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Rio Colorado Reclamation Committee
P.O. Box 637
Questa, New Mexico 57556

RE: RESPONSE TO REMEDIAL INVESTIGATION/FEASIBILITY STUDY, MOLYCORP QUESTA SITE

Introduction

The Questa Molycorp site Remedial Investigation/Feasibility Study is a sizeable compendium of a number of site investigation results performed over the past number years by Molycorp, Inc., Robertson GeoConsultants, and Dames and Moore, the last two mentioned private consulting firms. The company responsible for final draft production of the RI/FS is URS, Denver, CO. The document has been signed off by a Molycorp official (A. Wagner, PhD.) as a truthful rendition of all data presented.
The RI/FS contains a detailed description of all mine structures and facilities including all waste dumps, pits, excavations, tailing dumps, underground workings, shop and maintenance facilities, bone yards, process areas, fuel storage and transfer areas. Each area described has been chemically characterized by dozens of sample locations including rock, water, soil, and air samplings. Man made and naturally occurring phenomena induced by physical and chemical changes were described and characterized in detail, including the "scar" areas found throughout the site and general region of steep slopes and sulfide bearing rocks which undergo oxidation when exposed to atmospheric conditions. This document also includes flow diagrams identifying potential pollutants and their respective receptors. The Feasibility Study portions of the document list various possible actions that may be entertained for implementation of final remedy at the site. The alternatives as listed range from minimal action(s), such as simple administrative actions (fencing, posting, restriction of access) to a series of higher levels of remedy action(and associated cost) depending mainly on the volume and extent of rock haulage which will eventually be committed to by Molycorp in order to meet final reclamation task standards agreed upon by Molycorp, the NMED, and the USEPA. This document , while noted to be in a final draft format, does not specify the final remedy action(s) to which Molycorp will commit, nor the associated costs.

Summary and Conclusion Comments

The main focus of the reviewer of this document was to develop an understanding of the hierarchy of the potential risks of pollutant(s) and their associated pathways to the Red River and the downstream communities including Questa and surrounding enclaves. From a practical perspective, comments concerning mine site remedial action will be listed separate from the tailings areas, due to considerable differences in the type and degree of risk and considerable difference in actions that may be appropriate for each area.

Mine Site Concerns

From the data currently available for review, which is subject to addition and change as current field sampling continues, the number one risk factor at the mine site is the impact of metal contaminated ground water flows from the various waste rock piles directly to the Red River drainage. The various rock piles have been characterized both physically and chemically in detail. While the RI/FS is careful to note that the number of data points currently available may not be statistically valid to achieve a high level of certainty regarding a calculation of average metal(s) contents over the entire waste pile in question, enough information is available to discern basic trends and understanding of the impact of the waste piles on off site impacts, namely the Red River. While there appears some variance in the levels of metals of concern throughout each waste pile, with some areas within certain waste piles appearing to be much less acid producing than other areas, every waste pile investigated has some common characteristics. Namely, the waste rock piles operate as colluvium aquifers, a rock and soil matrix that transmits, holds, and transfers subsurface water which may arrive at that location via underground flow through bed rock, underground flow through alluvium, or accumulation of surface water from meteoric sources(rain and snow). The rock and water samples taken from the numerous sampling locations generally show low pH (acid rock and/or acid water) conditions, moderate to high levels of Aluminum, Barium, Copper, Iron, Lead, Manganese, Strontium, Sulphur(in form of Sulfides) and Zinc. Water samples from these areas reflect high levels of Total Dissolved Solids (TDS) , mainly in the form of sulfates. A spread of lesser amounts of additional chemistry of concern are present including Arsenic, Cobalt, Chromium, Thallium, Scandium, Vanadium, Yitrium, and Zirconium. As long as the waste dumps remain in their present state of location, they will continue to be a source of AMD and associated metal contamination to the Red River. Given the steep slopes and large aerial extent of exposure to water and oxidation potential, the waste dumps must be considered the largest single type of pollution source found at the site. Waste dump rock was described in the RI/FS as “two to five times more likely” to produce acid mine drainage as neighboring bedrock, aplite, andesite, or even the mineralized zones commonly known as the scar areas. While encapsulation of acid producing waste rock is a common and effective technique used for AMD control, successful encapsulation of the sulfide bearing waste dump material in their present locations is highly speculative and may be best described as ridiculously optimistic given their angle of repose and extreme length of slope run. Even if enough non acid producing material could be brought to the various locations to cover the waste dump to an adequate depth (four feet minimum to minimize frost action), the material would not inhibit water migration without application of some type of water impermeable membrane. Encapsulation in place would not address the movement of water from underground sources (bedrock or neighboring alluvium) to the colluvium waste dump zones, implying that encapsulation in place would not be

effective in controlling AMD generation. Furthermore, recent evidence of slope failure (Goat Hill) from behind the waste dump in scar material which had been backfilled with waste dump rock underlies the fact that the current location of the waste dumps is unstable both physically and chemically and will continue to be so until moved to some other location. In addition, the mechanical stability of the outslope surfaces the waste dumps in their present location is clearly reflected in the large vertical rills easily noted at each dump location. Stormwater management and control of steep slope failure due to rainfall and/or snow melt (surface water management) from outslopes of the waste dumps does not appear to be effective. The RI/FS does not address a long term, final plan for stormwater management or outslope erosion control during present mining operations nor final closure of the site. Given the dubious state of mechanical and chemical stability of the waste dumps in their present locations and attitudes as described in the site characteristics sections of the RI/FS and from field observation, complete relocation of the waste dumps should be considered as a preferred alternative action. The complete relocation of waste dump material is included in the range of options in the RI/FS for final site remedy implementation, but has not been identified as a preferred action as yet. Waste dump relocation to the main pit area addresses a number of areas of concern including waste dump material, the pit area itself, and improves the potential for a more stable final slope configuration, effective encapsulation, and better control of run-off and sedimentation.(stormwater management). However, some final slope must be left on the original steep sloping areas from which the dump material would be removed, necessitating the planning and execution of a final slope stabilization plan in these areas regardless of the final location of the dump material. The cost of waste dump relocation will add considerably to closure cost estimates of time and dollars and should be reflected in adjustment to the bonding requirements for the site.

The second concern of potential pollution source emanates from the underground mine workings and associated water discharges, since most of the subsurface drainage and parts of the surface drainage areas(especially Goat Hill and parts of Capulin Canyon) are controlled by underground workings in connection with the cave blocking/subsidence areas in the western portions of the mine site. The RI/FS states that mine dewatering operations are on-going and utilize the slurry pipeline to transfer as much as 2800 gallons per minute of mine water from the site to the tailings area. It is not clearly stated if the water has been or will be treated prior to release to the slurry pipeline or directly to the Red River should the pipeline be dismantled and removed as noted as a preferred action in the close out plan approved by the State of NMDE. Regardless of pipeline operation for mine dewatering, the treatment of mine water prior to release to Red River or other (Rio Grande) drainage begets a basic dilemma presented in the RI/FS but not discussed in enough detail to guess the process or outcome of certain actions that may or may not be entertained at the site prior to, during, and after close out work is performed. The impact of rising underground working water levels on springs and seeps along the Red River is not clearly described in the RI/FS document. What is stated in the document is that all areas, structures, and sites currently covered by a permit, such as a mining permit, close out permit, NPDES permit(to discharge), or other operating type of permit are outside the jurisdiction of the CERCLA process and will remain so as long the permit is valid. This in effect puts the entire area of active mining operations out of the CERCLA process unless a pollution stream can be identified leaving the permit boundary via water or air transport. This is an interesting statement in that the RI includes extensive description, characterization, and potential remedy discussion of the

waste rock dumps, which are active mining structures within in the current mining permit boundaries. It would seem that it would be appropriate to characterize the mine dewatering volumes and chemistry and include a discussion of site-wide impacts of pumping/not pumping, treatment (or not), and final plan for return to Red River drainage. It appears that due to the current scope of CERCLA's domain, some important long range operational issues are not yet being scrutinized.

Tailings Area Concerns

The tailings area constitutes a separate series of risks and data sets. Whereas the mine site soil and water data show clear evidence of some level of pollution under production, the tailings data does not reflect an obviously reactive soil and rock chemistry. Even though sulfite content was high (2%) the overall acid producing potential was low due to high calcium carbonate content in the tailings materials sampled for analysis. It is assumed that the high carbonate content of the tailings samples is due to the addition of lime to the tailings prior to discharge to the tailings area via pipeline. AMD (Acid Mine Drainage) production from the tailings area does not appear to be as likely as from the mine site waste dump materials. However, water quality impacts will likely continue in the form of high Total Dissolved Solids, mostly sulfate content. Metals pollution potentials do remain downstream of the tailings areas via seeps and outfalls, as "water treatment " to date prior to discharge via pipeline has been limited to pH adjustment via lime addition but no removal of residual metals content in the tailings. Downward migration to lower aquifers within the Rio Grande River drainage of any potential pollution stream is likely to be minimized by the presence of a middle aquitard rock unit(a shale or clay layer), which will likely impede downward migration of pollution and an underlying aquifer exerting an upward pressure on the aquitard unit, according the description in the RI/FS. These geologic conditions will likely result in the land areas directly below the seeps and outfalls bearing the main brunt of pollution stream leaving the tailings area. Land owners in these areas have experienced serious health problems related to metals ingestion by humans and animals (C. Herrara ATSDR disposition). Table 3-6, titled "Comparison of Tailings to Region 6 Risk-Based Screening Levels for the Industrial Outdoor Worker", shows arsenic levels exceeding the Screening Levels in a spread of 38 elements/valence parameters. Metals of potential concern measured at significant levels include Aluminum, Barium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Strontium, Vanadium, and Zinc. The RI/FS does not present sufficient data of air borne contaminant levels in dust emanating from the tailings to characterize the tailings as benign or a potential health risk at this point in time. There is no doubt that the tailings create a nuisance dust problem at frequent intervals related to local weather conditions and have on occasion resulted in curtailment of school and other recreational use to young people who live in the general area. Gauging the potential for long term health impacts has been addressed by the EPA via additional sampling sites for well sampling, airborne dust sampling, and additional seep sampling during the 2003 field season. Additional data may result in a better understanding of the potential health risks to the local human and animal population. The recent proposal (CDM) for airborne soil and water sampling does not appear to include a sampling transect that addresses airborne pollution in the area of the school grounds which have experienced a number of poor air quality events over the past number of years.

In the event that tailings delivered to the area between the last set of sampling data and the termination of tailings disposal at this site change in regards to their geochemistry, such as a change in process that might decrease resulting calcium carbonate content in the tailings, or a change in the ore body chemistry, such as increasing pyrite content, then the tailings could develop AMD characteristics similar to mine site conditions. However, at this time, it appears that the largest single source of pollution in this area will likely continue to be airborne dust from the tailings unless a more aggressive program is instituted to cover and re-vegetate the tailings with particular emphasis to minimize acreage of exposed tailings at any one time. A secondary concern of water pollution via high sulfate content and related high TDS is also warranted from seep and sub-surface water sources directly downstream from the tailings dam(s).

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