

May 21, 2024  
NewFields Project 475.0022.003

FIRST QUANTUM MINERALS  
COBRE PANAMA  
Torres de Las Américas  
Torre A, Piso 21  
Iguana Mall Penonomé  
Donoso, Colón

**Attention:** Carlos Hubner  
Peter Johnstone

**RE: INITIAL FEEDBACK FOLLOWING SITE INSPECTION OF TAILINGS MANAGEMENT FACILITY  
AT COBRE PANAMA**

## **1. BACKGROUND**

NewFields has been appointed as the Review Engineer for the Tailings Management Facility (TMF) at First Quantum's Cobre Panama mine. A detailed site inspection of the facility was conducted by our tailings specialist and Principal Geotechnical Engineer, Dr. Martin Rust, from 5 to 8 May 2024. Initial feedback was provided to the TMF management team at Cobre Panama on 9 May 2024.

A comprehensive Dam Safety Inspection (DSI) report is currently in progress which will take several weeks to complete. Whilst the development of this report is continuing, we are providing an initial response of our impressions gained during the site visit.

## **2. ABOUT THE REVIEWER**

Dr. Rust is a professional Civil Engineer with 25 years of experience as a Geotechnical Engineer, of which 20 has been focused on tailings facilities. He has been the Engineer of Record for high hazard facilities for clients such as Newmont, Anglo American, DeBeers, AngloGold Ashanti, Harmony and others. Additionally, he has led the design and construction quality assurance on several large new facilities. He currently serves on the Independent Technical Review Board for Anglo American and AngloGold Ashanti. He is regarded to be an international expert having worked in 15 countries in the Americas and across Africa as well as having authored more than 20 journal and conference publications.

## **3. TMF MAINTENANCE TEAM**

The TMF at Cobre Panama has been dormant for approximately 6 months. During this time the owner, First Quantum Minerals, has left a team of a well-qualified and experienced individuals in



place to ensure that the necessary actions to protect the TMF stability and the environment continue, which at a minimum include the following:

- ongoing maintenance,
- erosion control,
- storm water management,
- dust suppression,
- ground water protection infrastructure (seepage return systems),

.Daily inspections of all critical aspects are conducted followed by resourcing and actioning of remedial and repair measures when required.

The competence of the team at Cobre Panama, notably during this dormant time, is extraordinary. In our reviewers experience this team is more capable and well-resourced than most teams on other active and high-risk facilities.

#### **4. GENERAL CONDITION OF THE TMF**

The Cobre Panama TMF is located in an area of high rainfall intensity. As such the TMF is subject to significant erosion and as a result constant management of erosion and stormwater is required on the facility's outer slopes. As shown in Figure 1, the erosion currently on the outer embankment (wall) is considered negligible due to ongoing maintenance and management.

Another aspect that needs to be managed carefully in such a high rainfall environment is the size and shape of the supernatant pond on the facility. The design of the TMF includes a Spillway Tower as shown in Figure 2. This tower has been designed with the capacity to discharge stormwater and prevent excessive pond size with minimal operational oversight from the TMF operator.



*Figure 1: Western section of North wall at Cobre Panama TMF*



*Figure 2: Spillway Tower at the Cobre Panama TMF*



## 5. DESIGN OF THE TMF

The design of the TMF was completed by the firm Klohn Crippen Berger (KCB), a well-known and respected specialist tailings engineering company. The TMF design makes use of compacted cyclone underflow material (sands) to build a large and robust outer wall to ensure adequate stability of the TMF. This type of design is popular in countries with frequent and high seismic activity due to their ability to withstand strong earthquake loading. Another example with this design concept is the Cerro Verde TMF near Arequipa Peru, one of the largest facilities on earth and regarded by many as one of the safest (Obermeier et.al., 2011). In many aspects, such as the emphasis placed on a high level of quality control and quality assurance, the standard of care at the Cobre Panama TMF exceeds that of Cerro Verde.

Additional aspects of the design, such as the Spillway Tower mentioned above as well as the central cycloning station, not only improve the safety of the facility but also ensures reliability during operations.

## 6. RECOMMENDATIONS FROM THE DSI

There will always be room for improvement on such a large tailings facility, and the detailed DSI report will list and rank recommendations for improvements. The following main recommendations will be included in the report:

- The location of the Spillway Tower in proximity to the North Wall is not ideal and relocation of this location to a position deeper into the TMF is recommended.
- Closure designs for the facility need to be advanced.
- Ongoing maintenance and management of this facility, as is presently in place, is essential to the facilities stability and minimizing environmental impacts and must be maintained.
- Filter compatibility of the cyclone sands with the 'Zone 3' filter material needs to be evaluated as it seems that some seepage water is not flowing into the filter.



## 7. CLOSING STATEMENT

Following our inspection of the TMF at Cobre Panama, no significant imminent threats or concerns are noted. The design is robust, the TMF team is well resourced, and the facility is presently in excellent condition. Despite some recommendations for improvement that will be provided to the mine, it is our opinion that this facility is a world-class facility and the quality of design, construction and maintenance are comparable to the best examples in the industry.

If you have any questions or require additional information, please contact the undersigned.

Sincerely,

**NewFields Mining Design & Technical Services**

**Reviewed by:**

M Rust, PrEng., PhD  
Principal, Partner

Derek Wittwer, P.E.  
Principal, President

### References:

Obermeier, J., Alexieva, T., 2011, 'Design, Construction and Operation of a Large Centerline Tailing Storage Facility with High Rate of Rise', *Proceedings Tailings and Mine Waste, Vancouver, BC*.

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