State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340 telephone
(801) 359-3940 fax
(801) 538-7223 TTY
www.nr.utah.gov

Michael O. Leavitt
Governor

Robert L. Morgan
Executive Director

Lowell P. Braxton
Division Director

September 17, 2002

CERTIFIED RETURN RECEIPT
7099 3400 0016 8895 4982

Ms. Paula Doughty
Director, Environmental Affairs
Kennecott Utah Copper Corporation
8315 West 3595 South
P.O. Box 6001
Magna, Utah 84044-6001

Re: Joint Agency Review of Revised Mine Closure Plan, Kennecott Utah Copper Corporation, Bingham Canyon Mine, M/035/002, Salt Lake County, Utah

Dear Ms. Doughty:

The Division of Oil, Gas & Mining ("DOGM"), the Division of Water Quality ("DWQ") and Division of Environmental Response & Remediation ("DERR") have completed a joint agency review of your latest revised mine closure plan for KUCC's Bingham Canyon Mine, received April 17, 2002. After reviewing the latest information, the agencies have developed the following comments that will need to be addressed before we can proceed to grant tentative approval of the revised proposal. The Division's comments follow the format of KUC's plan. The other agencies review comments are attached and follow our comments. Please provide a response to these reviews by October 31, 2002.

The Division will suspend further review of the Bingham Canyon Mine revised closure plan until your response to this letter is received. If you have any questions in this regard please contact me, Lynn Kunzler, Tom Munson, Paul Baker or Doug Jensen of the Minerals Staff. If you wish to arrange a meeting to sit down and discuss these reviews, please contact us at your earliest convenience. Thank you for your cooperation in completing this permitting action.

Sincerely,

D. Wayne Hedberg
Permit Supervisor
Minerals Regulatory Program

jb
Attachment: Closure Plan Reviews
cc: Dennis Frederick, DWQ
Douglas Bacon, DERR
Mary Ann Wright, DOGM

Kennecott Closure Plan Comments Regarding the February 7, 2002 Document Titled, "Bingham Canyon Mine 2002 Reclamation and Water Management Plan"

General review comments related to the reclamation plan and its ability to define the outcome of reclamation:

The many pit closure scenarios presented in the plan relate to *potential* reclamation and/or treatment of groundwater in relationship to the pit and its final disposition. Most of the information is very general or speculative in nature. The plan attempts to define most of the dewatering or pit closure scenarios in relation to future mining and pit dewatering. The next step becomes, deciding which of these pit-dewatering scenarios will be carried out and to identify the *specific* environmental impacts associated with the chosen scenario. No one scenario, pit dewatering or pit closure with a terminal pit lake at a given elevation, can be picked as the most feasible at this point in time, because this decision has not been made. Some are of the opinion that the pit must remain dry and while some believe that a terminal pit lake would be better. One outcome is accepted as a given, that a pit lake must be below the pyrite halo and the most feasible exit point for water to leave the pit will be the tunnel at the 5490 foot elevation. This tunnel is within the pyrite halo so water will have to be pumped to this elevation.

Using this response, what needs to occur now, is a further refinement of these scenarios. It seems appropriate that Kennecott rank the most favorable and negative aspects of each pit closure scenario in terms of environmental, economic, or other factors and work towards developing a more detailed closure plan describing the preferred alternatives. Whether this is done in a tabular comparative/contrasting format, or otherwise, is not as important as assuring that all current identified studies, completion timeframes for the studies, etc., relating to the final outcome of the pit, are clearly defined in the decision making process.

On page 19, Kennecott has identified the Physical and Chemical controls and the related Flow Paths and Chemical Interactions. Closure scenarios identified include:

1. The pit being continuously dewatered.
2. The level of water in the pit is maintained below the pyrite halo, or allowed to flood to some intermediate level.
3. The underground mining will cause block caving, making pit dewatering impossible or impractical to prevent acid generation.

The data requirements identified as needed on page 25-26 to define the outcome of these dewatering scenarios are couched in terms of pit closure dictating the timeframe of when this data can be collected. Kennecott needs to better define why certain studies

are necessary to help decide the ultimate pit closure and what influence these studies will have regarding decisions for the ultimate pit closure. It seems that Kennecott may have enough data to decide what alternative would be appropriate given an ultimate mining scenario. The engineering needed to dewater the pit and the potential impacts to the surrounding hydrology, needs to be identified sooner, rather than later. The Division cannot make informed permitting decisions based upon such undetermined decision-making timeframes. It would help all parties to understand the ultimate outcome of the pit and groundwater, if we hope to move this closure process along. (TM)

<u>The review of the Bingham Canyon 2002 Reclamation and Water Management Plan follows the format of the plan as it was written.</u>

Comments were generated from statements made within the following sections of the plan.

Section 1.0 Introduction
Because the closure of the mine is at least 11 years in the future, changes in operations, regulations and technology will require an overly specific plan to be significantly modified in the future.
The approved plan regulates the closure of the Bingham Pit; new regulations are not normally made retroactive. While there may be some minor modifications, no major changes in the closure plan would be proposed without KUC's participation in those changes.

Conceptually, the Bingham Pit footprint will not change unless underground mining becomes a viable option. Because overall slope angle within the pit are dictated by both KUC's 1976 plan and MSHA regulations, the final pit configuration is predictable. With this information KUC can present a plan for the closure of the pit discounting the option of the underground mining aspect. If underground mining becomes an option, the plan as approved will need to be modified because of the possible ground subsidence associated with this type of mining.

If underground mining were chosen as an option, the present closure plan would need to be amended. For the purposes of this review, the Division will focus on activities that will need to take place to permit the closure of this facility without considering any other possible options. (DJ)

Section 1.3.2
The Bingham Canyon Pit has been designated a historic landmark based on its overall physical appearance and "reclamation obligations that would alter or amend the landmark should consider the implications of the activities on the landmark."

Under this context, is formation of a pit lake considered as altering the pit or changing the physical appearance of this landmark? (DJ)

Section 1.3.5
Figures 1-2 & 1-3 are maps and lists of historical sites within the boundaries of KUCC's permit M/035/002. To date, the majority of sites that fall within the permit boundaries have received a "no further action status" from EPA and DERR as identified in two Records of Decision dated December 13,2000 and September 28, 2001.

DOGM did not participate in the release of these areas from the reclamation liabilities associated with this permit. Until these areas have been inspected and released by DOGM, these sites remain a part of the permitted areas. It is possible additional reclamation of these sites could be required. (DJ)

Footnotes on Table 2-1
"Structures located in the Bingham Pit on waste rock surfaces that do not have soil chemistry favorable for revegetation will be demolished, but the underlying surface will not be reclaimed."
This statement is very general; some areas may require some recontouring even though the underlying surface will not support vegetation. Each of these areas will need to be evaluated on a site-by-site basis and clearly outlined/identified on the reclamation treatments map(?). (DJ)

Section 2.2.5
Tentative reclamation actions are based on the incomplete data set now available and may have to be changed later.
In the plan as written, many of the final reclamation decisions have been postponed until additional data is available. This is not acceptable; the plan can be amended when pertinent data, which will change final closure activities, is obtained. This document needs to be a complete reclamation plan that addresses the final closure of the Bingham Pit. (DJ)

Section 2.3 – Page 11
The closure approach consists of one or more activities for each facility.
In order to judge the effectiveness of this plan on the merits of the proposed closure efforts, a single approach needs to be presented for the Division's evaluation. (DJ)

A bulleted item on this page states, "Reclamation involves regrading and usually revegetating the affected areas."
These decisions will have to be made on a site-by-site basis with the Divisions' participation. (DJ)

Section 2.3 - page 14
"If existing soils or fill materials do not provide suitable growth media, topsoil will be imported and spread".
Please state the depth at which the soils will be spread. It is also stated "all surfaces to be revegetated will also receive a light application of chemical fertilizer". Will the soils be examined previous to respreading to ascertain the rate at which the fertilizer will be applied? (LK)

Section 3.0
The Elton and conveyor tunnel exist on the site.
Many other mine openings also exist on the site. Please state closure plans for all underground openings that are located within the permit area. (DJ)

Section 3.0 - page 17
The current pit walls below 5200' are net neutralizing,
Figure 3-4 indicates that the NNP in the bottom of the present pit to be 0. This would indicate that because there is no neutralizing potential. The materials in the bottom of the pit are potentially acid forming, please explain. (DJ)

Page 21 – Option 3c
Under the conceptual water movement within the pit, a statement is made that once water reaches the water table it will flow laterally and discharge into the bottom of the pit.
Because pumping in the valley, under the NRDC, could conceivably create a cone of depression, what assurances can KUC present that water entering the water table will not report to the valley instead of entering the pit? (DJ)

Option 3e
The lower the water level that is maintained in the pit, the further from the center of the pit the zone of capture will extend.
This statement infers that the establishment of a pit lake would interfere with the capture of bedrock waters surrounding the pit. Because the water surrounding the pit is located in bedrock and within the water table, will any delay in capturing this water result in the water flowing to the valley? (DJ)

Option 4
Water that discharges into the pit will be pumped out. The rate of pumping would be highest for a dry pit and will decrease as the height to which the pit is allowed to flood increases.
This statement implies that allowing a pit lake to form may inhibit the flow of water into the pit. If the option of allowing the pit to flood is chosen, where will the additional water that would have been pumped from a dry pit be reporting? (DJ)

Page 22 - Option 5
A majority of the underground workings are located outside of the pyrite halo, but some are within the halo.
How many and how extensive are the workings that do occur within the pyrite halo? Please confirm the direction of the groundwater flow patterns that may occur in these workings (towards or away from the pit). (DJ)

Option 5b
Some underground working gravity drain away from the open pit and discharges at a tunnel portal in Butterfield Canyon and along the east and west side of the Oquirrh Mountains.
If a pit lake is allowed to form, will this affect the amount and quality of water flowing from these workings? (DJ)

Option 5c
Some underground workings are currently being pumped and could continue to be after closure.
What is the quality and quantity of the water presently being pumped from these workings? What conditions will dictate whether pumping of these workings will continue or not? (DJ)

Option 7
Older sediments will become isolated from significant pit water contact by overlying younger sediments, but under certain circumstances, materials may also be redissolved from the upper portion of the sediment column.
What are the circumstances that would cause this dissolution and what are the materials that would be redissolved? (DJ)

A statement is made that long term average water quality may be roughly similar to water that was collected in the pit during the shutdown in the mid-1980s.
The Division does not feel that water collected in the pit in the 1980s would be similar in quality to water that would occur in the present day pit. The pit bottom in the 1980s was within areas of limestones and skarns, areas of high neutralization potential, the ultimate pit would occur in an area which is predominantly quartzites. The neutralization potential of quartzites is low to non-existent, compared to the materials that were present within the pit when waters collected during the temporary mine suspension in the 1980s. (DJ)

Section 3.1
KUC will ensure that contaminated water does not escape from the pit into the surrounding groundwater system.

What constraints will be placed in or around the pit that will ensure that any release of pit waters does not happen? How will KUC demonstrate the effectiveness of these constraints? (DJ)

KUC will minimize the impacts of pit dewatering on surrounding aquifer recharge and water levels.
Additional pumping, as a result of the pumping levels dictated by the NRDC, will impact the regional aquifer. What assurances can KUC provide have that the effects of pit dewatering will be minimized, when the impacts of other activities scheduled to begin in the near future have not been sufficiently addressed? (DJ)

Section 3.2
Various commercial activities may be continued in the pit after closure.
What will these commercial activities be? Will any of these activities affect the final pit configurations? (DJ)

Section 3.3
A partial list of possible post-closure activities includes: capturing and diverting surface and groundwater up gradient from the pit; revegetating selected benches on the pit walls; modifying selected pit benches to capture and divert surface water.
These items should be included as a part of this plan as items to be completed,not as possible activities. (DJ)

The plan also alludes to the possible impacts due to underground mining and block caving.
It is the Division's opinion that this change would require a modification to the present plan. Therefore, it should not be made a part of the present plan. Attempting to include information at this time will result in a significant delay in completing the processing of this plan. (DJ)

Section 3.4
In order to select final closure scenario new technologies such as sulfide passivation need to be identified.
Because the closure of the mine is possible within the next ten years, the Division feels that present technology needs to be thoroughly reviewed and utilized to complete a viable reclamation plan. (DJ)

Many of the data requirements cannot be addressed until the mine is nearing the end of its life and the ultimate characteristics of the pit can be predicted with more certainty.
It is the Division's opinion that because final mining will be completed within the present pit footprint, prediction of the ultimate pit characteristics should be possible at this time.

Waiting until the end of the mine life to present a mine reclamation plan is not an acceptable option at this time. (DJ)

Section 3.5 – page 27
If the pit is allowed to flood – "The radial flow into the pit will be maintained so that water does not flow from the pit into the surrounding bedrock."
Has testing been completed to assure that all peripheral flows will enter the pit? Partial filling of the pit will place a head pressure on areas of seeps, contacts and faults below the ultimate lake level, because of the zone of depression that peripheral pumping will establish. Could a flow of water be initiated into these areas and into the surrounding aquifer? With all the lenses, faults and rock contacts within the final pit configuration, how can KUC be assured that these features will not form conduits which will allow the water entering the pit to flow out of the pit through any of these structures? Pumping of contaminated water in the valley will ultimately form a cone of depression near the pumping sites. The projected pit bottom will be located in bedrock below the valley floor. What assurances does KUC have to demonstrate that waters from the pit lake will not flow to this cone of depression? (DJ)

This section contains a statement that the pit will either be kept dry or allowed to flood.
This decision needs to be made in this plan. In order to have a reclamation plan that allows the Division to assess the impacts of the reclamation on the environment, this is one of many decisions that need to be made at this time and become a part of the final plan. (DJ)

Section 3.5.1
In order to minimize flow from the surrounding unimpacted mountainsides to waste rock disposal areas, water collection systems will be placed upgradient in drainages that have significant surface or shallow groundwater flows.
What will be done with these flows after they have been captured? What is the criterion for assessing what flows are significant? (DJ)

Section 4.0
The average sulfide concentration, predominantly pyrite, in unweathered waste rock from the pit is about three percent, but sulfides are generally less abundant in waste rock exposed on the surface of the disposal areas.
Please explain why the sulfide levels of unweathered waste rock on the surface of the dumps will have a lower content than the average level. (DJ)

There are approximately 200 additional acres where the soil pH is low, but which have low salinity and very few intact sulfides. These sites are considered marginally favorable for vegetation establishment.
Please outline reclamation plans (if any) for this additional acreage. (DJ)

Waste rock contact flows are currently routed to the concentrator process water circuit. Please state where these flows will be directed after closure. (DJ)

Section 4.1-bullet item #1
"Slopes that are not reduced will be steep and covered with loose rock and could pose a hazard if accessed by the general public."

The statement made in the plan indicates that slope reduction will be necessary to alleviate this problem. KUC's approved 1976 reclamation plan states that the waste rock dumps will be left in a safe and stable condition. Many of the dumps have remained active since the implementation of the Utah Mined Land Reclamation Act ("Act"). Therefore, they are subject to the administrative rules under the Act.

Utah Minerals Rule R647-4-111.1 states, "The operator shall minimize hazards to the public safety and welfare following the completion of operations." Rule R647-4-111.6 states "waste piles, spoil piles and fills shall be regraded to a stable configuration and shall be sloped to minimize safety hazards and erosion while providing for successful revegetation." Waste rock dumps proposed to be left "as is", should be regraded to stable configurations that will provide for successful revegetation. These dumps are not stable in their current configuration such that successful revegetation can be demonstrated. Plans should be submitted that discuss slope reduction and reclamation of these dump slopes. (DJ)

Bullet Item #4
No major revegetation is planned because the majority of the waste material contains natural sulfide mineralization.
The Division recommends that all dumps that are scheduled for regrading be started as soon as possible. This will allow the newly formed surfaces to begin the weathering process. Once these areas have been regraded to final slope configuration, tests can be conducted to assess the reclamation possibilities of the newly formed surfaces. Newer technology such as bio-remediation of the areas that contain sulfide mineralization might be a useful tool, the end result of this testing would be the acceleration of the weathering process. The ultimate goal would be to successfully revegetate these slopes before final closure of the mine. (DJ)

The plan states that KUC will continue to maintain the ground and surface water collection system at the foot of the disposal areas to comply with all applicable requirements.
Will KUC continue to maintain the upgradient collection systems? (DJ)

In order to ensure compliance after closure in the most cost effective manner, the following goals must be considered during the closure planning:

- *Ensure that catastrophic events cannot compromise the water collection system or transport contaminated water and sediment off KUCC property.*

What steps will KUC take to ensure the long-term stability of the high dumps facing the Salt Lake valley? These dumps presently have zones of instability and are subject to high erosion during high water storm events. Because of the height of these dumps, failure of any portion could potentially compromise the water collection systems.
The 1976 plan states that dumps will be left in a safe and stable condition, predicted slope failures indicate that these dumps are unstable and should be recontoured. (DJ)

Section 4.3 –paragraph 2
In order to comply with the 1976 plan selective reclamation of overlying waste rock disposal areas has been considered.
In order to properly evaluate the shortcomings and potential impacts of this reclamation plan, KUC must commit to the reclamation activities as discussed in the plan. (DJ)

Paragraph 4
On higher waste rock slopes a more rigorous study of the probability of catastrophic events releasing contaminated materials from the property; potential reductions in ARD that must be captured and treated will be required.
Please state how these studies will be incorporated into the reclamation plan and how they will be used to impact the long-term planning. (DJ)

Section 4.4 – bullet # 4
Identification of new reclamation technologies, which may become available between now and closure.
The plan should be written using present day technology that will allow KUC to close the Bingham Pit with minimal impacts to the surrounding environment. In order to properly evaluate this plan, commitments to the reclamation plan as presented, must be made by KUC. Should future technology become available that would produce a better reclamation product, the Division would encourage KUC to incorporate these changes into the final closure plan. (DJ)

Section 4.4 – final paragraph
Others such as the base flow of ARD from specific areas and the final geometry of the waste rock surface cannot be determined until some operations have been shut down.
Because the majority of the waste rock dumps at the site are presently inactive, with no plans to reactivate, geometry of these features will not change. Any studies that may need to be made to evaluate reclamation of these features should be completed at this time. (DJ)

Table 4-2
This chart considers the possible waste dump slope reductions based on the risk of uncontrolled release of water or sediment from the property. The final plan, the 1976 plan and Division Rules require "the dumps will be left in a safe and stable condition." If the present dump configurations are presently unstable, reduction of the slopes will be required. (DJ)

Section 4.5 – paragraph 3
"Roads without a post-mining use will be blocked off."
Roads without a post-mining land use will need to be ripped to remove compaction, resloped (if needed) soiled and seeded. (DJ)

Section 4.5.1
The plan does not include several hundred acres that have also been reclaimed within the DOGM permit boundaries, but that were impacted by historic leach water contact or by other historic mining operations unrelated to open pit mining at Bingham Canyon.
The location of these areas should be shown in the plan to allow the Division to properly evaluate any impact of the overall plan. (DJ)

Paragraph 2
Waste rock has been removed from about 80 acres within drainages below the Eastside disposal area.
Please show these areas on one of the maps accompanying the plan. Also indicate in the plan what reclamation treatments (if any) have been applied to these areas. (DJ)

Section 4.5.2
All of these sites are underlain by waste rock soils that will support vegetation after relatively minor soil modification.
Please list what would possibly be involved in these minor soil modifications. (DJ)

Section 4.5.3
Approximately 2600 acres of waste rock surface are currently planned to be recontoured without revegetation.
The reduction of these slopes should be completed as soon as possible in order to properly evaluate the revegetation possibilities of these areas. After the slope reduction, consideration of possible treatment options, such as bio-remediation, lime treatment, etc., could be tested on the final slope faces. The use of bio-remediation of dumps where leach operations have taken place could have the potential of reducing the ARD discharge from these areas.

Section 4.5.3 - Final paragraph
These areas will generally be recontoured between the termination of the waste rock production and one to two years after mine closure.
The Division recommends that dump surfaces be recontoured as soon as possible after the dumps become inactive to allow for further evaluation of these areas for possible revegetation. (DJ)

Section 4.5.2
A slope study is planned to be performed on approximately 200 acres located on the southeast margin of the waste rock disposal areas.
Is the slope reduction and reclamation of these areas also being studied as a part of the Natural Resource Damage Claim plan? (DJ)

Section 4.5.5 Areas Requiring No Further Actions
This section heading is misleading because the areas in question are areas that are still under consideration, by the Division, as part of KUC's final reclamation liabilities. (DJ)

Paragraph 2
None of the slopes pose a significant risk of contaminant transport off the property and the costs of slope stabilization would not be offset by the reductions in long-term maintenance costs for the sediment and water collection systems located down gradient from the slopes.
Please describe what risks will be considered significant when considering off-site transport of contaminants? KUC's 1976 plan does not state that cost would be a factor when considering dump slopes. The plan states that the dumps will be left in a safe and stable condition. The Division presently feels that slope reduction is the only tool available to KUC for safety and long-term stability of the dump slopes. (DJ)

This paragraph also states that because of the distance from points of public access, bodies of water and low gradient poorly defined drainages, are reasons for not resloping waste dumps.
These items should be considered when evaluating public safety and the possibility of release of contaminants from the site. Dumps are to be left in a safe and stable condition; the above listed reasons are not a part of the considerations listed in the 1976 plan. (DJ)

Paragraph 6
The tall angle of repose slopes in upper Dry Fork Canyon and Freeman gulch are facing up-canyon, so risk of significant up gradient transport of sediment and water from these slopes is minimal.
Dumps at the site are to be left in a safe and stable condition. No mention is made in the approved plan as to the orientation of these features. (DJ)

If these slopes were reduced it would also cover previously unimpacted, forested areas within these drainages.
Pushing material down-slope is not the only method of slope reduction available to KUC for dump reclamation. (DJ)

Section 5.2
The 210 acre area containing capped gypsum-bearing material should not be intensely irrigated because this could transport sulfate to groundwater.
Post mine land use will have to be decided before this area can be released. (DJ)

Section 6.2
"After reclamation there will be no restrictions on post-closure land use."
Post-closure land use of these areas will be determined by the environmental assessment, performed at closure. (DJ)

Section 6.5
"All areas will be reseeded, except for those that will subsequentially be used for farming or where post-mining activities are planned immediately after closure."
When will the 'areas to be used for farming' be seeded (or put into agricultural production). (LK)

Section 7.0
Contaminated soils have been cleaned up around the old Arthur and Magna Concentrator, Bonneville Crushing and Grinding Plant.
To what level have the contaminants been cleaned up, (industrial or residential)? (DJ)

Section 7.1 – bullet #5
Materials or conditions that may have a significant negative impact on surface or groundwater quality will need to be removed or corrected before closure.
Will materials presently in place at the process facilities have to have a "significant" effect on the surface or groundwater before it is considered for clean up? (DJ)

Section 7.4 – bullet #3
The regional and demographic conditions at the time of closure and viability of selling or leasing specific buildings to another party for industrial development.
All buildings at the site, which do not have a post-mine land use at the present time, should be scheduled for demolition. If and when, a post-mine land use is approved for these facilities, they can be removed from the listing. (DJ)

Section 8.0
The plan states that in some locations of the tailings the salinity may be high enough to inhibit vegetation establishment.

Please describe the reclamation treatments that will be applied to these areas. (DJ)

Section 8.2
In some areas of the South Impoundment interior, where vegetation establishment may be difficult because of salinity issues, the primary goal will be to create a stable surface that will inhibit dust generation.
Please describe the activities that will be necessary to accomplish this goal. (DJ)

Section 8.2 – paragraph 2
For tailings that have acidified or that may acidify in the future, limestone or another neutralizing agent will be added to maintain a near-neutral pH in the long term.
If neutralizing agents can be added to maintain a near neutral pH of the tailings for the long term, why can't these agents be used during the reclamation of waste rock dumps at the mine?

Please describe the stabilization methods that will be used on these acid prone areas until the acid potential has diminished to a point where reclamation can take place. Also describe the reclamation treatments that will take place at that time. (DJ)

Section 9.0 0 – paragraph 2
All of the other areas included under the excess process water land use category in the 1978 permit are either closed or are only used by facilities that are not covered by DOGM permits.
Although the facilities utilizing these excess process water areas may not be included in the original 1978 permit, if they are located within mine-related areas or are required because of mining-related activities, reclamation of these features could be required under the Act. These affected areas and the associated facilities should be identified in the reclamation plan. A decision can then be made as to whether the areas in question need to be part of the final reclamation and closure plan. It should be noted that facilities utilizing these areas may not have been included in the 1978 plan because of a permitting oversight, or KUC's failure to notify the Division of the construction, or they may not have existed at the time the original permit was issued. (DJ)

Section 10.0
But the majority of the acid plume will be removed before closure.
What closure date is being considered when this statement is made? Will the plan provide contingences if the majority of the acid plume has not been removed before closure? If so, what are these contingencies? (DJ)

Table 10-1
Note 9 – It is estimated that up to 2500 gpm will ultimately need to be removed from the pit if no peripheral pumping is performed. If a pit lake is allowed to form, it may take up

to 30 years before any water needs to be removed from the pit depending on the depth that is allowed. The estimated water quality is based upon the character of the water that is presently being removed from the bottom of the pit.
The quality of the water presently being removed from the pit should not be used as a guide for demonstrating possible water quality of the water in the proposed pit lake. The pit lake will form in an area where the evaporation rate is higher than precipitation amounts. Because it may take up to 30 years to fill this lake, evaporation will result in the concentration of salts and metals. Because peripheral pumping presently removes most of the water before it flows into the pit, the overall quality of the water that will be allowed to flow into the pit is unknown at this time. Therefore, stating that the water quality of the pit lake will be similar to present pit water is conjecture on KUC's part. (DJ)

Section 10.2.1
In most cases the captured up-gradient water will be of good quality and could be used or discharged without restrictions.
Please describe how this water will be captured and delivered to areas where it can be utilized. Will discharge of this water from the site be regulated by KUC's UPDES permit? (DJ)

Section 10.2.2
Collection systems may include flow from the Dry Fork Tunnel and pumping from the West Mountain shaft and/or an extraction well.
The West Mountain Shaft was not included in Table 10-1. What will be the quality of water being removed from this shaft? (DJ)

The water will be captured in collection sumps and will either be piped to the bottom of the pit, or will be piped directly out of the pit.
Please indicate on a map where the collection facilities will be located and piping configurations that will support these sites. (DJ)

Contact water from seeps and springs on the lower embankment slopes will be captured in ponds, sumps or ditches. This water will then be managed in conjunction with contact waters from other parts of the mine.
In Section 9.1 of this plan, it states that water from the tailings will be discharged to the Great Salt Lake. Will the quality of this water be comparable to contact water emanating from the mine area? The final plan should include KUC's plan for treatment of contact water from the mine. (DJ)

The RO concentrate will be discharged to the tailings line during the active life of the mine.

Please describe where the concentrate will be discharged when the mine is no longer active? (DJ)

Section 10.2.4
It is also possible that a small pretreatment plant may also remain in place after closure to recover copper from selected copper bearing flows that discharge from the waste rock disposal areas.
Please show in the plan the area where this plant will be located. The ultimate disposition of the water being processed through the plant must be described. (DJ)

KUC plans to remove most of the acid plume before the mine closure, which would allow for lime treatment plant capacity to be available for mine flows.
A contingency plan should be included in case the flows from the acid plume have not diminished appreciatively at mine closure.

This paragraph also states that sludges generated during the treatment of mine waters will be handled in a similar manner to the sludges generated by the acid plume remediation.
The sludges currently being generated are being disposed of in the tailings pond. Will the tailings line and pond be available for the placement of sludges after mine closure? The present plan for the tailings area is that the area will be closed when the mine life ends. If the tailings area is to be used for disposal, will portions of the tailings area remain active after mine closure? (DJ)

DERR Comments on the KUCC Mine Closure Plan:

Comments Derived from the two Correspondence Memorandums to DWQ, Dated May 3, 2002 and July 3, 2002

General Comments on the KUCC Mine Closure Plan –

(1) DERR remains concerned about the limited role reclamation activities will have in terms of source control, to prevent or hinder the continued release of contaminants on certain portions of KUCC's property. In particular DERR is concerned about the limited reclamation that will be performed on the Bingham Pit Waste Rock Dumps (Eastside, Southside, and Bingham Canyon). DERR believes that further reclamation activities would assist in reducing potential risks to ongoing remedial activities and prevent exceedances of standards at established boundaries. DERR cautions KUCC to continue to meet the protection standards at the established boundaries, as agreed upon verbally between DERR and KUCC.

(2) DERR does not understand the reasoning behind KUCC's decision to revegetate versus recontour certain portions of the Bingham Pit Waste Rock Dumps. It appears that there is a disproportionate amount of waste rock surface that will mainly be recountoured but not revegetated. pH concentrations cannot be the only reason for selecting areas that will have revegetation success. For example, the evaporation ponds on the Eastside Dumps will shortly receive Portland Cement kiln dust, which has a neutralizing capability and will raise the pH concentrations in the dump material. However, this area is proposed for recontouring only. Please explain the decision.

(3) DERR understands that there are certain limitations that control the success of reclamation activities associated with the dumps. DERR does not understand why KUCC has decided to leave the majority of Bingham and Dry Fork Canyons un-reclaimed. Certainly there are some slopes that would support recontouring and revegetation, solely based upon topography. Please advise DERR on why these areas will remain untouched. DERR notes that the revegetation and recontouring activities KUCC performs upfront may assist KUCC in managing mine waste water into the future.

(4) DERR suggests that KUCC address in the plan the Environmental On/Off-site Assessment (EOA) sites that have been given a conditional "No Further Action" status under CERCLA. Please state why these sites were given a conditional NFA status and what conditions KUCC will need to meet, to stay in compliance under the terms of the site status.

(5) DERR suggests that if previously closed KUCC EOA sites are reopened for use, i.e., the Elton Tunnel for water management, the appropriate division of the Department of Environmental Quality will need to be contacted to address permitting requirements. Furthermore DERR should be contacted to coordinate activities involving sites on the EOA site list.

(6) The closure plan for the South Tailings Impoundment is documented within the text. There are two other operable components within the Magna Tailings Impoundment permitted area that will remain in some state of use past the life span of the South Impoundment: the North Impoundment Expansion and the Arthur Step-Back Repository. Please explain if these other two operable components will have a separate closure plan drafted or how they will fit into the closure plans of the South Impoundment. Please discuss the temporary closure of the Arthur Step-Back Repository and how it will be reopened to receive future remedial wastes.

(7) DERR notes that there is an extensive reliance on post closure monitoring and remedial activities in the KUCC Mine Closure Plan. Please explain the funding mechanism that will provide assurances to the regulatory agencies that these activities will be performed post mine closure.

Specific Comments on the KUCC Mine Closure Plan –

(1) Page 17, Section 3.0 Mine Area, 5th paragraph, 2nd sentence: It states that dewatering the pit and other underground mine workings has created a large cone of depression in the ground water table and has caused radial flow to be directed towards the pit, from the surrounding area. Please explain how this cone of depression will interact with the valley treatment project and the potential cone of depression that will be created by it. Please explain if there will be any negative impacts by either cone of depression on KUCC's ability to manage water flows both pre and post mine closure.

(2) Page 44, Section 4.5.4 Areas to Undergo Slope Stabilization Study, 1st paragraph: The plan lists certain drainages that will undergo a slope stabilization study on the current dumps within each of the eastern Oquirrh Mountain drainages. Tooele County sites are not included in the list. Like Middle Canyon, if there are any waste rock dumps that are located in Tooele County where a similar study to determine if stabilization of the slopes would be beneficial, KUCC should list these sites. DERR suggests that this section be revised if necessary.

(3) Page 47, Section 5.2 *Post-Closure Land Use*, 1st paragraph: It states that a 210 acre area containing gypsum bearing material should not be intensely irrigated, because of the potential to produce sulfate from the material located under the capped portion of the South Jordan Evaporation Ponds. DERR agrees with this statement and notes that native, shallow rooted vegetation should be allowed to take seed on-site to assist in preventing the necessity for intense irrigation. DERR further cautions KUCC in its development plans to prevent inappropriate land use of the 210 acres. DERR defines inappropriate use as that use which will interfere with the soil caps ability to prevent significant infiltration of surface water, lead to the production of sulfate-laden ground water, and impede the general protectiveness of the remedy.

(4) Page 48, Section 6.2 *Possible Post – Closure Land Use*, 1st paragraph: It states that after reclamation there will be no restrictions on post-closure land use. DERR suggests that KUCC should explain in more detail the potential land use that will be proposed for the rail corridor and associated sidelines. A delineation of which sections will be set aside for wildlife habitat or agricultural use versus support for industrial activities would assist the agencies to approve the KUCC recommendation that no restriction be placed upon post-closure land use. A "no restrictive use" standard may necessitate a more aggressive remedial/reclamation approach for the site due to potential contaminants of concern (i.e., concentrate spillage, slag, etc.) and the chosen land use. Please advise DERR on the land use options for the various spurs and main line of the railroad and other associated infrastructure.

(5) Page 52, Section 7.5 Reclamation Activities, 1st paragraph: It states that facilities demonstrated to have a post closure use would remain in place. DERR understands this to mean that these facilities could be sold off as resources by KUCC sometime in the future. Please explain if the soils underneath the facilities will be characterized prior to mine closure and sale of the property. Please explain the mechanism to prevent accidental exposure to potential contaminants upon the demolition of remaining facilities, either held by KUCC, a future property owner, or lessee.

(6) Page 59, Section 9.2 *Possible Post – Closure Land Use*, 1st paragraph: It states that based upon long-term need to handle water from the tailings impoundments and possibly other areas, much of the area currently used for excess water management will be maintained for its current use in perpetuity. However, some of the area may also be preserved as wetlands or wildlife habitat. Similar to comment #4 above, DERR suggests that KUCC should delineate the potential land use (either utilizing a map or written description) for the areas currently used for excess water management. Again this will assist the agencies in determining the appropriateness of the KUCC recommendations.

(7) Page 61, Section 10.0 Post Closure Water Management, 2nd paragraph, 3rd sentence: It states here that the water extracted from the acid plume in the valley contains the largest amount of acidity that will be treated by KUCC. It further states that the great majority of the acid plume will be removed prior to mine closure. It should be noted that this statement is a projection of modeling assumptions and should not be viewed as fact.

(8) Page 62, Table 10-1 Estimated Surface and Ground Water Flows at the Bingham Canyon Mine After Closure: It should be noted that the sulfate wells associated with the valley aquifer cleanup project will be extracting 3000 gpm of sulfate water, not 2500 gpm. Also, it would be helpful to note the concentration of metals within each of the flows.

(9) Page 64, Section 10.2 *Post – Closure Water Management Activities*, 1st paragraph, last sentence: It states that after closure, ongoing management of the facilities involved with mine water management efforts will include periodic inspections, routine maintenance and repairs. DERR notes that these operation and maintenance (O&M) activities should be reported to the respected regulatory agency, on a quarterly basis. Please revise the text.

(10) Page 67, Section 10.2.2 *Contact Water Collection System*, 4th paragraph: It states that in most cases contact water that is captured will have to be treated before it will meet standards acceptable for irrigation, drinking water or discharge to surface water. Please describe the most appropriate use for the contact water, pursuant to the nature of contamination. Please explain if the treatment of the contact water collected on the southend will or will not impact the effectiveness of the proposed Zone A or B treatment facilities of the Southwest Jordan Valley Ground Water Remediation Project, or if a separate treatment facility will be constructed.

(11) Page 68, Section 10.2.3 *Bingham Creek Groundwater Remediation*, 2nd paragraph: It states that the RI/FS calls for the installation of additional ground water extraction wells in the acidic portion of the plume that will be pumped at a rate of approximately 2000 to 2500 gpm. This statement is misleading. DERR notes that the proposal suggests the use of a series of wells, where each well will be established individually over time as the plume configuration changes. Each individual well will be pumped at approximately 2500 gpm until a new well is brought online. Please revise the text.

It states further that the pumping rate will remove most of the acidic plume before closure and will satisfy the NRD settlement and CERCLA corrective action requirements. As noted before, DERR believes that a notation in the text that this statement is based upon model predictions and will be proven in time by monitoring the plume characteristics during cleanup should be provided. Please revise the text.

(12) Page 69, Section 10.2.4 Mine Water Treatment and Discharge, 2nd paragraph: It states again here that the majority of contaminants associated with the acid plume in the SWJV will be removed prior to mine closure. DERR notes again that KUCC needs to plan to manage all mine

wastewater and develop management controls based upon worst-case scenarios, not model predictions.

DWQ KUCC MINE CLOSURE PLAN COMMENTS

(July 30, 2002)

1. The mine closure plan includes activities that will require perpetual care (e.g. de-watering and water treatment). How will these items be handled financially?

2. What impacts will the closure of the south end have on the tailings impoundment including meeting UPDES requirements?

3. How will monitoring well closure and abandonment be accomplished?

4. DWQ does not necessarily object to the formation of a terminal lake following mine closure, however, as stated in the plan, certain conditions must be met including:

   a) radial flow into the pit;
   b) maintaining a lake elevation below the pyrite halo; and
   c) any water discharged from the pit must be treated to appropriate standards.

5. The plan provides a minimum of mine dump reclamation. DWQ believes that the regrading and vegetation of additional dump areas will provide benefits to groundwater quality by minimizing the amount of poor quality water that will infiltrate into the dumps. DWQ suggests that KUC review and prioritize further areas for reclamation.