direct impacts to this species would include the long-term reduction of approximately 867 acres of sagebrush shrublands habitat and the permanent loss of approximately 101 acres of sagebrush shrublands habitat in association with the development of the proposed facilities. Indirect impacts would continue to result from mine-related noise and human presence. This impact would be considered negligible based on the overall availability of suitable habitat in the project vicinity.

Burrowing Owl. Although no burrowing owl nest sites have been documented within the project boundary, sagebrush shrubland and grassland vegetation that would be disturbed as a result of the Proposed Action would be suitable habitat for foraging birds within the study area. Direct impacts to this species would include the short-term reduction of approximately 943 acres of potential sagebrush shrubland breeding and foraging habitat until reclamation has been completed and vegetation has been re-established. The permanent loss of approximately 101 acres of habitat associated with development of the proposed facilities would occur. Indirect impacts would continue to result from mine-related noise and human presence. Based on implementation of BGMI's committed environmental protection measures and the existing level of mining activity, potential impacts to this species as a result of the Proposed Action would be considered low.

Long-eared and Short-eared Owls. Although no nests have been identified, suitable breeding habitat is present within the study area. Impacts to breeding birds as a result of proposed mine-related activities would be anticipated based on potentially suitable breeding habitat (e.g., open shrublands) in the proposed disturbance areas. Direct impacts to these species would result from the long-term reduction of approximately 943 acres of potential foraging habitat and the permanent loss of approximately 101 acres of potential foraging habitat in association with the development of the proposed facilities. These impacts would be considered negligible based on the overall availability of suitable habitat in the project vicinity. Indirect impacts would continue to result from mine-related noise and human presence. Based on the implementation of BGMI's committed environmental protection measures, the overall availability of suitable habitat in the project vicinity, and the existing level of mining, potential impacts to these species as a result of the Proposed Action would be considered low.

Loggerhead Shrike, Yellow-breasted Chat, and Vesper Sparrows. Based on the presence of potentially suitable breeding habitat, direct impacts to breeding pairs as a result of proposed mine-related activities could include abandonment of a breeding territory or nest site or the potential loss of eggs or young, which would reduce productivity for that breeding season. Direct impacts to this species would include the long-term reduction of approximately 943 acres of potential breeding and foraging habitat until reclamation has been completed and vegetation has re-established. The permanent loss of approximately 101 acres of breeding and foraging habitat in association with the development of the proposed facilities would occur. Indirect impacts would continue to result from mine-related noise and human presence. These impacts would be considered negligible based on implementation of BGMI's committed environmental protection measures, the overall availability of suitable habitat in the project vicinity, and the existing level of mining activity at the site.

The Bazza Waste Rock Facility Alternative would result in disturbance of approximately 565 fewer acres of terrestrial habitat (native vegetation) than the Proposed Action. Approximately 378 acres of low density mule deer habitat would be disturbed, of which approximately 101 acres would not be reclaimed. No impacts would occur to an important mule deer game migration corridor. Approximately 205 acres of pronghorn range would be disturbed. No direct impacts would occur to crucial pronghorn winter range. Impacts to breeding birds would be the same as the Proposed Action, except approximately 565 fewer acres of breeding bird habitat would be disturbed.

For special status species, impacts would be the same as the Proposed Action except approximately 565 fewer acres of habitat would be disturbed.

The Rodeo Creek diversion from north of the Betze Pit to south of the pit would result in an reduction of approximately 1.5 miles of intermittent/ephemeral stream habitat.

Cultural Resources

No adverse effects to historic properties are anticipated under the No Action Alternative.

For the Proposed Action, five known historic properties (i.e., those properties eligible for, or listed on, the National Register of Historic Places [NRHP]) are located in the area of potential effect. Adverse effects to the five NRHP-eligible sites were mitigated in accordance with the treatment plan and Programmatic Agreement (PA). The PA is an agreement among the BLM Elko District Office, Nevada State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation, and BGMI that defines the measures to be undertaken to ensure that BLM's objectives and responsibilities regarding the protection of historic properties are fulfilled. Although data recovery was completed at the five historic properties and Section 106 of National Historic Preservation Act provides for findings of no adverse effect through mitigation, some data about the site and the site itself are lost. Direct effects to NRHP-eligible properties, including surface or subsurface disturbance during project construction or operations, could occur. The historic properties treatment plan specifies BLM- and SHPO-approved mitigation procedures for each NRHP-eligible property potentially affected by the

proposed project. Based on the PA and the results of consultation and implementation of the treatment plan, the proposed project is not anticipated to have adverse effects on historic properties.

The Bazza Waste Rock Facility Alternative would result in similar impacts to cultural resources as the Proposed Action with the following exception. Two of the five NRHP-eligible sites that have undergone data recovery are located in the area of the Clydesdale Waste Rock Facility. Therefore, two of the five NRHP-eligible sites would not be lost through project construction compared to all five under the Proposed Action.

Native American Traditional Values

Under all of the alternatives, there would be no known or expected adverse effects to traditional cultural properties or places of cultural and religious importance.

Native American consultation regarding potential effects and possible mitigation is ongoing between the BLM Elko District Office and tribal representatives. If a traditional cultural property (TCP) or place of cultural or religious importance is identified by tribal representatives, no surface disturbance would occur within or immediately adjacent to the boundary of the property prior to completion of all consultation required by law. If data recovery or other form of mitigation is required at a TCP or place of cultural or religious importance, a data recovery or mitigation plan would be reviewed and approved by the BLM and SHPO. Tribal representatives would be asked to participate in the development of any such data recovery or mitigation plan. No TCP or place of cultural or religious importance has been identified to date.

Air Quality

Under the No Action Alternative, the proposed project would not be developed, and the associated air quality impacts would be limited to ongoing approved mining, mineral processing, and reclamation activities. Project emissions comprise a small fraction of the applicable ambient air quality standards.

Based on air quality dispersion modeling results for the existing Goldstrike Mine operations, the maximum concentrations of particulate matter with an aerodynamic diameter of 10 microns or less, nitrogen dioxide, carbon monoxide, and sulfur dioxide would not exceed Nevada or National Ambient Air Quality Standards under the Proposed Action. The proposed project would continue to operate at current levels of production, design capacity, or emission limits, and therefore is not anticipated to increase emission rates over current levels. There would be no impacts to Prevention of Significant Deterioration Class I areas as a result of the proposed project.

Mercury is naturally present in the soils, waste rock, and ore at the mine; therefore, it would be present as a small fraction produced during the various mine processes. Controls would be applied to each of the processes to reduce overall emissions. The estimated total airborne process emissions of mercury from the proposed project would be approximately 625 pounds over 5 years of roaster operation based on the 12.44 million tons of ore to be processed and current emission controls. The USEPA Regional Modeling System for Aerosols and Deposition (REMSAD) model was used to predict the relative contribution of mercury deposition from the Goldstrike Mine compared to other local, regional, and global sources to watersheds located in Nevada. Modeling results indicated that the Goldstrike Mine contributes from 0.01 to 2.47 percent of the mercury deposition to watersheds bordering Nevada, Idaho, and Utah. Annual deposition rates of mercury from Goldstrike operations ranged from approximately 2.25 grams per square kilometer per year (g/km^2-yr) near the source to <0.1 g/km^2-yr at a distance of 30 to 100 kilometers from the source based on REMSAD model isopleth output. The statewide average global background deposition of mercury is approximately 11.1 g/km^2-yr. Based on mercury assay data from drill core samples taken from the proposed layback areas, annual mercury emissions under the Proposed Action would be similar to, or less than, current emissions. BGMI will continue to comply with the Nevada Bureau of Air Pollution Control (BAPC), which requires the technologies to control mercury emissions, listed in Table 3.11-6 (Draft SEIS) to be operated until such time as additional or different controls are required by Nevada Maximum Achievable Control Technology (NvMACT).

Potential air quality impacts under the Bazza Waste Rock Facility Alternative would be the same as described for the Proposed Action with the following exception. The Bazza Waste Rock Facility Alternative would result in additional fugitive dust and haul truck combustion emissions compared with the Proposed Action due to the longer haul distance under this alternative.

Social and Economic Values

Under the No Action Alternative, BGMI would continue to employ the current mine workforce of approximately 1,600 workers until approximately 2011 when surface mining of the Betze Pit would be completed. Closure of the Betze Pit would require a reduction of work force beginning in approximately 2011 and final closure of the project in 2026. Changes in area population would be dependent on availability of alternative employment in the area. Ultimately, the area population could decline. Impacts on public infrastructure and services would occur due to reduction in mining force in 2011. Tax revenues would decline between the end of mining in 2011 and complete closure of the project in 2026. There also would be a concurrent decline in tax proceeds. Growth pressure on schools, housing, and public services would be reduced beginning in 2011.

The Proposed Action would continue to employ the current mine workforce of approximately 1,600 workers for 4 additional years (through 2015) beyond the currently permitted operation. There would be no increase in permanent workforce, thus no additional population growth as a result of the proposed project. There may be an increase in temporary contract workers to perform prestripping operations, but this work would be of relatively short duration. Annual tax revenues anticipated for the proposed project are expected to be approximately $11.4 million from net proceeds taxes, $21.6 million from sales and use taxes, $0.6 million from business activity taxes, and $3.4 million from *ad valorem* property taxes for the State and Eureka and Elko counties based on the 2004-2006 data. These levels are likely to continue for the additional years of mine life. Housing, public facilities and services, and schools in the study area are adequate since there would be no increase in employment as a result of the Proposed Action. The public revenue generated by the Proposed Action is expected to be a direct benefit to the communities because there would be no major public service shortfalls. The social and economic effects of the Proposed Action would be beneficial to study area communities.

Under the Bazza Waste Rock Facility Alternative, socioeconomic impacts would be nearly the same as the Proposed Action with a slight increase in employment (approximately 20 additional haul truck drivers for 2 years during 2011 and 2012) necessary due to the extended haul distance. There would be an estimated additional $2.6 million in labor income generated and additional $1.2 million in sales and use taxes for 2 years when compared with the Proposed Action.

Visual Resources

Under the No Action Alternative, there would be no additional disturbance beyond what currently exists or is currently permitted. The existing management guidelines for Visual Resource Management (VRM) Class IV lands would not be exceeded.

The Proposed Action would result in an expansion of the existing BGMI mining and processing operations in Boulder Valley. The most visible proposed features would include the new Clydesdale Waste Rock Facility, the new Goldstrike No. 3 Tailings Facility, and expansion of the Betze Pit to the northwest. After completion of reclamation activities, visual effects of the waste rock facilities would be reduced due to BGMI's commitment to vary their topography to mimic natural landforms to the degree possible. The tailings facility reclamation also would use native vegetation to blend in with the surrounding area. The long-term visual impact in Visual Resource Management Class IV areas would be low.

For the Bazza Waste Rock Facility Alternative, visual impacts associated with an increase in maximum height of the Bazza Waste Rock Facility by 100 feet to 800 feet above the original topography relative to the Proposed Action would be minor and offset in part by not constructing the Clydesdale Waste Rock Facility and haul road.

Hazardous Materials and Solid Waste

Under the No Action Alternative, the transportation, storage, and use of hazardous materials associated with the existing operations would continue as authorized.

The Proposed Action would require the continued transport, handling, storage, use, and disposal of materials classified as hazardous under various regulatory frameworks for an additional 4 years. All hazardous materials would continue to be shipped to and from the site in accordance with applicable U.S. Department of Transportation (USDOT) hazardous materials regulations. All shipping containers and vehicles would continue to be USDOT-approved for the specific materials. Historical incident analysis indicates that there would be a low probability of an accident involving the release of hazardous materials or fuel releases during the life of the Proposed Action.

Storage, containment, transportation, handling of hazardous waste, and all operations would be in accordance with BGMI's existing Environmental Incident Response Manual and Spill Prevention, Control and Countermeasures Plan, which would ensure that impacts from potential spills would be minimized and the spilled materials contained and removed. All hazardous waste generated at the mine would be disposed of in accordance with applicable federal and state regulations. Non-hazardous solid waste would be disposed of in a Class III waivered landfill. All hazardous substances would be handled in accordance with applicable Mine Safety and Health Administration or Occupational Safety and Health Administration regulations (Title 30 of the Code of Federal Regulations [CFR]).

Under the Bazza Waste Rock Facility Alternative, impacts would be similar to the Proposed Action. Hazardous materials would continue to be transported, stored, and used at the site at similar rates as current operations until operations are completed.

BLM-preferred Alternative

The Council on Environmental Quality Regulations (40 CFR 1502.14e) direct that an EIS "identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference."The BLM has selected a preferred alternative based on the analysis in this SEIS. This preferred alternative is the alternative that best fulfills the agency's statutory mission and responsibilities, considering economic, environmental, technical, and other factors. The BLM has determined that the preferred alternative is the Proposed Action. The Proposed Action includes the following major components:

- Expansion of the existing Betze Pit to include two additional laybacks to the north and west with associated in-pit and perimeter haul roads and buffer (129 acres of new disturbance of which 50 acres are public land);
- Construction of the Clydesdale Waste Rock Facility and associated access road (572 acres of new disturbance of which 414 acres are public land);
- Construction and operation of the Goldstrike No. 3 Tailings Facility (690 acres of which 46 acres are public land and 211 acres are previously disturbed); and
- Extension of surface mining and surface mining employment for 4 years.

The Proposed Action was selected as the BLM-preferred alternative based on the following reasons.

- It allows for extension of mining and employment for up to 1,600 mine workers for 4 more years in an economy highly dependent on mining.
- It would allow the existing Bazza Waste Rock Facility to be reclaimed 7 years earlier than would occur with the other alternatives. It would maximize the use of to-be-excavated Carlin material, a fine-grained plastic clayey silt, as an excellent growth medium and low permeability cover to

accelerate reclamation of the Bazza Facility. Carlin material does not stockpile safely and otherwise would be disposed of in a waste rock facility.

- The reclamation design of the proposed Clydesdale Waste Rock Facility would be based upon landforms, watersheds, hill-slopes, and channels that mimic natural conditions in the region, thereby minimizing erosion and promoting long-term stability.
- Mitigation measures have been incorporated into the design and reclamation plan for the Clydesdale Waste Rock Facility to minimize impacts to the existing mule deer migration corridor in the vicinity of the proposed facility. The deer migration corridor would be maintained at a width of at least 600 feet between the Clydesdale and Bazza waste rock facilities, and the proposed haul road would have breaks in the berms to allow wildlife passage. Surface disturbance would be staged where possible to be sequential such that if one part of an open corridor is disturbed, it would be completed and reclaimed before a subsequent section is started.
- The proposed Goldstrike No. 3 Tailings Facility would be constructed, operated, and closed according to NDEP, Bureau of Mining Regulation and Reclamation, Nevada Division of Water Resources, and Nevada Department of Wildlife regulations to minimize environmental impacts.
- Although the Bazza Waste Rock Facility Alternative would require more employees, which would be beneficial to the community, the alternative also would require burning a great deal more fuel, and cost more to mine the ore. Under certain economic conditions, the additional costs would increase the probability of cancellation of the project and with the cancellation would come the loss of the extension of the other 1,600 or so jobs associated with the mine.

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1.0 Introduction

The Final Supplemental Environmental Impact Statement (SEIS) for the Betze Pit Expansion Project contains the revisions to the Draft SEIS (Chapter 2.0) and a record of the written comments received on the Draft SEIS with responses to the substantive comments (Chapter 3.0).

The Betze Pit Expansion Project was distributed for public comment on August 22, 2008. The BLM held a public meeting to receive comments during the public comment period, which ended on October 6, 2008. None of the comments received during the public comment period required major changes or revisions in the Draft SEIS. The Draft SEIS has not been reprinted. Therefore, this abbreviated Final SEIS must be read in conjunction with the Draft SEIS (August 2008). For specific details on impacts to resources, including individual wildlife species, refer to the Draft SEIS (August 2008).

2.0 SEIS Modifications and Corrections

This chapter contains specific modifications and corrections to the Betze Pit Expansion Project Draft SEIS published in August 2008. These revisions were made in response to comments received during the 45-day public comment period from August 22 through October 6, 2008. **Table 2-1** identifies the text revisions. Where text has been modified or added, the new text appears in bold italic print. Deleted text appears with a strikeout line through the text. Revised tables and figures are presented in their entirety following **Table 2-1**.

Recommended mitigation measure S-1 on page 3.5-20 (Draft SEIS) required BGMI to prepare a conceptual plan for reclaimed morphometry and hydrology of the proposed Clydesdale Waste Rock Facility and present this plan to the BLM for review and approval. BGMI representatives presented the conceptual plan to BLM staff on October 24, 2008, and sent a letter to BLM on November 18, 2008, regarding the plan. The BLM determined that the conceptual plan prepared by BGMI was acceptable and that it satisfied the expectations of the recommended mitigation measure.

An additional modification to the Goldstrike Mine operations that is important to note is that BGMI personnel will be on the site until 2045 rather than 2030 as previously planned. This change affects the reclamation bond estimate (increased) and long-term monitoring costs (decreased) for the Long-Term Monitoring Trust fund established by the 1991 Record of Decision for the Betze Project (Goldstrike Mine).

Table 2-1 Modifications and Corrections to the Draft SEIS

Page	Draft SEIS Section Number	Paragraph[1]	Line	Revised Text
2-8	2.2.1.12	7	3	The groundwater elevations were approximately 5,265 feet above mean sea level (amsl), United States Geological Survey (USGS) ***North American Datum 1927 (NAD 1927).***
2-46	2.3.6.4	Figure 2-15		See revised Figure 2-15.
2-50	2.3.7.2	1	4	Under the Proposed Action, ongoing reclamation of the existing Bazza Waste Rock Facility would be accelerated and be substantially completed ***(approximately 2,314 out of 2,524 acres [92%])*** by the end of 2011. ***The remaining approximately 210 acres are comprised of existing ore stockpiles, landfill, and a stockpile access road that would not be reclaimed until 2033-2035 after all ore has been processed through the mill (see Figure 2-15).***
2-54	2.3.7.3	6	New	***BGMI currently operates two tailings disposal facilities, (the AA and North Block tailings facilities), and has one inactive facility, (Mill #4) that was acquired from Newmont. The two currently active facilities are expected to go into closure before the proposed Goldstrike No. 3 Tailings Facility. These facilities store conventional tailings, which produce a larger quantity of drain down solution than will the proposed thickened tailings from the Goldstrike No. 3 Tailings Facility.*** ***The Goldstrike No. 3 Tailings Facility is conceptually planned for closure in a manner similar to the North Block and AA tailings facilities. Conceptually, a store and release cover constructed of approximately 48 to 60 inches of low-permeability material is envisioned. This cover's design would limit the infiltration of meteoric water which may fall onto the footprints of the facilities from infiltrating into the tailings mass, thereby minimizing its contribution to long-term drainage from these facilities. In accordance with NDEP requirements, a more detailed final permanent closure plan would be drafted and submitted to the NDEP at least 2 years prior to the planned closure date. BGMI would draw upon the state of the art technology in cover design and actual data gathered over time. This would include knowledge gained through instrumentation and observation of existing store and release covers currently installed and planned between now and the anticipated closure date of the tailings facilities.*** ***The proposed Goldstrike No. 3 Tailings Facility is planned to utilize the same evaporation/ evapotranspiration (ET) cells planned for the AA and North Block tailings facilities (see Figure 2-15). It is projected that the storage capacity of these ponds would be adequate due to the decay of the solution production rate with time from the existing two facilities. Their size is estimated to total approximately 134 acres.***

Table 2-1 Modifications and Corrections to the Draft SEIS

Page	Draft SEIS Section Number	Paragraph[1]	Line	Revised Text
				The proposed Goldstrike No. 3 Tailings Facility is planned to utilize the same evaporation/ET cells planned for the AA and North Block tailings facilities (see Figure 2-15). It is projected that the storage capacity of these ponds would be adequate due to the decay of the solution production rate with time from the existing two facilities. Their size is estimated to total approximately 134 acres. ***The evaporation/ET facilities would be designed and constructed to comply with the appropriate NDEP water pollution control and mine closure regulations, permits, and an NDOW Industrial Artificial Pond Permit, as listed in Table 1-1 on page 1-5 and Appendix A of the Draft SEIS. The designs would be reviewed and approved by NDEP prior to construction. Normally, an evaporation pond is required to be built with a double containment liner system with leak detection systems. A system of this type is expected to be re-lined on a schedule to accommodate liner degradation.*** ***If an ET cell-based system is selected, NDEP will review and approve the design prior to construction. It will have adequate cover and a vegetation monitoring program to determine if undesirable constituents are being taken up by the vegetation. If such uptake was observed, a corrective plan would be put in place.*** ***At the time of closure, additional technology may have been developed that BGMI would utilize. Therefore, a closure plan has not yet been created, and is not required by NDEP until 2 years before closure. Potential ecological risk has not been assessed. The water bodies would not contain fish or prey for migratory birds due to the fact that there would be no natural inlet for such species to enter the water system. Therefore, migratory birds would not be expected to stay for any significant length of time. However, there are several demonstrated effective options for controlling wildlife access (bird balls, netting, etc.). The most appropriate measures for the specific design situation would be selected at that time.*** ***The water chemistry for the water drained from the Goldstrike No. 3 Tailings Facility is expected to be very similar in nature, if not identical, to the water drained from the AA and North Block tailings facilities because the two process facilities that feed these utilize identical chemical processes. The North Block Tailings Facility stores tailings from both the mill and roaster***

Table 2-1 Modifications and Corrections to the Draft SEIS

Page	Draft SEIS Section Number	Paragraph[1]	Line	Revised Text
				facilities, while the AA and Goldstrike No. 3 facilities will store tailings from the mill and roaster, respectively. Appendix A provides recent water quality data from waters drained from the North Block and AA tailings facilities that is reported to NDEP. Drain-down water generally meets stock water quality standards except for arsenic.
3.3-7	3.3.1.4	3	12	Delete the phrase "and river leakage" in the following text. Willow Creek and Rock Creek basins are not affected by pumping, so recharge is from precipitation ~~and river leakage~~, with discharge due to evaporation along with surface water and groundwater outflow.
3.3-10	3.3.1.4	Table 3.3-3a		See revised Table 3.3-3a.
3.3-11	3.3.1.4	Table 3.3-3b		See revised Table 3.3-3b.
3.7-3	3.7	Figure 3.7-1		See revised Figure 3.7-1 to better differentiate colors depicting Rodeo Creek diversion, sagebrush shrubland vegetation type, and perimeter buffer to laybacks.
3.7-10	3.7.2.1	2	7 & 8	Delete: ~~At present, there are no commitments to conduct mitigation. BGMI has declined to pursue an agreement at this time.~~
3.7-10	3.7.2.1	3	New	***There is an existing contractual agreement between BGMI and Newmont that governs the use of lands for mine dewatering. That agreement requires that all lands shall be reclaimed to conform to applicable standards and other reclamation standards ordinarily employed by BGMI and Newmont. Transitional reclamation work to be done to facilitate the transition to salt tolerant upland species was described above. BGMI has committed to work with Newmont, and appropriate resource agencies, to ensure that these transition measures are included in final reclamation of these lands. In addition, Newmont holds water rights independent of BGMI's mine dewatering to irrigate these agricultural lands.***
3.8-2	3.8.1.1	2	10	This area is considered by NDOW to be a very important ***historic*** migration corridor for big game (Lamp 2007b)***, though most of the current mule deer migration occurs in the Lantern gap to the south of the Betze Pit Expansion Project and on the east side, near the Pete Pit Mine Area.*** The migration corridor that extends along Bell and Rodeo creeks is used primarily by mule deer…
3.8-17	3.8.2.2	4	5	Delete: ~~If the data collected by these collars indicates a reduced use and/or probable abandonment of this corridor than restrictions and commitments imposed upon BGMI for the maintenance of this migration corridor may be eased or removed.~~

Table 2-1 Modifications and Corrections to the Draft SEIS

Page	Draft SEIS Section Number	Paragraph[1]	Line	Revised Text
4-3	4.3	2	15	Delete: ~~USEPA, Arlington; VA~~
6-12	6.1	7	New	***Raines, G. L., D. L. Sawatsky, and K. A. Connors. 1996. Great Basin Geoscience Database: USGS Digital Data Series, DDS-41. http://keck.library.unr.edu/pdfs/Geos_db/catalog.pdf***

[1] Paragraph number includes first partial paragraph at top of page, if applicable.

Revised Tables and Figures

Table 3.3-3a Pre-mining Simulated Water Balance (acre-feet)

Sources	Willow Creek Basin		Rock Creek Basin		Boulder Flat Basin		Marys Creek Basin		Maggie Creek Basin		Susie Creek Basin		Total Study Area [1,2]
	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	
Recharge													
Direct	14,000		9,800		11,200		1,500		13,800		6,400		56,800
Mountainfront		20,100		5,900		7,900		1,300		20,200		7,000	62,500
Groundwater inflow	600		6,800		17,100		3,400		3,400		1,500		
Surface water inflow		0		21,000		24,900		0		0		0	
River leakage													
Humboldt					25,900		0		0		0		25,900
Other	12,400	13,300	12,000	10,000	26,600	6,800	3,500	5,900	29,400	25,700	5,400	7,300	
Storage	8,800		5,400		32,700		1,600		10,400		3,000		62,000
TOTAL IN	35,800	33,300	34,000	36,900	113,500	39,600	10,900	7,200	57,100	45,900	16,400	14,300	207,300

Sinks	Willow Creek Basin		Rock Creek Basin		Boulder Flat Basin		Marys Creek Basin		Maggie Creek Basin		Susie Creek Basin		Total Study Area [1,2]
	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	
Evapotranspiration													
Natural ET	11,400		1,000		68,300		2,500		12,500		3,500		99,200
Crop ET													
Runoff to Humboldt						100		100		0		300	400
Surface water outflow		21,000		24,900		13,000		3,700		16,500		8,600	41,800 [3]
Groundwater outflow	2,500		17,800		6,800		600		8,600		2,300		4,800 [4]
River leakage													
Humboldt					0		200		100		300		600
Other	13,300	12,400	10,000	12,000	6,800	26,600	5,900	3,500	25,700	29,400	7,300	5,400	
Storage	8,700		5,200		31,700		1,700		10,200		3,000		60,600
TOTAL OUT	35,800	33,300	34,000	36,900	113,600	39,600	10,900	7,200	57,100	45,900	16,400	14,400	207,400

[1] Total flow into/out of basin. Does not include discharge components internal to basin.
[2] Computed from raw (unrounded) table values, to prevent accumulation of rounding errors.
[3] Discharge to Humbolt only. Does not include surface water discharge from one basin to another.
[4] Net groundwater outflow (total "groundwater out" minus total "groundwater in"). Does not include groundwater flow from one basin to another. Equals groundwater flow to the Clovers area.

Note: Blank cells are not applicable.

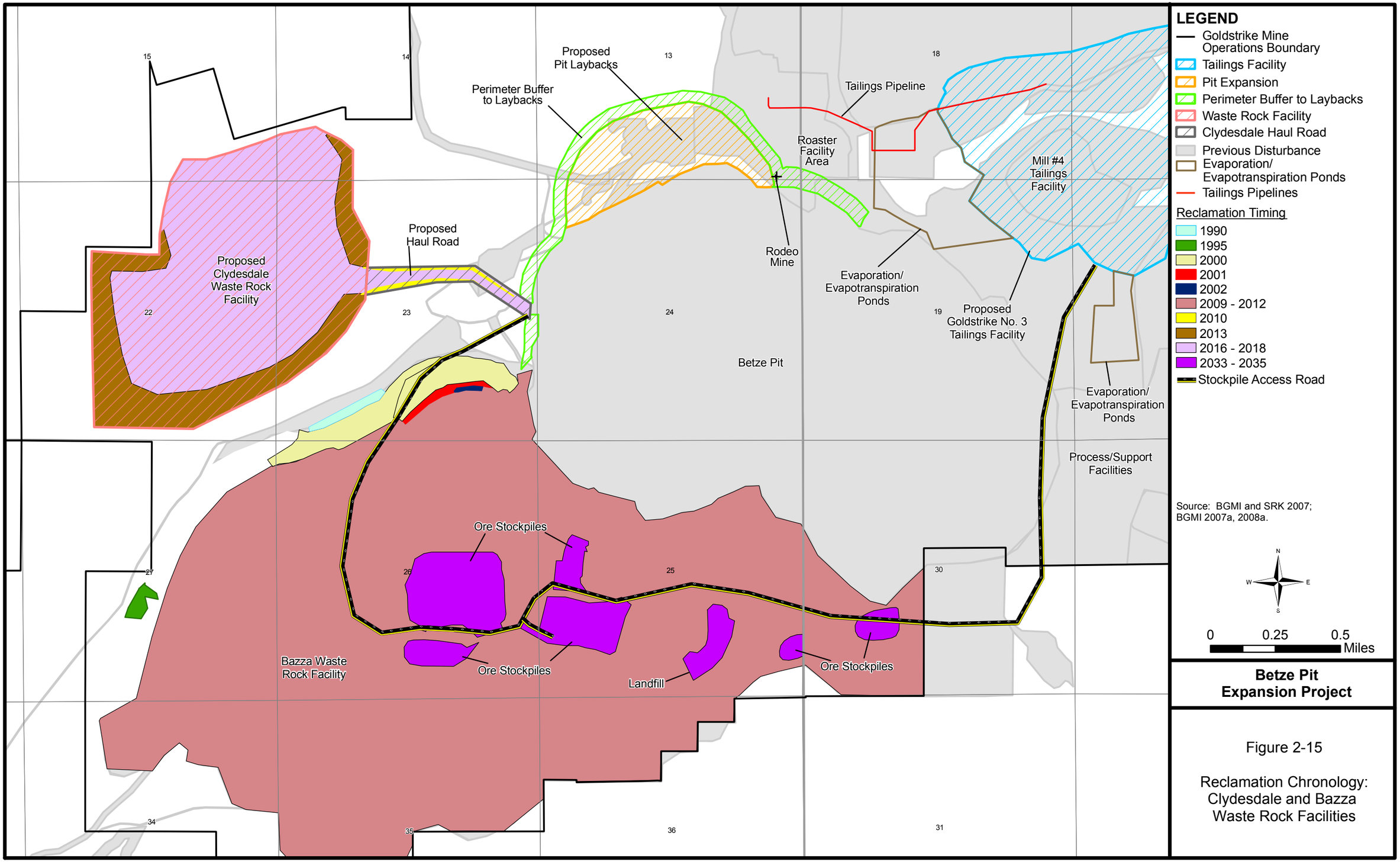
Source: Zhan 2008.

Table 3.3-3b Current Simulated Water Balance July 2005 – June 2006 (acre-feet)

Sources	Willow Creek Basin		Rock Creek Basin		Boulder Flat Basin		Marys Creek Basin		Maggie Creek Basin		Susie Creek Basin		Total Study Area [1,2]
	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	
Recharge													
Direct	14,000		9,800		11,200		1,500		13,800		6,400		56,800
Mountainfront		20,100		5,900		7,900		1,300		20,200		7,000	62,500
Groundwater inflow	600		7,100		37,900		4,000		15,200		1,700		
Surface water inflow		0		21,000		24,900		0		0		0	
River leakage													
Humboldt					25,900		0		0		0		25,900
Other	12,400	13,300	12,000	10,000	34,100	25,300	3,500	5,600	29,700	22,300	5,400	7,300	
Storage	8,800		8,500		95,400		2,000		37,300		4,100		156,100
Infiltration													
Irrigation					25,200								25,200
Injection wells					0								0
Reservoir					45,000								45,000
Pond					600								600
TOTAL IN	35,900	33,300	37,400	36,900	275,200	58,200	11,100	7,000	95,900	42,500	17,600	14,400	372,100

Sinks	Willow Creek Basin		Rock Creek Basin		Boulder Flat Basin		Marys Creek Basin		Maggie Creek Basin		Susie Creek Basin		Total Study Area [1,2]
	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	Ground	Surface	
Evapotranspiration													
Natural ET	11,400		1,000		88,800		2,500		12,300		3,500		119,600
Crop ET					17,700								17,700
Runoff to Humboldt						100		100		0		300	400
Surface water outflow		21,000		24,900		13,100		3,400		12,800		8,600	37,900 [3]
Groundwater outflow	2,500		20,300		17,200		1,000		26,900		3,500		4,800 [4]
River leakage													
Humboldt					0		200		100		300		600
Other	13,300	12,400	10,000	12,000	25,300	34,100	5,600	3,500	22,300	29,700	7,300	5,400	
Storage	8,700		6,100		62,800		1,700		10,200		3,000		92,500
Pumping													
Barrick pumping					33,300								33,300
Newmont pumping					30,200				24,200				54,400
Pumpback (diversion)						11,000							11,000
TOTAL OUT	35,800	33,300	37,400	36,900	275,300	58,200	11,100	7,000	95,900	42,500	17,600	14,400	372,100

[1] Total flow into/out of basin. Does not include discharge components internal to basin.
[2] Computed from raw (unrounded) table values, to prevent accumulation of rounding errors.
[3] Discharge to Humbolt only. Does not include surface water discharge from one basin to another.
[4] Net groundwater outflow (total "groundwater out" minus total "groundwater in"). Does not include groundwater flow from one basin to another. Equals groundwater flow to the Clovers area.
Note: Blank cells are not applicable.
Source: Zhan 2008.

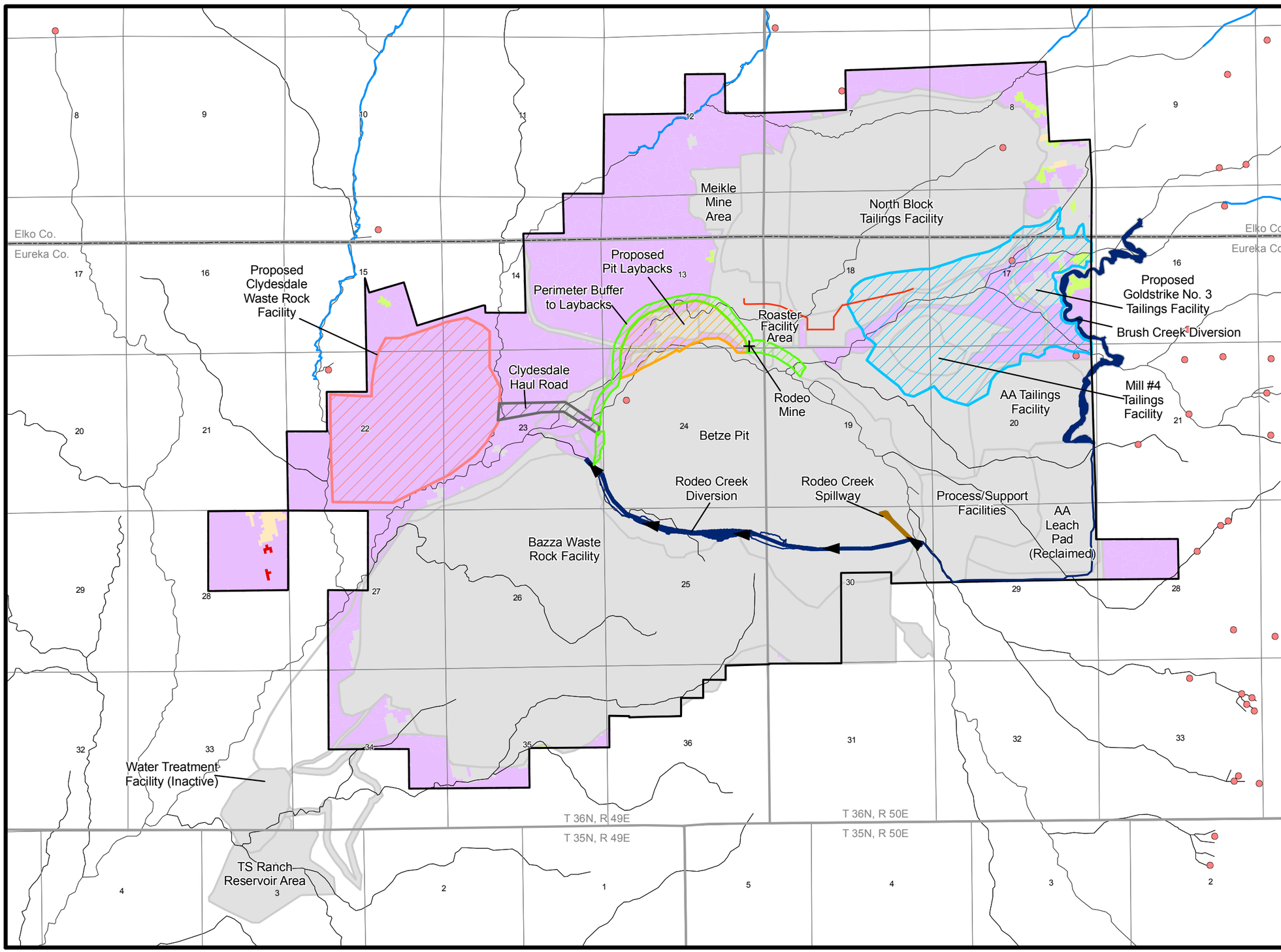


Betze Pit Expansion Project

Figure 2-15

Reclamation Chronology: Clydesdale and Bazza Waste Rock Facilities

11/05/2008



LEGEND

- Goldstrike Mine Operations Boundary
- Tailings
- Pit Expansion
- Perimeter Buffer to Laybacks
- Waste Rock Facility
- Clydesdale Haul Road
- Tailings Pipeline
- Rodeo Creek Spillway (Post-mining Closure)

Vegetation Cover Type

- Barren
- Industrial/Commercial
- Grassland
- Sagebrush Shrubland
- Salt-desert Shrubland
- Perennial Stream
- Creek Diversion or Channel
- Stream or Drainage Pathway (Intermittent or Ephemeral)
- Seeps and Springs

Source: USGS 2004.

N W E S

0 0.5 1 Miles

Betze Pit Expansion Project

Figure 3.7-1

Vegetation Cover Types within the Study Area

12/15/2008

3.0 Public Review of the Draft SEIS

The 45-day public comment period on the Betze Pit Expansion Project SEIS began on August 22, 2008, and ended on October 6, 2008. The BLM received 11 comment letters during the public comment period. **Table 3-1** lists each of the comment letters by respondent, the assigned letter number, and the number of comments per letter.

The BLM held a public meeting at the BLM Elko District Office in Elko, Nevada, on September 10, 2008. Thirteen persons signed the attendance record for the public meeting. No written or verbal comments were submitted at the public meeting.

Table 3-1 Public Comment Letters in Response to the Draft SEIS

Letter Number	Commenter	Number of Comments
Federal Agencies		
F1	USEPA	9
F2	USGS	6
Nevada State Agencies		
S1	Division of State Lands	7
S2	Division of Water Resources	2
S3	NDOW	4
S4	NDOW	2
Local Agencies		
L1	Elko County Board of Commissioners	5
Non-Government Organizations		
N1	Western Watersheds Project	32
N2	Great Basin Resource Watch	57
N3	Great Basin Resource Watch	7
Private Individuals		
P1	B. Sachau	7

Comments received during the public comment period are presented on the following pages, together with the BLM's responses to these comments. Each comment and each response is identified by the letter number and a comment number. Each letter has been reviewed in its entirety and considered by the BLM in preparation of the Final SEIS for the Betze Pit Expansion Project.

F1 - Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

October 2, 2008

Kirk Laird
Bureau of Land Management
Elko Field Office
3900 East Idaho Street
Elko, NV 89801-0611

Subject: Betze Pit Expansion Draft Supplemental Environmental Impact Statement (SEIS), Elko and Eureka counties, Nevada [CEQ #20080315]

The U.S. Environmental Protection Agency (EPA) has reviewed the above referenced document. Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) NEPA Implementation Regulations at 40 CFR 1500-1508, and our NEPA review authority under Section 309 of the Clean Air Act.

F1-1 We have appreciated the opportunity to work closely with you during the preparation of this Draft SEIS consistent with the draft Memorandum of Understanding between the Nevada Bureau of Land Management (BLM) and EPA on mining-related NEPA projects. We believe this process was helpful in early resolution of some issues
F1-2 we raised during the EIS preparation process, including ecological risk assessment, mercury emissions, facility design, and mitigation measures. We have concerns, however, regarding the potential impacts to soils, vegetation, and air quality after
F1-3 dewatering ceases, as well as the potential impacts associated with tailings closure. We recommend the Final SEIS provide additional information to address these issues. We
F1-4 have, therefore, rated this Draft SEIS as EC-2 – Environmental Concerns-Insufficient Information (see enclosed "Summary of Rating Definitions and Follow-Up Action").

F1-5 Specifically, we remain concerned that, after dewatering ceases, formerly saturated lands below TS Ranch Reservoir will dry up, and up to 10,000 acres of irrigated agricultural lands could be taken out of production by the land owner Newmont Mining Corporation. Adverse impacts could include soil salinity accumulations and the resultant saline and/or alkaline runoff conditions, accelerated eolian or surface water erosion, fire, and cheatgrass or other weed infestations. EPA has raised these concerns on past Betze project EISs and recommended mitigation commitments (see November 2000, September 2000, and January, 2003 EPA comment letters to BLM), but no efforts have been made to satisfactorily address them. The current Draft SEIS identifies measures to minimize these potential significant adverse impacts, but states that Barrick Goldstrike Mines, Inc., (BGMI) has declined to pursue an agreement with Newmont to implement them. We
F1-6 recommend that BLM include commitments in the Final SEIS and Record of Decision to

Printed on Recycled Paper

Responses to Letter

F1-1 Comment noted.

F1-2 Comment noted.

F1-3 See response to comments F1-5 (post-dewatering concerns for impacts to irrigated soils and vegetation), F1-7 (tailings closure methods and impacts), and F1-8 (ecological risks of evapotranspiration cells).

F1-4 Comment noted. Information has been added to the Final SEIS, as noted for the three concerns noted. (See F1-3 above, and responses to comments F1-5, F1-6, and F1-7.)

F1-5 A new paragraph was added to page 3.7-10 that explains the existing contractual agreement between BGMI and Newmont, which governs the use of these lands for dewatering. That agreement requires that all lands shall be reclaimed to conform to applicable standards and other reclamation standards ordinarily employed by BGMI and Newmont. The text in the last two sentences in paragraph 2 on page 3.7-10 was deleted.

F1-6 The text in Section 3.7.2.1 has been supplemented to include a description of the contractual agreement identified in response to Comment F1-5.

F1 - Letter (Continued)

F1-6 work with BGMI, Newmont, and appropriate resource agencies to develop a transition plan to minimize these potential significant, adverse impacts.

In addition, in our February 28, 2008, comments to you on the preliminary draft SEIS, we recommended that tailings closure methods be described in greater detail. According to page 2-54 of the Draft SEIS, passive disposal methods, including evaporation or evapotranspiration cells, would be used to dispose of draindown from the tailings facility. Although these facilities are proposed to be located on private lands, they should be described in greater detail in the Final SEIS, and their locations should be included on project maps such as 2-11 and 2-15. The Final SEIS should describe the design, operation, and closure of these systems and address the potential ecological risks posed by the evapotranspiration cells. For example, metals and salts could accumulate in the substrate and in the plants and invertebrates in these cells. The discussion should address cations such as sodium, which at high concentrations can affect plant growth.

F1-7

F1-8

F1-9

We request a copy of the Final SEIS when it is filed with our Washington, D.C. office. If you have any questions, please call me at (415) 972-3521, or Jeanne Geselbracht at (415) 972-3853.

Sincerely,

Kathleen M. Goforth, Manager
Environmental Review Office

003493

Enclosures: EPA's Summary of Rating Definitions and Follow-Up Action

Cc: David Gaskin, Nevada Division of Environmental Protection

Responses to Letter

F1-7 Figure 2-15 was revised. The evaporation/evapotranspiration (ET) cells are now depicted. The two cells are estimated to total approximately 134 acres. Text in Section 2.3.7.3 (page 2-54) has been modified to include more evaporation/ET cell details.

F1-8 See response to comment F1-7. The waters are permitted by state law. At the time of closure, additional technology may have been developed that BGMI would utilize. Therefore, a closure plan has not yet been created and is not required until 2 years before closure occurs. Potential ecological risk has not been assessed. The water bodies will not contain fish or prey for migratory birds due to the fact that there is no natural inlet for such species to enter the water system. Therefore, migratory birds would not be expected to stay for any significant length of time. However, there are several demonstrated effective options for controlling wildlife access (bird balls, netting, etc.). The most appropriate measures for the specific design situation will be selected at that time.

F1-9 Water samples taken from the North Block and AA Tailings facilities are expected to closely approximate Goldstrike No. 3 Tailings Facility water chemistry. Appendix A in the Final SEIS contains chemistry data from water samples taken in 2008 from the North Block and AA tailings facilities.

F1 - Letter (Continued)

Responses to Letter

Summary of Rating Definitions and Follow-up Action

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

F2 - Letter

United States Department of the Interior

U. S. GEOLOGICAL SURVEY

Reston, VA 20192

In Reply Refer To:
Mail Stop 423

October 7, 2008

Mr. Kirk Laird
Bureau of Land Management
Elko District Office
3900 E. Idaho Street
Elko, NV 89801-0611

Subject: Draft Supplemental Environmental Impact Statement for the Barrick Goldstrike Mining Company's Betze Pit Expansion Project

Dear Mr. Laird:

As requested by your correspondence of August 20, 2008, the U.S. Geological Survey (USGS) has reviewed the subject draft supplemental environmental impact statement (DSEIS) and offers the following comments.

SPECIFIC COMMENTS

Section 2.2.1.12 Water Management Operations, page 2-8, last paragraph

F2-1 The reference to "U.S. Geological Survey datum" is incorrect. Most likely, the authors' intent was to reference the "Geodetic Survey Vertical Datum." In our scientific products, we generally refer to National Geodetic Vertical Datum 1929 (NGVD29) or North American Vertical Datum 1988 (NAVD88). Information about the relation between these and other datums is available on the Internet at http://www.ngs.noaa.gov/PUBS_LIB/NAVD88/navd88report.htm.

Section 3.3.1.1 Hydrogeologic Setting, Hydrostructural Units, page 3.3-5, and Appendix B, Figure B-1, Pre-Mining Ground Water Levels

F2-2 The faults described in this section and their effects on ground-water flow should be visible on the Figure B-1. Ground-water flow lines should not cross faults described as barriers, such as the Siphon Fault. It also would assist the reader if the maps in the report were developed using the same base map with similar scales making it easier to compare the information contained in the maps.

Responses to Letter

F2-1 The reference was corrected as requested.

F2-2 Figure B-1 in Appendix B of the Draft SEIS is a generalized water level map that combines the water levels from all aquifers in hydrostratigraphic units exposed at the surface in the Boulder Valley area into one composite water level map. As such, water levels in the Tertiary/Quaternary Boulder Valley alluvium are contoured with water levels in the Paleozoic carbonate bedrock and the Paleozoic marine clastics as if they all were part of one single aquifer. As Figure B-1 in the Draft SEIS shows, most of the solid line contours are for the Boulder Valley alluvium, while the dashed water level contours are for the bedrock units in the adjacent ridges. Because multiple aquifers are combined into one composite water level map, the inferred flow lines in Figure B-1 are very general and do not reflect flow in any one single aquifer, except the Boulder Valley alluvium. Therefore, the flow lines will not reflect faults or other possible barriers to flow in the bedrock units. Figure B-1 should be viewed as a very general flow diagram for groundwater in the Boulder Valley area.

F2 - Letter (Continued)

Responses to Letter

F2-5 (Cont) dewatering rates to maintain the groundwater level beneath the Betze Pit and the Meikle underground mine at the desired level. The proposed expansion of the Betze Pit will not change the dewatering rates and will not affect groundwater levels in the Boulder Flat area. Figure 3.3-28 shows the comparison of the two dewatering scenarios (through 2011 and through 2015) using the 2000 model to eliminate recalibration confusion. BLM considered the proposal to run the 2007 model on the dewatering through 2011 scenario. However, based on the model's purpose, and the fact that all area within the 2007 model run on the dewatering scenario through 2015 is within the 2000/2003 Betze Project SEIS 10-foot drawdown contour (upon which mitigation was based), as shown in Figure 3.3-27, BLM chose not to.

F2-6 The reference has been corrected as requested.

F2 - Letter (Continued)

2

Table 3.3-3a Pre-Mining Simulated Water Balance, page 3.3-10, and Table 3.3-3b Current Simulated Water Balance, page 3.3-11

F2-3 The numbers listed as "totals" in the right-hand column of both tables do not match the total of the contribution from each river for many of the components of the water budget. Instead, they seem to duplicate the contribution from Susie Creek, except for "River Leakage - Other."

F2-4 In addition, Table 3.3-3b does not list "Total Out" from each river, and the "Total In" in the far right-hand column does not equal the "Total Out," indicating a missing or inaccurate term in the overall budget.

Section 3.3.2.2 Proposed Action, page 3.3-60, fourth paragraph, last sentence

F2-5 It would greatly assist the reader if the impacts due to recalibration of the ground-water model could be distinguished from the impacts due to the expansion of the pit. One approach to doing so would be to rerun the no-action scenario using the 2007 model. The results of this run could be compared to the results of the expanded-pit scenario run on the same model. The impacts due to recalibration would not affect this comparison.

References, page 6-12

F2-6 The reference to the Great Basin Geoscience Database is incomplete. The correct reference is:

Raines, G.L., D.L. Sawatsky, and K.A. Connors, 1996, Great Basin Geoscience Database: USGS Digital Data Series, DDS-41. Available on-line at http://keck.library.unr.edu/pdfs/Geos_db/catalog.pdf.

Thank you for the opportunity to review and comment on the DSEIS. If you have any questions concerning our comments, please contact Lloyd Woosley, Chief of the USGS Environmental Affairs Program, at (703) 350-8797 or at lwoosley@usgs.gov.

Sincerely,

/Signed/

James F. Devine
Senior Advisor for Science Applications

Responses to Letter

F2-3 Comment noted. Table 3.3-3a and Table 3.3-3b have been corrected and are included in the Final SEIS.

F2-4 Surface water flows and thus the accounting for surface water flow into and out of the model domain is more complex than shown in Table 3.3-3a and Table 3.3-3b. Surface water inflow refers to surface water entering each hydrographic area (HA) from other HA's. For example, the Rock Creek HA receives surface water from the Willow Creek HA via Upper Rock Creek and the Boulder Valley HA receives surface water flow from the Rock Creek HA via Rock Creek. Surface water outflow refers to water leaving each HA as streamflow. Surface water outflow from Willow Creek goes to Rock Creek as flow in Rock Creek and surface water outflow from the Rock Creek HA goes to Boulder Valley as flow in Rock Creek. Surface water outflow from Boulder Valley goes to the Humboldt River. Also included in the surface water outflow from Boulder Valley are about 400 acre-feet per year (AFY) that reach the termini of Bob Creek, Welch Creek or Mack Creek and are assumed to leave the model domain. The totals column on the right side of Table 3.3-3a and Table 3.3-3b is for illustration only and is not meant to be an accounting tabulation where totals for different categories should balance. Tables 3.3-3a and 3.3-3b are provided in the SEIS only to convey an approximate summary of the water accounting for the model domain before and after pumping in the Goldstrike Mine area. The tables are not meant to serve as a detailed water balance for the groundwater model. The purpose of providing Tables 3.3-3a and 3.3-3b is so that the reader of the SEIS can compare one table to the other to develop an understanding of how the water balance in the project area and cumulative effects area has changed due to mine dewatering from 1990 to the present.

F2-5 The proposed expansion of the Betze Pit would have minimal effect on groundwater drawdown. The dewatering currently taking place and described in the Betze Project 2000/2003 SEIS and the 4-year extension of dewatering for the Meikle underground mine under State of Nevada authorizations will not change due to the proposed expansion of the Betze Pit. Therefore, all dewatering is discussed under the No Action Alternative. Recalibration of the BGMI groundwater model was conducted under the 2000/2003 Betze Project SEIS and is an ongoing process to improve the estimates of groundwater levels and needed

S1 and S2 - Letter

Responses to Letter

JIM GIBBONS
Governor

STATE OF NEVADA

ANDREW K. CLINGI
Director

DEPARTMENT OF ADMINISTRATION
209 E. Musser Street, Room 200
Carson City, Nevada 89701-4298
(775) 684-0222
Fax (775) 684-0260
http://www.budget.state.nv.us/

October 3, 2008

Kirk Laird
US Department of the Interior
Bureau of Land Management
Elko District Office
3900 East Idaho Street
Elko, NV 89801-4611

Re: SAI NV # **E2009-076** Reference: **3809 NV-013 NVN-070708**

Project: **Goldstrike Mine Betze Pit expansion project draft EIS**

Dear Kirk Laird:

Enclosed are comments from the agencies listed below regarding the above referenced document. Please address these comments or concerns in your final decision.

Division of State Lands

Division of Water Resources

This constitutes the State Clearinghouse review of this proposal as per Executive Order 12372. If you have questions, please contact me at (775) 684-0213.

Sincerely,

R. Tietje
Nevada State Clearinghouse

S1 - Letter (Continued)

Nevada State Clearinghouse

From: Skip Canfield
Sent: Wednesday, September 10, 2008 2:38 PM
To: Nevada State Clearinghouse
Subject: RE: E2009-076 Goldstrike Mine Betze Pit expansion project draft EIS - Bureau of Land Management

The Nevada Division of State Lands provides the following comments:

There is a concern about the cumulative visual impacts to public lands users' experiences.

S1-1 As multiple use concepts are employed on our public lands, a comprehensive and consistent look at visual impacts must be considered. Small and inexpensive mitigation measures can play a large role in the compatibility of the built and natural environment.

Utilize appropriate lighting:

S1-2
- Utilize consistent lighting mitigation measures that follow "Dark Sky" lighting practices. Dark sky measures are inexpensive, simple to implement, and very mainstream. The result is a less obtrusive impact to other users of adjacent public lands. www.darksky.org

S1-3
- Effective lighting should have screens that do not allow the bulb to shine up or out. In fact, lighting that is installed using dark sky fixtures (light is only aimed at the subject property) is more efficient, safer, and results in reduced electricity costs.

S1-4
- Federal agencies should include light shields as a condition of approval for all permanent and temporary applications such as exploratory drilling rigs.

Utilize building materials, colors and site placement that are compatible with the natural environment:

S1-5
- Utilize consistent mitigation measures that address logical placement of improvements and use of appropriate screening and structure colors. Existing utility corridors, roads and areas of disturbed land should be utilized wherever possible.

S1-6
- For example, the use of compatible paint colors such as "sudan brown" for water tanks and other vertical structures reduces the visual impacts of the built environment. Using screening, careful site placement, and cognitive use of earth-tone colors/materials that match the environment go a long way to improve the user experience for others who might have different values than what is fostered by built environment activities.

S1-7
- Federal agencies should require these mitigation measures as conditions of approval for all permanent and temporary applications.

Skip Canfield, AICP
State Land Use Planning Agency

Responses to Letter

S1-1 The proposed project occurs within the Goldstrike Mine operations boundary, a Visual Resource Management (VRM) Class IV area. VRM Class IV objective provides for major modification of the existing character of the landscape that is consistent with the proposed project.

S1-2 The existing lighting is designed for 24 hours per day mining operations and safety within this VRM Class IV area. The proposed lighting mitigation measures are not necessary for this expansion project.

S1-3 See response to comments S1-1 and S1-2.

S1-4 See response to comments S1-1 and S1-2.

S1-5 See response to comment S1-1.

S1-6 See response to comment S1-1.

S1-7 See response to comments S1-1 and S1-2.

S2 - Letter

Responses to Letter

Nevada State Clearinghouse

From: Sue Gilbert
Sent: Monday, September 29, 2008 4:34 PM
To: 'clearinghouse@budget.state.nv.us.'
Subject: E2009-076

From: Nevada State Clearinghouse
Sent: Monday, August 25, 2008 1:52 PM
To: Robert K. Martinez
Subject: E2009-076 Goldstrike Mine Betze Pit expansion project draft EIS - Bureau of Land Management

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0213 Fax (775) 684-0260

TRANSMISSION DATE: 8/25/2008

Division of Water Resources

Nevada SAI # E2009-076

Project: Goldstrike Mine Betze Pit expansion project draft EIS

Follow the link below to download an Adobe PDF document concerning the above-mentioned project
for your review and comment.
E2009-076

Please evaluate it with respect to its effect on your plans and programs; the importance of its contribution to state and/or local
areawide goals and objectives; and its accord with any applicable laws, orders or regulations with which you are familiar.

Please submit your comments no later than Thursday, October 2, 2008.

Use the space below for short comments. If significant comments are provided, please use agency letterhead and include
the Nevada SAI number and comment due date for our reference.
Questions? Reese Tietje, (775) 684-0213 or clearinghouse@state.nv.us

____No comment on this project __x__Proposal supported as written
AGENCY COMMENTS:

S2 - Letter (Continued)

S2-1 All waters of the State belong to the public and may be appropriated for beneficial use pursuant to the provisions under Chapters 533 and 534 of the Nevada Revised Statutes (NRS), and not otherwise.

S2-2 Any water developments constructed and utilized for a beneficial use whether surface or underground must be done so incompliance with the referenced chapters of the NRS for the subject parcels of land wholly situated within the State of Nevada.

Signature: Diana Lefler, Staff Engineer

Date: 9/29/2008

Responses to Letter

S2-1 Comment noted.

S2-2 Comment noted.

S3 - Letter

STATE OF NEVADA

DEPARTMENT OF WILDLIFE

1100 Valley Road
Reno, Nevada 89512
(775) 688-1500 • Fax (775) 688-1595

JIM GIBBONS
Governor

KENNETH E. MAYER
Director

DOUG HUNT
Deputy Director

2008 SEP 25 PM 7:30

ELKO DISTRICT OFFICE		
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WELLS F.O.		
SUPPORT SRV.		
FIRE		
OPERATIONS		
CA. TRAIL		
PUBLIC AFFAIRS		

September 23, 2008

Kenneth E. Miller
District Manager
Bureau of Land Management
Elko District Office
3900 East Idaho Street
Elko, NV 89801

2008 SEP 25 PM 7:30

RE: Betze Pit Expansion Project Draft Supplemental Environmental Impact Statement comments

Dear Mr. Miller,

Thank you for this opportunity to comment on Barrick Goldstrike Mines Inc.'s (BGMI) proposed Betze Pit expansion project in Elko and Eureka counties. The Nevada Department of Wildlife's concerns with Barrick Goldstrike Mines Inc.'s proposal include the direct, indirect, and cumulative impacts to wildlife.

S3-1 Through the development of this document, the Nevada Department of Wildlife worked with the BLM, BGMI and other cooperating agencies to address wildlife concerns within the project area. NDOW's primary concern within the project vicinity is the impacts to the Area 6 mule deer herd. As stated in the document, this population of mule deer is well below historic levels, due primarily to habitat loss and alteration associate with fire, as well as mining and other influences. The Betze Pit, and other features in the Carlin Trend, intersect mule deer transitional habitat; that is, habitat that is used by mule deer to migrate from summering grounds in the north, and wintering grounds in the south. Historically, this migration corridor was used by up to 4,000 deer annually. Currently, far fewer deer use this transitional habitat, because there are far fewer deer in the Area 6 mule deer herd. Additionally, most of the current migration occurs in the gap to the south of the Barrick expansion project (the Pete pit mine area). However, NDOW has a long term goal of maintaining the integrity of this transitional habitat for the future, regardless of the number of deer that currently utilize it.

On page 3.8-17 in Section 3.8.22, the document states:

(NSPO Rev. 2-07)

(O) 5386

Responses to Letter

S3-1 Comment noted. In addition to the applicant-committed environmental protection measures for mule deer specified in Section 2.3.6.4 (Wildlife and Special Status Species) and Section 3.8.2.2 (Environmental Consequences, Proposed Action, pages 3.8-16 and 3.8-17 of the Draft SEIS), there is a working group composed of BLM, NDOW, BGMI, and Newmont Mining Corp. that will address this issue on a regional scale.

S3 - Letter (Continued)

JIM GIBBONS
Governor

STATE OF NEVADA
DEPARTMENT OF WILDLIFE
1100 Valley Road
Reno, Nevada 89512
(775) 688-1500 • Fax (775) 688-1595

KENNETH E. MAYER
Director

DOUG HUNT
Deputy Director

"BGMI has committed to assisting NDOW and the BLM in the collection of big game migration data in the project vicinity. BGMI has contributed approximately $31,894 for the purchase of 5 radio collars to monitor how mining, fire, and other influences are impacting the Area 6 deer herd. The use of these radio collars will help NDOW ascertain the continued use of this historic migration corridor and project how it may be used in the future. If the data collected by these collars indicates a reduced use and/or probable abandonment of this corridor than restrictions and commitments imposed upon BGMI for the maintenance of this migration corridor may be eased or removed."

S3-2 NDOW recognizes and appreciates BGMI's company-committed mitigation measures and continued support for the collection of data for the Area 6 deer herd. However, five radio collars are insufficient to determine an increase, decrease or abandonment of use of the migration corridor. As such, the data collected from these collars should not solely be

S3-3 used to determine whether to ease or remove any restrictions or commitments imposed upon BGMI for the maintenance of this corridor. NDOW would like to reiterate that we have an strong interest and a long term goal of maintaining the integrity of this

S3-4 transitional habitat for the future, regardless of the number or frequency of deer that currently use it.

Thank you, again, for this opportunity to comment on this document. Should you have questions regarding my comments, or if you need clarification on any of the information provided here, please contact me at the number below. Thank you for your time and consideration.

Sincerely,

KMiller

Katie Erin G. Miller
Eastern Region Mining Biologist
Nevada Department of Wildlife
60 Youth Center Road
Elko, NV 89801
(775) 777-2368
kmiller@ndow.org

Responses to Letter

S3-2 Comment noted.

S3-3 Comment noted. See response to comment S3-1.

S3-4 Comment noted. See response to comment S3-1.

S4 - Letter

STATE OF NEVADA
DEPARTMENT OF WILDLIFE
1100 Valley Road
Reno, Nevada 89512
(775) 688-1500 • Fax (775) 688-1595

JIM GIBBONS
Governor

KENNETH E. MAYER
Director

DOUG HUNT
Deputy Director

2008 SEP 29 PM 7: 30

September 25, 2008

Kathy Gunderman
Field Manager
Tuscarora Field Office
Bureau of Land Management
3900 East Idaho Street
Elko, NV 89801

RE: Betze Pit Expansion SEIS – mule deer migration corridor language

Dear Ms. Gunderman,

Thank you for this opportunity to comment on Barrick Goldstrike Mines Inc.'s (BGMI) proposed Betze Pit expansion project in Elko and Eureka counties. The Nevada Department of Wildlife's concerns with Barrick Goldstrike Mines Inc.'s proposal include the direct, indirect, and cumulative impacts to wildlife.
I recently sent a letter to Ken Miller (9-23-08) regarding NDOW's concerns with some of the language in the Betze Pit Expansion SEIS. NDOW would like to see the language in the document changed, as outlined below (underline indicates language we would like to see added, while the strikethrough indicates language we would like to see removed).

Page 3.8-2

S4-1 …This area is considered by NDOW to be a very important historic migration corridor for big game (Lamp 2007b), though, most of the current mule deer migration occurs in the Lantern gap to the south of the Betze Pit Expansion project and on the east side, near the Pete Pit Mine Area. The migration corridor that extends along Bell and Rodeo creeks is used primarily by mule deer…

Page 3.8.17

S4-2 BGMI has committed to assisting NDOW and the BLM in the collection of big game migration data in the project vicinity. BGMI has contributed approximately $31,894 for the purchase of 5 radio collars to monitor how mining, fire, and other influences are impacting the Area 6 deer herd. The use of these radio collars will help NDOW ascertain the continued use of this historic migration corridor and project how it may be used in the future. ~~If the data collected by these collars indicates a reduced use and/or probable abandonment of this corridor than restrictions and commitments imposed upon BGMI for the maintenance of this migration corridor may be eased or removed.~~

Responses to Letter

S4-1 The text was modified as requested to better describe mule deer migration habits in the area.

S4-2 The text was deleted as requested. The limited radio collar data should not be used alone to describe mule deer migration habits.

JIM GIBBONS
Governor

STATE OF NEVADA
DEPARTMENT OF WILDLIFE
1100 Valley Road
Reno, Nevada 89512
(775) 688-1500 • Fax (775) 688-1595

KENNETH E. MAYER
Director

DOUG HUNT
Deputy Director

NDOW feels that these changes to the document more accurately represent the current status of the mule deer herd in Area Six and reflect our intended long term goals for the successful management of this herd.

Thank you for your time and consideration in this matter. Should you have questions regarding my suggestions, please contact me at the number below.

Sincerely,

KMiller

Katie Erin G. Miller
Eastern Region Mining Biologist
Nevada Department of Wildlife
60 Youth Center Road
Elko, NV 89801
775-777-2368
kmiller@ndow.org

L1 - Letter

Elko County Board of Commissioners
569 Court Street • Elko, Nevada 89801
775-738-5398 Phone • 775-753-8535 Fax

COMMISSIONERS
SHERI L. EKLUND-BROWN
JOHN ELLISON
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WARREN RUSSELL

ELKO COUNTY MANAGER
ROBERT K. STOKES

EXECUTIVE ASSISTANT
MICHELE A. PETTY

October 1, 2008

Mr. Kirk Laird
BLM Elko District Office
3900 Idaho Street
Elko, Nevada 89801

RECEIVED
BUREAU OF LAND MANAGEMENT
ELKO FIELD OFFICE
2008 OCT -7 PM 7:30

RE: Barrick Betze Pit Expansion Project
Supplemental Environmental Impact Statement (SEIS)

Dear Mr. Laird:

The Elko County Board of Commissioners highly supports a favorable environmental analysis that will allow the Barrick Betze Pit Expansion Project to proceed. Barrick Mining is a major component in Elko County's economy that not only provides employment opportunities, but works well with other local businesses and holds the position of a highly regarded Community Service Leader in our area. Barrick Goldstrike Mines, Inc.'s contribution to the economies of Elko, Eureka and Lander Counties, cannot be overstated, as well as the personal involvement into the social and cultural components of those counties. Barrick's 1,600 mine employees will be able to continue working an additional minimum of 4 years, and potentially up to 20 years, with approval of the Proposed Action in this SEIS. As a Cooperating Agency on this SEIS project, Elko County has seen first hand the accommodating spirit in achieving consensus from all interested parties from Barrick Goldstrike Mines, Inc. We have provided input and a third party University of Nevada Reno socio-economic mining industry impact study as our contribution to the Betze Pit Expansion SEIS team. We are impressed with Barrick Goldstrike Mines, Inc.'s willingness to comply with the requirements to meet stringent environmental and cultural concerns. We believe this project will cause minimal impact to the area since there will be approximately only 1,180 acres of new disturbance, with less than 500 acres of public land disturbed, and 686 private acres, to an existing mine site location. The approval of the Proposed Action in this project will be in keeping with the County Commission's position of wise multiple use of public lands. We appreciate the opportunity for comment and participation with BLM's SEIS Project Team and look forward to continuing this close level of involvement on future public land issues.

L1-1
L1-2
L1-3
L1-4
L1-5

Sincerely,

Sheri Eklund-Brown

Sheri Eklund-Brown, Chair
Elko County Board of Commissioners
cc: BOC

Responses to Letter

L1-1 Comment noted.

L1-2 Comment noted.

L1-3 Comment noted.

L1-4 Comment noted.

L1-5 Comment noted.

N1 - E-Mail

From: Katie Fite<katie@westernwatersheds.org>
To: <kenneth_miller@blm.gov>,
08/29/2008 03:31 PM
<ken_miller@blm.gov>,
<kirk_laird@blm.gov>

Subject: Betze Barrick DEIS and ERA

August 26, 2008

Bureau of Land Management
Mr. Kenneth Miller
Kirk Laird
Elko District
3900 East Idaho Street
Elko, Nevada 89801
775-753-0200

RE: Betze Pit Expansion Project
3809 (NV-013)
NVN-070708

Western Watersheds Project has reviewed the Draft Supplemental Environmental Impact Statement for the Betze Pit Expansion Project and Risk Assessment. We have these comments to make about the proposal.

N1-1 First, there is not an adequate environmental baseline presented. There is no adequate analysis of the reduction in local and regional carrying capacity for wildlife and aquatic species of the past and ongoing mining in the area.

N1-2 The proceeds from this bond must be used to permanently retire all Barrick owned, leased, or controlled livestock grazing permits on BLM or other publicly or privately owned lands.

Responses to E-Mail

N1-1 Twenty years of environmental baseline data have been collected at the Goldstrike Mine and vicinity as summarized in this SEIS and evidenced by the references cited in this SEIS. Existing baseline data are adequate to assess impacts on wildlife and aquatic species from the proposed project.

N1-2 Grazing is excluded from the Goldstrike Mine operations boundary. Therefore, there are no grazing impacts nor grazing leases (including AUMs) to retire.

N1 - E-Mail (Continued)

N1-3 The proceeds from this bond must be used to purchase and permanently retire additional AUMs to mitigate for impacts to sagebrush dependent species including but not limited to sage grouse and pygmy rabbits.

N1-4 Global warming impacts of this action in making lands hotter and drier, i.e desertifying them, must also be mitigated. The total carbon footprint of the operation must also be examined.

N1-5 ESA consultation with regard to Lahontan cutthroat trout must be conducted. Full consideration must be given to the cumulative adverse effects of grazing, fires and other disturbances on in the affected landscape.

N1-6 Impacts to Lahontan cutthroat habitat such as those caused by a lowered water table and reduced water supply must be mitigated.

N1-7 For mitigation the BLM must require that Barrick Goldstrike Mines Inc. provide $100,000,000 for the impacts caused to the affected area, sage-grouse, aquatic species and other important habitats. Surrounding areas which will be impacted by a lowered water table, disturbed soils, disturbed vegetation, reduced quality and quantity of habitats, increased human disturbance, and air quality impacts.

N1-8 Allotments and other areas retired from grazing must be rehabilitated by removing and rehabilitating range improvements such as spring, seep, and water developments, water troughs and tanks, fences, roads, anything that impedes or affects wildlife use or movements so that wildlife infrastructure may be improved.

N1-9 Other large known or foreseeable impacts to sagebrush dependent systems and aquatic systems must be mitigated.

Responses to E-Mail

N1-3 See response to comment N1-2.

N1-4 Based on projections made by the Intergovernmental Panel on Climate Change and results from the United Kingdom's Hadley Centre's climate model (HadCM2), a model that accounts for both GHGs and aerosols, temperatures and precipitation are expected to increase in Nevada over the next century (EPA 1998). In Nevada, temperatures could increase by 3-4°F in spring and fall, and 5-6°F in winter and summer. The model predicted that precipitation is estimated to decrease in summer by 10%, to increase by 15% in spring, to increase by about 30% in fall, and to increase by 40% in winter (USEPA 1998).

The estimated amounts of greenhouse gas (GHG) generated from each alternative and impacts on climate change were analyzed in Section 3.15 (Energy Requirements) of the Draft SEIS. The Proposed Action would not change the present annual emission rate of CO_2 at the mine. However, it would extend the period of mining by 4 years over the No Action Alternative and generate 5 more years of CO_2 emissions. This extension of CO_2 emissions would not materially impact state, national, or global climate change. The proposed project would emit approximately 972,594 tons per year (tpy), or approximately .01 percent of the national annual GHG emissions of 8 billion tons (USEPA 2008).

N1-5 The BLM has engaged in discussions with the USFWS regarding Lahontan Cutthroat Trout (LCT). The cumulative effects of grazing, fires, and other disturbances are discussed in the Cumulative Impacts section of the Aquatic Resources (3.6), Vegetation Resources (3.7), and Wildlife Resources (3.8) sections in the Draft EIS.

N1-6 No impacts to LCT habitat would occur as a result of the Proposed Action, or the Bazza Waste Rock Facility Alternative. For the No Action Alternative, impacts associated with dewatering were analyzed in the 2000/2003 Betze Project SEIS. Implementation of the resulting mitigation plan is ongoing.

N1-7 Comment noted. Three trust funds were established as part of mitigation in connection with the 1991 Betze Project EIS and ROD. These

N1 - E-Mail (Continued)

Air quality impacts from gold ore roasting which affect the health of humans, wildlife or the environment at large must be eliminated.

N1-10 Mercury, arsenic, and other heavy metal impacts to humans, wildlife or the environment at large, including water and air quality impacts, must be eliminated.

Air and water quality impacts, which affect humans, wildlife, or the environment at large, from the cyanide leaching processing facilities must be eliminated.

N1-11 As the risk assessment describes, several toxic/poisonous materials will be increased or concentrated in land, air, or water. We just finished reading about the contamination of ground water by arsenic, and the serious problem it is causing in SE Asia and India. Thus, the risk assessment seems to greatly underplay the potential for ground water contamination, and other adverse effects to humans and the environment.

This is of particular concern in this region, as the earth's surface has been so peppered with holes, pits and other mining-related disturbances that a year or two ago, a whole reservoir drained --- somewhere. To this day, federal agencies have not determined where the water went. Te Carlin trend and other areas have suffered such severe impacts, and been so perforated with holes, that there is much greater risk for soil and water contamination.

N1-12 Where is the information on the pit lake that mysteriously drained?

N1-13 The climate part of the risk assessment fails to address global warming/ climate change impacts. It also fails to address the role of Barick and other livestock operations in the area in desertifying the landscape, and contributing greenhouse gases to the atmosphere.

N1-14 Since Barrick purchased/controls the ranching operation primarily because it

Responses to E-Mail

N1-7 (Cont) funds were created to mitigate impacts and provide long-term funding for monitoring of project facilities. These funds are described in the Applicant-Committed Environmental Protection Measures section (2.2.1.13) of the Draft SEIS. BLM has determined these funds are adequate mitigation for the expected impacts.

N1-8 See response to comment N1-2.

N1-9 See response to comment N1-7.

N1-10 Air quality impacts from the three alternatives are discussed in Section 3.11.2 (Air Quality). The pit expansion would not increase the existing levels of production, design capacity, or emission limits, and therefore, is not anticipated to increase the emission rates of particulate matter, gaseous materials, or trace metals associated with mineral processing.

Based on the 12.4 million tons of ore extracted from the proposed laybacks and the similarity in mercury content of the ore to previously mined areas in the Betze Pit, an estimated total emissions of 625 pounds of mercury would result from 5 years of mineral processing. This is not a significant increase over 2006 and 2007 emission rates.

No individual hazardous air pollutants (HAP) (encluding mercury) would be emitted in a quantity greater than the major source limit of 10 tpy, and the combination of HAP emissions would be less than the major source limit of 25 tpy. Therefore, the proposed project would not constitute a major HAP source.

The ecological risk assessment presented in the Wildlife Resources section (3.8.2.2, page 3.8-20) examined ecological risks to wildlife and aquatic species from the pit lake and concluded that there are no anticipated toxic effects.

N1-11 Comment noted. The Betze Pit Lake will act as a sink for groundwater. Groundwater will flow into the pit due to evaporation. The comment about the reservoir draining is not applicable to this SEIS.

N1-12 This comment is not applicable to this SEIS.

N1-13 A sensitivity analysis was evaluated to consider the potential effects of climate change on Betze Pit Lake water quality (Schafer 2008). The analysis was based on EPA general projections that estimate an overall increase in temperature and rainfall in Nevada (USEPA 1998). This

N1-14 purchased private properties to acquire water rights and keep close-by landowners from being severely affected by the mine's footprint, the livestock operation is closely linked to the mining part of this operation.

N1-15 Plus, in another Phase of the Betze pit process, BLM under Manager Hankins and Barrick outrageously cut a deal where fencing and "developing" springs and seeps for livestock water was claimed to be "mitigation". We stress that Barrick itself was the beneficiary of its own "mitigation" - with the cattle being grazed under Barrick's own permit being those fences were built for, water was to be piped for, etc.

N1-16 What is the status of local and regional populations of sage-grouse across northern Nevada? How have grouse habitats, lek areas, and populations been affected by recent fires? How have habitats and populations not just for sage-grouse, but for all sagebrush-dependent wildlife, changed since mining under Barrick began, since the last Betze pit EIS?

N1-17 What new or expanded power or utility lines will be involved, and how will their impacts to native biota be reduced?

N1-18 Barrick can not look just at the risk to an individual animal, but to the risk of already low and declining populations if additional disturbance, habitat loss, and stresses are placed on the system.

N1-19 Who or what animals are the downwinders for windblown dust with heavy metals? Is it Idaho, where Nevada fallout and mercury has already been known to have serious adverse effects?

N1-20 How have flows changed over time since the last Betze or other EISs here at various springs, seeps and streams? Which ones are in PFC? Which ones are not?

N1-13 (Cont) analysis indicates that models cannot predict climate changes in specific locations. However, EPA's analysis suggests that Nevada may become warmer and wetter over time (USEPA 1998). Consistent with EPA's general projections, the sensitivity analysis considered the potential impacts associated with a scenario which included slightly higher rainfall and slightly less evaporation. The model indicates that as a result of more rainfall and increased temperatures: 1) there will be a slight reduction in evaporative effect, 2) predicted water chemistry is expected to be slightly more diluted, and 3) salinity levels are expected to be approximately 4% to 9% lower than current conditions. Under those same conditions, predicted impacts on seeps, springs, and other surface waters from dewatering would be slightly less than those depicted in Section 3.4. of the Draft SEIS.

N1-14 See response to comment N1-2. Barrick's ranching operations are expected to continue independent of the Proposed Action, so impacts of their operations are not "closely linked" such that they need to be assessed in this SEIS.

N1-15 Comment noted. Mitigation performed to date benefits seeps, springs, and riparian areas. Mitigation in the 2003 Final Betze Project SEIS included a program to improve 15 springs at BGMI's expense. The planned improvements included 14 exclosures and one water development. The exclosures benefit wildlife only as livestock are excluded. To date, of the 15 projects, 9 exclosures have been completed (Burton 2008, personal communication).

N1-16 Local and regional populations of greater sage-grouse across northern Nevada have been steadily decreasing over the last 50 years. Although greater sage-grouse populations fluctuate from year-to-year based on habitat conditions and precipitation, an overall decrease in quality habitat as a result of grazing, fires, and development has caused most populations to decline. In particular, fires in northern Nevada have had a devastating impact on greater sage-grouse habitats. Fires remove sagebrush and important grasses and forbs and increase the spread of noxious weeds, fragmenting the landscape and reducing overall habitat quality. Since the last Betze Project SEIS, sagebrush habitats have decreased in quality, mainly due to fires in the Goldstrike Mine vicinity. Since 1991, hundreds of thousands of acres of sagebrush habitat have

N1 - E-Mail (Continued)

Responses to E-Mail

N1-16 (Cont) burned, causing most sagebrush-dependent species to decline as the habitat is fragmented and native species of grasses, forbs, and shrubs were replaced by noxious weeds such as cheat grass. Revegetation of burned areas has only been marginally successful and has not been feasible on a large scale.

N1-17 The re-routed (<2-mile section) power line and impacts to native biota are addressed in Section 3.8.2.2 (page 3.8-19) of the Draft SEIS. To minimize this potential impact, BGMI has committed to using raptor-deterring design measures, which may include, but would not be limited to, a 60-inch separation between conductors and/or grounded hardware in eagle-use areas as well as use of insulating or cover up materials for perch management.

N1-18 Section 3.8 of the Draft SEIS describes impacts to wildlife populations; Section 3.7 describes impacts to plant populations; and Section 3.6 describes impacts to aquatic populations due to habitat loss, disturbance, and stresses to the ecosystems. There are no long-term effects. The ecological risk assessment presented in Section 3.8.2.2 found no adverse toxic risks.

N1-19 Impacts within the study area and CESA are discussed in the Air Quality Section 3.8 of the Draft SEIS. Cumulative effects to air quality would not increase in quantity from the current levels measured for current activities at the mine site.

N1-20 Sections 3.3 and 3.4 of the Draft SEIS summarize the flow rates and water quality changes over time for seeps, springs, and streams. As discussed in the SEIS, the Boulder Valley Monitoring Plan and annual springs and seeps survey monitor changes in flow rate and water quality over time in more detail.

N1 - E-Mail (Continued)

N1-21 We stress that the EIS clearly states (at ES-3) that the habitat to be lost is primarily sagebrush. What is the level and degree of fragmentation for all remaining sagebrush vegetation and sage-grouse and pygmy rabbit habitat in the local area? In the region? Please review Connelly et al. (2004) and te March 2003 Federal Register Notice for ESA listing of the Columbia Basin pygmy rabbit in order to better understand all of the habitat factors that must be examined for a thorough analysis of the biological effects of this new disturbance.

N1-22 What types of noise will be generated, and where (including on travel routes) as a result of this project?

N1-23 How much land area in the local area, and in the sage-grouse PMU has NOT been disturbed by grazing, mining, mining exploration, or other developments?

N1-24 What new energy, utility corridor, geothermal/wind or other projects are underway, proposed or foreseeable in the area? How will these various projects affect the viability of local and regional populations of BLM sensitive, ESA-listed, and other important species?

N1-25 Please provide much more detailed and careful analysis of the presence of invasive species (including cheatgrass) in the local area and the region. How is this affecting habitats? Fire frequencies?

N1-26 Please also consider establishing a separate 100 million mitigation fund to be used in restoration efforts for the sagebrush biome, for cleaning up mercury and other pollutants, including in various western states where they have been spread by air currents, and other gold mining-related contamination of the environment.

N1-27 What happens to the local community and the miners after this Phase of Betze is played out?

N1-28 The EIS does not evaluate an adequate range of alternatives, as it does not examine a full suite of alternative mining practices that could limit or reduce the environmental effects of the undertaking.

Responses to E-Mail

N1-21 Section 3.8 of the Draft SEIS describes sage-brush habitat loss within the project area and CESA. Approximately 101 acres of habitat will be permanently lost. This direct impact as well as indirect impacts due to noise and human presence is considered negligible based on the overall availability of suitable habitat in the project vicinity.

N1-22 Noise impacts as a result of the Proposed Action are similar to the noise impacts from currently authorized mining activities (No Action Alternative) that have been analyzed in previous NEPA documents at the Goldstrike Mine.

N1-23 Section 3.1, Past, Present, and Reasonably Foreseeable Future Actions, (Draft SEIS) describes the extent of surface disturbances within the Carlin Trend.

N1-24 Reasonably foreseeable future activities and developments, are described in Section 3.1 of the Draft SEIS. Cumulative impacts of the actions are discussed in Sections 3.8 (Wildlife), 3.7 (Vegetation Resources), and 3.6 (Aquatic Resources).

N1-25 Section 3.7 (Vegetation Resources, Draft SEIS) describes the invasive species control program on the mine site and impacts of fire within the CESA.

N1-26 See response to comment N1-7.

N1-27 Section 3.12 (Social and Economic Values, Draft SEIS) describes the potential impacts to the community as a result of the Proposed Action, Bazza Waste Rock Facility Alternative, and No Action Alternatives. The local economy would benefit from continuation of current activity for an additional 4 years. When the mine closes, employment there will decline; however, that decline in employment will be delayed 4 years if the Proposed Action is approved.

N1-28 Chapter 2.0 (Description of Alternatives Including the Proposed Action, Draft SEIS) describes an evaluation of seven alternatives considered including the Proposed Action and No Action Alternatives. Only three alternatives met the criteria for detailed analysis in the SEIS.

N1 - E-Mail (Continued)

N1-29 How will geothermal plant or other development affect underground aquifers, and the mine waters/mining disturbance?

N1-30 How will water levels (measured and simulated) at various springs be affected by climate change/global warming? What STRESSES have occurred to these systems?

N1-31 What has been the livestock use, fire effects, etc. in each area/watershed?

N1-32 What mitigation projects from the past EISs have and have not been completed? We request that any fencing or spring development dollars unspent be foregone in this EIS process, and applied to permit buyout in the region, restoration, and other beneficial efforts for sagebrush-dependent wildlife.

We may be sending additional comments.

Sincerely,

Kenneth Cole
Western Watersheds Project
P.O. Box 2863
Boise, Id 83701

Responses to E-Mail

N1-29 A geothermal plant is not part of the Proposed Action, and its effects on underground aquifers and mine waters was not assessed. Due to distance from population centers and low temperature, development of geothermal resources is not expected in the foreseeable future.

N1-30 According to the EPA (1998), a warmer climate could lead to more fall, winter, and spring rainfall and an earlier, more rapid snowmelt. This increase in precipitation may or may not affect springs depending on the amount, intensity, and duration of precipitation and amount of infiltration into the ground. See also response to comment N1-4.

N1-31 BLM has considered the cumulative impacts of grazing, fire, and rehabilitation of wildfire affected lands with respect to impacts expected from the proposed action and alternative. BLM has not found any cumulative impacts which represent undue or unnecessary degradation of the public land. Further, BLM has not found that the impacts of the Proposed Action or alternatives, in the context of cumulative effects, are of sufficient degree to require additional mitigation or modification.

N1-32 Based on prior NEPA analysis and records of decision approving mining activities at the Goldstrike Mine, a number of mitigation measures for water and wildlife have already been implemented or are currently underway. Those measures include:

1) Presence of a network of existing monitoring wells. Wells are located in various geological strata and at a range of depths for the purposes of monitoring changes in the water table throughout the extent of the dewatering cone of depression. BGMI also is committed to installing up to three additional monitoring wells, if warranted. Semi-annual monitoring reports are submitted to BLM for review. The three additional monitoring wells will be installed if impacts are observed in “trigger” monitoring wells. These impacts have not yet been observed and therefore, the installation of additional monitoring wells has not yet been warranted.

2) Conservation and Mitigation of Riparian/Wetlands Area Trust Fund. This fund was established by the 1991 Record of Decision for the Betze Project for the purpose of protecting and enhancing riparian and wetland areas. The initial fund balance was established at $660,000, but the fund grew to over 1 million dollars. A number

N1-32 (Cont)

of projects have been completed and the current balance is approximately $500,000. Projects, which were funded in part or in total by the Riparian/Wetlands Area Trust Fund include:

a. Culvert Removal and Replacement in Maggie Creek Basin - In the fall of 2005, impassible culverts on Beaver Creek and the main stem of Maggie Creek were replaced with structures suitable for fish passage. The new Beaver Creek project is working well, although the project on Maggie Creek (Maggie Creek diversion) was damaged by severe flooding in 2006. Repairs were completed on the structure and the effectiveness of these repairs is being evaluated.

b. Maggie Creek Land Exchange - Approximately 6,000 acres of historic Lahontan cutthroat trout (LCT) habitat along Susie Creek was acquired in 2004 as a result of the Maggie Creek Land Exchange. The acquired lands are being managed in conjunction with public lands for improved stream and riparian habitat conditions as part of the Susie Creek Riparian Pasture.

c. Squaw Valley/Spanish Ranch Division Fence - The division fence between the Squaw Valley and Spanish Ranch allotments has been completed and provides for control and management of livestock on LCT-inhabited streams in the Squaw Valley Allotment.

3) Enhancement of springs. Nine springs on private land have been protected to provide improved riparian habitat. Up to six more springs may be included in this program. Additional spring enhancement projects are currently undergoing site-specific NEPA review. Spring sites are identified in coordination with NDOW and BLM.

4) Long-Term Review Monitoring and Mitigation Trust Fund. The balance in the fund is over $2.2 million and is to be used by BLM to review, monitor, or mitigate potential impacts from BGMI's operations that were not specifically addressed in the mitigation stipulations or reclamation plan for the Betze Project. To date, no projects have been financed with this fund.

5) Riparian Restoration Fund. This trust fund, in the amount of $40,000, is to be used by BLM for the purchase and planting of seedlings

N1-32 (Cont)

or container plants in riparian or wetland areas to accelerate revegetation of areas adversely affected by BGMI's groundwater pumping and water management operations. No funds have been expended from this fund to date as few riparian areas have been affected by pumping and water management operations.

6) Upper Willow Creek Habitat Enhancement Plan. The Upper Willow Creek Habitat Enhancement Plan was developed in connection with the 2003 Betze Project SEIS. Fencing was completed in 2004 and LCT-inhabited streams including Lewis, Nelson and Upper Willow creeks have shown excellent recovery. Cooperative monitoring by BGMI, BLM, NDOW, and Trout Unlimited show improvements in both LCT populations and in stream and riparian habitat conditions in these drainages.

7) Rock Creek water rights. A surface water right in Rock Creek in the amount of 1.5 cfs was conveyed to NDOW/BLM to sustain aquatic habitat and address Native American concerns in Rock Creek Canyon.

8) Biologist support. Since 2002, BGMI has paid $30,000 per year to BLM to support one-half of the salary of a field biologist in the Elko District Office. Those payments will continue through 2011.

Taken together, these mitigation measures have been determined to be adequate to address potential impacts of prior activities and the Proposed Action. Additional funds remain to be used for mitigation measures, including those referenced in the comment, if it is shown to be necessary. Permit buyout is not an action within the authority of the BLM. BLM believes the spring improvement/exclosure projects are a great benefit to wildlife and the projects should continue.

N2 - Letter

Great Basin Resource Watch
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Our mission is to protect the health and well being of the land, air, water, wildlife, and human communities of the Great Basin from the adverse effects of resource extraction and use.

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October 6, 2008

Kirk Laird
Project Manager
BLM Elko District Office
3900 East Idaho Street
Elko, NV 89801

Re: Supplemental Environmental Impact Statement for the Betze Pit Expansion Project, Nevada - BLM/NV/EK?PL-GI-08/22+1793

Dear Mr. Laird,

Great Basin Resource Watch (GBRW) appreciates the opportunity to comment on the Betze Pit Expansion Supplemental Environmental Impact Statement, SEIS). Below are summary highlights of the recommendations from our hydrologic consultant, Tom Meyers, who's full review is attached and constitutes the details of our comments.

N2-1

1. The SEIS should provide additional detail of the water balance for just the TS Reservoir and the Sand Dune, Knob, and Green Springs because if it does not balance it indicates that some water remains in the groundwater rather than discharging in the springs.

N2-2

2. The SEIS should explain, with a figure, how the water from the three springs (Sand Dune, Knob, & Green Springs) is physically captured, since the Sand Dune Canal according to figure 2-3 shows the canal is up to half a mile from the springs.

N2-3

3. The SEIS should clarify what mountain-front recharge as part of the surface water balance means, see Table 3.3-3.

N2-4

4. Tables 3.3-3 err in tabulating the total recharge. The column on the far right which is supposed to show the total instead for recharge and groundwater inflow shows only the value for basin listed on the right, Susie Creek. The same error occurred in other categories for both Sources and Sinks. The errors carry over to Table 3.3-3b. The BLM must correct this portion of the table.

N2-5

5. The BLM should not include the river leakage as inflow and outflow from the basins but should only include the net value which could be either recharge or a discharge from the basins. As surface water, the discharge from groundwater to the streams could be shown as a spring or seep, and as a sink in the groundwater system, and if it is lost from the stream to ET shown as a sink in the surface water system. At a minimum, the BLM must better define the items in Tables 3.3-3.

Working with Communities to protect their Land, Air and Water
Great Basin Resource Watch is a tax-exempt (501(c)3) organization

Responses to Letter

N2-1 The cover letter received from Great Basin Resource Watch summarized the more detailed comments enclosed with this correspondence, Therefore, the BLM has responded only to the more detailed comments rather than the summary comments. See response to comment N2-18.

N2-2 See response to comment N2-19.

N2-3 See response to comment N2-20.

N2-4 See response to comment N2-23.

N2-5 See responses to comments N2-24 through N2-30.

N2 - Letter (Continued)

N2-5 6. Table 3.3-3a states that natural ET from Boulder Flat is 68,300 af/y. That is 34% higher than the 51,000 af/y estimated by Mauer et al (1996). The SEIS should explain why there is such a difference.

N2-6 7. Table 3.3-3b indicates that natural ET for Boulder Flat has increased to 88,800 af/y. This is an increase of more than 20,000 af/y from pre-mining conditions, and in addition to the crop ET, which equals 17,700 af/y. The SEIS should explain the additional amount which, presumably, is due to the mounding of groundwater in the basin fill of Boulder Flat, that decreases the depth to water and increases the natural ET.

N2-7 8. Upon examination of the crop ET values in Table 3.3-3b, and given that typical consumptive use of about three acre-feet/acre, typical amount for that latitude of Nevada, it appears as though about seven af/acre is applied to the fields. This violates the water rights that would apply to these fields, which the State Engineer limits to four af/acre. The BLM should explain whether the company is over-irrigating.

N2-8 9. The BLM should have the modeler verify whether the groundwater model is recycling artificially recharged water and consider whether this is a proper conceptualization of flow in the area.

N2-9 10. The groundwater model should be redone with a proper conceptualization that reflects the limits caused by the faults, the probable extension parallel to the faults, and the proper connections between hydrostratigraphic units.

N2-10 11. Section 3.3.1.2 mentions the presence of geothermal system indicated by high temperatures at some deep carbonate wells. The SEIS should provide a map showing the location of these wells, or at least list the wells and their location so that the reader can understand where this potential geothermal water occurs.

N2-11 12. The SEIS must make a better case for disturbing 572 acres of additional land (SEIS, page 3.2-8) with a new waste rock dump to avoid a delay in reclaiming the existing WRD. Perhaps additional waste rock could be backfilled in the east end of the pit.

N2-12 13. The SEIS states that for the first fourteen years of pit lake development for the no action alternative, high-wall runoff would be the only inflow because the groundwater level would be below the bottom of the pit. The SEIS should explain whether this is due to the continuing dewatering for the Meikle Mine or whether it just takes that long for the groundwater levels to recover.

N2-13 14. The SEIS must consider the contaminants that may leach from the backfill into the groundwater beneath pit, before the pit fills and the backfill is submerged.

N2-14 15. If Rodeo Creek is diverted into the pit, more than 200 gpm will be lost from the surface water system of the Boulder Flat. This flow either recharges groundwater downstream from the pit, which supports water rights that may be extant after the mine ceases to operate or that supports downstream surface water flow. The BLM should analyze the effects of this diversion on water rights. Perhaps, the BLM should require that the creek not be diverted into the pit.

Responses to Letter

N2-6 See response to comment N2-31.

N2-7 See response to comment N2-32.

N2-8 See response to comment N2-34.

N2-9 See response to comment N2-40.

N2-10 See response to comment N2-43.

N2-11 See responses to comments N2-44 through N2-46.

N2-12 See response to comment N2-48.

N2-13 See response to comment N2-51.

N2-14 See response to comment N2-55.

N2 - Letter (Continued)

N2-15

16. The final pit lake area will exceed 800 acres which will evaporate 4000 af/y if the rate is 5 feet/year. This represents a substantial portion of the total available water rights in Boulder Flat basin. BGMI must obtain permanent water rights and dedicate them to this loss (waste) of water in perpetuity.

Feel free to contact our office or tom Myers directly if you need any further explanation or clarification.

Sincerely,

John Hadder,
Staff Scientist

cc. Roger Flynn

Responses to Letter

N2-15 See response to comment N2-57.

N2 - Letter (Continued)

Review of Hydrogeology and Water Resources for the Draft Supplemental Environmental Impact Statement, Betze Pit Expansion Project

October 1, 2008

Prepared for:

Great Basin Resource Watch
Reno, NV

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Introduction

Barrick Goldstrike Mining Inc. (BGMI) proposes to expand their current pit at the Betze Mine. It would add about four years of life to the existing project life. This review is of the draft supplemental environmental impact statement (SEIS). The focus is on mine watering, hydrogeology, pit lake development, and waste rock dumps.

BGMI proposed to divert and discharge Rodeo Creek into the Betze Pit (SEIS page 2-13, 14). The SEIS must analyze the impacts of doing this because the approval of this proposed action facilitates the need for rerouting Rodeo Creek.

Mine Dewatering

The SEIS states that the proposed expansion will not require additional dewatering and that dewatering for the existing Meikle Mine does and will maintain water levels sufficiently low enough that the Betze Pit no longer does or will require dewatering (SEIS, page 2-8).

N2-16 There is confusion in the SEIS regarding the length of dewatering for the No Action alternative. Apparently, the 2000 supplemental EIS discussed the scenario of dewatering ending in 2011. Now, dewatering for the No Action alternative will last four additional years, as noted here: "Under the No Action Alternative, BGMI will continue the current dewatering of the Betze Pit for 4 additional years beyond 2011 holding water levels at or near their current elevation" (SEIS, page 3.3-40). This suggests that the 2000 SEIS assumed the mining would be complete at an earlier date. It also suggests that permission was provided to extend pumping for four years without completing additional environmental analysis. This has resulted in the No Action alternative, which is an existing mine, requiring new analysis, for four additional years of pumping, to establish the No Action baseline against which the Proposed Action is compared.

N2-17 Dewatering water is stored in the TS Reservoir prior to use for irrigation. It also is an infiltration facility with water seeping through its bottom through a fracture (SEIS, page 2-11). The following sentence, "[w]hen irrigation does not consume all of the water delivered to the TS Ranch Reservoir, the water is treated for arsenic prior to discharge in the reservoir" (*Id.*),

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N2-16 The additional 4 years of dewatering at the Goldstrike Mine from 2012 through 2015 is for the Meikle underground mine and was permitted separately by State of Nevada authorizations. The impacts of four additional years of pumping under the No Action Alternative are disclosed and analyzed in the Draft SEIS on page 3.3-40. No federal permit is required to extend dewatering under the No Action Alternative.

N2-17 Water from mine dewatering operations is treated to remove naturally occurring arsenic in the water at the end of the 72-inch-diameter pipeline and prior to discharge to TS Ranch Reservoir. Water used for irrigation is not treated to remove the naturally occuring arsenic because it is not required. The water meets regulatory requirements for irrigation water quality.

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N2-17 suggests that treatment occurs only when reservoir water will discharge into the ground through the fracture. However, as long as there is water in the reservoir, whether it is being used for irrigation or stored over a non-irrigation period, there will be discharge to the groundwater. The implication here is that treatment should occur at all times because the reservoir constantly seeps water to the groundwater.

N2-18 Sand Dune, Knob, and Green Springs discharge water that seeps into the base of the TS Reservoir (SEIS, page 2-11). The total spring discharge was 30,000 gpm in 1996 and 11,300 gpm in 2006. The SEIS should provide additional detail of the water balance for just the TS Reservoir and springs because if it does not balance it indicates that some water remains in the groundwater rather than discharging in the springs. In other words, the reasons for the decreased spring discharge should be discussed. For one, dewatering rates have decreased and presumably less water is discharged to the reservoir, but the seepage rate through the bottom of the reservoir depends on the head caused by water levels in the reservoir. The reservoir must more frequently be dry or at low head levels if the spring discharge accurately represents the seepage from the reservoir. If it is not, more of the water must be bypassing the springs. The SEIS must explain this.

N2-19 The Sand Dune Canal supposedly captures the water discharging from the three springs and returns it to the water management system (SEIS, page 2-11). However, figure 2-3 shows the canal is up to half a mile from the springs. The SEIS should explain, with a figure, how the spring water is physically captured. Alternatively, the SEIS should estimate the amount of water discharging from these springs that seeps back into the alluvial groundwater (becoming secondary recharge, albeit artificial recharge).

This section on Mine Dewatering considers the water management, water balance, groundwater drawdown, and groundwater modeling.

Water Balance for the Study Area

N2-20 Tables 3.3-3 purportedly show the pre-mining and current (2007) water balance for five groundwater basins around the Betze mine. This table confusingly mixes surface and groundwater and shows fluxes that appear to be wrong. This section discusses this table.

First, Table 3.3-3a apparently intends to show conditions at steady state because it does not account for crop ET or show other sources of pumping, which did occur prior to mining due to irrigated agriculture on in the area; it appears to be a pre-development, not just pre-mining water balance. However, the table shows inflow and outflow from and to groundwater storage, which by definition means the system is NOT at steady state. If there is a change in storage, the system is not steady state. The storage inflow approximately equals storage outflow which suggests there is no real reason for including these rows in the table; there is no indication to where this storage flux goes. However, the storage fluxes do not affect the water balance shown.

N2-21 Second, the tables show two subheadings of recharge, direct and mountain front, but the mountain front recharge is in the surface water column even though the SEIS text describes the difference correctly:

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N2-18 Discharge from the springs is controlled mainly by the water level in the Boulder Valley volcanic aquifer and only indirectly by infiltration from the TS Ranch Reservoir and injection of excess mine water. Spring flow is related to buildup of groundwater storage caused by previous infiltration/ injection of excess mine water, and not the current discharge rate to the TS Ranch Reservoir or the current water level in the reservoir. Discharge from the springs is proportional to the potentiometric surface in the Boulder Valley volcanic aquifer. The volcanic aquifer discharges to the alluvial aquifer as well as through the springs. Spring flow, on an average annual basis, is about 40 percent of the infiltration of water through the TS Ranch Reservoir. This percentage varies considerably depending on the water level in the reservoir, evaporation rates, and precipitation rates in the Boulder Valley area.

N2-19 The Sand Dune Canal traverses the upper portion of Boulder Valley in an east-west direction. The Springs are upgradient and are located a ways north of the Sand Dune Canal. Water flows overland and enters the canal at various points. The Sand Dune Canal collects direct discharge from the springs, seasonal runoff from the local catchment and indirect discharge from the volcanic aquifer through the alluvium. Flows from the three springs totaled 11,300 gpm in 2006 (page 2-11 SEIS). The interchange of water between the volcanic aquifer, the alluvial aquifer, and the Sand Dune Canal is complex and tracked with the groundwater model. The numerical model accurately reproduces the measured canal flows and measured water levels in the aquifers.

N2-20 The Tables 3.3-3a and 3.3-3b have been revised to reflect conditions with and without mining. This information does not represent steady state conditions.

N2-21 See response to N2-20.

N2 - Letter (Continued)

Precipitation and mountain-front runoff are the main sources of recharge to the hydrologic system in the Boulder Valley area. Precipitation falling in the mountainous areas that does not infiltrate or evaporate in the mountains becomes the **mountain-front runoff that recharges the groundwater system** in the valley alluvium. (SEIS, pages 3.3-6 to -7, emphasis added)

By definition, recharge is "the entry into the saturated zone of water made available at the water-table surface, together with the associated flow away from the water table within the saturated zone" (Freeze and Cherry, 1979, page 211)[1]. Thus, the number called mountain-front recharge in Tables 3.3-3 cannot be recharge as commonly understood by hydrologists because it shows as a source to the surface water balance.

N2-21 As Maurer et al (1995, page 41) describe recharge, "[g]round-water recharge from infiltrating precipitation and runoff is estimated using the Maxey-Eakin method, which was first developed and applied in southern and eastern Nevada." As they describe it, the recharge estimated using the Maxey-Eakin method[2] is all of the recharge for the basin; it does NOT distinguish between distributed recharge occurring where the precipitation falls and the recharge that occurs at the mountain front, where runoff exits the mountains to infiltrate into the alluvial fans. As discussed by mining industry hydrologists, Stone et al (2001) describe how the distribution between meteoric water recharging onsite and running off to recharge the basin fill depends on the mountain-block geology. The M-E method applies equally well to basins rimmed with carbonate rock into which most precipitation infiltrates and to basins rimmed with more impervious rock (intrusives, clastics, etc.) where most of the precipitation becomes runoff to the top of the fans where it recharges. This is because Maxey and Eakin determined recharge based on the discharge from the basin, primarily ET from phreatophytes in the basin center (Avon and Durbin, 1994).

N2-22 Additionally, the sum of the so-called distributed and mountain-front recharge in Table 3.3-3a is much higher than other published estimates of recharge for these basins (NV State Engineer, 1971; Mauer et al, 1995; Flint et al, 2004), but the distributed recharge is close to the estimates from these other reports. This indicates that the author of the table did not intend mountain-front recharge to actually mean recharge in the sense that hydrologists understand it. *The SEIS should clarify what mountain front recharge as part of the surface water balance means.*

N2-23 Tables 3.3-3 err in tabulating the total recharge. The column on the far right which is supposed to show the total instead for recharge and groundwater inflow shows only the value for basin listed on the right, Susie Creek. The same error occurred in other categories for both Sources and Sinks. The errors carry over to Table 3.3-3b. *The BLM must correct this portion of the table.*

N2-24 River leakage is another poorly-explained phrase in the water balance discussion and Table 3.3-3. Typically river leakage is seepage from a river, which enters the basin as surface water, into the groundwater and is considered recharge to the groundwater system. It would be recharge in addition to the distributed and mountain-front recharge discussed above because typically it

[1] Additionally, the Handbook of Hydrology was consulted for other definitions of recharge. The only discussion in this compendium of thirty chapters describing all forms of basic hydrology regarding recharge was a discussion that to estimate "the net groundwater recharge rate requires that one perform a water balance at the ground surface" (Charbeneau and Daniel, 1992, page 15.5).

[2] It is recognized that the Maxey-Eakin method has other problems and that different methods have been proposed for estimating recharge. Some are physically based methods and others are attempts to fine-tune the M-E method with new estimates of precipitation or by including the geology of the basin.

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N2-22 See response to comment N2-20.

N2-23 Revised Tables 3.3-3a and 3.3-3b are included in the Final SEIS.

N2-24 In Tables 3.3-3a and 3.3-3b, the term "river leakage" refers to flow between the groundwater and surface water systems. It is divided into components from the Humboldt (external to the study area basins) and "other" (internal to study area basins). The "other" category is not a separate part of the total water balance, as it represents internal flows within the study area basins. The source of water for the groundwater system is the same as the sink of the water for the surface water system. Conversely, the source of water for the surface water system is the same as the sink of water for the groundwater system. The tables do not double-count the "other" category of river leakage because this category represents flows internal to the study area basins and is not presented as a separate component of the overall water balance. The reference to river leakage as recharge for the Willow Creek and Rock Creek basins in the third paragraph on page 3.3-7 of the Draft SEIS was incorrect and was deleted.

N2 - Letter (Continued)

represents a new source of water to the basin, discharge from a river that entered the basin carrying runoff from an upstream basin. Recharge of water from a stream originating from within the basin should be considered secondary recharge because it is water that had discharged into the stream from previously recharged water, from springs or seeps. Alternatively, if the stream is runoff from the basin, seepage from it would be mountain-front recharge and included in the recharge discussed in the last paragraph. Treating it separately would be double-counting the recharge.

N2-24 The table may double-count some of the recharge in the items labeled river leakage. The SEIS uses the phrase as such in the section concerning the current water balance: "Willow Creek and Rock Creek basins are not affected by pumping, so recharge is from precipitation and **river leakage**, with discharge due to evapotranspiration along with surface water and groundwater outflow" (SEIS, page 3.3-7, emphasis added). This sentence describes it correctly if the river leakage is of surface inflow to the basin. But, Tables 3.3-3 include river leakage both as a sink and as a source. The table may be correct for river leakage, as a source, from the Humboldt River to the groundwater in the Boulder Flat basin; the value shown for the Humboldt River, 25,900 af/y, is similar to previous estimates (Maurer et al, 1995). The "other" category is more difficult to understand and appears not to be justified in the tables.

N2-25 The "other" category presumably refers to other streams crossing the basins, such as Rock Creek in the Rock Creek basin which passes from Willow Creek upstream. The term as used in the table refers to flow into and out of various streams in the basins which have gaining and losing reaches. The flow values in the table apparently represent the amount gained and lost through different reaches. The problem with including this in the table is that it counts the flow each time it infiltrates into the alluvium and again when it seeps back into the stream. These fluxes, which are internal to the basins, should not be included in a water budget for a basin. The fluxes shown in the "other" category are added to the totals for "total in" and "total out", which causes the budget to be much higher than is realistic.

N2-26 It is reasonable to include as recharge to the basin the net inflow to the groundwater system from streams that enter a basin, as mentioned above. This includes the Humboldt River in Boulder Flat, Marys Creek, Maggie Creek, and Susie Creek. It also includes other streams in the Rock Creek and Boulder Flat basins. The table should not include any fluxes for "other" in Maggie Creek, Marys Creek, Susie Creek, or Willow Creek basins because these basins have no surface inflow to the basins. Additionally, the flux shown as a sink in the surface water category may be ET loss from surface water and could be shown as such, but it has effect on the groundwater budget.

N2-27 One significant inconsistency even in the way the table is presented is that "other" in the Boulder Flat sources section is blank while in the sources, "other" has 6,800 af/y of groundwater and 26,600 af/y as surface water. Considering that the leakage from the Humboldt River to Boulder Flat is reasonable, it is not reasonable to consider another 26,600 af/y as a sink from an "other" source.

N2-28 *The BLM should not include the river leakage as inflow and outflow from the basins but should only include the net value which could be either recharge or a discharge from the basins. As surface water, the discharge from groundwater to the streams could be shown as a spring or seep, and as a sink in the groundwater system, and if it is lost from the stream to ET shown as a sink in the surface water system. At a minimum, the BLM must better define the items in Tables 3.3-3.*

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N2-25 See response to N2-24.

N2-26 See response to N2-24.

N2-27 See response to N2-24.

N2-28 See response to N2-24.

N2 - Letter (Continued)

N2-29 The water budget numbers in Tables 3.3-3 do not appear to add up either. For example, groundwater outflow should equal the difference between the sum of recharge and groundwater inflow and the sum of discharges from the system. In pre-mining conditions, that should be limited to the sink of natural ET. It is possible that the net river leakage (see discussion above) and the difference between storage in and storage out may balance the budget, if these terms had been properly defined, but various attempts at using these fluxes did not balance the budgets.

N2-30 Table 3.3-3a states that natural ET from Boulder Flat is 68,300 af/y. That is 34% higher than the 51,000 af/y estimated by Mauer et al (1996). The SEIS should explain why there is such a difference.

N2-31 Table 3.3-3b shows the fluxes for the year July 2005 through June 2006. Many problems and inconsistencies occur in this table, but the first is that natural ET for Boulder Flat has increased to 88,800 af/y. This is an increase of more than 20,000 af/y from pre-mining conditions. This is in addition to the crop ET, which equals 17,700 af/y. *The SEIS should explain the additional amount which, presumably, is due to the mounding of groundwater in the basin fill of Boulder Flat, which decreases the depth to water and increases the natural ET.* This is a tremendous loss of water which counters the argument that much of the dewatering water is being saved by being placed back into the basin.

N2-32 Groundwater inflow to Boulder Flat shows how the dewatering there is drawing water form surrounding basins. Based on the new groundwater outflow terms, Maggie Creek is the primary source for Boulder Flat basin. Drawdown from the mine, shown on Figure 3.3-2 has also caused a gradient for flow from Rock Creek to Boulder flat basin. Table 3.3-3b shows that storage is a very large source of water, approximately 95,400 af/y, to Boulder Flat and to Maggie Creek, about 37,300 af/y. These values suggest the amount of water released from storage, which becomes a source to the water budget, exceeds the amounts actually pumped by the two mining companies (totaling 87,700 af/y). This does not make sense, although it may be partly explained by the storage fluxes shown in Table 3.3-3a. The storage sink in Boulder Flat also increases substantially, which probably accounts for the water being stored in the valley fill from reservoir seepage and over-irrigation.

N2-33 Speaking of over-irrigation, Table 3.3-3b shows that crop ET is 17,700 af/y and irrigation as a source (recharge) to groundwater is 25,200 af/y. The sum of these values (not accounting for surface runoff or return flow), 42,900 af/y, is the total amount applied to fields. If the consumptive use is about three acre-feet/acre, a typical amount for that latitude of Nevada, the total irrigated acreage would be about 6000 acres; this area is consistent with the reported irrigated acreage for Boulder Flat. About seven af/acre is therefore applied to the fields, or that the fields are over-irrigated by three af/acre. *This violates the water rights that would apply to these fields, which the State Engineer limits to four af/acre. The BLM should explain whether the company is over-irrigating. If so, they should use a different mean of disposing of the water, which keeps it in the basin. If they do so, the groundwater mound could be reduced and the amount of recharged water lost to ET would be decreased. It would save substantial amounts of water.*

Dewatering Drawdown

N2-34 Dewatering since 1990 has caused significant drawdown in the carbonate rocks near the Betze and Meikle Mines (SEIS, Figure 3.3-3). Faults have controlled the drawdown significantly, causing water level changes of hundreds of feet in a small distance such as the change observed

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N2-29 For Table 3.3-3a (pre-pumping), water lost from a basin through evapotranspiration (ET), surface water outflow, and groundwater outflow is approximately balanced by water coming into a basin through recharge, groundwater inflow, and surface water inflow. For Boulder Valley, inflow from the Humboldt River also is part of the balance between inflow and outflow for the basin.

N2-30 Maurer et al. (1996) estimated total discharge from Boulder Valley at 63,000 acre-feet per year (AFY), including ET of 51,000 AFY and groundwater outflow to the Clovers area of 12,000 AFY. The BGMI model estimates pre-mining discharge at 71,000 AFY, including 66,000 AFY for ET and 5,000 AFY to the Clovers area. This is a reasonable agreement with Maurer et al. (1996). Also, the BGMI estimates are between those of Maurer et al. (1996) and Berger (2000).

N2-31 Model results indicate no discharge of groundwater from Boulder Valley to the Humboldt River. Most of the water infiltrated at the TS Ranch Reservoir, through infiltration ponds and injection wells, or applied as irrigation water discharges from Boulder Valley as increased ET. The increased ET values used in Table 3.3-3b are consistent with the estimates of Berger (2000) for the increasing ET trend in Boulder Valley from 1989 to 1995.

N2-32 The irrigation project in Boulder Valley consists of 73 pivots irrigating approximately 10,000 acres. The irrigation water applied between July 2005 and June 2006 was 25,200 AFY and only a portion of the pivots were in use at that time. Therefore, the unit irrigation rate was approximately 4 AFY. In the numerical model, crop ET is assumed to be 70 percent (17,700 AF) of the applied irrigation. The remaining 30 percent (7,500 AF) was represented as deep infiltration to groundwater. The amount of water applied by the irrigation pivots to land in Boulder Valley does not exceed state engineering limits.

N2-33 See Response to Comment N2-32.

N2-34 The volcanic aquifer in Boulder Valley is upgradient of the carbonate aquifer, suggesting that some connection exists between the two aquifers and that some recycling of artificially recharged water should occur. Results of monitoring and model calibration suggest that recirculation is weak and provides a minor contribution to total flow.

N2 - Letter (Continued)

N2-34 across the Siphon fault southwest of Betze. The faults also cause significant drawdown to extend northwest of the mines; the 1600-foot drawdown trends northwest more than 5 miles parallel to the Siphon fault and is about 3 miles wide. Significant drawdown, up to ten feet, extends northwest another five miles (SEIS, Figure 3.3-3), although this may be misleading as will be discussed below. Recharge of the dewatering water has caused the water levels to increase in the volcanic rocks and alluvium in the Boulder Flat (*Id.*).

N2-35 The SEIS uses a groundwater model to predict required pumping rates and drawdown. That model has been recalibrated many times as new monitoring data becomes available.
The SEIS indicates that the expansion of ten-foot drawdown for pumping an additional four years is "due to recalibration of the model between 2000 and 2007" (SEIS, page 3.3-40) and not due to the additional four years of dewatering pumpage that will occur. This is for the No Action and Proposed Action because the pit is within the drawdown cone of the Meikle Mine. Figure 3.3-28 shows the ten-foot drawdown cone for the model, as calibrated in 2000, for pumping to 2011 and to 2015 is virtually the same. The SEIS uses this figure to argue that the additional pumping really does not expand the drawdown.

That the additional pumping does not increase the ultimate drawdown extent must be due to the artificial recharge (from irrigation and the TS Reservoir) reaching the bedrock aquifer. The current pumping, as modeled, must draw some water from the upper layers that are being recharged. This may explain why the drawdown does not continue to expand. With no artificial recharge reaching the layers being pumped, the drawdown would continue to expand because the pumping rate exceeds the natural recharge rate for the basin. By definition, this would continue to add to the deficit because the pumping exceeds the inflow. Certainly, the pumping draws flow from nearby basins, which would also represent a new discharge from those basins (as shown in Table 3.3-3) and also decrease the groundwater storage. Therefore, the reason the model does not show continuing expansion of the drawdown is that the artificial recharge provides some of the flow being pumped.

So, the recalibration does affect the prediction. As should be expected, recalibration should improve the model predictions, if the model is based on an accurate conceptual model. But, the difference caused by recalibration does not appear to occur in the cumulative impacts section. Figure 3.3-48 shows the ten-foot drawdown for the model as calibrated in the two different years (2000 and 2007); the up-dated calibration has resulted in a slightly more compact ten-foot drawdown.

The BLM should have the modeler verify whether the model is recycling artificially recharged water and consider whether this is a proper conceptualization of flow in the area. The essential question regarding the conceptual flow model is whether there is a connection between the tertiary Carlin formation or volcanics and the underlying Paleozoic bedrock. In the Maggie Creek basin, Newmont's modeling assumed there was no connection and monitoring has thus far borne out that conceptualization. If the model has a connection that is deemed in incorrect, the conceptualization could cause the model to inappropriately limit the predicted drawdown extent. This is especially true for that part which occurs as the pit lake and deep drawdown cone is filling. Because the pit lake will be 350,000 af, the pit will effectively continue to pump groundwater primarily from the carbonate aquifer.

N2-36 The figures shown in the SEIS indicate there is another, much greater problem with the modeling. The shape of the predicted ten-foot drawdowns shown on Figure 3.3-26 or -27 does

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N2-34 (Cont) Bedrock water levels are discontinuous across the Siphon fault, with a pre-mining carbonate potentiometric surface of 5,260 feet amsl and a volcanic aquifer potentiometric surface of 4,710 feet amsl. Currently, the potentiometric surface in the carbonate aquifer is 3,576 feet amsl and the volcanic potentiometric surface is 4,780 feet amsl. This sharp transition between the volcanic and carbonate aquifers suggests minimal hydraulic communication between the aquifers.

N2-35 On an ongoing basis for over a decade, BLM has reviewed the information provided by BGMI and its contractors for the dewatering program and its effects on regional groundwater systems. BLM has determined that the explanation for the minimal increase/change in the maximum 10-foot drawdown cone of depression as depicted in the Draft SEIS is satisfactorily explained by two factors. First, is the recalibration of the model. The recalibration of both the BGMI Boulder Valley numerical model and the Newmont Gold Quarry model improves the hydraulic value arrays used in the model to reflect transient changes in water levels in monitoring wells. This recalibration affects the drawdown configuration as reflected in Figure 3.3-48 of the Draft SEIS. Second, while BLM notes there is a margin for error in all such models, the model relied upon in the SEIS was verified in the previous reviews for the 1991 Betze Project EIS, the 1994 Meikle EA/BA, and the 2000/2003 Betze Project SEIS. In addition, the relatively minimal change in the maximum 10-foot drawdown also is attributable to the steady state relatively lower pumping rates and timeframe for the extended period of dewatering compared to the overall dewatering program. The maximum drawdown contour represents the maximum drawdown at each point during the whole simulation, which does not occur in the same year at every point. The maximum extent of drawdown also occurs during the recovery phase of mining operations. The pumping of groundwater for an additional 4 years represents an increase of 8.4% (from 1,085,000 acre-feet in 2011 as reported in the 2003 Betze Project SEIS to 1,176,000 acre-feet in 2015 based on the updated 2007 groundwater model). Since the 8.4% occurs over approximately 20% of the total pumping time, (1990-2015), this in part explains the reason for the small change in the maximum extent of drawdown. Therefore, there is no reason to expect the additional pumping to effect a significant change of maximum drawdown contour.

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N2-36 not resemble the observed drawdown on Figure 3.3-3. For example, the existing ten-foot drawdown in the Paleozoic bedrock is already approaching the headwaters of Antelope Creek near NA-28[3] which is just a couple miles short of the predicted ten-foot drawdown for cumulative pumping (Figure 3.3-27). However, the predicted ten-foot drawdown extends well across Boulder Flat and toward Rock Creek which it ultimately parallels. The shape of the observed drawdown does not resemble the modeled shape for the predicted ten-foot drawdown at all. Rather, the observed drawdown appears to be bounded by faults. The drawdown map shows mounding in the tertiary alluvium of Boulder Flat and in the volcanics southwest of the Betze Mine (Figure 3.3-3). The mounding is due to injection, irrigation, and seepage from the TS Reservoir.

N2-37 The SEIS discusses the Boulder Narrows Fault just southwest of the three springs in Boulder Flat. The SEIS indicates that this fault controls the location of the three springs and in fact the springs are circumstantial evidence of the location of the fault. Another indication of its presence is a 700-foot offset in the rhyolite and a 3000-foot increase in the thickness of the basin fill (SEIS, page 3.3-5). The fault coincides with the predicted extent of the 10-foot drawdown for Barrick-only pumping (Figure 3.3-27), which indicates that the fault is part of the conceptual model used for the groundwater model. However, the observed drawdown contour map shows a mound in that area due to artificial secondary recharge of dewatering water. This mound may also cause the spring discharge. Therefore, *the apparent use of a fault in the groundwater model without substantial physical evidence of its presence, and some evidence in water levels suggesting an alternative explanation for the springs, may be another example of how the model used an incorrect conceptualization. The BLM should reconsider the flow data in the area to verify the conceptual model that a fault exists and controls flow in that area.*

N2-38 It is curious as to why the cumulative pumping, which includes Barrick and Newmont, would extend so much further to the west with the ten-foot drawdown almost touching Rock Creek (SEIS, Figure 3.3-48). This is curious because the maps of existing drawdowns parallel faults and the discussion of drawdown indicates that the faults separate the effects of dewatering by company. Why does adding Newmont's pumping extend the drawdown so far west under Boulder Flat when the companies and agencies claim the effects of the two companies' pumping do not overlap? This suggests another error in the conceptualization of the groundwater model for flow through the faults.

N2-39 The Siphon Fault apparently separates the carbonate rock, which hosts the Betze deposits, from the volcanic rock to the southwest, and causes a significant difference in drawdown in the bedrock. The important, unanswered question is: does the carbonate rock extend under the volcanic rock? Is the dewatering in the carbonate rock, which appears limited to the carbonates northeast of the Siphon fault, actually extending at depth underneath the volcanics? Plume (1996) shows the western extent of the carbonate province passing through Boulder Flat, but substantially to the west of the Siphon fault. There should be more discussion regarding the location of this "boundary" because it has significant ramifications for the long-term effects of dewatering in Boulder Flat. If the dewatering actually extends beneath Boulder Flat, potentially beneath the monitoring wells, it could be establishing a vertical gradient which will cause long-term, beyond the end of mining, decrease in water levels.

N2-40 *The failure for the predicted drawdown to resemble the observed drawdown, the fact the model apparently recirculates recharge water to the dewatering level, the failure of the model to limit drawdown at some faults, and*

[3] NA-28 is considered a volcanics monitoring well (SEIS, Figure 3.3-3), therefore the water level in this one should not be used to set the drawdown mentioned here.

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N2-36 Three points are discussed to address these comments. First, Figure 3.3-3 of the Draft SEIS shows the changes in groundwater elevation in the Betze Pit region based on fourth quarter 2006 and first quarter 2007 monitoring well groundwater level data and pre-mining groundwater levels shown in Figure B-1 (Appendix B of the Draft SEIS). Figure 3.3-26 (Draft SEIS) shows the maximum extent of the 10-foot drawdown contours, approximately 100 years after mining, for the 2000 and 2007 model results. The fact that the shapes of the predicted 10-foot drawdowns shown on Figure 3.3-26 or 3.3-27 do not resemble the observed drawdown on Figure 3.3-3 is not an issue since the former figure represents the maximum extent of drawdown at approximately 100 years after mining while the latter figure represents drawdown from the pre-mining baseline as of 2007. It takes approximately 100 years before the cone of depression reaches its maximum extent and the model predicts that the shape of cone of depression will change based on time.

The second point relates to the comparison of a hand contoured water level decline map for the aquifers in Boulder Valley (Figure 3.3-3) for fourth quarter 2006 and first quarter 2007 to the computer generated maximum predicted 10-foot drawdown for the model domain (Figure 3.3-26 or Figure 3.3-27). The model generated 10-foot predicted maximum drawdown combines all layers in the model domain and does not represent any single aquifer and does not represent any given time period. A computer generated drawdown map of this type is not meant to be compared to a hand contoured water level decline map and such a comparison should not be used to judge the calibration or "accuracy" of a groundwater model.

The third issue revolves around the Boulder Narrows fault and why it is reflected in the drawdown predicted by the model but does not appear to affect water level declines shown on Figure 3.3-3. Here again, Figure 3.3-3 is a generalized map with very generalized contouring of water level declines in the Boulder Valley area and should not be compared to a model generated map. This figure was intended to give the reader a general overview of water level changes, not to represent in detail the pattern of the maximum predicted 10-foot drawdown.

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N2-36 (Cont.) The groundwater model in use by BGMI was developed and presented for review in the 2000/2003 Betze Project SEIS. This model has been reviewed by independent professional modelers with recognized credentials and by the BLM's modeling experts.

N2-37 See response to comment N2-36.

N2-38 Both BGMI and Newmont models, which cover the same Hydrological Areas (HAs), were used to simulate the combined or cumulative hydrological effects resulting from dewatering and water management activities in the Carlin Trend. Both models predict the extent of maximum drawdown that would occur at any time over the long-term recovery period. The projected extent of maximum drawdown from both models was then combined to illustrate maximum "possible" impacts (Draft SEIS Figure 3.3-48). BLM chose this approach as a "conservative" projection.

The projected maximum drawdown extent from the Newmont model is substantially greater than the BGMI model. BGMI believes that the Newmont model significantly overestimates the drawdown extent in the Rock Creek Hydrological Area (HA) and Willow Creek HA. The predicted 10-foot drawdown contour in this area follows Rock Creek, due to the boundary conditions defined in the Newmont model. Based on the geologic structure in the area, extensive monitoring results and calibrated modeling, BLM believes that the drawdown cone has not extended, and will not extend, to the Willow Creek Basin and that the edge of the drawdown cone will be much farther away from Rock Creek than is predicted by the Newmont models.

The monitoring networks of both BGMI and USGS have indicated no groundwater drawdown near the Rock Creek area. The recent Interferometer Synthetic Aperature Radar (InSAR) study conducted by UNR/Nevada Bureau of Mines has indicated that bedrock subsidence corresponds well with the observed regional drawdown associated with mine dewatering. The InSAR study clearly shows that there has been no bedrock subsidence near the Rock Creek area. The most likely reason for the difference in the drawdown projections to the west is the representation of the hydrogeology of the volcanic aquifers in two models. Groundwater monitoring of the responses to infiltration of water through the TS Ranch Reservoir has identified a high permeability

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N2-40 *the effect of Newmont's pumping suggest that the model is partially based on an incorrect conceptual model of flow in the area.* The long-term drawdown may look more like the ten-foot drawdown on Figure 3.3-3 extended significantly further to the northwest, far beyond the point shown on predicted drawdown maps. *The model should be redone with a proper conceptualization that reflects the limits caused by the faults, the probable extension parallel to the faults, and the proper connections between hydrostratigraphic units. Failing to do this may lead to drastic underestimates of the drawdown to the northwest.*

Monitoring Wells

N2-41 An examination of the monitoring wells shown on Figure 3.3-3 suggests there are too few wells of certain bedrock types. For example, DEE-5 is a Paleozoic limestone well that lies within the 1600-foot drawdown for Paleozoic bedrock. Because the ore body is hosted within carbonate rock, the carbonate aquifer is the target for much of the necessary dewatering and it is in that aquifer that the largest drawdown occurs. This well which experiences such drawdown is the furthest northwest monitoring well in the carbonate aquifer. Estimates of drawdown in the carbonate beyond that point are based on guesswork or on the water levels observed in the Paleozoic siltstone layer, which the SEIS describes as Paleozoic marine clastic rocks. However, this may effectively be mixing water levels from two significantly different hydrostratigraphic units. The carbonate aquifer is the most conductive in the Great Basin and the siliclastics are an aquitard either between the lower and upper carbonate or above the carbonate (Plume, 1996). The siliclastic rocks "have been thrust eastward over the carbonate rocks by the Roberts Mountain Thrust throughout most of the project area" as occurs in the rest of the Great Basin. The low conductivity of this unit (SEIS, Table 3.3-2) confirms its aquitard status. Therefore, the rapid decrease in drawdown to the northwest may reflect the lack of connection between this aquitard and the carbonate aquifer. If the carbonate aquifer extends under the siltstone as described in the SEIS, the carbonate drawdown may extend, unmonitored, much further to the northwest than currently mapped.

N2-42 Some monitoring wells to the northwest appear to mix tertiary volcanics with Paleozoic siltstone (ie, NA-45). If this means the screen spans two formations, the water level may not be very useful in the calibration of the model which treats the two formations as different hydrostratigraphic units.

N2-43 Section 3.3.1.2 mentions the presence of geothermal system indicated by high temperatures at some deep carbonate wells. The SEIS should provide a map showing the location of these wells, or at least list the wells and their location so that the reader can understand where this potential geothermal water occurs. These wells could add to the knowledge required to improve the conceptual model as discussed above.

Existing Bazza and Proposed Clydesdale Waste Rock Dumps

N2-44 Figure 2-15, showing the Reclamation Chronology for the existing Bazza waste rock dump and for the proposed Clydesdale WRD, clearly shows three sections of the Bazza WRD to not be reclaimed until 2033-2035 (they are the purple areas in the middle of the WRD). Under the alternative in Section 2.4 of not building the new Clydesdale WRD, the SEIS indicates that a reason to build the new WRD is that reclamation of the Bazza WRD "would not be completed until 2018, a delay of 7 years compared with the Proposed Action" (SEIS, page 2-56). There is clearly an error here, either in figure 2-15, or in the reasoning for building the Clydesdale WRD.

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N2-38 (Cont) volcanic aquifer extending from Antelope Creek to Boulder Valley. The volcanic unit, extending west from Boulder Valley through the Sheep Creek Hills to Rock Creek, has not shown any response to the infiltration of water into the high permeability unit. This unit appears to have a very low permeability and little hydraulic connection to the main high-permeable volcanic aquifer. The Newmont models likely represent the unit with an unrealistically high permeability.

N2-39 It is unlikely that highly permeable carbonate rock underlies the volcanic unit across the Siphon Fault. This judgment is evidenced by the following: 1) Carbonate rock is not intrinsically high-permeability material. The high-permeability feature at the Goldstrike Mine area is associated with solution cavities developed by the circulation of water within the fault-bounded structure associated with the ore body; 2) Drill holes with depths of about 2,000 feet (at elevation of 3,300 amsl, 300 feet lower than the carbonate water level) were still in the volcanic unit without intercepting carbonate rock; 3) Interferometric Synthetic Aperture Radar (InSAR) has successfully detected very small deformations in the earth's crust due to withdrawal of groundwater. InSAR signals show no subsidence beyond the Siphon Fault, and therefore, no evidence of drawdown at depth; and 4) Because both the Goldstrike carbonate aquifer and the Boulder Valley volcanic aquifer are very permeable (>30 ft/day) near the Siphon Fault, any significant hydraulic connection would result in recirculation of water, hindering BGMI dewatering operations.

N2-40 The groundwater model in use by BGMI was developed in 1991 and was presented for public review in the 2000 Betze Project Draft SEIS. This model has been reviewed by independent professional modelers with recognized credentials and by the BLM's modeling experts. No groundwater model is perfect, but the independent review conducted on the BGMI model and the use of the model over the past 17 years suggest that the model is based on a reasonable conceptualization of the hydrogeologic regime in the six hydrographic basins covered by the model and that the use of the model for predicting the impacts of dewatering in the Goldstrike Mine area is justified and defensible.

N2-41 This comment is concerned with the distribution of monitoring wells relative to the aquifers in the project and cumulative impacts areas, and the carbonate drawdown, which may extend, unmonitored, much further

N2-41 (Cont) to the northwest than currently illustrated by Figure 3.3-3 (Draft SEIS). Figure 3.3-3 shows water level changes at the uppermost bedrock due to the pumping. The drawdown contours in the northwest area are created based on the monitoring points and interpolations. They are accurate and nearly identical to various USGS studies (Plate I, Plume, USGS scientific investigation report 2005-5076; Figure 21, Maurer et al., Water-Resource Investigations Report 96-4134). In response to the second part of the comment, NA-28 and NA-53, both screened in volcanic aquifer, are located along Antelope Creek, near the leading edge of the cone of depression emanating from the carbonate aquifer. It is believed that locations of these two wells are beyond the extent of the carbonate aquifer in the northwest direction. This judgment is evidenced by the following: 1) Drill hole (NA-53D) with depths greater than 2,000 ft. does not intercept carbonate formation; 2) Interferometric Synthetic Aperture Radar (InSAR) has successfully detected very small deformations in the earths crust along the Carlin Trend, such as deformations occurring with the withdrawal of groundwater. InSAR signals show no subsidence beyond Antelope Creek; and 3) It appears that NA-28 and NA-53 are located beyond the edge of Carbonate-Rock Province of Great Basin (USGS Professional Paper 1409-D, 1995).

N2-42 See response to comment N2-41.

N2-43 All the monitoring wells in the Paleozoic carbonate aquifer located northwest of the Betze pit have elevated water temperatures. These wells are shown on Figure 3.3-3 in the Draft SEIS. The potential geothermal water occurs at depth within the Betze/Post/Meikle carbonate block bounded by the Siphon and Post faults.

N2-44 Under the Proposed Action, the entire 2,524-acre Bazza Waste Rock Facility would be reclaimed by 2012 except for approximately 149 acres that comprise the existing ore stockpiles (purple color on Figure 2-15, page 2-46) and the stockpile access road (Figure 2-15, page 2-46), estimated at 44 acres (3.65 miles by 120-foot width) and the landfill (17 acres). The ore stockpiles, landfill, and access road would be reclaimed in 2033 to 2035 after the last of the ore is processed through the mill. Under the No Action and Bazza Waste Rock Facility Alternatives, the Bazza Waste Rock Facility would not be reclaimed until 2018, and the Bazza waste Rock Facility 7 years after the Proposed Action. The

N2 - Letter (Continued)

N2-44 Figure 2-15 indicates that the advantages of early reclamation of the Bazza WRD are illusory or wrongly expected.

N2-45 Another reason the SEIS uses for constructing a new WRD is that the properties that make the Carlin material useful for reclamation will be lost due to storage (SEIS, page 2-56). But, the SEIS should explain how the same is not true for storing Carlin formation material for the new WRD.

N2-46 *The SEIS must make a better case for disturbing 572 acres of additional land (SEIS, page 3.2-8) with a new waste rock dump to avoid a delay in reclaiming the existing WRD. Perhaps additional waste rock could be backfilled in the east end of the pit.*

N2-47 The Betze Pit has yielded a significant amount of potentially acid generating (PAG) rock. The SEIS implies that the additional rock to be mined in the expansion will have similar amounts of PAG rock to that which have been observed previously. The fate of PAG rock in the proposed pit laybacks is unclear. Nineteen percent of the rock in the proposed laybacks will be PAG, which is similar to that observed during the mine's life (SEIS, page 3.3-22). In the same section, the SEIS states: "about 10 percent of the rock to be mined from all sources (current authorized mining and the proposed laybacks) from early 2007 through 2015 is classified as PAG" (*Id.*). *The BLM should correct this discrepancy in the SEIS.*

Pit Lake Development

No Action Pit Lake Development

N2-48 The SEIS states that for the first fourteen years of pit lake development for the no action alternative, high-wall runoff would be the only inflow because the groundwater level would be below the bottom of the pit. The SEIS should explain whether this is due to the continuing dewatering for the Meikle Mine or whether it just takes that long for the groundwater levels to recover. In other words, does pit lake development commence at the end of mining the pit or at the end of dewatering the Meikle Mine?

N2-49 Figure 3.3-6 shows inflow/outflow to/from the lake by source. The figure would be clearer if it were presented in two parts – one as is and one with a vertical scale small enough that the fluxes for several components that appear near zero could be considered.

N2-50 Three factors require explanation. *First, why does the flow rate from Rodeo Creek vary with time? Is the modeling not just assuming an average annual flow from the creek.*

N2-51 Second, and most important, the graph shows a negative flux into the carbonate rock. Does this represent seepage to the aquifer of the highwall runoff and Rodeo Creek? The SEIS mentions that inflow will evaporate and infiltrate (SEIS, page 3.3-23). If it does, it may *substantially degrade the groundwater. The SEIS should consider this and determine whether any of the water seeping from the pit will degrade existing water in the carbonate aquifer.* This outflow will apparently continue long enough that some of the contaminants could flow away from the pit within the carbonate far enough that they will not be returned to the pit.

N2-52 Third, prior to the pit filling, the backfill will be open to moisture and oxygen from the air, and oxidation could occur. Some of the highwall runoff, rain, and potentially inflow from Rodeo Creek will leach through the backfill within the pit (the backfill will have much higher porosity and conductivity than the surrounding pit walls). *The SEIS must consider the contaminants that may leach from the backfill into the groundwater beneath pit, before the pit fills and the backfill is submerged.*

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N2-44 (Cont) existing ore stockpiles, access road, and landfill would not be reclaimed until 2028-2035 depending on alternative.

Figure 2-15 was modified to label the ore stockpiles that are colored purple. The first paragraph on page 2-50 was modified to clarify that the existing ore stockpiles, landfill, and access road on the Bazza Waste Rock Facility would not be reclaimed until 2033-2035, the same timeframe as the Proposed Action.

N2-45 Under the Proposed Action, Carlin material excavated from currently authorized pit expansion areas would not be stored but would be hauled directly from the pit and placed as cover to reclaim the Bazza Waste Rock Facility. Under the No Action and Bazza Waste Rock Facility alternatives, Carlin material excavated from pit expansion areas would have to be disposed of in existing waste rock facilities for reasons discussed in Section 2.4, Bazza Waste Rock Facility Alternative (No Clydesdale), on pages 2-56 and 2-58 of the Draft SEIS.

N2-46 The in-pit backfill waste rock dumps are a valuable resource for the Betze Pit mine operations. Maximizing in-pit backfill waste rock dump capacity and utilizing this capacity efficiently are the major criteria for the dump planning process. The in-pit backfill facilities are a limited resource. During the period that the Clydesdale Waste Rock Facility is in use, there is insufficient capacity in the in-pit backfill dumps for the material mined. The remaining material must be delivered to the Clydesdale Waste Rock Facility. Constraints on in-pit waste rock dump capacity during this period include: 1) maintaining required space for the Newmont Deep Post Underground Yard and the Betze Drift Underground Yard in the pit bottom; 2) maintaining overall dump slopes of 32 degrees with some 27 degree slopes around key underground infrastructure; 3) maintaining safe dump lifts of 160 ft or less. This typically requires mine operations to fill a completed phase in 160-foot lifts from the bottom up. This results in a delay in the full utilization of any new capacity created by the completion of a layback; 4) maintaining a safe buffer zone between the advancing in-pit waste rock dumpand the next layback to be mined. After completion of the North Betze Layback at the end of 2012, in-pit backfill capacity is greatly increased. The majority of mined waste rock will go to the in-pit backfill dumps during 2013 – 2015. During this period the Clydesdale facility will

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N2-46 (Cont.) only be used for the material at the top of the laybacks because the hauls to this facility are significantly shorter than hauling down hill to the in-pit waste rock dumps.

N2-47 The percentage of potentially acid generating (PAG) rock is stated correctly in the Draft SEIS text. Approximately nineteen percent of the mined rock in the proposed laybacks (2nd NW and 3rd NW laybacks of the Proposed Action) is expected to be PAG. The percentage of PAG declines to 10% when including rocks mined from currently authorized laybacks in addition to rocks mined from the proposed laybacks.

N2-48 Table 2-2 on page 2-9 of the SEIS shows the projected dewatering schedule for the No Action Alternative. From 2008 to 2015, the dewatering rate decreases gradually from 16,165 gpm to 10,686 gpm. This will start the rise in the groundwater table beneath the Betze pit. After 2015, the dewatering rate drops dramatically to 2,350 gpm and stays there to 2026. It is during this period that the groundwater level beneath the Betze pit will rise quickly and begin to fill the pit. Thus, the 14 years begins in 2009, but the period after 2015 will see most of the rise in the groundwater level.

N2-49 Comment noted. The flow rate for Rodeo Creek varies in Figure 3.3-6 (Draft SEIS) due to the groundwater model showing such a variation as groundwater levels rise in the project area. Figure 3.3-6 is presenting a summary of what the model results showed as groundwater rebound and resaturation was modeled in the project area.

N2-50 See response to comment N2-49.

N2-51 Seepage into the carbonate bedrock beneath the Betze pit may occur during the period before groundwater rebound reaches the pit floor elevation. Any seepage that may occur would be “trapped” beneath the pit bottom because of the extensive amount of drawdown around the pit. As the groundwater rebounds and fills the pit, any seepage into bedrock would be returned to the pit lake and reside in the pit lake water or sediments.

N2-52 See response to comment N2-51.

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Proposed Action Pit Lake Development

N2-53 The proposed action will increase the surface area of the pit by 15% over the no action alternative. Due to the increased evaporation, the pit lake will stabilize at a lower water level and the pit lake will be just 90% of the currently planned pit lake. With the Rodeo Creek diversion into the pit, the total volume will be about 353,000 (converted from ML on Table 3.3-10). The smaller pit lake size is not an advantage of this proposed action because the additional surface area will cause more long-term loss to evaporation from the Boulder Flat basin.

N2-54 The proposed action also would increase the amount of PAG rock to be backfilled into the pit. This increases the amount of potential oxidation that could occur in the backfill before the pit lake submerges the backfill.

Water Rights

N2-55 If Rodeo Creek is diverted into the pit, more than 200 gpm will be lost from the surface water system of the Boulder Flat. This flow either recharges groundwater downstream from the pit, which supports water rights that may be extant after the mine ceases to operate or that supports downstream surface water flow. The BLM should analyze the effects of this diversion on water rights.

N2-56 Perhaps, the BLM should require that the creek not be diverted into the pit. The fact that diverting Rodeo Creek into the lake will slightly improve the pit lake water quality (SEIS page 3.3-27) is not relevant, especially since Nevada does not consider pit lakes as potential drinking water supplies.

N2-57 As the pit lake fills, it will evaporate more water. The final pit lake area will exceed 800 acres which will evaporate 4000 af/y if the rate is 5 feet/year. This represents a substantial portion of the total available water rights in Boulder Flat basin. BGMI must obtain permanent water rights and dedicate them to this loss (waste) of water in perpetuity.

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N2-53 Comment noted. The additional evaporation from the Proposed Action was evaluated in Section 3.3.2.2 of the Draft SEIS.

N2-54 Comment noted. This increase in PAG and oxidation of the backfill was considered in the pit lake geochemical modeling.

N2-55 Diversion of Rodeo Creek into the Betze Pit at the end of mining is a closure option and can only be permitted by the Nevada State Engineer's Office and NDEP. The BLM has no authority or jurisdiction over the diversion of Rodeo Creek. Should the Nevada State Engineer decide to authorize diversion of Rodeo Creek into the pit at mine closure, that office would be responsible for adjudication of any water rights issues.

N2-56 See response to comment N2-55.

N2-57 The issue of potential water rights conflicts due to evaporation from a pit lake was addressed in the Betze Project 2000/2003 SEIS. Evaporative issues from the pit lake are predicted and reported to the Nevada State Engineer's office.

N2 - Letter (Continued)

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October 7, 2008

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Re: Supplemental Environmental Impact Statement for the Betze Pit Expansion Project, Nevada - BLM/NV/EK?PL-GI-08/22+1793 - additional comments

Dear Mr. Laird,

Please accept these addendum comments from Great Basin Resource Watch regarding the mercury analysis within the SEIS, and Native American concerns.

Mercury analysis

N3-1 The mercury emission data from the Goldstrike Mine used in the SEIS is outdated, see Table 3.11-5, pg 3.11-11. The Nevada Department of Environmental Protection, NDEP, has reported stack emission test data from fall and winter 2007/2008. The more current test data shows larger mercury emissions, ~685 lb/yr.[i] Also of note, in the NDEP summary is the wide variation in the individual component emissions, for example, the roasters released ~234 lb/yr in 2006 and ~448 lb/yr in 2007. Lower carbon kiln emissions in 2007 substantially offset the increase from the roasters. Thus, there is a wide variation in emissions in general, and the SEIS should bracket anticipated emissions much more widely, at least ± 200 lb.

N3-2 The SEIS states on pg 3.11-14, *"The levels range from about1 ppm to 5 ppm in the expansion area and from 1 ppm to 10 ppm in the previously authorized mine areas (BGMI 2008a). Based on the 12.4 million tons of ore from the proposed laybacks and similarity in mercury content of the ore from previously mined areas, an estimated total emissions of 625 pounds of mercury would result from 5 years of mineral processing. Therefore, it is not anticipated to increase mercury emission rates."* It is not clear how the 625 lb number was determined. GBRW *assumes* that the analysis is based on consistency of mercury in ore and mercury capturing technology that is and will remain in place.

N3-3 However, in Barrick Goldstrike Mine Inc. 's applications to the NDEP mercury control program the potential to emit from just the roasters is ~1164 lb/yr.[ii] While actual emissions are currently lower than 1164 lb/yr, Barrick is proposing a much higher level of emissions, which, if the application is accepted by the NDEP Goldstrike could, by law, be allowed to release this amount of mercury. GBRW even sees 625 lb over 5 years or ~155 lb/yr in addition to the annual 600 to 700 lb/yr currently as unacceptably high. **The BLM should not issue a final EIS or record of decision until the Nevada mercury control program has determined the MACT standard for the Goldstrike Mines, and a clearer picture of allowed mercury emissions can be seen.**

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N3-1 The mercury emissions data reported in Table 3.11-5 (page 3.11-11) is from 2006, the most recent data available when the Draft SEIS was prepared and released. The 2007 mercury emissions data for the Goldstrike Mine thermal units reported to NDEP are now available and presented in Appendix C of the Final SEIS. Total emissions were 709 lbs/year of mercury for the Goldstrike Mine in 2007, a 15% increase from 2006. There will always be some year-to-year variations in total mercury emissions and individual source mercury emissions based on variations in mercury content of the processed ore and fluctuations in the amount of ore processed. Table 3.11-4 (page 3.11-11) of the Draft SEIS shows a significant decrease (63%) in mercury emissions from 2005 to 2006 with implementation of additional controls on the carbon kiln, and a decrease of 58% when comparing years 2005 and 2007. The 709 lbs/year mercury emissions data for 2007 does not change the impact analysis or conclusions of the SEIS. The SEIS reports actual emissions data from the mine rather than attempt to bracket anticipated variations. This is the best information currently available for assessing mercury emissions and this analysis is derived from the latest version of the EPA REMSAD modeling and AggreGATOR program.

N3-2 The estimate of 625 lbs total mercury emissions was based on the following calculation: (12.4 million tons of ore throughput for the proposed expansion / 12.24 million tons of ore throughput for year 2006) x 617 lbs/year mercury emissions from year 2006.

N3-3 The 1,164 lbs per year potential to emit (PTE) reflects a theoretical maximum but the anticipated actual mercury emissions, based on approved control technology, would be lower as shown by the 2006 and 2007 mercury emissions data. The actual emissions in the NDEP permit are expected to be less than 1,164 lbs per year.

The estimated mercury emissions from the Proposed Action are not in addition to the 600-700 lbs/year total. Actual emissions are estimated to average approximately 125 lbs/year (625 lbs/5 years) from the ore processed from the proposed expansion, and this average is already included in the 600-700 lbs/year total. Ore from the proposed expansion will be processed along with ore from previously permitted areas of the Goldstrike Mine.

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N3-4 **The SEIS should also include an analysis of fish tissue samples and other mercury concentrators from at least the cumulative impacts region analyzed for mercury as part of the local and cumulative impacts.** The deposition modeling analysis is helpful, but is spare on actual mercury data for solid conclusions to be drawn. A better sense of the residual deposition that exists and its extent in aquatic ecosystems would be obtained by field sampling and analysis.

Native American concerns

N3-5 To date the BLM has not addressed the issue of Western Shoshone title to the land currently under consideration here. As such the Western Shoshone have not given consent to the mining company to expand the Betze Pit.

N3-6 Of particular concern is the potential dewatering impacts at Rock Creek, which is a significant spiritual and cultural area for the Western Shoshone. The SEIS does mention Rock Creek, and states that, *"The potential cumulative impacts from dewatering have been addressed in the CIA (BLM 2000b) and Betze SEIS (BLM 2000a, 2003b) and were previously mitigated (**Figure 3.3-48** and Section 3.3.4.2). This mitigation may not address impacts to Native American values as they relate to water resources. However, no impacts have been identified to date,"* (pg. 3.10-5). It seems unlikely to GBRW that consultation with regional tribes would not have clarified how Rock Creek could be impacted by decreasing water levels. The fact that the BLM uses the phrase "may not address" above indicates that it is unaware of what those impact may be and thus is unable to assess them. **GBRW recommends that the BLM pursue a more complete understanding of the spiritual and cultural affects of this project and dedicate more effort to connect to all the Native American governments and organizations.**

N3-7

Thank you again for accepting these comments, and feel free to follow up with any questions or clarifications.

Sincerely,

John Hadder

John Hadder

Larson Bill, Western Shoshone Defense Project

cc: Roger Flynn, Western Mining Action Project

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[i] Nevada Bureau of Air Pollution Control, "Calendar Year 2007 Actual Production/Emission Reporting Form Addendum for Mercury Emissions," http://www.ndep.nv.gov/baqp//hg/aer.html.

[ii] Barrick Goldstrike Mine Inc., "Nevada Mercury Control Program Operating Permit to Construct - Roasters," Prepared by Air Sciences Inc., February, 2008. 1164 lb/yr was derived by GBRW using the reported potential to emit of 0.00062 gr/dscf, and the following calculation:

$$\text{emissions} = \text{Hg concentration(gr/dscf)} \times \text{volumetric flow rate(dscfm)} \times \left(\frac{60\text{min}}{1\text{hr}}\right) \times \text{operating time(hr/yr)} \times \left(\frac{1\text{lb}}{7000\text{gr}}\right)$$

Responses to Letter

N3-3 (Cont) As noted in the response to comment N3-1, mercury emissions are expected to decline with continued implementation of NMCP and a decrease in ore processing through the mill beginning in 2009 (Table 2-9, page 2-34). BLM has sufficient information to determine potential impacts and base its decision on the results of this SEIS and the Plan of Operations Amendment.

N3-4 Figure 3.11-4 (page 3.11-20) of the Draft SEIS shows the Goldstrike Mine's mercury deposition contributions by watershed as a percent of total. The highest percent contribution of mercury by the Goldstrike Mine is 5.89% in the Willow Creek/Rock Creek valley watershed. Other regional and global sources contribute a much greater proportion of mercury deposition in the region. Sampling and analysis of mercury in fish within the CESA is not justified given the minor (<6%) contribution of the Goldstrike Mine to mercury deposition within regional watersheds compared with the contributions from other sources. NDOW has analyzed fish tissue for mercury content from select recreational sites in Nevada. The nearest sampling site, Wildhorse Reservoir, is approximately 90 km northeast of the Goldstrike Mine. Average mercury content in fish tissues ranged from 0.52 ppm in channel catfish to 0.09 ppm for brown trout. There is no health advisory for eating fish from Wildhorse Reservoir (http://www.ndow.org/fish/health/index.shtm).

N3-5 Western Shoeshone claims to title of these lands have been resolved by the U.S. courts.

N3-6 Updates to BGMI's hydrologic model, including recalibration and the modified dewatering program, continue to show no impact to Rock Creek. Potential impacts to Rock Creek described in the 2000/2003 Betze Project SEIS were a result of Newmont's hydrologic model. Due to that potential impact, BGMI transferred a 1.5 cfs in-stream flow right to BLM and NDOW as mitigation. There have been no changes to the potential impact to Rock Creek and therefore additional mitigation is neither necessary nor appropriate. See Appendix B of the Final SEIS for further explanation.

N3-7 BLM consultation with Native American governments and organizations for this SEIS was described in Section 3.10.1.2 (Native American Consultation) in the Draft SEIS. Table 3.10-1 (page 3.10-3) summarizes the Native American consultation status by tribe. To date, there have been no issues raised by the Native American governments, organizations, or communities regarding this project.

P1 - E-Mail

From: Bk1492@aol.com
08/24/2008 07:00 PM

To: kirk_laird@blm.gov,
kenneth_miller@blm.gov,
americanvoices@mail.lhouse.gov

Subject: betze pit expansion project

P1-1 blm - the killer of wild horses agency - the environmental destroyers - hardly reprsentative of the citizens of this country

P1-2 the scandal plagued us dept of interior needs a complete top to bottom refocus. they should never be handling any environmental matters since they are all about business. they so focus business that they care not who gets killed in the way.

P1-3 this plan will kill wildlife, birds, vegetation, people. there is endles toxic pollution from mercury.

P1-4 the mule deer populations will fall precipitously from this pollution.

P1-5 3.ll-ll mercury disposition is horrendous

P1-6 the mine should not be expanded.

P1-7 clear safe water is in fact worth more than gold.

b. sachau
15 elm st
florham park nj 07932

Responses to E-Mail

P1-1 Comment noted.

P1-2 Comment noted.

P1-3 Comment noted. Mercury deposition from the Goldstrike Mine accounts for a fraction of the global background deposition as discussed in Section 3.11.2, Environmental Consequences (Air Quality) of the Draft SEIS.

P1-4 The impact to the mule deer population numbers as a result of the mine expansion was disclosed in Section 3.8 of the Draft SEIS.

P1-5 USEPA computer simulation modeling using the Regional Modeling System for Aerosols and Deposition (REMSAD) showed that mercury deposition from the Goldstrike Mine in northern Nevada varies with distance from the mine site, but is a fraction of the global background deposition as discussed in Section 3.11 (Air Quality) of the Draft SEIS.

P1-6 Comment noted.

P1-7 Comment noted.

4.0 Additional References

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Appendix A

Water Quality Data from AA and North Block Tailings Facilities

Table A-1 Water Quality Data from AA and North Block Tailings Facilities

Location	Collection Date	Constituent	Result (mg/L)
North Block Site 2	30-Jan-08	Alkalinity	83.3
North Block Site 3	30-Jan-08	Alkalinity	79.6
North Block Site 5	30-Jan-08	Alkalinity	1.3
AA Tailings Draindown Site 1	30-Jan-08	Alkalinity	289
North Block Site 2	02-Sep-08	Alkalinity	81.9
North Block Site 3	02-Sep-08	Alkalinity	2.8
North Block Site 5	02-Sep-08	Alkalinity	79.1
AA Tailings Draindown Site 1	03-Sep-08	Alkalinity	258
North Block Site 2	30-Jan-08	Aluminum-Dissolved	<0.080
North Block Site 3	30-Jan-08	Aluminum-Dissolved	<0.080
North Block Site 5	30-Jan-08	Aluminum-Dissolved	<0.080
AA Tailings Draindown Site 1	30-Jan-08	Aluminum-Dissolved	<0.080
North Block Site 2	02-Sep-08	Aluminum-Dissolved	<0.080
North Block Site 3	02-Sep-08	Aluminum-Dissolved	<0.080
North Block Site 5	02-Sep-08	Aluminum-Dissolved	<0.080
AA Tailings Draindown Site 1	03-Sep-08	Aluminum-Dissolved	<0.080
North Block Site 2	30-Jan-08	Antimony-Dissolved	0.00896
North Block Site 3	30-Jan-08	Antimony-Dissolved	0.00782
North Block Site 5	30-Jan-08	Antimony-Dissolved	<0.00300
AA Tailings Draindown Site 1	30-Jan-08	Antimony-Dissolved	<0.00300
North Block Site 2	02-Sep-08	Antimony-Dissolved	0.00652
North Block Site 3	02-Sep-08	Antimony-Dissolved	<0.00300
North Block Site 5	02-Sep-08	Antimony-Dissolved	0.00634
AA Tailings Draindown Site 1	03-Sep-08	Antimony-Dissolved	<0.00300
North Block Site 2	30-Jan-08	Arsenic-Dissolved	0.714
North Block Site 3	30-Jan-08	Arsenic-Dissolved	0.771
North Block Site 5	30-Jan-08	Arsenic-Dissolved	1.4
AA Tailings Draindown Site 1	30-Jan-08	Arsenic-Dissolved	0.184
North Block Site 2	02-Sep-08	Arsenic-Dissolved	0.839
North Block Site 3	02-Sep-08	Arsenic-Dissolved	1.38
North Block Site 5	02-Sep-08	Arsenic-Dissolved	0.94
AA Tailings Draindown Site 1	03-Sep-08	Arsenic-Dissolved	0.246
North Block Site 2	30-Jan-08	Barium-Dissolved	0.0113
North Block Site 3	30-Jan-08	Barium-Dissolved	0.0117
North Block Site 5	30-Jan-08	Barium-Dissolved	0.138
AA Tailings Draindown Site 1	30-Jan-08	Barium-Dissolved	0.0072
North Block Site 2	02-Sep-08	Barium-Dissolved	0.0104
North Block Site 3	02-Sep-08	Barium-Dissolved	0.135
North Block Site 5	02-Sep-08	Barium-Dissolved	0.0114
AA Tailings Draindown Site 1	03-Sep-08	Barium-Dissolved	0.0066
North Block Site 2	30-Jan-08	Beryllium-Dissolved	<0.00200
North Block Site 3	30-Jan-08	Beryllium-Dissolved	<0.00200
North Block Site 5	30-Jan-08	Beryllium-Dissolved	<0.00200
AA Tailings Draindown Site 1	30-Jan-08	Beryllium-Dissolved	<0.00200
North Block Site 2	02-Sep-08	Beryllium-Dissolved	<0.00200
North Block Site 3	02-Sep-08	Beryllium-Dissolved	<0.00200

Table A-1 Water Quality Data from AA and North Block Tailings Facilities

Location	Collection Date	Constituent	Result (mg/L)
North Block Site 5	02-Sep-08	Beryllium-Dissolved	<0.00200
AA Tailings Draindown Site 1	03-Sep-08	Beryllium-Dissolved	<0.00200
North Block Site 2	30-Jan-08	Bicarbonate	83.3
North Block Site 3	30-Jan-08	Bicarbonate	79.6
North Block Site 5	30-Jan-08	Bicarbonate	1.3
AA Tailings Draindown Site 1	30-Jan-08	Bicarbonate	289
North Block Site 2	02-Sep-08	Bicarbonate	81.9
North Block Site 3	02-Sep-08	Bicarbonate	<1.0
North Block Site 5	02-Sep-08	Bicarbonate	79.1
AA Tailings Draindown Site 1	03-Sep-08	Bicarbonate	258
North Block Site 2	30-Jan-08	Boron-Dissolved	0.06
North Block Site 3	30-Jan-08	Boron-Dissolved	0.062
North Block Site 5	30-Jan-08	Boron-Dissolved	0.095
AA Tailings Draindown Site 1	30-Jan-08	Boron-Dissolved	0.347
North Block Site 2	02-Sep-08	Boron-Dissolved	0.071
North Block Site 3	02-Sep-08	Boron-Dissolved	0.108
North Block Site 5	02-Sep-08	Boron-Dissolved	0.075
AA Tailings Draindown Site 1	03-Sep-08	Boron-Dissolved	0.371
North Block Site 2	30-Jan-08	Cadmium-Dissolved	0.0028
North Block Site 3	30-Jan-08	Cadmium-Dissolved	<0.0020
North Block Site 5	30-Jan-08	Cadmium-Dissolved	<0.0020
AA Tailings Draindown Site 1	30-Jan-08	Cadmium-Dissolved	<0.0020
North Block Site 2	02-Sep-08	Cadmium-Dissolved	<0.0020
North Block Site 3	02-Sep-08	Cadmium-Dissolved	<0.0020
North Block Site 5	02-Sep-08	Cadmium-Dissolved	<0.0020
AA Tailings Draindown Site 1	03-Sep-08	Cadmium-Dissolved	<0.0020
North Block Site 2	30-Jan-08	Calcium-Dissolved	436
North Block Site 3	30-Jan-08	Calcium-Dissolved	456
North Block Site 5	30-Jan-08	Calcium-Dissolved	162
AA Tailings Draindown Site 1	30-Jan-08	Calcium-Dissolved	519
North Block Site 2	02-Sep-08	Calcium-Dissolved	412
North Block Site 3	02-Sep-08	Calcium-Dissolved	159
North Block Site 5	02-Sep-08	Calcium-Dissolved	419
AA Tailings Draindown Site 1	03-Sep-08	Calcium-Dissolved	467
North Block Site 2	30-Jan-08	Carbonate	<1.0
North Block Site 3	30-Jan-08	Carbonate	<1.0
North Block Site 5	30-Jan-08	Carbonate	<1.0
AA Tailings Draindown Site 1	30-Jan-08	Carbonate	<1.0
North Block Site 2	02-Sep-08	Carbonate	<1.0
North Block Site 3	02-Sep-08	Carbonate	<1.0
North Block Site 5	02-Sep-08	Carbonate	<1.0
AA Tailings Draindown Site 1	03-Sep-08	Carbonate	<1.0
North Block Site 2	30-Jan-08	Chloride-Dissolved	66.6
North Block Site 3	30-Jan-08	Chloride-Dissolved	65.3
North Block Site 5	30-Jan-08	Chloride-Dissolved	30.5
AA Tailings Draindown Site 1	30-Jan-08	Chloride-Dissolved	99.2

Table A-1 Water Quality Data from AA and North Block Tailings Facilities

Location	Collection Date	Constituent	Result (mg/L)
North Block Site 2	02-Sep-08	Chloride-Dissolved	68.6
North Block Site 3	02-Sep-08	Chloride-Dissolved	29.6
North Block Site 5	02-Sep-08	Chloride-Dissolved	68
AA Tailings Draindown Site 1	03-Sep-08	Chloride-Dissolved	89.5
North Block Site 2	30-Jan-08	Chromium-Dissolved	<0.0060
North Block Site 3	30-Jan-08	Chromium-Dissolved	<0.0060
North Block Site 5	30-Jan-08	Chromium-Dissolved	<0.0060
AA Tailings Draindown Site 1	30-Jan-08	Chromium-Dissolved	<0.0060
North Block Site 2	02-Sep-08	Chromium-Dissolved	<0.0060
North Block Site 3	02-Sep-08	Chromium-Dissolved	<0.0060
North Block Site 5	02-Sep-08	Chromium-Dissolved	<0.0060
AA Tailings Draindown Site 1	03-Sep-08	Chromium-Dissolved	<0.0060
North Block Site 2	30-Jan-08	Copper-Dissolved	0.085
North Block Site 3	30-Jan-08	Copper-Dissolved	0.212
North Block Site 5	30-Jan-08	Copper-Dissolved	0.012
AA Tailings Draindown Site 1	30-Jan-08	Copper-Dissolved	<0.010
North Block Site 2	02-Sep-08	Copper-Dissolved	0.035
North Block Site 3	02-Sep-08	Copper-Dissolved	0.015
North Block Site 5	02-Sep-08	Copper-Dissolved	0.124
AA Tailings Draindown Site 1	03-Sep-08	Copper-Dissolved	<0.010
North Block Site 2	30-Jan-08	Cyanide WAD	0.0201
North Block Site 3	30-Jan-08	Cyanide WAD	0.028
North Block Site 5	30-Jan-08	Cyanide WAD	0.461
AA Tailings Draindown Site 1	30-Jan-08	Cyanide WAD	0.163
North Block Site 2	02-Sep-08	Cyanide WAD	0.0735
North Block Site 3	02-Sep-08	Cyanide WAD	0.397
North Block Site 5	02-Sep-08	Cyanide WAD	0.13
AA Tailings Draindown Site 1	03-Sep-08	Cyanide WAD	0.0406
North Block Site 2	30-Jan-08	Fluoride-Dissolved	<0.500
North Block Site 3	30-Jan-08	Fluoride-Dissolved	<0.500
North Block Site 5	30-Jan-08	Fluoride-Dissolved	1.35
AA Tailings Draindown Site 1	30-Jan-08	Fluoride-Dissolved	0.55
North Block Site 2	02-Sep-08	Fluoride-Dissolved	<1.00
North Block Site 3	02-Sep-08	Fluoride-Dissolved	1.54
North Block Site 5	02-Sep-08	Fluoride-Dissolved	<1.00
AA Tailings Draindown Site 1	03-Sep-08	Fluoride-Dissolved	<0.500
North Block Site 2	30-Jan-08	Iron-Dissolved	0.87
North Block Site 3	30-Jan-08	Iron-Dissolved	0.914
North Block Site 5	30-Jan-08	Iron-Dissolved	0.236
AA Tailings Draindown Site 1	30-Jan-08	Iron-Dissolved	0.091
North Block Site 2	02-Sep-08	Iron-Dissolved	2.85
North Block Site 3	02-Sep-08	Iron-Dissolved	0.343
North Block Site 5	02-Sep-08	Iron-Dissolved	3.01
AA Tailings Draindown Site 1	03-Sep-08	Iron-Dissolved	0.325
North Block Site 2	30-Jan-08	Lead-Dissolved	<0.00300
North Block Site 3	30-Jan-08	Lead-Dissolved	<0.00300

Table A-1 Water Quality Data from AA and North Block Tailings Facilities

Location	Collection Date	Constituent	Result (mg/L)
North Block Site 5	30-Jan-08	Lead-Dissolved	<0.00300
AA Tailings Draindown Site 1	30-Jan-08	Lead-Dissolved	<0.00300
North Block Site 2	02-Sep-08	Lead-Dissolved	<0.00300
North Block Site 3	02-Sep-08	Lead-Dissolved	<0.00300
North Block Site 5	02-Sep-08	Lead-Dissolved	<0.00300
AA Tailings Draindown Site 1	03-Sep-08	Lead-Dissolved	<0.00300
North Block Site 2	30-Jan-08	Magnesium-Dissolved	188
North Block Site 3	30-Jan-08	Magnesium-Dissolved	190
North Block Site 5	30-Jan-08	Magnesium-Dissolved	9.28
AA Tailings Draindown Site 1	30-Jan-08	Magnesium-Dissolved	133
North Block Site 2	02-Sep-08	Magnesium-Dissolved	184
North Block Site 3	02-Sep-08	Magnesium-Dissolved	10.3
North Block Site 5	02-Sep-08	Magnesium-Dissolved	195
AA Tailings Draindown Site 1	03-Sep-08	Magnesium-Dissolved	119
North Block Site 2	30-Jan-08	Manganese-Dissolved	1.9
North Block Site 3	30-Jan-08	Manganese-Dissolved	1.77
North Block Site 5	30-Jan-08	Manganese-Dissolved	0.463
AA Tailings Draindown Site 1	30-Jan-08	Manganese-Dissolved	6.08
North Block Site 2	02-Sep-08	Manganese-Dissolved	1.83
North Block Site 3	02-Sep-08	Manganese-Dissolved	0.489
North Block Site 5	02-Sep-08	Manganese-Dissolved	1.73
AA Tailings Draindown Site 1	03-Sep-08	Manganese-Dissolved	6.35
North Block Site 2	30-Jan-08	Mercury-Dissolved	<0.00020
North Block Site 3	30-Jan-08	Mercury-Dissolved	<0.00020
North Block Site 5	30-Jan-08	Mercury-Dissolved	0.00088
AA Tailings Draindown Site 1	30-Jan-08	Mercury-Dissolved	<0.00020
North Block Site 2	02-Sep-08	Mercury-Dissolved	<0.00020
North Block Site 3	02-Sep-08	Mercury-Dissolved	0.00133
North Block Site 5	02-Sep-08	Mercury-Dissolved	0.00036
AA Tailings Draindown Site 1	03-Sep-08	Mercury-Dissolved	<0.00020
North Block Site 2	30-Jan-08	Nickel-Dissolved	0.276
North Block Site 3	30-Jan-08	Nickel-Dissolved	0.252
North Block Site 5	30-Jan-08	Nickel-Dissolved	0.012
AA Tailings Draindown Site 1	30-Jan-08	Nickel-Dissolved	0.073
North Block Site 2	02-Sep-08	Nickel-Dissolved	0.256
North Block Site 3	02-Sep-08	Nickel-Dissolved	0.012
North Block Site 5	02-Sep-08	Nickel-Dissolved	0.243
AA Tailings Draindown Site 1	03-Sep-08	Nickel-Dissolved	0.062
North Block Site 2	30-Jan-08	Nitrate/Nitrite-Total	0.294
North Block Site 3	30-Jan-08	Nitrate/Nitrite-Total	0.301
North Block Site 5	30-Jan-08	Nitrate/Nitrite-Total	8.36
AA Tailings Draindown Site 1	30-Jan-08	Nitrate/Nitrite-Total	1.01
North Block Site 2	02-Sep-08	Nitrate/Nitrite-Total	<0.0500
North Block Site 3	02-Sep-08	Nitrate/Nitrite-Total	6.64
North Block Site 5	02-Sep-08	Nitrate/Nitrite-Total	<0.0500
AA Tailings Draindown Site 1	03-Sep-08	Nitrate/Nitrite-Total	3.6

Table A-1 Water Quality Data from AA and North Block Tailings Facilities

Location	Collection Date	Constituent	Result (mg/L)
North Block Site 2	30-Jan-08	pH	7.4
North Block Site 3	30-Jan-08	pH	7.4
North Block Site 5	30-Jan-08	pH	5.99
AA Tailings Draindown Site 1	30-Jan-08	pH	7.27
North Block Site 2	02-Sep-08	pH	7.34
North Block Site 3	02-Sep-08	pH	6.64
North Block Site 5	02-Sep-08	pH	7.42
AA Tailings Draindown Site 1	03-Sep-08	pH	7.32
North Block Site 2	30-Jan-08	Potassium-Dissolved	95.9
North Block Site 3	30-Jan-08	Potassium-Dissolved	92.6
North Block Site 5	30-Jan-08	Potassium-Dissolved	17.8
AA Tailings Draindown Site 1	30-Jan-08	Potassium-Dissolved	13.8
North Block Site 2	02-Sep-08	Potassium-Dissolved	106
North Block Site 3	02-Sep-08	Potassium-Dissolved	20
North Block Site 5	02-Sep-08	Potassium-Dissolved	101
AA Tailings Draindown Site 1	03-Sep-08	Potassium-Dissolved	14
North Block Site 2	30-Jan-08	Selenium-Dissolved	0.0181
North Block Site 3	30-Jan-08	Selenium-Dissolved	0.0206
North Block Site 5	30-Jan-08	Selenium-Dissolved	0.00838
AA Tailings Draindown Site 1	30-Jan-08	Selenium-Dissolved	0.0137
North Block Site 2	02-Sep-08	Selenium-Dissolved	0.00745
North Block Site 3	02-Sep-08	Selenium-Dissolved	0.00704
North Block Site 5	02-Sep-08	Selenium-Dissolved	0.0109
AA Tailings Draindown Site 1	03-Sep-08	Selenium-Dissolved	0.00863
North Block Site 2	30-Jan-08	Silver-Dissolved	<0.0050
North Block Site 3	30-Jan-08	Silver-Dissolved	<0.0050
North Block Site 5	30-Jan-08	Silver-Dissolved	<0.0050
AA Tailings Draindown Site 1	30-Jan-08	Silver-Dissolved	<0.0050
North Block Site 2	02-Sep-08	Silver-Dissolved	<0.0050
North Block Site 3	02-Sep-08	Silver-Dissolved	<0.0050
North Block Site 5	02-Sep-08	Silver-Dissolved	<0.0050
AA Tailings Draindown Site 1	03-Sep-08	Silver-Dissolved	<0.0050
North Block Site 2	30-Jan-08	Sodium-Dissolved	803
North Block Site 3	30-Jan-08	Sodium-Dissolved	729
North Block Site 5	30-Jan-08	Sodium-Dissolved	153
AA Tailings Draindown Site 1	30-Jan-08	Sodium-Dissolved	340
North Block Site 2	02-Sep-08	Sodium-Dissolved	724
North Block Site 3	02-Sep-08	Sodium-Dissolved	142
North Block Site 5	02-Sep-08	Sodium-Dissolved	644
AA Tailings Draindown Site 1	03-Sep-08	Sodium-Dissolved	313
North Block Site 2	30-Jan-08	Sulfate-Dissolved	345
North Block Site 3	30-Jan-08	Sulfate-Dissolved	3360
North Block Site 5	30-Jan-08	Sulfate-Dissolved	685
AA Tailings Draindown Site 1	30-Jan-08	Sulfate-Dissolved	1960
North Block Site 2	02-Sep-08	Sulfate-Dissolved	3540
North Block Site 3	02-Sep-08	Sulfate-Dissolved	694

Table A-1 Water Quality Data from AA and North Block Tailings Facilities

Location	Collection Date	Constituent	Result (mg/L)
North Block Site 5	02-Sep-08	Sulfate-Dissolved	3400
AA Tailings Draindown Site 1	03-Sep-08	Sulfate-Dissolved	2000
North Block Site 2	30-Jan-08	Thallium-Dissolved	0.00714
North Block Site 3	30-Jan-08	Thallium-Dissolved	0.00837
North Block Site 5	30-Jan-08	Thallium-Dissolved	<0.00100
AA Tailings Draindown Site 1	30-Jan-08	Thallium-Dissolved	<0.00100
North Block Site 2	02-Sep-08	Thallium-Dissolved	0.00568
North Block Site 3	02-Sep-08	Thallium-Dissolved	<0.00100
North Block Site 5	02-Sep-08	Thallium-Dissolved	0.00641
AA Tailings Draindown Site 1	03-Sep-08	Thallium-Dissolved	<0.00100
North Block Site 2	30-Jan-08	Total Dissolved Solids-Total	4600
North Block Site 3	30-Jan-08	Total Dissolved Solids-Total	4500
North Block Site 5	30-Jan-08	Total Dissolved Solids-Total	1200
AA Tailings Draindown Site 1	30-Jan-08	Total Dissolved Solids-Total	3300
North Block Site 2	02-Sep-08	Total Dissolved Solids-Total	4900
North Block Site 3	02-Sep-08	Total Dissolved Solids-Total	1200
North Block Site 5	02-Sep-08	Total Dissolved Solids-Total	4800
AA Tailings Draindown Site 1	03-Sep-08	Total Dissolved Solids-Total	3300
North Block Site 2	30-Jan-08	Zinc-Dissolved	0.0268
North Block Site 3	30-Jan-08	Zinc-Dissolved	0.0225
North Block Site 5	30-Jan-08	Zinc-Dissolved	0.0133
AA Tailings Draindown Site 1	30-Jan-08	Zinc-Dissolved	<0.0100
North Block Site 2	02-Sep-08	Zinc-Dissolved	0.0341
North Block Site 3	02-Sep-08	Zinc-Dissolved	0.0145
North Block Site 5	02-Sep-08	Zinc-Dissolved	0.0331
AA Tailings Draindown Site 1	03-Sep-08	Zinc-Dissolved	0.0104

Appendix B

Potential Dewatering Impact on Base Flows of Rock Creek

BARRICK

MEMORANDUM

TO:	Kirk Laird, SEIS Project Manager, Elko BLM Office
	Scott Duncan, Project Manager, ENSR
COPY:	Andy Cole, Environmental Manager, Barrick Goldstrike Mines Inc.
FROM:	Johnny Zhan, Ph.D., Senior Env. Manager-Hydrology, Barrick Gold Corporation
DATE:	October 18, 2008
SUBJECT:	Potential dewatering impact on base flows of Rock Creek

Dear Kirk and Scott,

This memorandum serves as the formal response to the letter of Great Basin Resource Watch, dated on October 7, 2008, regarding to potential dewatering impact on base flows of Rock Creek.

Background information - Intercepts:

(1) **Cumulative Impact Analysis of Dewatering and Water Management Operations for the Betze project, South Operations Area Project Amendment, and Leeville Project** (BLM, April 2000, page 3-60):

"For Rock Creek, the modeled data assume an initial (premine) baseflow of 6.4 cfs, and between the end of mining for Goldstrike and Gold Quarry (year 2012) and year 2150, baseflow could be reduced to 4.8 cfs (HCI 2000a)."

(2) **Final Supplemental Environmental Impact Statement Betze Project** (BLM, January 2003, Appendix A, page 10):

"Model projections indicate that Barrick's dewatering activities are not expected to have a direct impact on the Rock Creek site. The cumulative impacts analysis, relying on Newmont's model, predicts that there could be a temporary reduction of up to 1.5 cfs in Rock Creek's base flow in the future". "Although Barrick disagrees with the conclusions of the Newmont hydrologic model, Barrick will convey a 1.5 cfs in-stream flow to the Nevada Division of Wildlife and BLM for wildlife purposes."

Flow predictions from the Newmont hydrologic model

Figure 1 is the output from Newmont's EIS model, which shows the flows with and without mining. The difference between these two conditions, so called base flow reduction (1.5 cfs), can be derived from this figure.

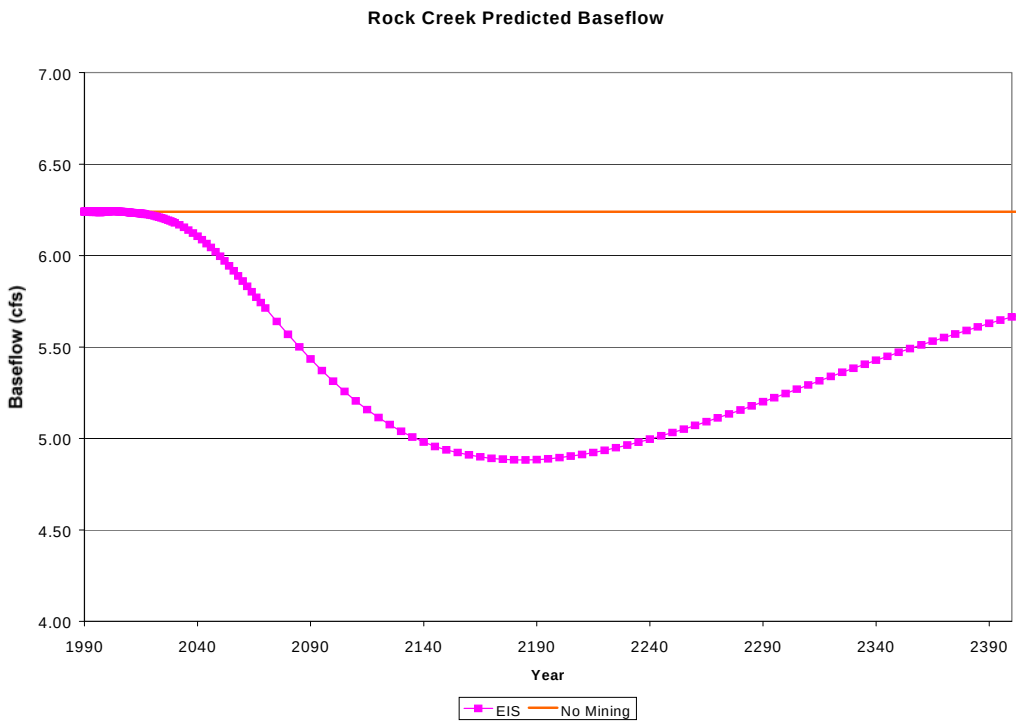

Figure 1. Simulated base flow at Rock Creek from Newmont's EIS model.

It is believed that the simulated flows from Newmont's model are obtained from the model node at the mouth of Rock Creek Canyon, which is just above the USGS gage station RKC-4 (Figure 2).

Figure 2. The Native American's TCP location.

(Note: TCP location not shown due to confidential nature of the information presented.)

Flow predictions from the Barrick hydrologic model

The Barrick model did not predict any flow reduction in Rock Creek for the 2003 SEIS study (pumping to end of 2011). Neither did it predict any flow reduction for the extended dewatering scenario (pumping to end of 2015). For both modeling exercises, 400-year recovery periods were simulated. Simulated annual average flows at RKC-4 (USGS Gage 10324500), are identical (33 cfs) for both cases. The simulated average is only slightly smaller than the USGS estimate of 40 cfs (Maurer, et al., USGS report 96 – 4134), and the long-term measured value of 40 cfs (1919-2005).

USGS flow measurements in Rock Creek

In an early internal study, I analyzed the statistics of RKC-4 flow measurements (from April 1, 1919 through April 12, 2001). It was found that the lowest monthly average flow in Rock Creek occurs in August. The average August flow rate is 1.34 cfs. The flow data were found to be widely scattered with a standard deviation of 3.39 cfs. For the period studied, about 49% of days in August had zero flow. If so-called baseflow can be treated as the lowest monthly flow, the baseflow in Rock Creek is 1.34 cfs, which is far less than the Newmont prediction (6.4 cfs), even less than the predicted flow reduction (1.5 cfs).

Recent measurements

1. The monitoring networks of both Barrick and USGS have indicated no groundwater drawdown near the Rock Creek area.
2. The recent InSAR study conducted by UNR/Nevada Bureau of Mines has indicated that bedrock subsidence corresponds well with the observed regional drawdown associated with mine dewatering. However, there was no bedrock subsidence near the Rock Creek area.
3. 10-Year moving averages of the Rock Creek flow rates do not indicate a declining trend.

Triggering point NA-51S

In order to determine if and when Rock Creek flow will be impacted by Betze dewatering program, a trigger point (NA-51S) was chosen in the Final Supplemental Environmental Impact Statement Betze Project (BLM, January 2003, Appendix A, page 9).

NA-51S is an existing piezometer located to the west of the Betze pit. It lies between the measured drawdown from the dewatering operation and Rock Creek. It was specified that if NA-51S shows more than 10 feet of drawdown on the annual basis, it will trigger Barrick take additional monitoring/mitigation action. As indicated on Figure 3, water levels in NA-51S have shown no impact from dewatering.

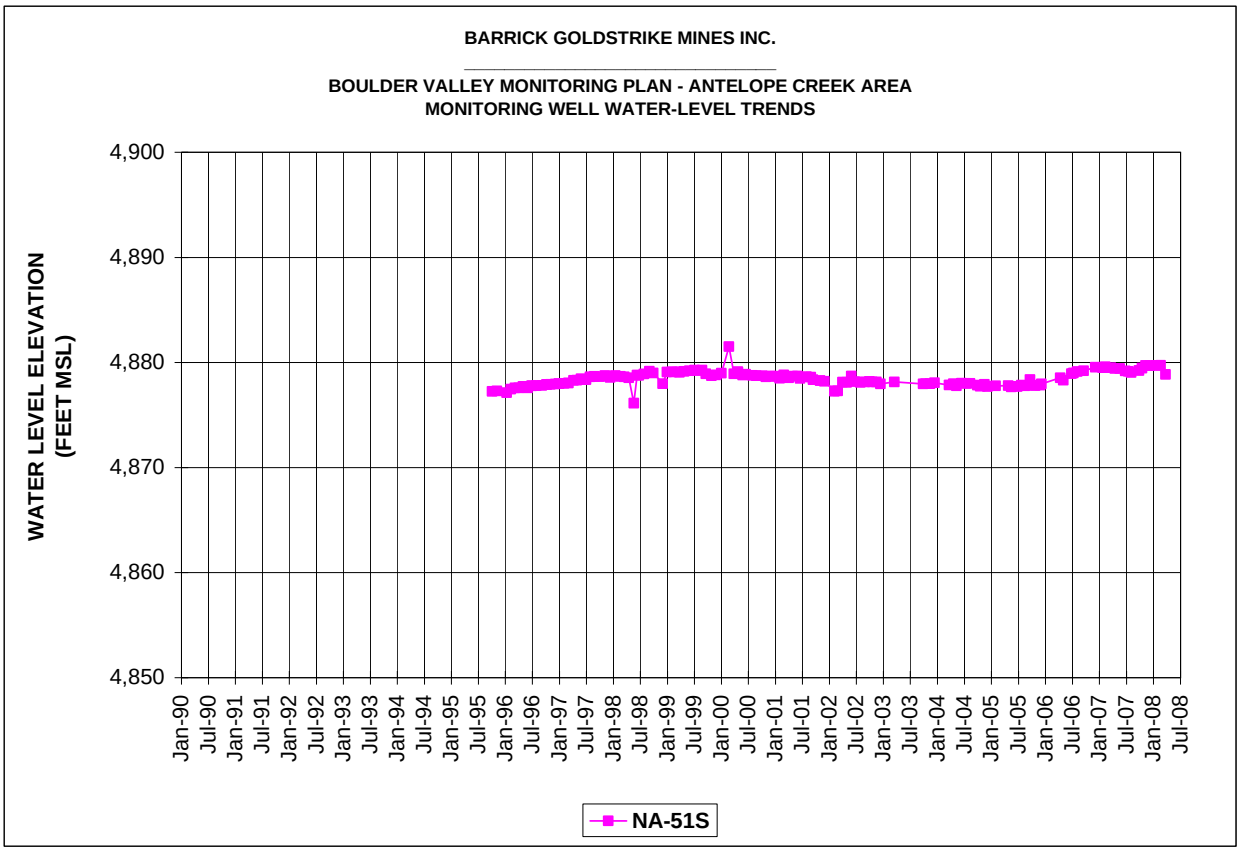

Figure 3. Measured water level at the triggering point (NA-51S).

Should you have any questions about this memo, please contact me at 801-990-3798 or jzhan@barrick.com without hesitation.

Appendix C

Mercury Speciation Data for 2006 and 2007 at Goldstrike Mine

AIR SCIENCES INC.

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TECHNICAL MEMORANDUM

GOLDSTRIKE HG SPECIATION FOR 2006 AND 2007

PREPARED FOR: Katie Laird, Barrick Goldstrike Mines Inc.

PREPARED BY: Kevin Lewis, Air Sciences Inc.

PROJECT NO.: 59-43-9

COPIES:

DATE: October 31, 2008

This memorandum provides the speciation of the Goldstrike mercury (Hg) emissions reported under the Nevada Mercury Control Program (NMCP) for 2006 and 2007.

Hg Speciation Test Data

Goldstrike has performed numerous stack tests of the exhausts from Goldstrike's Hg sources using the Ontario Hydro Method (OHM) to determine the Hg speciation. These tests are summarized in Table 1 below. There is currently no OHM data for the Mill 1 and 2 dry grinding processes. Therefore, Hg speciation information is based on the Method 29 test performed in October 2007.

Table 1: Hg Speciation Test Data

Source Description	Hg0 (lb/hr)	Hg2 (lb/hr)	Hgp (lb/hr)	Hg0	Hg2	Hgp
Autoclave 1	0.00286	0.000156	0.0000675	92.75%	5.06%	2.19%
Autoclaves 2 & 3	0.000603	0.000201	0.0000594	69.84%	23.28%	6.88%
Autoclave 4	0.0017	0.00018	0.0003	77.98%	8.26%	13.76%
Autoclaves 5 & 6	0.000458	0.000185	0.0000463	66.44%	26.84%	6.72%
Roasters 1 & 2	0.0319	0.00336	0.000128	90.14%	9.49%	0.36%
Retort 1	0.00226	0.00127	0.000158	61.28%	34.44%	4.28%
Retort 2	0.000419	0.000001	0.000004	98.82%	0.24%	0.94%
Retort 3	0.00218	0.00185	0.00101	43.25%	36.71%	20.04%
Mill Furnaces & EW Cells	0.036	0.0003	0.000018	99.12%	0.83%	0.05%
EW Cells only	0.00265	0.0000209	0.0000344	97.96%	0.77%	1.27%
Carbon Kiln	0.017	0.00027	0.000031	98.26%	1.56%	0.18%
Lab Assay Furnaces	0.001	0.00074	0.00059	42.92%	31.76%	25.32%
De Minimis Lab Equipment	ND	ND	ND	ND	ND	ND
Mill 1 Ore Dry/Grind	0.000367	ND	0.0014	20.77%	ND	79.23%
Mill 2 Ore Dry/Grind	0.0002555	ND	0.0010055	20.26%	ND	79.74%

ND = no data.

Table 2: Test Method and Date for Table 1

Source Description	Test Method and Date
Autoclave 1	OHM - 7/12/2007
Autoclaves 2 & 3	OHM - 7/16/2007
Autoclave 4	OHM - 5/2/2006
Autoclaves 5 & 6	OHM - 7/23/2007
Roasters 1 & 2	OHM - 6/2/2006
Retort 1	OHM - 7/27/2007
Retort 2	OHM - 4/27/2006
Retort 3	OHM - 7/25/2007
Mill Furnaces & EW Cells	OHM - 4/25/2006
EW Cells only	OHM - 7/20/2007
Carbon Kiln	OHM - 5/4/2006
Lab Assay Furnaces	OHM - 5/3/2006
De Minimis Lab Equipment	ND
Mill 1 Ore Dry/Grind	M29 – 10/22/2007
Mill 2 Ore Dry/Grind	M29 – 10/23/2007

ND = no data.

2006 Hg Speciation

Table 3 summarizes the Hg emissions reported for calendar year 2006 under the NMCP and the estimated speciation of these emissions.

Table 3: 2006 Reported Hg Emissions and Speciation Estimates

Source Description	Hg, total (lb/yr)[i]	Hg0 (lb/yr)	Hg2 (lb/yr)	Hgp (lb/yr)
Autoclave 1	10.7	9.9	0.5	0.2
Autoclaves 2 & 3	28	19.6	6.5	1.9
Autoclave 4	14.5	11.3	1.2	2.0
Autoclaves 5 & 6	30.8	20.5	8.3	2.1
Roasters 1 & 2	234.1	211.0	22.2	0.8
Retort 1	1.13	0.7	0.4	0.05
Retort 2	1.13	1.1	0.003	0.01
Retort 3	1.13	0.5	0.4	0.2
Mill Furnaces & EW Cells	9.2	9.1	0.1	0.005
EW Cells only	20.8	20.4	0.2	0.3
Carbon Kiln	248.3	244.0	3.9	0.4
Lab Assay Furnaces	16.3	7.0	5.2	4.1
De Minimis Lab Equipment	0.66	0.3	0.2	0.2
Facility Total	**616.8**	**555.4**	**49.1**	**12.3**

2007 Hg Speciation

Table 4 summarizes the Hg emissions reported for calendar year 2007 under the NMCP and the estimated speciation of these emissions.

Table 4: 2007 Reported Hg Emissions and Speciation Estimates

Source Description	Hg, total (lb/yr)[ii]	Hg0 (lb/yr)	Hg2 (lb/yr)	Hgp (lb/yr)
Autoclave 1	8.8838	8.2	0.4	0.2
Autoclaves 2 & 3	6.2900	4.4	1.5	0.4
Autoclave 4	1.4860	1.2	0.1	0.2
Autoclaves 5 & 6	11.0038	7.3	3.0	0.7
Roasters 1 & 2	447.8733	403.7	42.5	1.6
Retort 1	8.8967	5.5	3.1	0.4
Retort 2	0.9728	1.0	0.002	0.01
Retort 3	6.6920	2.9	2.5	1.3
Mill Furnaces & EW Cells	4.4615	4.4	0.04	0.002
EW Cells only	19.1123	18.7	0.1	0.2
Carbon Kiln	147.3176	144.8	2.3	0.3
Lab Assay Furnaces	17.5200	7.5	5.6	4.4
De Minimis Lab Equipment	4.4366	1.9	1.4	1.1
Mill 1 Ore Dry/Grind	14.0538	2.9		11.1
Mill 2 Ore Dry/Grind	9.8960	2.0		7.9
Facility Total	**708.9**	**616.4**	**62.5**	**29.8**

[i] Nevada Division of Environmental Protection, Bureau of Air Pollution Control. 2006. *Calendar Year 2006 Actual Production/Emissions Reporting Form Addendum for Mercury Emissions*.

[ii] Nevada Division of Environmental Protection, Bureau of Air Pollution Control. 2007. *Calendar Year 2007 Actual Production/Emissions Reporting Form Addendum for Mercury Emissions.*