State of Utah
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

Michael O. Leavitt
Governor
Dianne R. Nielson, Ph.D.
Executive Director
Don A. Ostler, P.E.
Director

288 North 1460 West
P.O. Box 144870
Salt Lake City, Utah 84114-4870
(801) 538-6146 Voice
(801) 538-6016 Fax
(801) 536-4414 T.D.D.

M/035/015
& M/035/002

Water Quality Board
Leroy H. Wullstein, Ph.D.
Chairman
Lynn F. Pett
Vice Chairman
Robert G. Adams
R. Rex Ausburn, P.E.
Nan Bunker
Leonard Ferguson
Dianne R. Nielson, Ph.D.
K.C. Shaw, P.E.
Ronald C. Sims, Ph.D.
J. Ann Wechsler
William R. Williams
Don A. Ostler, P.E.
Executive Secretary

November 3, 1997

Ms. Elaine J. Dorward-King, Ph.D.
Director, Environmental Affairs
Kennecott Utah Copper
8315 West 3645 South
Magna UT 84044-6001

Dear Ms. Dorward-King:

Subject: Review of KUC Report on Operational Monitoring; Recommendations for the 1997 Reports Required by Appendix A and B; Kennecott Tailings Impoundment; Ground Water Discharge Permit No. UGW350011

The Tailings Impoundment ground water discharge permit includes Appendix A and B that specify monitoring programs for acidification potential and operational inflows respectfully. The monitoring programs for these two appendices were approved in September 1996 for Appendix B and March 1997 for Appendix A. The 1996 annual reports are the first reports submitted under these two appendices. This letter presents a few specific questions regarding my review of the report submitted for Appendix B (Operational Monitoring Report) and presents recommendations for the 1997 versions of both reports.

The 1996 Operational Monitoring report goes beyond the requirements of Appendix B in many instances by providing historical data and summary statistics for Tailings Seeps, surface water stations, lysimeters and wells completed in tailings material. This information would be quite helpful for permit renewal purposes if provided again in the report for the 1998 data. The 1998 data report is due on March 31, 1999. The renewal date for the Tailings permit is December 21, 2000.
One question specific on the results in the Operational Monitoring Report is the percent moisture values shown for many ABA sample results. Many of the values shown in Table 10 are less than 0.01% moisture. A moisture content that is this low suggests that the samples have been oven dried at 105 degrees centigrade rather than the 50 degrees centigrade specified in Appendix A. Please advise me what lab protocol for drying samples was used for the ABA data presented in this report.

After carefully considering the data presented in both the Operational Monitoring Report (Appendix B) and the Appendix A Sampling Results Report reviewed earlier (see my letter of August 13, 1997), modification is needed in the coverage provided by these two reports. Currently, acid base

accounting (ABA) data is contained in part by both reports. To clarify results from acid generation analysis, all ABA and kinetic test results, discussion and data tabulations should be placed in the Appendix A sampling results report compiled annually. The Operational Monitoring Report required by Appendix B should contain the rest of the data and analysis for operational monitoring. To make this completely clear, Appendix B should be amended by deleting references to "net acid generating capacity" in Table 2 on page 4.

The following items are presented for incorporation in the 1997 reports. These are grouped according to the appendix they relate to.

Appendix A Items

1. To make it easier for review and analysis, an enhanced depiction of correction factors used for the hydrochloric and nitric acid leaches performed in the ABA analysis is needed. Table 11 (shown in the Operational Monitoring Report for 1996) shows a correction factor such as 0.98. In the 1997 report the following data items should be included in addition to the items currently shown on Table 11: LECO Total Sulfur value, and the uncorrected LECO percent sulfur following the hydrochloric and nitric acid leaches. The sample weights before and after each acid leach should also be included. This would allow verification of the impact that the correction factors have. This table should be included in the Appendix A report for 1997.

2. The summary of ABA data in tables 9 and 10 (shown in the Operational Monitoring Report for 1996) should have a descriptive header that identifies what sample locations are depicted. This table should be included in the Appendix A report for 1997.

3. Table 10 (shown in the Operational Monitoring Report for 1996) depicts the percent moisture along with other ABA results. The values shown for percent moisture are composed of some "as received" values and some moisture contents just prior to analysis. The "as received" moisture content is not useful information and should not be included. The moisture content at the time of analysis should be provided for all samples analyzed. This table should be included in the Appendix A report for 1997.

Appendix B Items

1. The method detection limits (MDL) for the SPLP analysis should be adjusted downward to reflect the capabilities of ICP Mass Spec. equipment. (This is a departure from Method 1312 but will provide data that is much more meaningful)

2. The TCLP analysis of Hydromet samples should be discontinued after the 1997 samples are analyzed and SPLP run on these samples instead. (This will require an amendment to Appendix B)

The review of the Operational Monitoring Report was conducted after the review of the Kennecott report on Appendix A Sampling Results. Accordingly, some of the comments provided in my August 13, 1997 letter did not take into account the ABA data included in the Operational report. Of the eight items noted in my August 13th letter, the following items were adequately addressed in the Operational Monitoring Report and do not require a response.

Item 3. The table with the correction factor was contained in Table 11 of the Operational report.

Item 8. Data for the Hydromet Plant effluent was contained in the Operational report on Table 10.

A formal response to the other items in my August 13, 1997 letter is still needed along with a response to the question on moisture % of ABA samples. Please provide a response to these items by December 3, 1997. The remaining items noted in this letter should be incorporated into the 1997 reports due on March 31, 1998. An amendment to Appendix B to accommodate some of these changes should be submitted by December 31, 1997. Thank you for your cooperation in this matter. Please feel free to contact me if you should have any questions on this letter.

Sincerely,

John Whitehead

John Whitehead, Ground Water Hydrologist
Ground Water Protection Section

JW:jw/fb

Attachment

cc: Terry Sadler, Salt Lake County Health
Gene Farmer, Farmer and Associates
Wayne Hedberg, DOGM

f:\wq\permits\jwhitehe\wp\kenncott\tailings\opsrpt.ltr
FILE:Kennecott Tailings Impoundment