phelps dodge Sierrita Inc.
6200 W. Duval Mine Road • P. O. Box 527 • Green Valley, AZ 85622-0527 • (520) 648-8500

John D. Brack
General Manager

September 7, 2006

Sent Via Certified Mail 7001 1940 0001 8037 6326
Return Receipt Requested

Mr. Robert Casey
Water Quality Enforcement Unit Manager
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Re: Amendment to Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Phelps Dodge Sierrita Tailing Impoundment

Dear Mr. Casey,

Thank you for meeting with Phelps Dodge Sierrita, Inc. on August 11, 2006 for an overview of the work plan[1] submitted pursuant to Mitigation Order on Consent No. P-50-06.

At the meeting, we discussed the potential range of mitigation measures that would be considered under A.R.S. § 49-286 during the completion of the feasibility study (FS). To clarify the mitigation measures that would be considered, we have modified Section 5.1.2 of the work plan to include measures that would control sulfate migration from the Phelps Dodge Sierrita Tailing Impoundment (PDTSI) and measures that could ultimately reduce sulfate concentrations in groundwater down gradient of the PDTSI. We are submitting the attached revised Section 5.1.2 to you as an amendment to the work plan.

Thank you for your time and consideration in this matter.

Sincerely,

John D. Brack

cc: Joan Card/ADEQ

[1] Hydro Geo Chem, Inc., 2006. Work Plan to Characterize and Mitigate Sulfate With Respect to Drinking Water Supplies in the Vicinity of the Phelps Dodge Sierrita Tailing Impoundment, Pima County, Arizona. August 11, 2006.

Amendment to Work Plan to Characterize and Mitigate Sulfate With Respect to Drinking Water Supplies in the Vicinity of the Phelps Dodge Sierrita Tailing Impoundment, Pima County, Arizona

September 6, 2006

5.1.2 Mitigation Action

Mitigation actions are generic approaches to mitigation that can be employed singly or in combination to accomplish the mitigation action objectives. A mitigation action can consist of several difference technologies and process options. For example, water treatment is a mitigation action that can be used to remove sulfate from drinking water. Water treatment can employ difference technologies for removing sulfate such as reverse osmosis, electrodialysis, or nanofiltration. Within each technology there may be several process options that can be used to implement the technology.

For the mitigation of non-hazardous substances such as sulfate, A.R.S. Section 49-286 identifies potential mitigation actions as follows:

- Providing an alternative water supply,
- Mixing or blending if economically practicable,
- Economically and technically practicable treatment before ingesting the water, and
- Other mutually agreeable mitigation measures.

The FS also will evaluate and consider mitigation measures that would: 1) control sulfate migration from the PDSTI through mitigation actions such as groundwater pumping, but not removal or physical containment, and 2) ultimately reduce sulfate concentrations in the basin fill

aquifer to meet the numeric mitigation objective through mitigation actions such as groundwater pumping and natural attenuation, individually or in combination. As discussed elsewhere in this work plan, Sierrita already operates an interceptor well system. The effectiveness of this system in reducing migration of sulfate from the PDSTI and in reducing sulfate concentrations in the basin fill aquifer will be evaluated and considered as it relates to the design and effectiveness of other mitigation measures. In addition, the FS will evaluate the feasibility and effectiveness of enhancing this system to further reduce migration of sulfate from the PDSTI and to reduce sulfate concentrations in the basin fill aquifer. The FS also may identify, evaluate and consider other mitigation measures that may achieve the objectives described above. As is discussed below, the mitigation alternatives developed as part of the FS will be evaluated in accordance with A.R.S. § 49-286.B, which states that the mitigation selection process shall balance the short-term and long-term public benefits of mitigation with the cost of each alternative, and that only the least costly alternative may be required if more than one alternative satisfies the mitigation objectives. Other FS criteria such as implementability and effectiveness will also be considered during alternative evaluation. Additional mitigation actions to be considered include monitoring of groundwater and drinking water, institutional controls such as restrictions on well drilling, and natural attenuation.

Each mitigation action can employ various technologies depending on site-specific conditions. Alternative water supply can be accomplished by various means including replacement wells, use of unimpacted supply well, well modifications, connection to an existing public water supply, or bottle water. Mixing and blending refers to commingling waters with difference sulfate concentrations to meet the numeric mitigation object. Water treatment would use a physical, chemical, or biological process to remove sulfate and other constituents from

drinking water. Depending on the situation, water treatment can be conducted before the point-of-entry to a distribution system using a centralized plan or wellhead treatment system or at the point-of-use with home-based treatment system.