

**STATE OF NEW MEXICO
BEFORE THE WATER QUALITY CONTROL COMMISSION**

In the Matter of:)
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PROPOSED AMENDMENT)
TO 20.6.2 NMAC (Copper Rule))
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No. WQCC 12-01(R)

EXHIBIT GRASS – 4



Waste Rock Stockpiles and Design Criteria Concerns

Presentation to Copper Rules Technical and
Advisory Committee by Freeport-McMoRan
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Introduction

- Stockpiles
 - Material handling plans
 - Design goals
 - Engineering considerations
 - Proposed discharge controls
- Concerns with Draft Rules Design Criteria



Material Handling Plan

- Segregation of acid generating materials and materials that may generate or release water contaminants and the method for handling, storage or disposal of the materials in facilities designed to prevent water pollution;
- Stockpiling of non-acid generating materials for potential use in reclamation;
- Blending of material types;
- Disposal of all material types; and
- Any chemical amendments of the waste rock or overburden



Design Goals

- Discharge controls must limit contact of waste/mine materials with water sources to limit the production of leachate
- Any leachate produced must be collected or attenuated to avoid an exceedance of ground water quality standards



Design Considerations

- The design of discharge control systems must consider:
 - precipitation (amount, intensity, duration, distribution)
 - watershed characteristics (size, shape, topography, geology, vegetation)
 - run-off (peak rate, volumes, time distribution) and degree of protection warranted
 - Depth to groundwater or the thickness of the vadose zone



Proposed Discharge Controls

- Upgradient stormwater (run on) diversion/management plan.
- Spring/seep survey and underdrain collection system if required
- An engineered seepage collection system at the base of the stockpile
- Attenuation of chemical constituents in soil and rock considering depth to groundwater or the thickness of the vadose zone
- Impacted stormwater pond to collect run off and seepage
- Interceptor well system or other hydraulic capture system



Proposed Discharge Controls

- If the results of the material characterization, material handling plan, and proposed discharge controls do not adequately collect discharge or attenuate discharge quality then:
 - An engineered liner system that provides the same level of groundwater protection or greater than a single, 60 mil (high density polyethylene) geomembrane liner (or other material having the same or greater level of characteristics with regard to permeability, tensile strength, tear and puncture resistance, and resistance to degradation by ultraviolet light) over a prepared subgrade



Concerns with Draft Rules Design Criteria

- Long Term Impacted Stormwater Ponds – Long term is defined as greater than 72 hours. Industry standard is 30 days.
- LCRS System – Requires a filter layer between the geomembrane liner and the drainage layer. These filters are prone to plugging or biofouling and are not required.
- Long Term Impacted Stormwater Pond – Subgrade has a required permeability of 1×10^{-6} cm/s. Because the water is stored only for a short period of time it is industry standard to only have a subgrade that is protective of the liner with no permeability requirements.
- 48-hour Draindown Storage Capacity – Typically this value is between 8 and 24 hours depending on pump/power reliability.
- Subgrade – Required to be placed in two 6-inch lifts. Industry standard is to place the subgrade materials in a single 12-inch lift.
- Waste Rock Stockpiles – Liner system of 60 mil HDPE and 12 inches of 1×10^{-6} cm/s soils. There are currently no permitted or operating lined waste rock stockpiles in the US. The Copper Rules need to provide for an unlined option with a hydraulic capture system or if groundwater standards won't be exceeded.