FREEPORT-McMoRan

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June 18, 2015

Certified Mail #70150640000775396745
Return Receipt Requested

Ms. Trais Kliphuis, Director
New Mexico Environment Department
Resource Protection Division
P. O. Box 5469
Santa Fe, New Mexico 87502

Dear Ms. Kliphuis:

Re: Revised Ecological Risk Assessment
Hanover/Whitewater Creeks Investigation Unit - Chino AOC

Freeport-McMoRan Chino Mines Company (Chino) appreciates the opportunity to submit comments, under separate cover, on the revised *Ecological Risk Assessment* for the Hanover/Whitewater Creeks Investigation Unit (HWCIU) under the Chino Administrative Order on Consent (AOC). Chino received the revised draft HWCIU report from the New Mexico Environment Department (NMED) risk assessor, Formation, on April 20, 2015. The comment letter was submitted today to Mr. David Mercer of the NMED.

Please contact Mr. Ned Hall at (520) 393-2292 if you have any questions regarding Chino's comments on the risk assessment.

Sincerely,

Sherry Burt-Kested, Manager
Environmental Services

SBK:pp
20150618-002

xc: David Mercer, NMED (via email)
Joseph Fox, NMED (via email)
Petra Sanchez, US Environmental Protection Agency (via email)
Ned Hall, Freeport-McMoRan Inc. (via email)

Freeport-McMoRan Chino Mines Company – Administrative Order on Consent
Comments on the New Mexico Environment Department Ecological Risk Assessment for the Hanover Whitewater Creek Investigation Unit (HWCIU)

This document presents Freeport-McMoRan Chino Mines Company's (Chino's) comments on the New Mexico Environment Department (NMED) Revised Ecological Risk Assessment (ERA) for Hanover Whitewater Creek Investigation Unit (HWCIU) received on April 20, 2015. Chino submitted comments dated September 9, 2012 and additional comments on May 10, 2013 on an earlier draft report dated July 24, 2012. The revised ERA was prepared by NMED's contractor, Formation Environmental, in accordance with the Scope of Work associated with the Administrative Order on Consent (AOC) between Chino and the NMED dated December 23, 1994. Chino's comments are as follows:

General Comments:

Introduction and Purpose

NMED has included discussion of the "white rain effects" in Sections 2, 3, and 6. Chino believes that the reader would benefit from having a more detailed discussion in Section 1 describing the relationship between the white rain event and the corresponding decrease in overall impacts since the BERA was finalized for better context leading into the later sections. This additional information would provide the reader with a link between the historic report and the updated information discussed in later sections of this ERA. Therefore, Chino requests that NMED consider adding additional detail of the "white rain effects" in Section 1.1.2 or 1.1.4.

Risk Analysis of Vegetation

NMED revised the ERA to incorporate the majority of Chino's comments on the vegetation analysis. A single outstanding comment from the September 9, 2012 letter (this comment was not addressed in NMED's April 19, 2013 responses to comments) was not addressed, which pertains to the removal of location ERA 32 from the risk analysis. Interim remedial actions occurred at Groundhog Mine between 2003 and 2005; and in 2011, and all Groundhog Mine Site stockpile material was removed down to bedrock and hauled to the West Stockpile. Location ERA 32 and the surrounding area that ERA 32 represented were removed, and the area was reclaimed and revegetated. The data reflecting these interim remedial actions has been submitted to NMED in the *Groundhog Completion Report* (Golder 2009) and in the *Groundhog Completion Report Addendum* (Golder 2011). The *Revised ERA* does incorporate this data in the report tables section. Chino requests that NMED include the *Completion Reports*

in the reference section and update Section 3 text discussion as well to reflect the updated data *in lieu* of the ERA-32 data.

Risk Analysis of Terrestrial Wildlife

NMED revised the ERA to incorporate the regression bioaccumulation factors (BAFs); to correct the foodweb models; to discuss risk by reach versus individual locations; and, to include the STSIU-related information to the extent that is technically appropriate for the HWCIU. Based on these changes, however, Chino requests NMED consider two additional technical comments on the risk analysis as follows:

- Section 3.0, in the 4th paragraph, states "the ecotoxicologically-based SSLs generated in the Sitewide ERA were used as the primary tool for evaluating risks for the H/WCIU in the initial draft of the ERA (NewFields 2008)". The section further indicates that a recalculated SSL was incorporated for copper. Section 3.4 of the 2015 ERA, however, cites to the U.S. Environmental Protection Agency (USEPA) Ecological Soil Screening Level (EcoSSL) values. Use of these values is a departure from the Sitewide ERA and it is unclear why these values were only recently included in the HWCIU ERA, particularly since these values were established and available a decade ago. Chino recommends adding a sentence in Section 3.0 that introduces the EcoSSL values and provides context for their inclusion, such as *"In addition to the screening levels developed in the Sitewide ERA, USEPA EcoSSL values have now been included in the ERA."*

- Background soil concentrations are discussed in Section 2.3, but background soil concentrations of metals were not addressed in Section 3. Chino recommends including discussion of background concentrations when discussing the pertinent ecological screening levels in Section 3.

- In Section 3.3, NMED states "95th UCL is the appropriate EPC for risk assessment purposes" which follows NMED's response to comment letter dated June 9, 2015. Despite that, in Section 3.3 and 3.4 there is limited risk discussion utilizing the 95th UCL for copper and no discussion of the 95th UCL for cadmium, lead, or zinc. In Section 3.3, NMED compares the copper UCL to the risk-based concentration (RBC) and pre-Feasibility Study remedial action criteria (pre-FS RAC) established for STSIU, but then resorts back to using the 95th percentile when evaluating individual reaches. Additionally, there is no risk discussion utilizing 95th UCLs in Section 3.4, even though they were calculated and presented in Table 3.1-1. Chino recommends that Section 3.3 and 3.4 be updated to incorporate the 95th UCL values (shown in Table 3.1-1) in place of the 95th percentile values, where applicable.

Risk Analysis of Aquatic Receptors

In Section 4, some inconsistencies exist in the RBCs of the seven metals (Cd, Cr, Cu, Pb, Mo, Se, and Zn) to which dissolved-metal concentrations in surface waters are compared in Table 4.1-1. Additionally, some of the RBCs could not be replicated based on the information presented in the ERA. Specific comments concerning their derivation and/or applicability are provided below.

- As mentioned in the September 9, 2012 comment letter and more thoroughly discussed in Appendix F of ARCADIS (2013), ARCADIS reviewed and commented on the CLF study conducted by Little and Calfee (2008). As discussed in Appendix F, considerable uncertainties associated with the reported CLF effect concentrations were identified. Additionally, the applicability of the effect concentrations (which were derived in laboratory dilution water) to ambient water across the Chino Mine Site is highly uncertain because of the known mitigating-effects of some water quality parameters (e.g., organic carbon, major cations/ions) on copper bioavailability. Chino recommends that these uncertainties be discussed in the ERA.

- Chino agrees with the description provided in the ERA that the "CLF-based effect concentrations are only potentially relevant if the CLF is present in the H/WCIU". As described in recent CLF surveys (Jennings 2007), the CLF has not been documented in the H/WCIU. Chino recommends that this specific detail should be noted in the ERA to put the CLF-based effect concentrations in perspective.

- The footnotes in Table 4.1-1 indicate that the "Acute Criteria" for Cd, Cu, Pb, and Zn are based on the approach outlined in the Arid West Water Quality Research Project (AWWQRP), though no details were presented to explain the AWWQRP-type calculations performed for the ERA. Additionally, the AWWQRP (2006) report only presented methods and recalculated water quality criteria for Cu and Zn (along with aluminum, ammonia, and diazinon) but did not discuss Cd and Pb. Therefore, it is not possible to evaluate the RBC calculations for Cd and Pb based on the limited information presented in the ERA. Additionally, the tabulated "Acute Criteria" RBCs for Cu and Zn, which were included in the AWWQRP, could not be reproduced from information in the AWWQRP (2006) report. The four pieces of information needed to fully evaluate Table 4.1-1 are listed below.

- Chino recommends that in Table 4.1-1, chronic criteria derived using the AWWQRP-type approach should be listed in addition to the already-listed acute criteria derived using the same AWWQRP-type approach. Those chronic criteria should be calculated from the acute criteria using recalculated acute-to-chronic ratios.

- The Footnote 2 in Table 4.1-1, which references to Appendix D regarding the derivation of the AWWQRP-based RBCs, appears to be misleading. The RBCs are listed in the table as being hardness-based water quality criteria that were "calculated with equation

1b or 2a of 20.6.4.900[I] NMAc (*sic*); As Amended through July 17, 2005" and thus are unrelated to AWWQRP-type recalculated criteria. The table included in Appendix D should be updated, or additional information provided, to transparently show how the AWWQRP process was used to derive the RBCs.

- In Appendix D, the hardness-based acute and chronic criteria listed in the tables were not "capped" at a maximum hardness of 400 mg/L as $CaCO_3$, but the hardness-based acute and chronic criteria listed in Table 4.1-1 appear to have been "capped" at a maximum hardness of 400 mg/L as $CaCO_3$

Based on the above bullets that might affect whether a given metal concentration at a given location exceeds a derived RBC (and thus might affect a risk-based decision), the following additional information is requested, and should be included in the revised report:

1. An explanation of how the AWWQRP-type criteria were calculated for Cd, Cu, Pb, and Zn (as indicated by footnote 2 in Table 4.1-1), especially considering that the AWWQRP (2006) report did not address Cd and Pb.

2. Clarification about which, if any, of the AWWQRP-type criteria are listed in Table 4.1-1 and the table in Appendix D (as alluded to in footnote 2 in Table 4.1-1); and if no AWWQRP-type criteria are listed, an explanation of the apparent inconsistency with footnote 2 that indicates the "Acute Criteria" for Cd, Cu, Pb, and Zn are based on the AWWQRP approach.

3. An explanation of why the hardness-based acute and chronic criteria listed in Table 4.1-1 appear to have been "capped" at a maximum hardness of 400 mg/L as $CaCO_3$ but the corresponding criteria listed in the table in Appendix D do not appear to have been "capped" at a maximum hardness of 400 mg/L as $CaCO_3$.

4. An explanation of why, even when the water hardness is less than 400 mg/L as $CaCO_3$, the hardness-based acute and chronic criteria listed in Table 4.1-1 do not exactly equal the corresponding criteria listed in the table in Appendix D.

Chino acknowledges that the above information is forthcoming and reserves the right to provide additional comments after additional review is completed.

Figures

- Figures are currently utilizing historic aerial imagery. Updated aerial imagery from 2014 will be provided by Chino and should be included to show the current status of the IU and surrounding areas.

- Figures 1.0-1 and 1.1-1 leave out part of Lower Whitewater Creek. The IU should be continuous from below Tailings Pond 7 to Whitewater Creek confluence with San Vicente Arroyo. Also the last shape incorporates more uplands than actual Whitewater Creek IU.

- Figures 1.1-7, 1.1-8, and other figures related to Physical Reaches 6-9 show the Whitewater Creek diversion running through operations. Chino will provide a shape file of the correct location for the New Whitewater Creek Diversion.

- Figure 2.1-7: ERA 31 sample does not appear to be located on the Side Channel, but in Lampbright Draw.

References:

Arid West Water Quality Research Project (AWWQRP). 2006. Evaluation of U.S. EPA Recalculation Procedure in Arid West Effluent dependent Waters - Final Report. Arid West Water Quality Research Project (AWWQRP), Pima County Wastewater Management Department, Tucson, AZ.

ARCADIS. 2013. Revised Site-Specific Copper Toxicity Model Report. Prepared on behalf of Chino Mines Company. October.

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Harfenist, A.T., Power, K.L. Clark, and D.B. Peakall. 1989. A review and evaluation of the amphibian toxicological literature. Can. Widl. Serv. Tech. Rep. Ser. No. 61, Ottawa. 222 pp.

Jennings, 2007. Surveys for Chiricahua Leopard Frogs in southwestern New Mexico and northwestern Mexico. Gila Center for Natural History, Western New Mexico University.

Little, E.E. and R.D. Calfee. 2008. Toxicity of Herbicides, Piscicides and Metals to the Threatened Chiricahua Leopard Frog (Rana chiricahuensis). U.S. Geological Survey Administrative Report. Columbia Environmental Research Center, Columbia, MO.

Schafer (Schafer & Associates). 1999. Chino Mines Administrative Order on Consent Site-wide Ecological Risk Assessment Technical Memorandum No. 1 (TM-1): ERA Workplan. May 14

U.S. EPA. 2013. ProUCL Verson 5.0.00 Technical Guide. Office of Research and Development. EPA600/R-07/041