Letter No. 1

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U.S. Department of the Interior
U.S. Geological Survey

The USGS provides the Nation with reliable, impartial information about the Earth to minimize the loss of lives and property from natural disasters, to manage biological, water, mineral, and energy resources, to enhance and protect the quality of life, and to contribute to wise economic and physical development.

Date October 23, 2007

Number of Pages including this page: 3

To: Mr. Kenneth E. Miller, Field Manager
Bureau of Land Management
Elko Field Office
3900 Idaho St.
Elko, NV 89801

Telephone #:
Fax #: 9-1-775-753-0255

From: Brenda Johnson
Executive Secretary
Office of Environmental Affairs Program
U.S. Geological Survey Mail Stop 423
12201 Sunrise Valley Dr.
Reston, VA 20192

Telephone #: (703) 648-6832 Fax #: (703) 648-5644

The U.S. Geological Survey has reviewed the subject Draft Supplemental Environmental Impact Statement and offers the following comment for the Newmont Mining Corporation's South Operations Area Project-Nevada.

Thanks

If there are any problems with this fax, please call:
Office of Environmental Affairs Program
(703) 648-6832

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Reston, VA 20192

In Reply Refer To:
Mail Stop 423

OCT 3 1 2007

Mr. Kenneth E. Miller, Field Manager
Bureau of Land Management
Elko Field Office
3900 Idaho St.
Elko, NV 89801

Subject: Draft Supplemental Environmental Impact Statement for the South Operations Area Project Amendment Cumulative Effects, Elko and Eureka Counties, NV

Dear Mr. Miller:

As requested by your correspondence of August 31, 2007, the U.S. Geological Survey (USGS) has reviewed the subject draft supplemental environmental impact statement (EIS) and offers the following comment.

SPECIFIC COMMENT

Chapter 3, Cumulative Effects, Section titled "Terrestrial Wildlife, T&E, Candidate, and Sensitive Species" and Section titled, "Fisheries and Aquatic Resources", pages 3-37 through 3-67

There are many statements of fact that are not supported by scientific references. The assessments would be enhanced if the final EIS included supporting references. Statements of fact that would benefit from having supportive references include, but are not limited to the following:

- "Lewis' buckwheat (*Eriogonum lewisii*) is the only sensitive species with suitable habitat in the Study Area; although it has not been documented on any sites affected by mining. The plant occurs on dry, open ridges at elevations of 6,470 to 9,720 feet … habitat on which it occurs does not usually support intense fires that would harm this plant." (page 3-37, 2nd column, 1st paragraph)
- "The Humboldt River is considered a warm water fishery with species tolerant of high sediment load and warm water temperatures. Twenty-three species, including many which are introduced, have been recorded for the Humboldt River." (page 3-60, 2nd column, last paragraph)

I-1

Response I-1: Text revised to include appropriate references where applicable in this Final SEIS.

There also are a number of instances in these sections that reference proposed mitigation actions. However, limited information is provided about the analysis and/or studies that were conducted that led to the determination that the mitigation actions were necessary. Similarly, limited information is provided about the proposed mitigative actions. For instance, on pages 3-46 (first column, end of first paragraph) and 3-49 (first column, end of first full paragraph), it is stated that, "Mitigation programs implemented by mining operations include obligations to maintain or augment flow in springs and streams that are import to wildlife species." Without further information the public is unable to independently evaluate stated conclusions, such as on page 3-65 (1st column, first paragraph, last sentence), "mitigation programs are expected to reduce these potential impacts." 1-2

Thank you for the opportunity to review and comment on the draft supplemental EIS. If you have any questions concerning our comments, please contact Lloyd Woosley, Chief of the USGS Environmental Affairs Program, at (703) 648-5028 or at lwoosley@usgs.gov.

Sincerely,

for James F. Devine
Senior Advisor for Science Applications

Response 1-2: Referenced text concerning mitigation programs is a general statement describing mitigation plans for operations in the Carlin Trend not intended as a citation for a particular operator. Detailed discussion of project-specific mitigation plans is available in the SOAPA (BLM 2002a), Leeville Project (BLM 2002b) EISs, and Barrick's Betze Project (Final SEIS BLM 2003). Mitigation plans for the above listed projects are described in the *Stabilization and Rehabilitation Programs* section of Chapter 2.

Letter No. 2

2007 OCT 31 AM 7:50

Humboldt River Basin Water Authority
c/o P.O. Box 2008
Carson City, Nevada 89702

Elko County
Eureka County
Humboldt County
Lander County
Pershing County

October 28, 2007

Bureau of Land Management
Elko Field Office
Attention: SOAPA/Leeville Project SEIS Coordinator
3900 Idaho Street
Elko, Nevada 89801

RE: Comments to Draft Supplemental Impact Statements for Newmont Mining Corporation's South Operations Area Project amendment (SOAPA) and Leeville Project

To Whom It May Concern:

On behalf of the Humboldt River Basin Water Authority (HRBWA), I am please to submit the following comments to the Draft Supplemental Impact Statements for Newmont Mining Corporation's South Operations Area Project amendment (SOAPA) and Leeville Project. At the outset, let me note that HRBWA supports responsible mining on public lands within the Humboldt River Basin. Mining is a critical element to the region's natural resource dependent economy. The Authority encourages the Bureau of Land Management (BLM) to facilitate mining operations which effectively mitigate project impacts and provide significant contributions to the regional economy.

Page 3-25, 7th bullet (of both SEISs) – A reduction of base flow in the Humboldt River at Dunphy of 3.4 cfs represents a loss of 723.6125 acre-feet of available surface water otherwise available to downstream users in this fully adjudicated river system. At 3.5 acre-feet per acre, this is enough water to irrigate an estimated 207 acres of farmland. Over a 100-year possible recovery period, the loss of base flow in the Humboldt River could total more than 72,360 acre-feet of surface water. This total represents the direct impact to downstream water rights holders and would serve as the benchmark against feasibility of various mitigation measures might be considered. **2-1**

Alternatively, the draft SEISs disclose, but fail to quantify, the extent to which mine related discharges to the Humboldt River will serve to augment base flows. A quantitative estimate of possible mine related increases in base flow should be provided in the final SEISs. Disclosure of the possible net change in base flow during and after mine dewatering should be included in the final SEISs. **2-2**

Response 2-1: Comment noted. The maximum base flow reduction of 3.4 cubic feet per second (cfs), would occur in about year 2040, with a long-term (100 years) decrease of about 0.9 cfs (HCI 2007a). Also see Response 2-2.

Response 2-2: The Final EIS for the South Operations Area project (BLM 1993), Cumulative Impact Analysis (CIA) of Dewatering and Water Management Operations for the Betze Project, South Operations Area Project Amendment, and Leeville Project (BLM 2000) describes the predicted base flow effects that could be attributed to mine dewatering and discharge to the Humboldt River system. As per the Ninth Circuit Court's Decision, the analysis of the cumulative impact to water was considered adequate in the 2002 FEIS (BLM 2002a) and CIA (BLM 2000). The intent of the water resources section of this Final SEIS is to update information since 2002. As stated in the CIA and in the Final EIS for the South Operations Area Project (BLM 1993), Newmont has committed to augmenting low flows in the river using senior water rights that the company owns or controls. After cessation of mine dewatering discharges, Newmont will undertake a program to mitigate potential water losses to irrigation water rights holders in the middle and lower Humboldt River sub-basins. Prior to each irrigation season, Newmont will determine the acre-feet of water that might be lost during that season, based on the projected impacts to the Humboldt River base flow for that year. Newmont will work with the Water Master for the Humboldt River to administer a like amount of its senior water rights as if they were the most junior rights in the sub-basin for that irrigation season.

The draft SEISs fail to recognize that as a fully adjudicated system, all water in the Humboldt River is owned by someone. The draft SEISs fail to consider the economic consequence of the cumulative loss of base flow in the Humboldt River attributable to the various mining projects on the Carlin Trend. **2-3**

Potential Mitigation: Feasible measures to mitigate the loss in Humboldt River base flow resulting from mining on the Carlin Trend are not identified and analyzed in the draft SEISs. The final SEISs should describe feasible methods to mitigate impacts to water rights holders. All relevant, reasonable mitigation measures must be identified in the final SEISs. The Humboldt River Basin Water Authority is prepared to assist BLM in identifying such methods to mitigate impacts to base flows. The probability of the mitigation measures being implemented must also be discussed in the final SEISs. **2-4**

It is important to note that monitoring is not considered one of five methods recognized by the Council on Environmental Quality to mitigate impacts. Those five acceptable methods include avoiding, minimizing, rectifying, reducing and compensating (40CFR1508.20).
I trust these comments will serve to improve the Leeville Project as such may ultimately be approved by the BLM for development and operation.

Sincerely,

Benny Hodges
Chairman

cc: Board Members and Alternates, HRBWA

Response 2-3: Section 8.0 – *Grazing Management* and Section 9.0 – *Socioeconomics* in the CIA (BLM 2000) identify the potential economic effects that could result from changes in base flow conditions in the Humboldt River as a result of mine dewatering and discharge.

Response 2-4: See Response 2-2.

JIM GIBBONS
Governor

STATE OF NEVADA

ANDREW K. CLINGER
Director

2007 NOV -2 AM 7:30

ELKO FIELD OFFICE		
DM		✓
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LAW ENF		
NON-RENEW		
RENEWABLE		
S.A.		
FIRE		
REHAB		
CA. TRAIL		
CF CODE		
X=ACTION		

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 30, 2007

Kenneth Miller
US Department of the Interior
Bureau of Land Management
Elko Field Office
3900 East Idaho Street
Elko, NV 89801-4611

Re: SAI NV # **E2008-105** Reference: **1793.7/3809**

Project: **Draft SEIS for S. Operations Area Impact Statement**

Dear Kenneth Miller:

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

The following agencies support the above referenced document as written:

State Historic Preservation Office

This constitutes the State Clearinghouse review of this proposal as per Executive Order 12372. If you have questions, please contact me at (775) 684-0209.

Sincerely,

Krista Coulter
Nevada State Clearinghouse

Letter No. 3

Rebecca Palmer

From: Planning Section [Clearinghouse@budget.state.nv.us]
Sent: Wednesday, September 05, 2007 2:43 PM
To: Rebecca Palmer
Subject: E2008-105 Draft SEIS for S. Operations Area Impact Statement - Elko Field Office

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0209 Fax (775) 684-0260
DATE: September 5, 2007

RECEIVED
OCT 04 2007
DEPARTMENT OF ADMINISTRATION
OFFICE OF THE DIRECTOR
BUDGET AND PLANNING DIVISION

State Historic Preservation Office

Nevada SAI # E2008-105
Project: Draft SEIS for S. Operations Area Impact Statement

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

http://budget.state.nv.us/clearinghouse/Notice/2008/E2008-105.pdf

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 Tuesday, October 23, 2007.

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? Gosia Sylwestrzak, (775) 684-0209 or mailto:clearinghouse@budget.state.nv.us.

Document will take time to load

___No comment on this project ✓ Proposal supported as written 3-1

AGENCY COMMENTS:

Signature: Rebecca L Palmer Date: 10/3/07

Distribution:
Sandy Quilici, Department of Conservation & Natural Resources Jeff Hardcastle, State Demographer Alan Di Stefano, Economic Development Kathy Dow, Economic Development Stan Marshall, State Health Division Sherry Rupert, Indian Commission Skip Canfield, AICP, Division of State Lands Michael J. Stewart, Legislative Counsel Bureau Alan Coyner, Commission on Minerals D. Driesner, Commission on Minerals Christy Morris, Commission on Minerals John Walker, Nevada Division of Environmental Protection Jim Shabi, Nevada Dept. of Employment, Training and Rehabilitation, Research and Analysis Pete Anderson, Division of Forestry Mike Dondero, Division of Forestry Rich Harvey, Division of Forestry Catherine Cuccaro, Department of Transportation Anthony Grossman, Department of Wildlife, Director's Office Steve Foree, Department of Wildlife, Elko Robert Martinez, Division of Water Resources James D. Morefield, Natural Heritage Program Steve Weaver, Division of State Parks Mark Harris, PE, Public Utilities Commission Pete Konesky, State Energy Office Rebecca Palmer, State Historic Preservation Office John Muntean, UNR Bureau of Mines Jon Price, UNR Bureau of Mines Russ Land, Nevada Division of Environmental Protection Gosia Sylwestrzak, zzClearinghouse Reese Tietje, zzClearinghouse -Reese Maud Naroll, zzClearinghouse-Maud Gosia Sylwestrzak, zzClearinghouse -Gosia

Response 3-1: Comment noted.

Letter No. 4

Follow up

Planning Section

From: Skip Canfield **Sent:** Tue 9/11/2007 4:36 PM
To: Planning Section
Cc:
Subject: RE: E2008-105 Draft SEIS for S. Operations Area Impact Statement - Elko Field Office
Attachments:

The Nevada Division of State Lands provides the following comments:

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

Although one project might seem insignificant, and even those that are only temporary, in the big picture, as we employ the multiple use concepts of our public lands, please consider a comprehensive and consistent look at visual impacts and how very small and inexpensive mitigation measures can play a large role in the compatibility of the built and natural environment.

1. Utilize consistent lighting mitigation measures that follow "Dark Sky" lighting practices. Please see www.darksky.org. 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.

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.

2. 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.

--A good example is the use of a paint color called "sudan brown" for water tanks and other vertical structures. 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.

4-1

Skip Canfield, AICP
State Land Use Planning Agency

-----Original Message-----
From: Planning Section
Sent: Wednesday, September 05, 2007 2:42 PM
To: Skip Canfield
Subject: E2008-105 Draft SEIS for S. Operations Area Impact Statement - Elko Field Office

NEVADA STATE CLEARINGHOUSE
Department of Administration, Budget and Planning Division
209 East Musser Street, Room 200, Carson City, Nevada 89701-4298
(775) 684-0209 Fax (775) 684-0260
DATE: September 5, 2007

Division of State Lands

Nevada SAI # E2008-105

Response 4-1: Visual impacts associated with the SOAPA Project were analyzed using procedures set forth in the Visual Contrast Rating Handbook (BLM 1986). The project meets Visual Resource Management objectives for Class IV which allows the greatest degree of modification of the landscape by management activities.

Text in the *Visual Resources* section of Chapter 3 has been revised to address cumulative effects of night lighting.

Project: Draft SEIS for S. Operations Area Impact Statement

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

http://budget.state.nv.us/clearinghouse/Notice/2008/E2008-105.pdf

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 Tuesday, October 23, 2007.

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? Gosia Sylwestrzak, (775) 684-0209 or mailto:clearinghouse@budget.state.nv.us.

Document will take time to load

____No comment on this project ____Proposal supported as written

AGENCY COMMENTS:

Signature: Date:

Distribution:
Sandy Quilici, Department of Conservation & Natural Resources
Jeff Hardcastle, State Demographer
Alan Di Stefano, Economic Development
Kathy Dow, Economic Development
Stan Marshall, State Health Division
Sherry Rupert, Indian Commission
Skip Canfield, AICP, Division of State Lands
Michael J. Stewart, Legislative Counsel Bureau
Alan Coyner, Commission on Minerals
D. Driesner, Commission on Minerals
Christy Morris, Commission on Minerals
John Walker, Nevada Division of Environmental Protection
Jim Shabi, Nevada Dept. of Employment, Training and Rehabilitation, Research and Analysis
Pete Anderson, Division of Forestry
Mike Dondero, Division of Forestry
Rich Harvey, Division of Forestry
Catherine Cuccaro, Department of Transportation
Anthony Grossman, Department of Wildlife, Director's Office
Steve Foree, Department of Wildlife, Elko
Robert Martinez, Division of Water Resources
James D. Morefield, Natural Heritage Program

Steve Weaver, Division of State Parks
Mark Harris, PE, Public Utilities Commission
Pete Konesky, State Energy Office
Rebecca Palmer, State Historic Preservation Office
John Muntean, UNR Bureau of Mines
Jon Price, UNR Bureau of Mines
Russ Land, Nevada Division of Environmental Protection
Gosia Sylwestrzak, zzClearinghouse
Reese Tietje, zzClearinghouse -Reese
Maud Naroll, zzClearinghouse-Maud
Gosia Sylwestrzak, zzClearinghouse -Gosia

Letter No. 5

Great Basin Mine Watch

85 Keystone Ave., Suite K
Reno, NV 89503
775-348-1986
info@greatbasinminewatch.org
www.greatbasinminewatch.org

Board of Directors

Bob Fulkerson, Chair

Glenn Miller, Ph.D, Treasurer

Norman Harry, Secretary

Aimee Boulanger

Julie Ann Fishel

Larson Bill

Nicole Rinke

Staff

Dan Randolph
Executive Director

Vanessa Conrad
Program Assistant

John Hadder
Staff Scientist

November 1, 2007

Bureau of Land Management
Elko field Office
Attention: SOAPA Project SEIS Coordinator
3900 Idaho St.
Elko, NV 89801

RE: Draft Supplemental Environmental Impact Statement for South Operations Area Project Amendment.

Dear Project Coordinator,

Please find our comments of the Draft Supplemental Environmental Impact Statement (DSEIS) for South Operations Area Project Amendment prepared by Tom Meyers for Great Basin Mine Watch. We have reviewed and fully accept these comments.

According to our review there are a number of inadequacies in the DSEIS, which are addressed specifically within the detailed comments. The concerns noted below regarding water resources, groundwater modeling, agriculture, and air quality should be corrected. The groundwater model should be recalibrated and new predictions made for the final SEIS. **5-1**

One additional comment we will include here is the limitation of the cumulative impact boundary contained in the DSEIS. Great Basin Mine Watch for the record still does not agree that the impacts of the project end at the boundaries generally shown in figures in the SDEIS. We refer you to our comments during scoping that we stand by: **5-2**

"In the original EISs for the projects, the BLM defined the cumulative impact study area as the Carlin Trend, and therefore did not consider mines such as the Pipeline, Marigold or Phoenix Project.[1] *We strongly urge the BLM to* ***not*** *again draw an imaginary line as the study area boundary, but to rather use boundaries appropriate to the particular resource or value and the level of disturbance to that resource and the natural boundaries of impact for the resource.*

[1] Final Environmental Impact Statement Newmont Mining Corporation's South Operations Area Project Amendment (SOAPA FEIS) Appendix E; pg 40.

Response 5-1: BLM completed the Draft SEIS in accordance with instructions received from the Ninth Circuit Court directing BLM to address the adequacy of cumulative effects analysis for resources in the vicinity of the mine project. The court concluded that the CIA (BLM 2000) comprehensively evaluated cumulative effects associated with mine dewatering and discharge.

BLM has provided updated water quality and quantity information obtained since compilation of the CIA and initiation of the SOAPA and Leeville Projects to the present time in the Draft and Final SEIS documents.

The numerical groundwater model was recalibrated and updated in March 2007 by Hydrologic Consultants Inc. (HCI 2007a). The results of that recalibration and update are discussed in the *Water Quantity* section of the SOAPA Final SEIS.

Response 5-2: The cumulative effects Study Area for each resource are determined on a case by case basis. BLM defined the Carlin Trend as the cumulative effects analysis area for most resources or resource uses and considers it a reasonable Study Area for purposes of this cumulative effects assessment associated with development of the SOAPA and Leeville projects. Detailed descriptions and rationale used to develop individual resource cumulative effects Study Areas are provided in the respective sections of Chapter 3 in this Final SEIS. The Pipeline, Marigold, and Phoenix projects were determined to not contribute additive effects on resources present and affected in the vicinity of the SOAPA and Leeville projects.

For all surface water impacts, the whole Humboldt River drainage must be considered. To arbitrarily assume the impacts of the SOAPA and Leeville projects' pumping water into Maggie Creek will not either exacerbate or lessen the impacts of the Lone Tree pit lake formation on the Humboldt River, as an example, is not defensible. In a similar manner, any salts or metals added to the river by SOAPA/Leeville, will have a cumulative impact with any salts added by any other mines, or power plants, in the drainage. **5-3**

For many resources the study area should encompass the area of northern Nevada with the high number of large mines. The BLM map "Northern Nevada Mines" (14 November 2006) can serve as a guide. The area from the Jerritt Canyon mine in the northeast, to the Sleeper mine in the northwest, to the Standard and Coeur Rochester mines in the southwest, to the Yankee mine in the southeast, should be used for many resources." **5-4**

- Great Basin Mine Watch, March 27, 2007 Scoping Comments for Supplemental EIS's for SOAPA and Leeville Projects.

We hope that the BLM will reexamine the cumulative impacts boundary as part of the FEIS.

Sincerely,

John Hadder
Staff Scientist

Response 5-3: Dewatering at the Lone Tree Mine ended on December 20, 2006. Since then, the Lone Tree Mine pit has been filling with water and by mid-March 2008, the pit lake was 410 feet deep. The pit lake is 48 percent full by elevation and 33 percent full by volume. The Lone Tree pit lake currently contains approximately 1,600 acre-feet of water and when full, the pit lake will contain 4,750 acre-feet and be 875 feet deep at its deepest point.

Groundwater elevation monitoring in the area of the mine reflects filling of the Lone Tree Mine pit lake. The deeper bedrock aquifer has recovered a similar amount (about 400 feet) while the shallower alluvial aquifer(s) have either continued to decline or have remained stable since dewatering stopped. Measured aquifer responses to the cessation of dewatering are consistent with those predicted by Newmont's numeric groundwater model. Groundwater levels in shallow alluvial system adjacent to the Humboldt River remain unaffected by past dewatering and pit lake filling because of a ubiquitous clay layer that isolates the shallow alluvial aquifer and Humboldt River from the underlying alluvial aquifers.

Projected inorganic constituent load from mine dewatering projects to the Humboldt River is described in Section 3.3.8 of the CIA (BLM 2000) beginning on page 3-88.

The TS Power Plant is a zero discharge facility. All process water is reused and evaporated.

Response 5-4: See Response 5-2.

Review of Draft Supplemental Environmental Impact Statement, South Operations Area Project Amendment Cumulative Effects

October 31, 2007

Prepared for:

Great Basin Mine Watch
Reno, NV

By

Tom Myers, Ph.D.
Hydrologic Consultant

Introduction

This report is a review of the Draft Supplemental Environmental Impact Statement for the South Operations Area Project Amendment Cumulative Effects analysis (SEIS). The SEIS analyzing cumulative effects of mining on the Carlin Trend was required as the result of litigation filed by Great Basin Mine Watch. This report focuses on water resources, air quality, and waste rock issues.

The SEIS incorporates the original DEIS documents by reference. Therefore, the Great Basin Mine Watch comments on the original DEIS and FEIS are also incorporated by reference. It included substantial comments on the groundwater modeling in the area.

The SEIS lists the Emigrant project and an expansion of Betze/Post as the only reasonably foreseeable new mining on the Carlin Trend. It also discusses the TS Ranch Coal-Fired Power Plant being constructed by a Newmont subsidiary.

Waste Rock

Mining removes and relocates vast quantities of rock as part of the quest for minerals (SEIS, pages 3-1,2). The waste rock ends up in heap leach pads, tailings impoundments and waste rock dumps. A primary issue with the movement of waste rock is the potential for meteoric water to leach and release to the environment trace metals. For this reason, the SEIS should include a table showing the cumulative area and tonnage of waste rock, tailings and heaps for all of the mines in the area. The table should also note the amount of PAG waste at each facility and include the cumulative amount of metals stored based on TRI. Table 3-1 is a start, but is insufficient. **5-5**

Additionally, Table 3-1 cannot be correct. The Genesis/Lantern mine cannot have created the largest total amount of waste rock. The amount of waste at Gold Quarry cannot be as low as indicated. Several mines are missing from the table; these include at least Rain, Meikle and Hollister. It is also difficult to believe that only one year of data is available at Betze/Post; it has been reporting waste rock amounts to NDEP for years. **5-6**

Response 5-5: The "cumulative area" disturbed by mining in the portion of the Carlin Trend that has been determined to contribute additive impacts to resources affected by the SOAPA and Leeville projects is described in **Table 2-1** of this Final SEIS. The volume of potentially acid generating (PAG) waste rock at each facility producing PAG waste rock is included in **Table 3-1**.

As described in the Draft and Final SEISs, various methods for managing PAG waste rock have been and continue to be employed throughout mining operations in the Carlin Trend. These methods include: blending PAG rock with non-PAG rock; encapsulation of PAG rock with non-PAG rock; contouring and regrading waste rock disposal facilities to limit infiltration of precipitation; being placed as in-pit backfill below predicted groundwater elevations at the end of mining and dewatering activities; and construction of capping systems that efficiently store and release (via evapotranspiration) precipitation to limit the volume of water available for infiltration into and through the waste rock. Waste rock disposal facilities within the Carlin Trend are monitored for stability, trace metal release, and revegetation (reclamation). All waste rock disposal facilities are subject to BLM and NDEP reclamation requirements, which the agencies consider when calculating the reclamation cost estimate for the financial guarantee covering the operations. BLM and NDEP monitor performance of individual waste rock disposal facilities in meeting closure requirements (including release of trace metals to the environment) and will not release any financial guarantee until BLM and NDEP determine, along with all agencies with jurisdiction, that the operator has successfully completed reclamation according to the terms of its plan of operations.

Waste rock disposal sites are no longer reported under TRI requirements based on the *de minimus* exemption.. On April 2, 2003, the federal District Court for the District of Columbia ruled that EPA had improperly required metals mining operations to report low concentrations of metals and metal compounds occurring naturally in the rock moved and stored during these operations. Under the ruling, these low concentrations are not reportable under TRI. (The exclusion applies to a listed material present in a mixture at levels below 1%, or 0.1% if the material is a carcinogen.)

Response 5-6: Table 3-1 revised per comment.

Waste rock production from the Meikle Mine is placed in the existing waste rock disposal facility associated with the Betze/Post Mine operation. **Table 3-1** (see Chapter 3 in this Final SEIS) has been updated to reflect revised volumes of waste rock deposition in the Carlin Trend. Volume of waste rock identified for the Genesis Project includes reasonably foreseeable future mine expansion.

Supplementing the table, there should be a map showing the location of the individual facilities. If possible the map should locate the PAG waste to aid in identification of potential future hot spots, defined as areas where seepage could release AMD to the environment. The SEIS could talk about mitigation strategies with respect to PAG waste, such as mixing with neutralizing rock or encapsulation, but it should not rely on these mitigations to assume there can never be any seepage of AMD. The efficacy of the mitigation depends on release rates and the extent of mixing, not just the mass of net neutralizing material. **5-7**

Grazing and Agriculture

The SEIS indicates that grazing will continue during and after mining without substantial changes. Currently, agriculture is booming in Boulder Flat because the irrigation pivots are being used to dispose of dewatering water. However, the agriculture will not continue once the TS Power Plant is completed and mine dewatering ceases because the water rights for that plant are not temporary dewatering rights but are the agricultural rights that were converted to mining and milling (for the use of dewatering water for irrigation; this was done by changing the point of diversion to the dewatering wells). The point of use for some of the certificated water rights has since been changed to the power plant. Thus, the power plant will use water rights that had previously been for agriculture. An example is the conversion of water rights permit 30241 (certificate 10047) to permit 71424. This conversion was a change in the point of diversion to the Goldstrike Mine with an intended use of industrial for power production. The permit was then amended with application 76015, which is currently listed as ready for action. **5-8**

These changes in water rights are for changes from agriculture to industrial. The agricultural economy in the basin will therefore change as the dewatering ceases and more water is diverted to the power plant. Because it is part of the reasonably foreseeable future actions, this DEIS should discuss the changes in the economy to be expected due to the loss of agriculture.

Air Quality

The assessment of before/after annual concentrations of PM_{10} may be misleading. One reason is that 1997-2002 is not really a pre-mine period. SOAP commenced operations more than a decade previous to the commencement of data collection. It may have been dormant, but there were still exposed areas from which particulate matter could discharge. For this reason, the claim that there has been no effect of mining on PM10 air quality may not be correct. **5-9**

There is no monitoring at the mines for gaseous pollutants (page 3-9), therefore it is not possible to assess whether gaseous emissions could be problem. It is not appropriate to state that "[i]t is uncommon for gaseous pollutants to be detected in the vicinity of mining operations" (page 3-9) without any reference. **5-10**

The failure to analyze $PM_{2.5}$ is unacceptable. The claim that "[m]etallic mineral processing produces few $PM_{2.5}$ emission, as primary fine particle emissions typically are produced from sources such as diesel engines, wood burning activities, and other industrial and commercial combustion processes" (page 3-12) may be correct, but applying it to these mines requires the BLM to ignore the diesel engine trucks and other excavating equipment. This equipment operates continuously at the mines. Their emissions should be considered in this analysis. Accepting NDEP's determination that "meeting the PM_{10} standards and control measures serves as a **5-11**

Response 5-7: See Response 5-5 and **Figure 2-1**.

Response 5-8: The scale of livestock grazing operations in Boulder Valley is not dependent on water from mine dewatering, nor connected to the former agricultural water rights now changed for industrial use for the TS Power Plant. Irrigation water right points of diversion were not changed to any dewatering wells.

The TS Power Plant water rights were changed from irrigation to industrial, but did not involve any mining and milling use, the manner of use of portions of existing irrigation water rights at Mack Creek Farm was changed directly to industrial, and points of diversion were initially changed by applications 71424-71436 to proposed well sites around the proposed TS Power Plant. Further design required the proposed points of diversion be amended and moved to four sets of potential water sources including well sites at the TS Power Plant, existing pivot water supply wells at the old Boulder Creek Fields (the wells and some of the pivots there pre-exist mine dewatering), existing wells at Mack Creek Farm, and injection wells-- not dewatering or mining/milling supply wells-- owned by Barrick Goldstrike Mines, Inc. at the northern end of Boulder Valley (these would have been refitted as dedicated water supply wells for the TS Power Plant). The Mack Creek Farm and Boulder Creek Fields applications were withdrawn. Permits 71431 and 71434 for the TS Power Plant site points of diversion were issued, but with very restricted diversion limits. Permits 71424, 71428-30, and 71432 were issued for the injection wells, but the idea to use them as supply wells proved unworkable.

Applications 76012-17 were then filed to change points of diversion from Barrick's injection wells to two proposed supply wells for the TS Power Plant. Applications 76018-19 were filed to adjust allocations at the on-site wells and to correct the point of diversion of the completed backup supply well. Applications 76012-76019 were all issued November 30, 2007.

The Mack Creek Farm agricultural base rights changed for the TS Power Plant were selected because they were not involved in substitution of use for mine dewatering. No water rights transferred to the TS Power Plant were connected to substitution of use by mine dewatering,

The TS Power Plant water rights transfers have no foreseeable effect on future agriculture in Boulder Valley.

Response 5-9: Data presented in the Draft and Final SEISs incorporates data collected since 1997 (which predates construction of SOAPA and Leeville projects). data prior to 1997 are not available for these project areas. Since that time, no major increases in concentrations have been recorded, and values remain within State of Nevada and National Ambient Air Quality Standards.

Response 5-10: Monitoring of gaseous emissions is not required under air quality permits required for mines in the Study Area; the text has been revised. For most mining operations, the air pollutant of potential concern is particulate matter. While there may be some gaseous pollutants emitted by heavy equipment operating at a mine, it is unlike a power plant, pulp mill, or smelter. Gaseous pollutants at mining operations do not have the minimum volume of emissions of these pollutants that require monitoring. Cumulative effects modeling of , NOx, SOx, and CO was conducted using the three regulated sources of these emissions within the Carlin Trend. Results of this modeling exercise are described in *Air Quality* section of Chapter 3 in this Final SEIS.

Response 5-11: Particulate matter has been addressed in the Draft and Final SEISs using the designation. It is common practice to address particulate impacts by examining those impacts resulting from . Nothing special or unusual about the SOAPA complex suggests that a different practice should be followed. For mining operations, control measures for $_{.5}$ particulate are the same as those implemented for particulate. According to 40 CFR 52.24(k), Appendix S of Part 51, States should use the nonattainment major NSR program as a surrogate to address the requirements of nonattainment major NSR for the $_{.5}$ NAAQS. By applying a nonattainment major NSR program in the interim period, States will effectively mitigate increases in $_{.5}$ emissions and protect air quality because $_{.5}$ is a subset of emissions.

surrogate approach for controlling $PM_{2.5}$ emissions and protecting air quality" (*Id.*) is not an excuse for not analyzing the impacts. Impacts occur whether a regulation is violated or whether a bureaucratic agency determines the activity is within the letter of the law. Future regulation may come about due to analysis showing an impact. Accepting NDEP's assumptions is circular reasoning wherein it assumed that one activity takes care of the problem so that no monitoring is necessary to verify the assumption's veracity or to identify other sources. PM_{10} control measures differ from the measures that would be used for $PM_{2.5}$. **5-11 (contd)**

The SEIS relies on an air quality model that incorporates meteorological data and emissions as based on EPA published factors. Calibration apparently relies on topographic input and textbook parameters, such as dispersion. EPA has approved the model (Id.) but it is used herein apparently without verifying the input, the emissions from the sources, and without calibrating the parameters, such as dispersion. The model input should be verified with measurements at the various sources; the factors used by EPA are averages and if the emissions at these mines lie above the mean or are outliers the emissions could be grossly higher than modeled and BLM would not know it. Calibration should include adjusting model parameters so that predicted concentrations at receptors equals the observed values, if any are collected. **5-12**

The air quality analysis is based on model calculations at various receptors, defined as "the locations at which the model was directed to calculate concentrations" (page 3-12). The receptors were established on a 1000-meter spacing on a grid. It would be useful to show a figure showing the distribution of the receptors. There is no actual data collected to verify the predictions from the model. The model calibration is thus accepted without any indication of whether it accurately predicts PM_{10} concentrations. **5-13**

It may be common practice to utilize this model without data to calibrate it, but the resulting predictions should not be considered anything but educated guesses. It would be like running the MODFLOW program, a widely accepted modeling code, to predict impacts on groundwater without any calibration beyond accepting textbook hydrologic properties.

Water Resources

The SEIS updates previous analysis of groundwater resources and the impacts of mine dewatering. Impacts on water resources are very important; this section focuses on various water resources concepts including artificial recharge, perennial yield, modeling predictions and reality, and the estimate of natural recharge in the area.

Artificial Recharge

The following statement from the SEIS is very misleading:

> Not all groundwater pumped for mine dewatering is lost to the water balance of the affected hydrologic basins because a percentage of the pumped water is reinfiltrated. Over 50 percent of pumped groundwater typically is infiltrated for the Betze and Leeville mines, with less than 10 percent of pumped groundwater being subject to infiltration from the Gold Quarry Mine. (SEIS, page 3-20) **5-14**

Recharging dewatering water may technically keep the water within a basin but it creates new discharges and significant deficits at scales of less than the full basin.

Response 5-12: Use of published emission factors to estimate emissions are common practice. The USEPA published the Compilation of Air Pollutant Emission Factors (Document AP-42) specifically to allow this process as it would be difficult to measure all emission sources at a facility.

The reviewer suggests that modeling was done without "calibrating the dispersion." This response assumes the reviewer believes model results should be compared to actual measured concentrations. This suggestion would be inconsistent with USEPA guidance. Air quality models are not "calibrated." Model codes used in the modeling analysis were verified or validated in complex studies (EPA, 2008. *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources* - http://www.epa.gov/ttn/chief/ap42/index.html).

The air quality model used in the current analysis is a widely-used program mandated in 40 CFR Part 51, Appendix W; Guideline on Air Quality Models. Calibrating AQ models is deemed "unacceptable" in regulatory modeling per Section 8.2.9.

Response 5-13: Figure 3-2 has been revised to show receptor locations. See also Response 5-12.

Response 5-14: Pumping from the deeper carbonate/siltstone bedrock aquifer system creates a deficit within the deeper bedrock system. To the extent that the bedrock system is in communication with shallower basin fill groundwater systems, either within specific tributary basins or the Humboldt River itself, there may be a change in groundwater flow regimes at specific points along the collective flow paths of the basin fill and bedrock aquifer systems. The percentage of bedrock aquifer system water lost to evaporation and/or evapotranspiration is minimal compared to the total volume of groundwater.

The Hadley fields are flood irrigated during the growing season from about mid-April to mid-October. As is standard practice at the Nevada Division of Water Resources (H. Ricci, NDWR, personal communication, 1995), 30 percent of the water delivered to the irrigation system was assumed to recharge the groundwater system. The irrigation rate was determined by Newmont's monthly records of water distribution from the Gold Quarry dewatering system (HCI 2007).

Reinfiltration and excessive irrigation creates a mound in the basin fill aquifer. Mounding increases the gradient driving seepage to nearby streams and decreases the depth to groundwater. The SEIS indicates the mound is as much as 55 feet. The mounds in Boulder Flat have increased seepage from Boulder Flat to the Humboldt River; this seepage will increase as the mound slowly migrates southwestward. The mound also keeps the water table closer to the ground surface which increases groundwater evapotranspiration (ET). Figure 3-4 in the SEIS shows the dominant vegetation in Boulder Flat is greasewood and salt desert shrub. Nichols (1992) found a significant relationship between the depth to groundwater and evapotranspiration from greasewood. The groundwater model assumptions (HCI 2000) include the fact that ET becomes a maximum when the groundwater table reaches the ground surface. Therefore, the discharge from the groundwater in the basin fill has increased, probably substantially, from its pre-mining conditions due to the recharge of and irrigation with dewatering water.

5-14 (contd)

The BLM should account for these new groundwater discharges before it claims that reinfiltration is keeping all or most of the dewatering water in the basin; the statement from the SEIS above should be revised to reflect the increased discharge from the system.

The artificial recharge of dewatering water may not be available to fill the deficit being created because the recharge is to the basin fill aquifer but the dewatering depletes bedrock aquifers, either carbonate or siltstone. If there is not a substantial contact between aquifers, this is potentially a major problem. The carbonate aquifer supports substantial interbasin flow downgradient from the basins and discharge to the Humboldt River. Prudic et al (1995) found approximately 35000 af/y of discharge to phreatophytes and the Humboldt River in the reach between Elko and Palisade. The drawdown caused by dewatering may divert some of the discharge from the Humboldt River to fill the deficit.

Perennial Yield

The perennial yield of a groundwater basin is the amount of water which can be economically pumped annually without causing a permanently increasing drawdown. Usually it equals the discharge from the basin including evapotranspiration and streamflow plus interbasin groundwater flow from the basin. The total perennial yield for the six groundwater basins around the mines (Susie, Maggie Cr, Marys Cr, Willow Cr, Boulder Flat and Rock Creek) totals 38,800 af/y with Boulder Flat accounting for 30,000 af/y and Maggie and Susie Creek basins combined equaling 6000 af/y. Independent recharge estimates are much less than the perennial yield estimates (Flint et al 2004), therefore the perennial yield needs to be supported by substantial interbasin flow.

Dewatering has far exceeded and will continue to exceed the cumulative perennial yield. The dewatering pumpage of 2,000,000 af, if it is correct, will total approximately 51 years of the entire perennial yield for the six basins. The deficit above the perennial yield will be approximately 950,000 af. Total pumpage to date is 1,135,000 af which equals 37 years of the perennial yield in the basin and is a deficit of 595,000 af or about 20 years of the perennial yield. Pumpage from 1992 to 2007 has totaled about three times that which would be allowed by the Nevada State Engineer if he followed Nevada water law of approving water rights applications up to the perennial yield of a basin.

5-15

The source of water to fill the deficit being created on the Carlin Trend is a major problem. When mining ceases, there will be several open pits with groundwater drawdown as much as 1900 feet around them; the pits will fill with water. The drawdown cone volume is effectively the volume of

Response 5-15: Section 3.2.7 – "Impacts to the Regional Water Balance" in the CIA report (BLM 2000) provides modeled results of changes in groundwater flow as a result of dewatering and discharge for three primary drainages associated with the Carlin Trend area. These drainages include Boulder Creek, Maggie Creek, and Rock Creek. Modeling has accounted for all major groundwater deficits including drawdown cone-of-depression, pit lake volume, pit lake evaporation, groundwater mounding/recharge, and crop evaporation. Predicted timeframes provided in these model results indicate a specific recovery period for each of the hydrographic basins; these predicted recovery timeframes account for recovery of "deficits" created by the dewatering and discharge of water associated with mine development. Model results account for "perennial yield" of each basin as a component of recharge affected by the groundwater cone-of-depression during dewatering and recovery.

water that has been removed from the system. The difference between the volume of the pits and the amount of water that would have been stored in the pore spaces of the pit volume is an additional deficit which must be filled.

5-15 (contd)

The SEIS should account for of all the groundwater deficits being created, including drawdown cone and pit lake volume. It should also include in the accounting the actual volume of the mound being created by recharge including an accounting for the additional discharge caused by the mound. The SEIS should then consider how many years of the perennial yield will be tied up making up the deficit.

Model Predictions and Reality

Much of the analysis has been done by updating the groundwater model used in the 2000 cumulative impacts analysis (CIA). It is good that the BLM has updated the model. The updated model was not reviewed for this analysis. However, the SEIS should present up-to-date drawdown maps for the study area. The maps should show drawdown in the Carlin, Vinini and carbonate formations. Predicted drawdown from 2000 should also be shown. This would allow the reader to assess the quality of the original model. This is known as verification. Had this been done, the BLM would have seen the discrepancies discussed below where the current drawdown exceeds the predicted maximum extent of drawdown. The suggested map would also allow the BLM to assess better where additional monitoring may be required to assess the propagation of stress to the northeast.

5-16

The SEIS presents only very cursory results from the up-to-date model. These are primarily limited to a comparison of the maximum extent of the 10-foot drawdown between the CIA prediction and the current prediction. It shows a significant contraction of the ten-foot drawdown area in three locations and states that "the maximum extent of the predicted 10-ft drawdown isopleth due to all Carlin Trend dewatering will be smaller than those predicted previously for environmental assessments in the Carlin Trend" (SEIS page 3-27). However, one location where the model shows a decrease in the ten-foot drawdown extent contradicts the observed data. Two other areas of decreased drawdown have occurred in an area where there is no data. The conclusions in the SEIS regarding less drawdown are dubious. These problems are discussed in the next paragraphs.

5-17

Figure 3-2 presents the ten-foot drawdown cones from the two models (2000 and 2007). The report does not indicate what formation, or model layer, this modeled drawdown will occur in, so it is more difficult to assess.

The first contradiction in the model results is west and southwest of Carlin. The 2000 model indicated that the ten-foot drawdown would include most of the Marys Creek area while the 2007 model indicates the boundary has moved north about three miles. Three wells in the Marys Creek basin, six miles south of the mine site near the Humboldt River, contradict this change and indicate the model was inappropriately updated. The wells provide monitoring data (Newmont 2006) for the alluvium, siltstone and carbonate aquifers (Figure 1). The alluvial well, PAL4 varies as would be expected with wet/dry cycles on the Humboldt River. The siltstone well, PAL1, screened 300 feet BGS and 280 feet below PAL4, may show about a 2 foot drop with time, although the seasonal variation is of the same order of magnitude as the potential trend. The recovery in 2005/2006 may reflect the higher runoff of that period. The water levels are about 5 feet higher than those in the alluvial well which reflects a significant upward gradient between these points. If the recovery in PAL1 is due to high flow, the recharge likely occurs upstream and not at the site. Well PAL3a,

5-18

Response 5-16: The 2007 model update completed by Hydrologic Consultants, Inc (HCI 2007a) was conducted using the same model structure used since 1992, with the exception of adding mounding at Maggie Creek Reservoir and irrigation associated with the Hadley area. The Carlin Trend model is updated and recalibrated every 2 years (most recent update was completed in March 2007). An up-to-date drawdown map has been provided as **Figure 3-5** in this Final SEIS which represents the cumulative or additive drawdown from multiple pumping areas within the Carlin Trend. Calibration conducted on the Carlin Trend model every 2 years has resulted in validation of the model. The following is excerpted from the 2007 Update to the Carlin Trend Numerical Groundwater Model (HCI 2007a):

2.3.4 Steady-State Calibration

Since the only change to the steady-state Carlin Trend model was the finer discretization in the Leeville area, the steady-state calibration did not change from the 2004 Carlin Trend model (HCI, 2005). For completeness, however, the steady-state calibration is presented in this report. It is the same as the steady-state calibration presented in HCI (2005).The 2007 steady-state calibration was evaluated by producing a quality plot using the 161 measured water levels throughout the HSA (Figure 4). On a quality plot, each point represents the measured water level (horizontal axis) and model-predicted water level (vertical axis) at a monitoring location. One measure of the ability of the model to replicate steady-state water levels can be made by fitting a line through the resulting data set. Ideally, a best-fit line would produce a slope close to unity, would pass through the origin, and would also have a correlation coefficient (or) close to 1.0. The calculated best-fit line for the steady-state simulation of the Carlin Trend model had a slope of 1.0 and a corresponding = 0.99. The measured and computed data for the steady-state calibration are contained in Table 3. Plate 1 shows the spatial distribution of the residual between the measured and computed heads.

Three methods that are often cited (Anderson and Woessner, 1992) to assess the "accuracy" of a model are the mean error (ME), the mean absolute error (MAE), and the root mean squared error (RMS). All three of these methods are ways of expressing the average difference between computed and measured heads. Statistical analyses of the measured and calibrated water levels using the ME, MAE, RMS and standard deviation are presented in Table 4. The ME, MAE, RMS, and standard deviation are 3.1, 30.9, 46.6, and 46.5 ft, respectively. The difference between the highest and lowest measured water levels in the HSA is more than 2,200 ft, and the absolute value of the highest residual is 172.9 ft or about 7.8 percent of the range of measured heads.

2.3.5 Transient Calibration

A transient simulation was conducted to evaluate the changes in water levels in the ground-water system calculated by the model in response to historic pumping, injection, infiltration, and irrigation using data obtained from NMC and Barrick for the period of 1988 through December 2006. There were no new hydrogeologic interpretations to add to the transient model, and the model calibration remained satisfactory even with more than two years of additional water level data (i.e., from August 2004 to December 2006) added to the transient calibration plots. This indicates the "maturity" of the Carlin Trend ground-water flow model. Therefore, the numerical model was not changed, other than adding recharge from the Maggie Creek reservoir and Hadley fields.

Data from 198 monitoring wells were used to evaluate the transient calibration. The monitoring well locations are shown on Plate II. Hydrographs showing the calibrated and measured water levels for the selected wells are presented in Appendix A. These wells were selected on the basis of their spatial distribution, the hydrostratigraphic unit into which they were completed, and the amounts of water level data that were available for comparison to model calculated values.

Overall, the transient model calibration is conservative in that it either matches or over predicts drawdown relative to measured values. The predictive capabilities of a ground-water model can be assessed by the use of hydrographs. The potential hydrologic effects in the HSA are a function of declines in regional ground-water levels resulting from mine dewatering and pit lake infilling. Consequently, the "accuracy" of the predictions of the model depends more on the ability of the model to predict water level changes produced by the mining activities than its ability to replicate a series of pre-stress water levels at one point in time. Total reliance on the ME, MAE, and RMS as the only measures of model calibration fails to address the predictive capabilities of the model. Visual examination of the hydrographs presented in Appendix A provides another way of assessing the predictive capabilities of the ground-water model.

Response 5-17: See Response 5-16 for information about the up-to-date model and predicted areas where the drawdown would change. The modeled drawdown areas shown on **Figure 3-5** in this Final SEIS are for the water table aquifer, which includes several geologic units over the Study Area, including carbonate, sandstone, siltstone, siliciclastic, and volcanic rocks. As further discussed in Responses 5-15 and 5-16, observed drawdown is consistent with model predictions.

Response: 5-18: The 10-ft isopleths on **Figure 3-5** depict the maximum area of potential drawdown greater than 10 feet in the upper most layer of the groundwater model (Layer 1). PAL-4 is completed within this layer. As pointed out in this comment, no drawdown has been measured in PAL-4 (Layer 1). PAL-1, also with no measured drawdown from dewatering, is completed within Layer 2 of the groundwater model. PAL-3a is completed within Layer 5. The slow, gradual reduction in water elevation recorded in this piezometer is caused by dewatering at Gold Quarry. The groundwater model reproduces (calibrates to) all three piezometers water level histories, including the small drawdown detected in PAL-3a. The ability of the groundwater model to reproduce these water levels supports the currently projected 10-foot isopleth in this area.

1000 feet deep in carbonates, shows a definite trend with time, dropping about 5 feet since 1993. It experienced a temporary recovery during 2005/2006 but the last two reported water levels were the lowest in the period of record.

Based on the Marys Creek Basin wells, drawdown is extending southwest of the mine to near the Humboldt River, at least in the carbonate aquifer. It may not have yet reached ten feet, but the use of these wells in the recalibration of the model should have resulted in the model predicting drawdown in this basin. That the current modeling actually predicts a contraction of the drawdown prediction raises questions about how the model was recalibrated and verified.

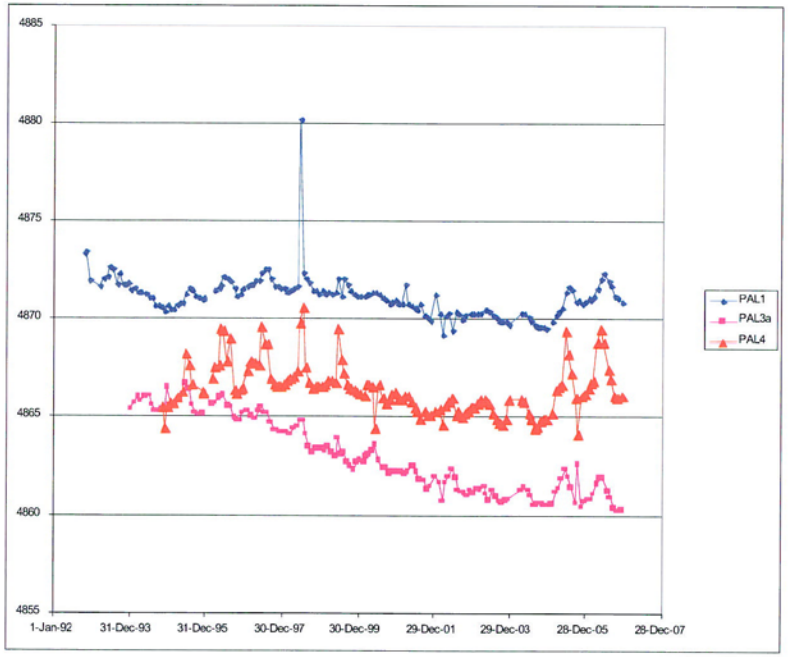


Figure 1: Hydrographs of wells in the Marys Creek basin.

5-18 (contd)

The second area of concern is north of Leeville. The revised 10-foot drawdown prediction is about 15 miles closer to Leeville than in the 2000 model. The primary concern with this is the lack of data to support either location. Plume (2005) shows the 100-foot drawdown cone extends about 8 miles north into the Maggie Creek area. But the location is indeterminate because there are no wells with data to assess the location. Plate 6a of the Maggie Creek Basin Monitoring Plan (Newmont 2006) shows a similar location for the 100-foot drawdown. Either of these locations for the drawdown contradicts both the 2000 and 2007 predicted 10-foot drawdown, which is drawn just

5-19

Response 5-19: Both Plume (2005) and Plate 6a in the Maggie Creek Basin Monitoring Plan depict groundwater elevation changes in the bedrock aquifers (Paleozoic carbonates and siltstones) while the 10-ft isopleths on **Figure 3-5** are for aquifers located near the surface (model layer 1). Layer 1, depending on location, includes basin fill rocks including Quaternary alluvium, Carlin Formation (Tertiary), volcanic rocks, and locally the Paleozoic bedrock units. Plume points out that water level declines in carbonate rocks near Gold Quarry have not affected water levels in overlying basin-fill deposits because the older basin-fill deposits at the base of the Carlin Formation consist of fine-grained poorly permeable sediments. The modeled 10-ft isopleth northeast of Gold Quarry (along Maggie Creek) is within Carlin Formation sediment and is consistent with observed data for this area.

HDP-12 is screened 2,400 feet below the ground surface within upper plate Ordovician Vinini cherty and siliceous mudstones (model Layer 3). The groundwater model replicates the 29 feet of drawdown at this depth below the surface but predicts less than 10 feet of drawdown at the surface (Layer 1).

north of the SOAPA area in the SEIS. The fact that the current 100-foot drawdown extends several miles beyond the point of the 10-foot modeled drawdown suggests the model is wrong.

5-19 (contd)

Well HDP-12 also contradicts the models. It monitors groundwater level just west of the Tuscarora fault, in the Tuscarora Mountains about ten miles northeast of Leeville. As shown on Plate 6a of Newmont (2006), the drawdown there is 29 feet, but this is northeast of the extent of the 10-foot drawdown in the models. This is an additional indication the model is wrong northeast of Gold Quarry Mine.

5-20

Northeast of Gold Quarry three wells monitor groundwater levels – HW-1D, HW-1S, and EIS-MW3. Water levels in both HW-1D and HW-1S, lying about 4 miles from the pit, have experienced about a 150 foot drawdown since 1992 (Figure 2). It took about two years, from 1992 to 1994, for stresses to propagate to these monitoring wells. Since then there has been a continuously increasing drawdown. HW-1D is in carbonate rock and HW-1S is in Vinini sandstone above the carbonate (Figure 3). The water levels change in parallel to each other indicating a good connection between the lower portion of the Vinini sandstone and the underlying carbonate rock. An additional well, EIS-MW3 was installed in 2005 about four miles further from the pit. It has not experienced any drawdown since its construction (Figure 2). It also is in the Vinini sandstone (Figure 4).

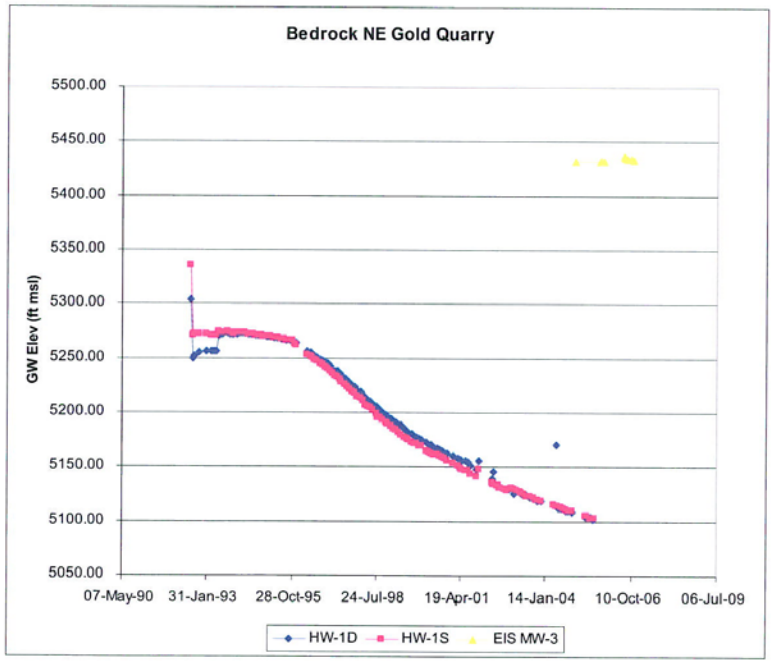


Figure 2: Hydrographs of wells northeast of Gold Quarry mine in the south end of the Independence Range.

Response 5-20: The water resources monitoring program is reviewed and modified, as needed, with input from the BLM.

The CIA report (BLM 2000) evaluated the likelihood of predicted drawdown within the 10-ft isopleth actually affecting springs, seeps and surface water in the Independence Range northeast of Gold Quarry. Spring systems within the cumulative drawdown area were "separated into two distinct types based on elevation: 1) higher elevation springs, seeps, and spring-fed steams supported by perched or localized aquifers such that there is not a saturated continuity between the shallow ground water system and the deeper, more regionally extensive aquifer system; and 2) lower elevation springs, seeps, and perennial streams that are potentially influenced in part by flow from a deeper, regionally extensive aquifer system." This analysis defined the "transition between the two perennial source types occurs at an elevation of approximately 6,000 feet."

This comment suggests the need to expand groundwater monitoring into the Independence Range at elevations greater than 6,000 feet where potential impacts to surface water is not expected. BLM has considered the need for additional groundwater monitoring in this area; monitor well EISMW-3 was required in the SOAPA New Mitigation Measures (BLM 2002a) and that mitigation plan has identified a 'contingency well' east of EISMW-3 if water levels "decline by 20 feet in any given year, or by an absolute decline of 50 feet." No measurable drawdown has been observed in EISMW-3 since installation. Additional groundwater monitoring in this area is not warranted at this time.

Water levels in EIS-MW3 are about 180 feet higher than the first measurements in the other wells (Figure 2), not counting the high first observations which were the static water level upon construction. This may reflect the well's location higher in the mountains nearer a zone of recharge; contours drawn for the before-development state would show a ridge coinciding with the topographic ridge. Based on the completion diagrams (Figures 3 and 4), the water level in HW-1S represents the potentiometric surface several hundred feet below the level of EIS-MW3. Considering the rate the drawdown expanded in HW-1s and –d, it could be causing drawdown at levels below EIS-MW3 that remain undetected in the well. The fact that the completion diagram indicates silt in the Vinini formation at HD-1d also indicates the deeper wells could be in a leaky confined aquifer which would both cause the stress to propagate more quickly and temporarily protect the upper layers from experiencing the additional drawdown.

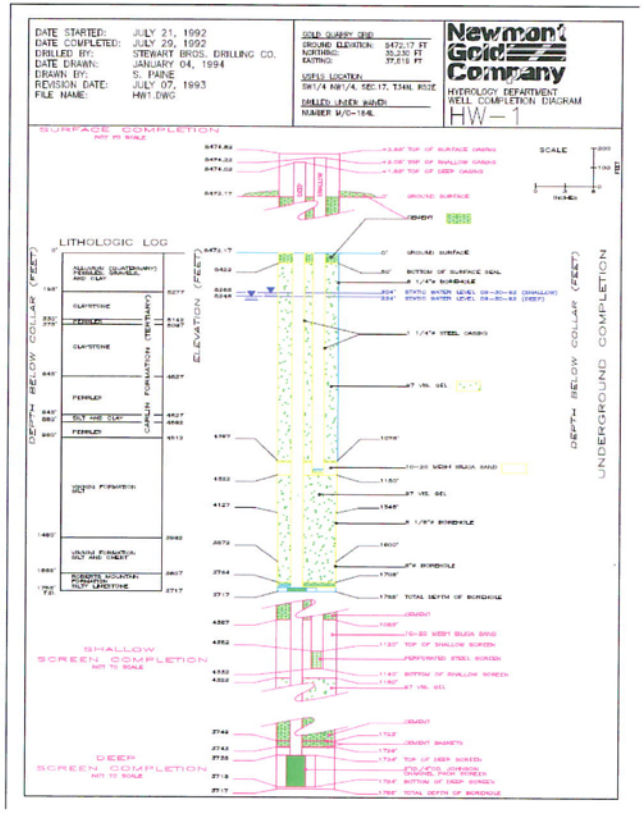


Figure 3: Well completion diagram for monitoring well HW-1 showing the multiple connection.

5-20 (contd)

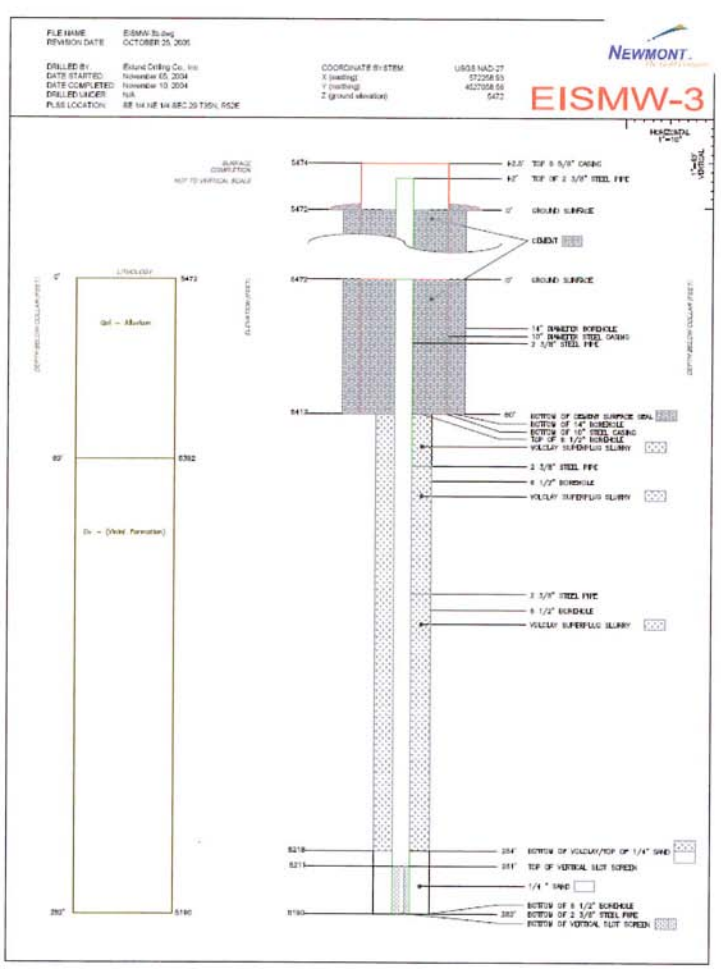


Figure 4: Well completion diagram for well EISMW-3.

As part of the SEIS, the BLM should require a much more extensive monitoring network northeast of Gold Quarry in the Independence Range. The network should include additional wells in upper and lower Vinini formation and in the underlying carbonate.

5-20 (contd)

Recharge Estimates

Another aspect of the model has recently been determined to be wrong. HCI used the Maxey-Eakin method to estimate recharge; however, incorrectly. As described by HCI (1998, pages 29-31), they used the Maxey-Eakin recharge efficiencies, but used them with precipitation determined from local stations. Recently, the Nevada State Engineer ruled that the Maxey-Eakin method applies only when used with the Hardman precipitation map. This is because the method is essentially a statistical relationship that was developed by comparing estimated discharge from 13 basins with precipitation estimates determined with the Hardman map. It could be that the Hardman map underestimated precipitation. If Maxey and Eakin had access to more current higher precipitation estimates, the recharge efficiencies would have been set lower so as to result in the same discharge (discharge had been estimated independent from the precipitation). **5-21**

This is important because higher precipitation estimates result in unrealistically high recharge estimates. In order to adequately calibrate the model, parameters are set to run more water through the system than would be the case if the correct recharge had been used (correct based on a proper use of Maxey-Eakin). It also allows the groundwater deficits to recover faster and minimizes the modeled effect of dewatering on discharge to streams and springs.

General Comments Regarding Water Resources

The SEIS list many mitigation projects and the EIS which caused their implementation. Many of these projects include riparian enhancement and monitoring. The 2003 Betze SEIS apparently conveyed 1.5 cfs of water rights to NDOW for instream flow use (SEIS p. 2-16). The SEIS should describe this in more detail. What was the source of the water rights, their priority, and which stream will have the instream flow rights? Were the rights converted from one a different beneficial use to that of instream flow? **5-22**

Barrick's Betze/Post and Meikle mine dewatering averages 20,000 gpm or 32,200 af/y. This may be the current rate, but certainly is not a long-term average (SEIS p. 2-20). The SEIS should not pretend the current rate resembles the past. There should a complete summary of dewatering for each mine and cumulatively for the entire study area. **5-23**

The SEIS should include a table of discharges to the river from each facility, including Lone Tree. The BLM should include Lone Tree and measure any losses from the river that are occurring due to the filling of the Lone Tree pit. The BLM should include seepage runs in this investigation. **5-24**

Federal Reserved Water Rights

The Draft SEIS fails, like the first FEIS, to adequately review the nature, extent and scope of federal reserved water rights under Public Water Reserve # 107. BLM has a duty under FLPMA and federal law to manage all operations to protect the flows in the waters covered by PWR 107 (e.g., springs and waterholes), and under NEPA to review the extent of these rights and the impacts from mine operations (including dewatering) on these waters and rights. **5-25**

Additional Mining and Other Operations

The Draft SEIS does not provide the detailed and quantitative analysis of all of the other mining operations listed in the cumulative impacts tables in the original Draft and Final EISs. This **5-26**

Response 5-21: Maxey-Eakin (1949) was properly applied to estimate recharge for the groundwater model. BLM is unaware of any decision by the Nevada State Engineer that re-writes Maxey-Eakin. Jeton, Watkins, Lopes and Huntington (USGS 2005) evaluated the Oregon Climate Service's computer program which estimates precipitation in Nevada, which is called the Parameter-elevation Regressions on Independent Slopes Model, or PRISM. Jeton *et al.* conclude that "…for watershed-scale studies, developing basin-specific precipitation-elevation relations from representative climate stations (ideally in or near the study basin) may be more appropriate" than using PRISM. The State Engineers office does not encourage the use of PRISM to calculate precipitation and recommends either using basin-specific precipitation data or, if those data are not available, the Hardman map.

Response 5-22: The source of the water right is Barrick Goldstrike Mines, Inc. – Application No. 71517 with a priority date of 01/01/1886; the right applies to Rock Creek.

Response 5-23: The CIA report (BLM 2000) includes an evaluation of past, present, and future mine discharges in the Carlin Trend including the Betze-Post and Meikle Mines. More information is included Section 3.2 – *Impacts from Mine Dewatering and Localized Water Management Activities* (BLM 2000). The most recent groundwater model update report by HCI (2007a) includes graphs of past and predicted dewatering rates for the Gold Quarry and Leeville mines.

Response 5-24: An analysis of existing and projected mine dewatering and discharge rates throughout the Humboldt River basin was compiled in the CIA (BLM 2000). Updates to water resource conditions in the Carlin Trend were completed as a result of recalibration of the numeric groundwater model (HCI 2007a) used to predict impacts to water resources in the Carlin Trend in the Draft SEIS. BLM has determined that information provided in the CIA, including pumping rates, discharge rates, and predicted effects on the Humboldt River, along with the "2007 Update of Carlin Trend Numerical Ground-Water Flow Model" (HCI 2007a), remain valid for purposes of the SEIS analysis. See also Response 5-3 and 5-23 above.

Response 5-25: Public Water Reserves covering four springs in the cumulative effects study area are located outside the area of predicted groundwater drawdown and are not expected to be affected by mine dewatering activities. Only seeps and springs that have sufficient flow to be important for stockwatering and domestic use qualify as public water reserves under the 1926 Executive Order, and the reservation applies to only that amount of water necessary to fulfill the purpose of the reservation – namely, to prevent monopolization of springs and waterholes on public land needed for stockwatering or domestic purposes. *United States vs. City and County of Denver*, 656 P.2d 1 (Colo. 1982); *Purposes of Executive Order of April 17, 1926, Establishing Public Water Reserve No. 107, 90 I.D.81 (1983)*. The United States has filed claims for PWR's under the 1926 Executive Order on four springs occurring within the study area. None of those springs are projected to be incrementally impacted by mine dewatering at SOAPA. The SOAPA EIS (BLM 2002a) identified 5 seeps or springs that may be incrementally impacted by dewatering at SOAPA. As explained in this Final SEIS, none of those five seeps or springs would qualify as a PWR 107 water right, since four of them are situated on private land, and water rights for the fifth spring predate the 1926 Executive Order establishing PWR 107 rights. Consequently, SOAPA will not have any cumulative impact on PWR 107 water rights.

Prior NEPA analyses identified 25 other seeps and springs that could potentially be impacted by previously-approved dewatering at the South Area Operations Project. Comprehensive groundwater and spring/seep monitoring data document that none of those springs or seeps have been impacted by mine dewatering. Moreover, pursuant to approved mitigation plans, Newmont is required to monitor groundwater levels in sensitive areas to provide advance notice of potential impacts to those seeps and springs, which will allow for mitigation measures to be implemented in advance of any effect on flows. Newmont is required to provide mitigation for lost flows at seeps and springs through replacement of flows or provision of substitute water sources to ensure that uses of potentially impacted seeps and springs are protected from the cumulative impacts of mine dewatering at SOAP and SOAPA, regardless of whether they are a Public Water Reserve. Specifically, in the event the flow of springs or seeps on public land is impacted, Newmont is required to take action "to replace any stockwater loss caused by mine dewatering."

is required by the Ninth Circuit's decision. A full and detailed review of the impacts from each of these mines on the environment, including air and water resources, Native American religious/cultural resources and uses, fisheries and wildlife, among other impacts, should be reviewed. The same is true for other past, present and reasonably foreseeable future actions such as the power plant. Although briefly discussed, the full impacts from that plant are not detailed. 5-26 (contd)

Conclusion

The SEIS does not meet the requirements of a cumulative effects analysis of issues in the Carlin Trend area. The concerns noted above regarding water resources, groundwater modeling, agriculture, and air quality should be corrected. The BLM should also include the additional discussion requested above for the final SEIS. The groundwater model should be recalibrated and new predictions made for the final SEIS. 5-27

References

Bureau of Land Management (BLM), 2000. Cumulative Impact Analysis of Dewatering and Water Management Operations for the Betze Project, South Operations Area Project Amendment, and Leeville Project. April, 2000. U.S. Bureau of Land Management, Elko, NV

Flint, A.L., L.E. Flint, J.A. Hevesi, and J.B. Blainey, 2004. Fundamental concepts of recharge in the Desert Southwest: A regional modeling perspective, pages 159- 184 in Hogan, J.F., F.M. Phillips, and B.R. Scanlon (ed.), Groundwater Recharge in a Desert Environment: the Southwestern United States. American Geophysical Union, Washington DC.

Newmont, 2006. Maggie Creek Basin Monitoring Plan 2nd. Quarter of 2006 and 3rd. Quarter of 2006

Plume, R.W., 2005. Changes in Ground-Water Levels in the Carlin Trend Area, North-Central Nevada, 1989 – 2003, Scientific Investigations Report 2005-5075. U.S. Geological Survey.

Prudic, D.E., J.R. Harrill, and T.J. Burbey, 1995. Conceptual Evaluation of Regional Ground-Water Flow in the Carbonate-Rock Province of the Great Basin, Nevada, Utah, and Adjacent States. U.S. Geological Survey Professional Paper 1409-D. Washington.

Response 5-26: The comment suggests incorrectly that the SEIS does not provide a sufficiently detailed discussion of mining operations or other past, present, and reasonably foreseeable actions within the study areas, such as the TS Power Plant. The purpose of the SEIS is to provide an updated and expanded examination of the potential cumulative impacts of SOAPA. The Council on Environmental Quality's regulations define a "cumulative impact" as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR § 1508.7). Accordingly, the SEIS contains a sufficiently detailed discussion of other past, present and reasonably foreseeable actions within the study areas to allow BLM to evaluate the interaction between the impacts of those activities and SOAPA. In doing so, the SEIS provides a detailed summary of the past, present and reasonably foreseeable activities within the various cumulative impact study areas, and examines, on a resource-by-resource basis, the potential incremental impacts of SOAPA when added to the impacts from those other actions.

Response 5-27: The Carlin Trend model has been recalibrated and updated results are presented in this Final SEIS and in the report "2007 Update of Carlin Trend Numerical Ground-Water Flow Model" (HCI 2007a). BLM completed the Draft and Final SEISs in accordance with the Ninth Circuit Court's decision.

Letter No. 6

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

November 9, 2007

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

Subject: South Operations Area Project Amendment Cumulative Effects Draft Supplemental Environmental Impact Statement (SEIS) [CEQ # 20070368]

Dear Mr. Miller:

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's (CEQ) NEPA Implementation Regulations at 40 CFR 1500-1508, and our NEPA review authority under Section 309 of the Clean Air Act.

The Bureau of Land Management (BLM) published the South Operations Area Project Amendment (SOAPA) Cumulative Effects Draft Supplemental Environmental Impact Statement (SEIS) in response to a decision by the U.S. Court of Appeals for the Ninth Circuit: Great Basin Mine Watch v. Hankins, 456 F.3d 955, 9th Circuit 2006. The Court required BLM to prepare a Supplemental EIS to adequately address the cumulative impacts for the SOAPA, which was analyzed in a Draft EIS in 2000 and a Final EIS in 2002. BLM signed the Record of Decision for the project in 2002. The project has been operating throughout the law suit.

We have rated the SOAPA Draft SEIS as "EO-2 – Environmental Objections – Insufficient Information" (see enclosed "Summary of Rating Definitions and Follow-Up Action"). Together, the 2002 SOAPA Final EIS and the current SOAPA SEIS constitute the SOAPA EIS. Our rating is based on our continuing environmental objections to the project because of its potential significant adverse impacts to water quality. We do not believe the project includes sufficient measures to ensure against acid rock drainage. Neither the original EIS nor the Draft SEIS contains sufficient information to confirm that the acid neutralization potential of SOAPA waste rock is adequate to prevent acid generation and ensure against adverse impacts to water quality over the long term. We recommend that the Final SEIS provide additional information regarding mine geochemistry, measures to prevent acid drainage, mitigation for potential impacts to pit lake water quality, water quality monitoring, mercury emissions and controls, and

bonding and long-term financial assurance. Our detailed comments are enclosed. Our recommendations are consistent with our previous comments on the SOAPA Draft and Final EISs. While we understand that this project has been ongoing for several years, this SEIS provides an opportunity for reevaluation of, and adjustments to, some project components to ensure protection of environmental resources, both during mine operation and after mine closure.

We are glad we had the opportunity to review this Draft SEIS and raise these issues to BLM in advance of our letter. We look forward to working with BLM to identify solutions to the concerns we have raised. We request one copy of the Final SEIS be sent to this office when it is officially filed with our Washington, D.C. office. If you have any questions, please call me at (415) 972-3846, or have your staff call Jeanne Geselbracht at (415) 972-3853.

Sincerely,

Nova Blazej, Manager
Environmental Review Office

003491
Enclosure

Cc: David Gaskin, Nevada Division of Environmental Protection
Paul Pettit, Newmont Mining Corporation
Damien Higgins, U.S. Fish and Wildlife Service

South Operations Area Plan Amendment
Draft Supplemental Impact Statement

Mine Geochemistry and Waste Rock Management

In our October 26, 2000, comment letter on the South Operations Area Plan Amendment (SOAPA) Draft Environmental Impact Statement (EIS) and our June 4, 2002, comment letter on the SOAPA Final EIS, we expressed objections to the project in part because of its potential for significant adverse impacts to water quality from acid rock drainage. We requested a copy of the geochemistry studies conducted for the project and recommended the Final EIS include a summary of the geochemistry to clarify the acid generating potential of the waste rock piles. Specifically, we requested static and kinetic test results for representative samples of each rock type, sampling type and frequency, the geochemical model used, volume estimates for each rock type that would be placed in the waste rock piles, and volumetric calculations of acid neutralization potential to acid generation potential (ANP:AGP) for the waste rock. We also recommended that BLM require more frequent waste rock sampling; specify, in detail, the requirements and source for the neutralizing material necessary in the waste rock dumps; consider that neutralizing waste rock may need to be stockpiled for purposes of strategic placement; and address long-term bonding needs prior to issuance of the Plan of Operations. We did not receive this information, and it was not provided in the Final EIS or the current Draft Supplemental Impact Statement (SEIS).

According to the Draft SEIS (Table 3-1), 47 percent of the waste rock at Gold Quarry is potentially acid generating (PAG). Acid mine drainage from PAG rock releases metals and other constituents that can contaminate surface water, groundwater, and mine pit lakes for hundreds or thousands of years. PAG waste rock must be strategically placed so it is surrounded by sufficiently neutralizing waste rock to preclude the generation of acidic drainage and associated contaminants. Given such a high amount of PAG rock at SOAPA, EPA believes there may not be a sufficient amount of neutralizing waste rock to buffer all the acid generated, which could result in long-term unmitigated releases to surface water and groundwater. In addition, we believe the amount of PAG rock at SOAPA could be significantly greater than 47 percent. The 47 percent projection was estimated based on Newmont's Net Carbonate Value (NCV) testing, which does not account for some uncertainties and does not appear to have been confirmed with kinetic tests. We believe the NCV values may underestimate the potential for acid generation at this mine.

We are also concerned because the Draft SEIS (p. 3-3) states that waste rock generated at the mine is classified in accordance with Nevada Division of Environmental Protection (NDEP) Waste Rock and Overburden Evaluation Guidelines (1996). NDEP classifies PAG waste rock with an ANP:AGP ratio of 1.2:1 or higher as non-PAG rock. This reference is inconsistent BLM Nevada's Instruction Memorandum No. NV-97-017, which defines samples with an ANP:AGP ratio between 1.0 and 3.0 or a net neutralizing potential between -20 and +20 tons $CaCO_3$ per kiloton rock material as having an uncertain acid generation potential, and recommends kinetic tests be conducted on

6-1

Response 6-1: The comment refers to past EPA comments on the Draft SOAPA EIS and the Final SOAPA EIS that were issued for public comment in 2000 and 2002, respectively. Those prior comments, as well as the present comment, address measures for characterizing and managing waste rock for those proposed actions, which were previously evaluated in NDEP and BLM review of the various permit applications and disclosed in the SOAPA Project EISs. The purpose of the SEIS is to provide updated and expanded analyses of the potential *cumulative* impacts of SOAPA when combined with other past, present and reasonably foreseeable actions. Reevaluation of the plan of operations for SOAPA, which was analyzed in permit applications for conformance to mining regulations and described in EISs is outside the scope of the SEIS. BLM is not aware of any new information or changed circumstances that would justify such a reevaluation at this time.

samples within this range to better determine potential to generate acid. If only waste rock with an ANP:AGP ratio equal to or less than 1.2:1 is classified and disposed as PAG rock without confirmation by kinetic testing, it is possible that some waste rock is being misclassified and improperly disposed.

Recommendation: We recommend that BLM reevaluate the geochemistry for this mine and provide a description in the Final SEIS of this evaluation, supporting it with the detailed geochemistry information requested above. If kinetic testing has not been conducted, we recommend BLM require it for waste rock with ANP:AGP ratios between 1:1 and 3:1 to better characterize this portion of the waste rock and help determine how it should be properly disposed. If kinetic testing is not conducted, we recommend waste rock with AGP:ANP ratios less than 3:1 be classified as PAG for purposes of proper disposal.

6-1 (contd)

Neither the 2002 SOAPA Record of Decision nor Newmont's *Refractory Ore Stockpile and Waste Rock Dump Design, Construction and Monitoring Plan* (2003) include sufficient measures to ensure that waste rock piles would be adequately designed and material with sufficient acid neutralization potential would be available to prevent acid generation at the mine. In light of the high volume of PAG waste rock at the mine, we believe sufficient neutralizing waste rock may not be available and borrow material may be needed to adequately neutralize PAG waste rock at the mine. Accurate characterization of the waste rock is important in determining the amount and timing of available neutralizing waste rock to sufficiently encapsulate and buffer the PAG rock. One purpose of a waste rock handling plan is to specify how the distinctions within and between the different rock types will be made during operations and how each rock type will be disposed accordingly. We have serious concerns about the existing plan for waste rock management at this mine for the following reasons:

- The plan specifies that sulfide waste rock dumps are placed on a 12-inch layer of waste rock, existing subsoil, or borrowed subsoil with a permeability of 1×10^{-5} cm/sec or less. EPA's analysis has determined that such a layer would not necessarily preclude leachate movement through it.

- The plan specifies that PAG material within the waste rock dump is encapsulated with a 10-foot layer of waste rock with an ANP:AGP ratio of at least 3:1, especially in situations where the first-loaded material is PAG. A thick neutralizing base layer is a positive component of the management plan. However, the plan does not account for the actual amount of neutralizing waste rock needed for each PAG cell based on stoichiometry. For example, a ten-foot layer of neutralizing rock may not be sufficient for lifts of PAG waste rock many times thicker.

- The plan does not specify that sulfide waste rock would be encapsulated on all sides with sufficiently neutralizing waste rock. PAG rock could be laterally surrounded with "non-reactive material," which would not necessarily provide any neutralizing potential. The appropriate volume and neutralizing capacity of

6-2

Response 6-2: As discussed in **Response 6-1** above, measures for characterizing and managing waste rock in connection with SOAPA operations were evaluated in prior agency review of permit amendment applications and disclosed in a NEPA document. The current plan for characterizing and managing waste rock at SOAPA was previously approved by the Nevada Division of Environmental Protection (NDEP) and reviewed by BLM. Pursuant to the State of Nevada's water pollution control permit program, NDEP approved Newmont's Refractory Ore Stockpile and Waste Dump Design, Construction and Monitoring Plan (2003). As discussed in the SOAPA FEIS, that plan includes specific requirements for characterizing, managing, and monitoring waste rock generated at SOAPA to ensure that water resources are not adversely impacted by acid generation within the waste rock disposal facilities (SOAPA FEIS, pp. 2-23 to 2-28, 3-3 to 3-5, and 4-2 to 4-5). The BLM is not aware of any new information or changed circumstances that would require reevaluation of the waste rock characterization and management requirements for SOAPA. There are no known incidences of acid rock drainage being released to the environment from the waste rock disposal facilities at SOAP or SOAPA.

encapsulating rock needs to be calculated for each lift of PAG rock based on stoichiometry of the material.

Recommendation: The Final SEIS and Record of Decision (ROD) should describe how sufficient neutralizing material will be assured and all waste rock will be properly disposed during all phases of the project to prevent acid rock drainage. The site specific waste rock handling plan should identify all areas of PAG waste rock based on the appropriate geochemical analysis, and identify the source of neutralizing material for each phase when PAG waste rock is disposed. If the volume and neutralization potential of waste rock will not be sufficient based on stoichiometry, we recommend appropriate borrow material be used. The Final SEIS should describe the site specific waste rock handling plan, and it should be included in the ROD.

Recommendation: We recommend an implementation monitoring plan be developed and followed to ensure proper placement of waste rock.

6-2 (contd)

The Final EIS and Draft SEIS do not identify or discuss the potential impacts should the waste rock dumps fail to contain and control all waste rock drainage (acidic and neutral), both beneath and downgradient of the facility. The Gold Quarry North Waste Rock Disposal Facility is proximate to Maggie Creek. These documents do not provide information on how contaminated groundwater or surface water would be mitigated should it occur.

Recommendation: The Final SEIS should discuss the potential impacts to surface water and groundwater resources should the waste rock dumps generate uncontrolled drainage either in the short- or long-term, and describe contingency measures to control these releases.

6-3

Water in the post-closure Gold Quarry pit lake would exceed drinking water or aquatic life water quality standards for antimony, manganese, mercury, and selenium (Draft EIS, p. 4-51). However, the potential ecological risks have not been fully addressed, and commitments to mitigation measures have not been made. The Draft SEIS (p. 3-29) states that, because pit lakes are not intended to be used by fisheries, aquatic life standards are not applicable to the pit lake. However, fish live in several pit lakes in Nevada. It is appropriate, therefore, to discuss whether future pit lake water is predicted to always meet all aquatic life standards, describe measures to monitor the pit lake and mitigate potential impacts, and estimate the cost of conducting these activities.

Recommendation: The Final SEIS and ROD should describe monitoring measures for pit lake water quality during and after infilling, the mitigation measures that would be implemented if necessary, and the estimated cost of conducting these activities. These costs should be included in the post-closure monitoring and mitigation fund.

6-4

Response 6-3: NDEP evaluates the design and construction of each waste rock disposal facility built in the Carlin Trend for conformance with regulations and to ensure that leachate formation is controlled and limited to reduce or eliminate release of trace metals to the environment. BLM reviews these designs.

Waste rock disposal facilities are constructed on a base of compacted, low-permeability material designed to prevent vertical migration of fluids. The compacted base is sloped to allow drainage to a collection point. Majority of water draining to the collection point is lost to evaporation. Excess water accumulating in the collection pond is transported to the 5/6 tailing impoundment in the South Operations Area. Surface drainage upslope of the base perimeter is diverted to prevent run-on to the disposal facility. Additionally, agencies require installation of monitoring wells to determine if leachate is affecting the environment.

Discovery of leachate that is releasing trace metals to the environment through the monitoring program could lead to mitigations involving removal of portions of waste rock disposal facilities and reconstruction of the facility to arrest the problem areas. Other options include regrading the surface of the facility to reduce the amount of infiltration that is occurring in the facility. Agencies will maintain reclamation bonds on facilities until adequate stability (physically and leachate formation) is achieved.

Response 6-4: Pit lakes in Nevada are not required to contain water of sufficient quality to support aquatic life. As described in the Draft SEIS, pit lakes are not intended to be used for drinking water (humans or livestock), recreational swimming, or fisheries. Water quality standards that support these uses are generally not applicable to pit lakes. Most hard rock mine pit lakes will not evolve to support aquatic life because many are very deep with steep sides, and become permanently stratified. Because of the steep pit walls, limited littoral zone is available to support primary biological productivity and aquatic life. Consequently, primary productivity is associated with the limnetic zone (algal), and this is expected to be further limited by lack of nutrients (usually phosphate) that is bound up with iron and other metals. Post-mining water monitoring of pit lake quality will be conducted by the mining companies.

During pit lake development, real-time measurement of chemistry will provide data to assess potential water quality issues and allow effective management of lake chemistry. During the first 5 years of pit lake development, the monitoring program for the lake would include:

- Water level monitoring of the pit lake;
- Surface sampling and laboratory analysis of lake water chemistry for NDEP Profile I suite plus phosphorous;
- Depth profiling of total dissolved solids (TDS), pH, temperature, and dissolved oxygen;
- Depth sampling of lake water chemistry;
- Alluvial groundwater level monitoring on a site-wide and regional scale; and
- Bedrock groundwater level monitoring on a site-wide and regional scale.

Monitoring data will be used to determine the physical and chemical evolution of the pit lake using frequent sampling intervals during initial filling, and longer intervals as the lake evolves. Monitoring data will be used to interactively plan the management program.

Financial Assurance

In light of the high amount of PAG waste rock at this mine, EPA has serious concerns that bonding for this project may be significantly underestimated because additional borrow material may be necessary. Adequate bonding is critical to ensure funds will be available to properly close the site and reduce the potential for future taxpayer liability. 6-5

Recommendation: We recommend BLM reevaluate the reclamation bond, taking into account the potential need for neutralizing borrow material. The Final SEIS and ROD should include an updated bond estimate.

In light of the uncertainty whether sufficient neutralizing waste rock is available for the SOAPA, it is unclear that the high volume of PAG waste rock disposed since 2002 has been sufficiently encapsulated/neutralized. In our Draft EIS comment letter, we recommended that the Final EIS discuss whether long-term operations and maintenance may be necessary after closure of the South Operations facilities and indicate the estimated financial assurance amounts for these activities. This information was not provided in the Final EIS, and BLM responded that addressing closure would be an iterative process with NDEP. As we have stated in the past, BLM should not wait until closure to determine whether a long-term operation and maintenance plan will be needed to avoid environmental degradation in the future. Such determinations are a part of project evaluation during project planning because they are necessary for decisions on whether and how the proposed project should go forward. NEPA requires that all relevant information concerning environmental impacts be disclosed to the public before decisions are made and before actions are taken (40 CFR 1500.1 (b)). If a long-term trust fund is deemed necessary, early contribution of funds is necessary to ensure adequate funds will be available in the future to cover operation and maintenance after the mine is closed and reduce the potential for future taxpayer liability. Deferring payments for many years would require a larger sum to be paid by the mine operator near or after project completion. 6-6

Recommendation: In its reevaluation of the geochemistry of this mine, we recommend BLM address whether a long-term operation and maintenance plan and trust fund are needed to control acid drainage in the future. The Final SEIS and ROD should thoroughly discuss this assessment by providing information to support BLM's determination. If a long-term operation and maintenance plan would be needed, the Final EIS and ROD should describe the plan in detail and identify and justify the amount and terms of the trust fund.

BLM anticipates seepage from the tailings will be minimal (Final EIS, Response 63r), and treatment and disposal of residual effluent, if necessary, would be addressed in the Closure Plan that will be submitted to NDEP two years prior to closure. In our comments on the Draft and Final EISs, we recommended that BLM require a long-term care plan for the tailings prior to approval of the Plan of Operation, with financial assurance sufficient to cover the monitoring and pump/ treat/ disposal that may be necessary after closure.

Response 6-5: Pursuant to applicable Federal (43 CFR 3809) and State of Nevada (NAC 519A.380) requirements, the adequacy of financial assurance for reclamation of SOAPA is reviewed at least every three years. For projects that provide phased bonding, adequacy of financial assurance is reviewed annually (43 CFR 3809.553b). Pursuant to those requirements, BLM and NDEP have routinely reviewed the financial assurance of SOAPA and bond amounts have been increased commensurate with current estimated reclamation costs. Periodic reviews of financial assurance will continue to be conducted until reclamation is complete. Newmont currently maintains a bond level of $112.4 million for SOAPA.

Response 6-6: Based on available data, the amount of neutralizing waste rock available to encapsulate PAG material at SOAPA appears adequate. The reviewer implies a contingency bonding effort may be necessary prior to completion of the Closure Plan, which is specifically ruled out in 65 Fed. Reg. 69998, 70069 (2000).

The Draft and Final SEISs were compiled to address cumulative effects for the SOAPA project. Development of post-closure, long-term operation and maintenance plans is outside the scope of the SEISs. As stated in this SEIS, a final closure plan would be developed with NDEP within two years of mine closure. Also see Response 6-5.

We recommended that BLM not wait until two years prior to closure to require financial assurance for this activity for the reasons stated in the previous paragraph.

Recommendation: The Final EIS and ROD should commit to including sufficient coverage for handling closure/post-closure tailings seepage for as long as it may be necessary. This financial assurance should be included in the updated bond estimate and, if necessary, long-term operation and maintenance plan and fund. **6-6 (contd)**

Mercury Air Emissions

The Emigrant Project Draft EIS (p. 4-11) and Leeville Mine Draft EIS (p. 4-14) both indicate that ore processed from those mines at the South Operations Area would offset production from existing sources with no projected increases in total annual mercury emissions from the South Operations Area. It is unclear what such offsets would entail and which existing sources would be offset. Different ore bodies contain different amounts of mercury. Although mercury emissions controls at Newmont's South Operations Area capture a substantial amount of mercury at its processing facilities, emissions are a function of the mercury content of the ore. None of the earlier EIS analyses conducted for the SOAPA, Leeville, or Emigrant projects estimate the amount of mercury that could be released into the air by processing ore from the Leeville and Emigrant mines, describe how controls at the South Operations facilities will reduce mercury emissions from these ores, or discuss potential deposition impacts to watersheds. In addition, it is unclear whether the current mercury emissions at the South Operations Area, reported as 311 pounds for 2006 (Draft SEIS, Table 3-2), are expected to be similar over the remainder of the life of the Leeville project. **6-7**

Recommendation: The Final SEIS should provide additional information regarding ore sources and existing and future projected mercury emissions and watershed deposition impacts from Emigrant, SOAPA, and Leeville ore processing at South Operations, as well as from other mines that may foreseeably be processed at Newmont's South Operations. This discussion should break down the mercury emissions projections for each mine to illustrate how emissions are, or will be, offset.

Recommendation: The Final SEIS should provide an updated, detailed list of all sources of mercury, the unit processes that generate mercury, and the equipment included in the system to condense, capture, and/or treat mercury and reduce mercury emissions.

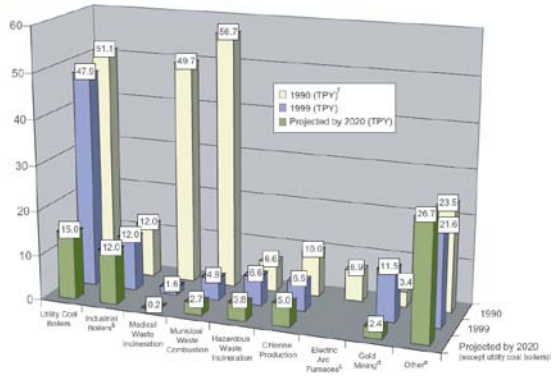
The 2006 testing required for Tier 1 facilities under Nevada's Mercury Control Program has revealed that the pre-heaters at Newmont South Operations Area emit a significant amount of mercury air emissions. **6-8**

Recommendation: The Final SEIS should identify the controls Newmont anticipates installing on these units in the second phase of Nevada's Mercury

Response 6-7: The Nevada Mercury Air Emissions Control Program adopted in 2006 requires reporting of mercury emissions from stationary sources that process gold or silver ore (NAC 445B.2 – 445B.41). Newmont's Gold Quarry ore processing facilities reported a total of 311 pounds of mercury emitted during calendar year 2006 (928 pounds annually from all sources in the Carlin Trend).

Mercury emissions from the U.S. are estimated to contribute 3 percent of the global total, of which gold mining and processing accounts for about 0.16 percent (USEPA 2008). The following figure taken from EPA's Roadmap for Mercury, July 2006 indicates where mercury emissions from gold mining ranks in terms of other sources of mercury on a national basis.

FIGURE 2. Air Emissions Data for Mercury



[a]Fifteen tons per year will be acheived when full implementation of the Clean Air Mercury Rule is achieved, which may exceed 2020.
[b]Growth in this sector is being offset by regulation.
[c]Electric Arc Furnaces data not available for 1999. The 2002 estimate is 10 tons per year.
[d]The 1990 emissions estimate is a preliminary estimate and is based on back calculations and assumptions using data from 1999 along with information about types of processes, production rates, and ores used in 1990 compared to 1999.
[e]These projected emissions do not account for reductions from non-regulatory actions described elsewhere in the Roadmap.
[f]1 ton equals 0.9070 metric ton

Response 6-8: Emissions from ore pre-heaters at the South Operations Area have decreased from 267.05 lbs/yr Hg in 2005 to 51.92 lbs/yr Hg in 2006 (reported to NDEP-BAQP in 2006 Annual Hg Emissions Addendum) and were further reduced to 23.81 lbs/yr Hg in 2007 (reported to NDEP-BAQP in 2007 Annual Hg Emissions Addendum) based on annual source testing. Newmont is proposing additional control(s) to achieve NVMACT under the Phase II permitting application for the Nevada Mercury Air Emissions Control Program (NMCP).

Controls that could be installed during the second phase of the mercury control program include and Energy Recovery System (to cool the gas stream); addition of chemical additives to the caustic scrubber; improved retort efficiency; and addition of carbon absorbers.

6-8 (contd)

Control Program, and discuss whether a significant change in the pre-heater emissions is expected.

6-9

In the section addressing mercury emissions, the Draft SEIS discusses a recent study by EPA's contractor, ICF International (November 30, 2006). The Draft SEIS (p. 3-17) states this report concludes that "the dominant influence on air quality impacts for mercury is generally the source closest to the receptor." This is an incorrect interpretation of the report. The analysis in the report for individual states focuses on the single grid cell where sources in that state contribute the most to deposition. For instance, Figure 7-42 of the report depicts the single grid cell (blue triangle) with the maximum simulated contribution from sources within Utah. The "Contributions to Total Deposition" chart in Figure 7-42b of the report indicates that, for this grid cell, Utah sources are contributing 74.7% of total deposition. This single grid cell is not necessarily the location in the state that has the greatest overall mercury deposition or the greatest deposition from out of state sources. Therefore, it does not present a complete picture of how Nevada sources, and northern Nevada sources in particular, are affecting neighboring states.

In order to draw conclusions about the cumulative impacts of mercury in the cumulative effects study areas (CESA), the model's GIS AggreGATOR tool should be used. For any given 12-km grid cell within the United States, the tool can be used to trace mercury emissions back to the sources that were tagged for the model. For example, Gold Quarry is individually tagged in the model, as are the Barrick Gold Strike, Twin Creeks, Jerritt Canyon, Bald Mountain, and Cortez mines. In addition, the model includes a collective tag for all Nevada gold mines.

This model and tool will be updated within the next few weeks, and we will provide BLM with a copy as soon as it is available. The current version of the tool allows the user to trace emission related deposition backward from a 12-km grid to the tagged sources. The update will allow users to start with individual or combined tagged sources of interest and determine their deposition impacts. This application should, in turn, help the user delineate a reasonable CESA for mercury impacts.

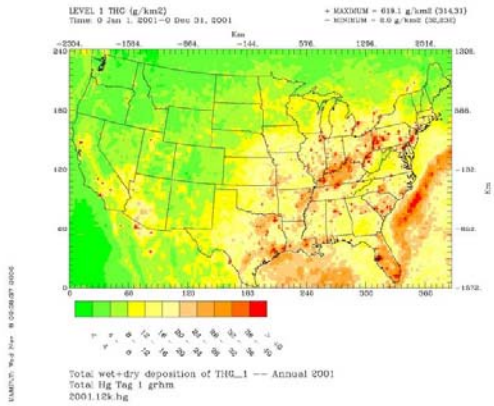
> **Recommendation:** The Final SEIS should describe and quantify in detail the mercury impacts in the CESA based on the modeling results, which can be accessed with the updated GIS AggreGATOR tool.

6-10

The Emigrant Mine should be included in the CESA because of its ore processing association with the South Operations Area. The CESA for air and water resources affected by mercury may need to be expanded based on the results of the modeling. The updated model and tool, which will allow users to start with individual or combined tagged sources of interest and determine their deposition impacts, should help BLM to delineate a reasonable CESA for mercury impacts. The cluster of grid cells that are demonstrated by the model to be affected to a reasonable degree by mercury deposition in and from northern Nevada should suggest the location and extent of the CESA.

Response 6-9: The discussion about mercury in the Draft SEIS discloses that, at the peak impact point in Utah, the effect of mercury from Nevada sources is minor. The Draft SEIS is correct, except that for purposes of the USEPA/ICF International document, the "peak impact point" is defined as the point with peak impacts from sources within Utah only. Essentially, the document defines a peak impact point using sources within the state only; then the document determines how much is contributed by other states at that point. The possibility that there could be a higher peak impact point at some other location than the one predicted by the Utah sources alone detailed in the comment is inconsistent with the national model results (see figure below) which shows the peak impacts when all states are considered as being at the same location. Peak deposition at the peak impact point in Utah is approximately 63 grams per square kilometer (g/). Of this total, less than 0.2 percent (0.13 g/) is sourced from other states. The national map shown below shows that impacts on the portion of Utah nearest the Carlin Trend are some of the lowest deposition rates in the state of Utah and certainly not indicative of any substantial migration of mercury from sources in the Carlin Trend. At the peak impact point in Nevada, the deposition rate was 70.2 g/, reducing to less than 12 g/ in the area east of Carlin. Based on this information, it is unlikely that sources in the Carlin Trend have any measurable contribution to mercury deposition Utah. It is not clear whether **Figure 7-42** reflects the model results from Utah sources only, but it is clear the national figure (Figure 6-3c below) includes the sources from all states and presents the same picture for Utah as Figure 7-42. On **Figure 7-42(b)**, the discussion concerns results at the blue triangle location, which is defined on the basis of Utah-only sources. \

Figure 6-3c. Simulated Annual Mercury Deposition (g km^{-2}) for the REMSAD 12-km Modeling Domain (with GRAHM Boundary Conditions): Total (Dry + Wet) Deposition.



Response 6-10: The Cumulative Effects Study Area for air resources is based on regulated emission sources and fugitive dust sources that could combine together and result in an additive impact on the environment. The state of Nevada has developed their regulatory program for air emissions using designated airsheds that are based on hydrographic basins. As such, the determination of cumulative impacts for air pollutants uses these airshed basins as the model inputs. The proposed Emigrant Mine is located in an airshed basin that is too distant (based on model criteria) from other sources in the Carlin Trend to include as an additive source for cumulative effects assessment.

It is appropriate to include mercury emissions that result from processing carbon impregnated with precious metals from leach operations at the proposed Emigrant Mine in the modeled area for cumulative effects to air quality because the carbon is processed at the South Operations Area. Emissions from operations that would be associated with the proposed Emigrant Project that are not included in the cumulative effects include gaseous emissions from mining equipment and fugitive dust from haul trucks and mining equipment. The model domain as described in the *Air Quality* section of this Final SEIS provides the rationale for the cumulative effects study area designation.

No peer-reviewed mercury model is available to assess the direct, indirect, and cumulative deposition of mercury from sources within the Carlin Trend.

Recommendation: We recommend BLM reconsider the CESA associated with mercury emissions. The Final SEIS should describe how the CESA was delineated and support the decision with the model results. **6-10 (contd)**

Appendices

Appendices A, B, and C are missing in the Draft SEIS and should be provided in the Final SEIS. **6-11**

Response 6-11: Appendices A, B, and C are included in this Final SEIS.