



Freeport-McMoRan Chino Mines Company  
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GR009RE  
MOD 17-1

February 2, 2017



**Certified Mail #70160750000113394674**  
**Return Receipt Requested**

David Ennis  
Energy, Minerals, and Natural Resources Department  
Mining and Minerals Division  
Mining Act Reclamation Program  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Dear Mr. Ennis:

**Re: Freeport-McMoRan Chino Mines Company, Modification Request**  
**To Permit No. GR009RE, Section 8.E.2.(c) Suitable Cover Material**

Freeport-McMoRan, Chino Mines Company (Chino) requests to modify Permit GR009RE Revision 01-1 Section 8.E.2.(c). This section states:

Kneeling Nun Rhyolite or other suitable material approved by MMD shall be excavated from the Upper South Stockpile. Additional borrows areas can be identified by the Permittee to supply cover material for the base, intermediate, and top layers as provided by the Condition L.5.

Section 8.E.2. (b) allows modification of the provisions in Section 8.E.2 based on the results of the test plot study as indicated in Section L.1. (e). Chino has completed the test plot study and seeks formal approval of materials formerly referred to as "leach cap" as suitable cover materials. The term leach cap has led to some confusion because it is similar to a term applied to the copper extraction process, hence moving forward Chino will refer to these materials as reclamation cover material (RCM). The RCM materials placed on the test plots were tested in accordance with the agencies approved Chino Material Handling Plan South Pit Area (Plan), July 31, 2006 and the Comprehensive Cover Performance Evaluation, DP-1340 Condition 81 Work Plan, October 23, 2003. This approval is sought after completion of studies required in Sections 8.L.1 and 8.L.5 and Conditions 81 and 82 of DP-1340.

In the North Mine Area (NMA), the Kneeling Nun Rhyolite was approved by the Mining and Minerals Division (MMD) as suitable cover. subsequent investigations associated with Condition 81 (DP-1340) and Section 8.L.5 (GR009RE) indicated that the best available cover materials for closure were rhyolite, leach cap, or a mixture of materials at Chino that meet the requirements described in the material handling plan. The use of this material was further evaluated at the Chino Stockpile Test Plots in accordance with Condition 82 and Section 8.L.1. The Chino Mine test plot reclamation covers were constructed using a mixture of RCM. The RCM consists mostly of Tertiary Stock, Kneeling Nun tuff and Cretaceous Colorado Formation, as well as other igneous rocks that intruded the older geologic formations. The RCM met the criteria of a rigorous material handling plan. These various geologic materials that make up the RCM were placed concurrently in the stockpile as they were encountered at the shovel pit and it is impractical and un-necessary to segregate them during reclamation.

In 2015, Chino completed a quantitative vegetation study comparing the test plot results to those of the native vegetation found in the Rustler Canyon reference area (Chino Stockpile Test Plot 2015 Addendum- Submitted 12/9/2015). The quantitative vegetation study was conducted using survey techniques approved by MMD. Per MMD's request, Chino submitted a technical memorandum, *Chino Test Plots Vegetation Statistics*, on January 30, 2017 describing the statistical methods used in analyzing the data from the vegetation surveys. The test plot study, as required by the permit, was conducted for an eight year period. In contrast, the New Mexico Mining Act requires a minimum responsibility period of 12 years after seeding before final vegetation success can be determined and complete financial assurance released by the MMD. Because the test plots are still in the responsibility period they are not expected to achieve the final vegetation standards. Nonetheless, a comparison can be made to assess if they are on a trajectory to achieve those standards. The test plot vegetation results collected in 2015 demonstrate that the vegetation on the test plots meets or is on a trajectory to meet the MMD vegetation success standards.

More than 100 plant species have been identified on the test plots, indicating that the RCM provides the conditions necessary to support a self-sustaining ecosystem as required by 19.10.5.507.A NMAC and Section 8.E.2.b of Permit GR009RE. The canopy cover on the test plots is about 70% of the canopy cover measured on the reference area, which meets the canopy cover requirement for vegetation success. Shrub density at the test plots exceeded the shrub density at the reference area. Shrub canopy cover was not sufficient to meet the diversity guidelines at this time. We anticipate that shrub canopy cover will increase with time as the reclamation matures. The vegetation met the diversity requirements for forbs and warm-season grasses. Cool season grasses were deficient, but still consistent with the reference area. The results from the vegetation surveys of the stockpile test plots and Rustler Canyon reference area demonstrate that the RCM used at the test plots is capable of supporting a self-sustaining ecosystem. Therefore at this juncture, the revegetation efforts are considered successful with respect to the establishment of self-sustaining vegetation.

The test plot study demonstrated that the proposed RCM is erosion resistant and can be managed to produce a functional store and release cover. The material handling and construction methods employed by Chino at the test plots demonstrate that the RCM can be used to construct a cover system in accordance with Permit GR009RE and 20.6.7.33 NMAC.

The New Mexico Environmental Department (NMED) on November 10, 2016 approved Chino's RCM and stated that "the cover shall consist of a minimum of 36 inches of Reclamation Cover Material (RCM) in accordance with Subsection F of 20.6.7.33 NMAC. RCM is defined as pre-mining salvaged soils, overburden from un-mineralized Tertiary volcanic rocks and igneous rock, Paleozoic sedimentary rocks, and intrusive dikes and sills. Non-volcanic overburden from potentially mineralized deposits shall be tested and segregated according to the July 7, 2006 South Pit Area Materials Handling Plan. Materials meeting the water holding capacity and with appropriate erosion-resistant properties required by Subsection F of 20.6.7.33 NMAC may be sourced for use as cover material from the existing RCM stockpiles, planned borrow areas, or combined with other approved, suitable mine sources using an approved cover material handling plan".

Chino requests to modify the MMD Permit in Section 8.E.2. (c) to state:


Reclamation cover materials [(RCM) i.e., suitable cover materials] shall be defined as:  
1) materials that meet the 2006 South Pit Area Materials Handling Plan and 2)  
materials that meet the following soil texture and rock fragments specifications: soil textures of – Loamy Sand, Sandy Loam Silt, Silty Clay Loam, Clay, Loam, Sand Clay Loam, Sandy Clay, Silt Loam, and Clay Loam with rock fragment ranging from 10-70% by volume. Materials meeting the soil texture and rock fragment specifications may be sourced from existing RCM stockpiles, planned borrow areas, or combined with other

Mr. David Ennis  
February 2, 2017  
Page 3 of 3

mine sources that fulfil the criteria defined in the 2006 South Pit Area Materials Handling Plan. Design specifications for the cover in Section E.2 may be modified during the final engineering design to consider erosion resistance with MMD approval.

Chino appreciates your assistance in processing this application. Find enclosed the application fee in the amount of a \$1000 check. Please contact Ms. Lynn Lande at (575) 912-5235 if you have concerns or questions regarding this submittal.

Sincerely,



Thomas L. Shelley, Reclamation Manager

TLS:rlm  
20170201-001  
Enclosure

xc: Brad Reid, NMED