State of New Mexico
Energy, Minerals and Natural Resources Department

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Via ELECTRONIC MAIL

April 25, 2022

Erich J. Bower, President, and General Manager
Freeport-McMoRan Tyrone Inc.
P.O. Box 571
Tyrone, NM 88065

RE: MMD Comments on the Closeout Plan, Tyrone Mine Emma Expansion Project, Revision 21-1, Permit No. GR010RE

Dear Mr. Bower,

The New Mexico Mining and Minerals Division ("MMD") received a submittal from Freeport-McMoRan Tyrone Operations ("Tyrone") entitled, *Permit GR010RE – Tyrone Mine Existing Mining Operation, Permit Revision Application for EMMA Expansion Project at the Tyrone Mine*, dated October 22, 2021 ("Application"). MMD has assigned Revision 21-1 to process the Application. MMD also received a submittal, dated November 12, 2021, entitled, *Emma Project Closure/Closeout Plan* ("CCP") that supplements the Revision 21-1 Application. Additional supplements to the Application, were received by MMD from Tyrone: a letter entitled, *Tyrone's Response to MMD Comments on the Emma Expansion Project*, dated January 24, 2022, and separate studies on Viewshed, Noise, and Lighting in an email, entitled *Emma – Site Assessment Update for New Unit*, on January 31, 2022.

MMD reviewed the Application and sent comments on it to Tyrone in a letter, dated April 8, 2022, along with comments from the state agencies on the Application and CCP. MMD provides the following comments on the CCP and the Viewshed, Noise, and Lighting studies. Please respond to the MMD comments in this letter within 45-days of receipt.

CCP Comments

1. Section 2.1 Description of Emma Project Area, page 4 of the CCP, describes the proposed Emma Project features at the end-of-year 2026 (EOY 2026) including the Emma pit, EHW and 6HW waste stockpiles, haul roads, and supporting

infrastructure. How will the placement of the ore on the Tyrone leach stockpile(s) affect the closeout plan for those leach stockpiles?

2. Section 2.3.7.3 Borrow Materials, page 12 of the CCP, states that potential reclamation cover material ("RCM") identified include native soils, alluvium, in-situ Gila conglomerate, Precambrian granite, and other non-potentially acid generating ("NPAG") materials from the Emma pit. Figure 2-3, Emma Project Generalized Surface Geology Map, and Figure 2-5, Emma Project Generalized Hydrogeologic Cross-Section B-B', show the Quaternary-Tertiary Gila Conglomerate offset from the proposed Emma pit so that Gila conglomerate may not be excavated from the proposed Emma pit. Gila Conglomerate is currently the approved RCM and Precambrian granite from the Little Rock Mine may be approved as RCM pending the results of the USNR test plot study. Please note that Precambrian granite has not been approved yet, for use as an RCM. If Gila conglomerate is encountered and excavated from the Emma pit, how will it be handled and stored for later use as RCM?
3. Section 2.3.7.3 Borrow Materials, page 12 of the CCP, states that the RCM requirement for the Emma Project is approximately 320,720 cubic yards (CY) of salvaged soil and other RCM excavated from the Emma pit. If the 320,720 CY represents the amount of salvaged soil materials and other proposed RCM for the cover, what is the relative proportion of salvaged soil to other proposed RCM that will make up the vegetative cover?
4. Section 3.1, Emma Pit, page 13 of the CCP indicates that a one-foot-thick layer of soil from the Soil Stockpile will be placed over the NPAG waste rock backfill in portions of the Upper East, Upper North, Upper South, and South Main areas of the Emma pit (and over the regraded EMW and 6HW waste stockpiles as indicated in Section 4.1 of the CCP). MMD will require a test plot study using the proposed NPAG excavated from the Emma pit to demonstrate that it will support vegetation that will meet the vegetation success requirements of Appendix C of Revision 09-1 for the Tyrone Mine. MMD requires a plan and financial assurance ("FA") to place a minimum of an additional foot-thick layer of approved RCM from the Tyrone 5A Stockpile or another approved source to supplement the proposed one-foot-thick layer of soil from the Soil Stockpile until MMD approves the NPAG as RCM or as RCM combined with the soil from the Soil Stockpile as a vegetative cover at the Tyrone Mine. The rationale for the test plot study is that the proposed salvaged soil and NPAG overburden are new, site specific, and untested cover material sources. 19.10.5.508 NMAC requires that site-specific characteristics must be considered in applying the standards and requirements. Additionally, if the NPAG overburden material is to be used as part of the cover, then it should be evaluated using soil suitability criteria to identify deficiencies.
5. Section 3.1.1, Water Balance and Geochemical Modeling, page 14 of the CCP indicates the sources of water inflow to the Emma pit includes groundwater inflow, direct precipitation on the pit pond, and runoff generated from within

the perimeter of the Emma pit. Is stormwater inflow expected into the Emma pit from surrounding areas outside of the pit during operations or at mine closeout?

6. Section 3.3, 6HW Waste Stockpile, page 17 of the CCP, indicates that approximately 5.9 acres of the 6HW Waste stockpile will be located within the Tyrone Conditional Waiver Area. Condition 9.E of Revision 09-1 for the Tyrone Mine requires that this area be reported in the Tyrone Stockpile Open Pit Waiver Update ("Waiver Update") annually by August 31. Tyrone shall provide a description of how the portion of the 6HW Waste stockpile that is proposed for inclusion in the Conditional Waiver Area has the same qualifying characteristics as the other conditionally waived stockpile areas at the Tyrone Mine.
7. Section 3.4, Soil Stockpile, pages 17-18 of the CCP, states that the soil stockpile will be seeded with in interim seed mix listed in Table 3.3, Interim Seed Mix for Stockpiled Soil Materials at Emma. See MMD Comments on Table 3.3 below.
8. Section 3.5, Emma Haul Roads, page 18 of the CCP, describes the construction of the Northern Emma Haul Road and the Southern Emma Haul Road. See also MMD comments (Comment 17) on the Northern Emma Haul Road in the April 8, 2022 MMD comment letter on the Application (copy attached).
9. Section 4.1, EMW Waste and 6HW Waste Stockpiles, page 21 of the CCP, states that the materials from the EWH and 6HW Waste stockpiles are valuable resources of RCM that will be available for use in reclamation of the southern mine area of Tyrone in the future. These materials are yet unproven RCMs and have to be further evaluated and tested. See Comment 4 above.
10. Section 4.1, EMW Waste and 6HW Waste Stockpiles, Stockpile Erosion and Drainage Control, page 21 of the CCP, states that stormwater will be controlled using conventional terrace channels integrated to down drains. Since these waste stockpiles have not yet been constructed and the EMW Waste Stockpile is largely in the New Unit area, was consideration given to using geomorphic regrading and drainage designs versus conventional terrace channels and down drains? Please explain why geomorphic designs were not proposed in the CCP for the EMW Waste stockpile.
11. Section 4.1, EMW Waste and 6HW Waste Stockpiles, Stockpile Cover and Revegetation, pages 21-22 of the CCP states that the NPAG material excavated from the Emma pit and placed in the EMW and 6HW stockpiles have been identified as RCM and that a one-foot-thick layer of locally salvaged RCM (Note: MMD assumes that in this context RCM was meant to indicate locally salvaged soil) would be placed over the regraded waste stockpiles and be revegetated. See Comment 4 above and MMD comments on Appendix D, Characterization of Suitable Soils and Overburden and Soil Salvage Plan for the Emma Expansion Project, of the CCP.
12. Section 4.1, EMW Waste and 6HW Waste Stockpiles, Emma Pit, pages 22-23 of the CCP describes the reclamation proposed for the Emma pit. See Comment 4 above and MMD comments on Appendix D, Characterization of Suitable

Soils and Overburden and Soil Salvage Plan for the Emma Expansion Project, of the CCP.

13. Section 4.1, EMW Waste and 6HW Waste Stockpiles, Emma Pit, pages 22-23 and Table 4-1, Summary of Key Design Criteria for Facilities to be Closed, Emma Pit, of the CCP describes the reclamation proposed for the Emma pit. What is the proposed reclamation of areas located below potentially acid generating ("PAG") highwalls?
14. Section 5.0, Reclamation Plan, pages 24-30 of the CCP proposes reclamation for the Emma stockpiles, Emma pit, borrow areas, haul roads and other areas of the Emma Project. Appendix A, Reclamation Design Drawings depicts the proposed reclamation area of the Emma Project. Although, in aggregate the reclamation drawings show all of the proposed revegetated areas, MMD requests a single plan-view drawing of the Emma Project area showing the Emma stockpiles, Emma pit, and the other Emma disturbed areas features, with all proposed revegetated areas to be in a single color-shade, similar to Sheet 12 of the Reclamation Design Drawings in Appendix A of Updated Closure/Closeout Plan for the Little Rock Mine, as revised, dated March 31, 2022.
15. Section 5.1.2.1, General Stockpile Reclamation Activities, page 25 of the CCP describes the reclamation of the Emma EMW and 6HWstockpiles, specifically, regarding the placement of 12 inches of soils from the Soil Stockpile over areas to be reclaimed (for FA purposes only). See Comment 4 above. Additionally, see MMD comments on Appendix D, Characterization of Suitable Soils and Overburden and Soil Salvage Plan for the Emma Expansion Project, of the CCP.
16. Section 5.2.2, (Emma Pit) Planned Closure/Closeout Activities, page 26-27 of the CCP; Figure 3-2, Emma Predicted Open Pit Surface Drainage Area; Figure 7-1, Proposed Post-Mining Land Use and Waiver Areas; and Appendix A, Drawing 003, General Arrangement Post-Closure, of the CCP, provides details for the reclamation of the Emma pit. Figure 3-2 depicts the area in the Emma pit where PAG may be found in the Emma pit. This area appears to be consistent with an Emma pit area shown in Drawing 003 that will not be revegetated during reclamation of the Emma pit. However, Figure 7-1 shows this area, with the exception of the Mine North Area, as having a wildlife post-mining land use ("PMLU"). Please explain how the area surrounding the Main North Area in the Emma pit shown in Figure 7-1 will meet a proposed wildlife PMLU, when Appendix A Drawing 003 shows this area will not be revegetated and the area is located in an area of PAG rocks shown in Figure 3-2.
17. Section 5.6, Water Management and Treatment Plan, pages 29-30 of the CCP states that Tyrone will pump the Emma pit sump during the post-closure period. 19.10.5.507.A NMAC requires the permit area will achieve a PMLU or a self-sustaining ecosystem. Please explain how the Emma pit sump will meet the requirements of 19.10.5.507.A NMAC. A PMLU may involve active management of the land.

18. Section 5.5, Borrow Areas, page 29 of the CCP describes the reclamation of the Soil Stockpile and the EMW Waste stockpile. See Comment 4 above and MMD comments on Appendix D.
19. Section 5.6 Water Management and Treatment Plan, pages 29-30 of the CCP describes the proposed plan for ground water and surface water management and treatment during the post-closure period for the Emma pit including the proposed Emma pit sump. The Emma pit sump is proposed to be nominally approximately 0.62 acres in size except during storm events where the sump may increase to approximately 0.85 acres in size. MMD recommends minimizing the size of the sump further, if practicable, to reduce the surface area of water exposed in the sump that may exceed state water quality standards.
20. Section 6.0, Closure and Post-Closure Monitoring, Reporting, and Contingency Plans, pages 30-31 of the CCP states that Tyrone will submit to MMD and NMED semi-annual reports summarizing reclamation and post-closure activities each year. MMD supports Tyrone's commitment to submit these reports in addition to the other reports required by Permit No. GR010RE.
21. Section 6.6, Public Health and Safety, page 34 of the CCP describes Tyrone's efforts to provide for public safety in and around the Emma pit and other Emma Project areas. Please refer to MMD Comments 9 and 16 of the April 8, 2022 MMD Comment letter on the Tyrone Emma Project Revision 21-1 Application (copy attached).
22. Section 7.0, Post-Mining Land Use Designation pages 34-35 of the CCP and Section 7.1, Wildlife Habitat Post-Mining Land Use, page 35-36 of the CCP states that the Emma pit highwalls and benches would provide cliff habitat and the proposed revegetated areas would support terrestrial wildlife. See Comment 16 above.
23. Section 8.0, Capital and Operation and Maintenance Cost Estimates, pages 38-41 of the CCP; Appendix B, Earthwork Cost Basis Document; and Excel Cost Estimate Spreadsheets 20210012_Emma_Stockpile_Earthwork_RCE.xlsm.
    a. Please update all labor and equipment rates to 2022 values.
    b. The Equipment Watch user adjustment for the mechanics wage is the hourly rate for a Group I-Unskilled Laborer. MMD believes that the appropriate hourly rate used should be for a Group III-Skilled Laborer instead. Please justify the use of the Group I-Unskilled Laborer rate over the other laborer Groups' hourly rate using the New Mexico Administrative Code or change the hourly rate for the mechanics wage to the Group III-Skilled Laborer rate.
    c. The Cost Estimate uses the Group VI-Operator hourly rate for the EX3600-5 shovel. According to the New Mexico Administrative Code Section 11.1.2.18.AH, the Group-VIII-Labor rate should be used for shovels. Please change the labor rate used in the Cost Estimate for the EX3600-5 to the Group VIII rate.

Tables

24. Table 2-2, Summary of Emma Project Related Permits of the CCP. Please refer to MMD Comments 3 and 4 of the April 8, 2022 MMD Comment letter on the Tyrone Emma Project Revision 21-1 Application (copy attached).
25. Table 3-3 of the CCP Interim Seed Mix for Stockpiled Soil Materials at Emma. MMD recommends that if the Stockpile Soil Materials are seeded in the late summer or fall, seeding with an annual cover crop grass species such a winter wheat, triticale, rye, or barley alone as fast establishing cover crops followed by seeding with the Tyrone reclamation seed mix approved in Appendix C of Revision 09-1 (at the approved Tyrone reclamation seeding rate) the following spring. Depending on local conditions and rainfall 8-20 lbs./ac are recommended as a cover crop seeding rate. A seeding rate of 3.10 lbs./ac using the Interim Seed Mix shown in Table 3-3 proposed would be considered insufficient. If seeding of the Stockpiled Soil Material will be done in the spring or early summer MMD recommends seeding with the approved Tyrone reclamation seed mix at the approved Tyrone reclamation seeding rate without the cover crop seed. In all of the aforementioned seeding scenarios, an application of approved mulch is recommended directly after seed mix application.
26. Table 7-1, Proposed Interim Seed Mix and Rates for the Emma Project Reclamation Sites of the CCP. *Dalea candida*, White Prairie Clover is listed as a shrub species in the Primary seed mix. It should be listed as a forb.

Figures

27. Figure 1-3, Proposed Expansion of Existing Tyrone Mine Permit and Design Limit Boundary Associated with the Emma Project of the CCP. MMD recommends depicting contour intervals in this drawing.
28. Figure 7-1, Proposed Post-Mining Land Use and Waiver Areas of the CCP. See Comment 16 above.

Appendix A. Reclamation Design Drawings

29. Appendix A, Drawing 006, EMW Waste Stockpile Closure Plan of the CCP. Please clearly depict the pre-mining watercourse of the Oak Grove Wash on this drawing. Also please indicate the projected flow of stormwater from the EMW Waste stockpile east draining energy dissipater.
30. Appendix A, Drawing 008, 6HW Waste Stockpile Closure Plan of the CCP. How will the 6HW stormwater down drain interface with the existing reclaimed 7A waste stockpile stormwater drainage system?
31. Appendix A, Drawing 010, Haul Road Closure Plan of the CCP. Please clearly depict the pre-mining watercourse of the Oak Grove Wash on this drawing.

Appendix D, Characterization of Suitable Soils and Overburden and Soil Salvage Plan for the Emma Expansion Project

32. Appendix D, Section 3.1 Soil Survey, page 4 of the CCP states that larger rock fragments (> 75 mm) were removed from the soil samples. Table 6, Physical and Fertility Characteristics of Native Soils at Emma show Coarse Fragments (% by weight) of the soil samples. Please explain how the Coarse Fragments in Table 6 were derived.
33. Appendix D, Section 4.2, NPAG Overburden Materials, page11 states that drill hole samples, with a few exceptions, were taken from the first 100 feet of core. MMD believes that the samples taken from these depth intervals may not be completely representative of the NPAG overburden, particularly at intervals deeper than 140 feet deep and that additional sampling is needed.
34. Appendix D, Section 4.3 Chemical and Physical Characterization Data, page12 states that pulped samples from 2018 core samples of NPAG materials were medium-textured silt loams are not considered representative of the waste that would be generated during mining and further, that rock content of the core samples was not evaluated. Footnote 2 of Table 7, Physical and Fertility Characteristics of NPAG Overburden states that texture may not be representative for pulped 2018 drill core samples. How does the texture of the core samples translate to final texture of the proposed NPAG Overburden to be used at reclamation? MMD is concerned that the textural and rock fragment characterization and chemical characterization of the NPAG material proposed as a component of a vegetative cover system is incomplete. MMD considers these physical characteristics as a critical factor for the successful revegetation of the disturbed areas at the Tyrone. Therefore, MMD will require that additional chemical and physical characterization including texture and rock fragment content of the NPAG overburden be performed on run of mine NPAG overburden from the Emma Project area. In addition, MMD will require test plots to demonstrate that the proposed vegetative cover of a one-foot-thick layer of salvage soil over the NPAG waste rock from the Emma Project will be successful in establishing vegetation. See Comment 4 above and Comments 35 and 36.
35. Appendix D, Table 6, Physical and Fertility Characteristics of Native Soils at Emma, page 13; and Table 7, Physical and Fertility Characteristics of NPAG Overburden, page 14. The native soils and the NPAG overburden should also be analyzed for Bulk Density and Available Water Holding Capacity.
36. Appendix D, Table 8, Chemical Characteristics of Selected Native Soils, page 15 shows that the Soil Pedon ESS-E2 for the Fluvents (FLUV) were not tested for Sulfur Forms and ABA. FLUV soils are proposed to contribute a relatively large volume of salvageable Soils (Table 11, Estimated Volume of Salvageable Soils). Please explain why the ESS_E2 FLUV soil sample was not tested for these chemical characteristics.

37. Appendix D, Table 10, Extractable Metals in NPAG Overburden and Selected Native Soil Samples, page 17 shows that Soil Pedon ESS-E2 FLUV was not tested for extractable metals. Please explain why this soil was not tested for these chemical characteristics.
38. Appendix D, Table 12, Interim Seed Mix for Stockpiled Soil Materials, page 20. See Comment 25 above.

Lighting Study – Emma Expansion Project Closure/Closeout Plan

1. Section 3.0, Project Impacts, page 5, states that considering that the closest residential receptor will be approximately a mile away from the Emma Project during initial phases of the project while at ground level, lighting will be visible at receptors located to the south of the project for less than one year. Please provide a conceptual arrangement for the lighting systems that will be used during the initial phases (during the first year) of the project on a drawing of the Emma Project area.
2. Section 4.0, Mitigation, page 5, states that no mitigation measures are deemed necessary, assuming that the use of best lighting practices are implemented. Are there best lighting practices in addition to the shielding of light fixtures downward and scheduling controls mentioned in Section 3.0, Project Impacts? In addition, if light trespass occurs for residential receptors, what will be the measures used to mitigate the light trespass?

Viewshed Analysis – Emma Expansion Project Closure/Closeout Plan

1. Section 3.0, Project Impacts, page 4 states the desktop viewshed analysis determined that portions of both SR 90 and the proposed re-alignment of the county road will have direct line-of-sight to newly constructed features within the proposed Emma permit boundary. Figure 2-1, Viewshed Analysis Overview – Observer Points, shows Simulated Observer points overlying a topographic map of the proposed Emma Project. Were the Simulated Observer points ground truthed to confirm the modeling results?

Noise Study – Emma Expansion Closure/Closeout Plan

1. Section 4.0, Noise Modeling Methodology, page 8 states that the model predicted the maximum noise levels produced during Emma operations using expected noise sources from mining operations and haul road traffic in year 4 of operations. Were blasting operations considered in the Noise Model? If not, please explain why.
2. Section 8.0, Mitigation, page 20 states that no significant adverse impacts to the closest NSA's (noise sensitive areas) were identified and no mitigation measures are necessary assuming that the use of best practices for operation and maintenance of noise generating equipment is implemented. Will noise be monitored and/or confirming noise surveys be implemented during Emma Project mining operations?

Please contact me at (505) 216-8945 or at David.Ohori@state.nm.us if you have any questions.

Sincerely,

David Ohori, Permit Lead
Mining Act Reclamation Program (MARP)
Enclosure

cc: Holland Shepherd, Program Manager, MARP
Anne Maurer, Mining Act Team Leader, Mining Environmental Compliance Section (MECS), New Mexico Environment Department (NMED), Ground Water Quality Bureau
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