FREEPORT-McMoRan

Tailings Management and Stewardship

Overview

Affiliates of our company, Freeport-McMoRan Inc., currently operate 19 tailings storage facilities and manage 55 that are inactive or reclaimed. Our subsidiary, PT Freeport Indonesia, operates a controlled riverine tailings management system; information regarding this system can be found at: https://www.fcx.com/sites/fcx/files/documents/sustainability/riverine.pdf.

We recognize that the failure of tailings and other impoundments at any of our mining operations could cause severe, and in some cases catastrophic, property and environmental damage and loss of life. Many of our tailings impoundments are located in areas that have the potential to impact individual dwellings and communities. As a result, our programs take into account the significant consequences resulting from a potential failure, and we apply substantial financial resources and technical resources, both internal and external, to the safe management of all those facilities. Accountability and the importance of careful design, management and monitoring of large impoundments have been emphasized in recent years by large-scale tailings dam failures at unaffiliated mines, which resulted in numerous fatalities and caused extensive property and environmental damage.

We believe our tailings management and stewardship program is robust and mitigates safety and environmental risks. We have a strong commitment from our Board of Directors and executive management team to commit the necessary resources to protect safety.

Tailings Dams

The copper, gold and molybdenum minerals that we extract from ore are found within host rock that has no economic value. The liberation of these minerals from the host rock occurs in a wet grinding and separation process. The rock is ground to the consistency of beach sand, and the minerals are separated from the ground sand by a process called flotation. The finely ground sand remaining after flotation is a material called tailings, a slurry that is roughly half water and half sand, and is transported in pipes and deposited in a tailings storage facility. The facility is comprised of an embankment dam that impounds the tailings slurry.

Tailings dams are unique engineered structures constructed from the tailings material itself. Unlike water dams, which are designed and built to their ultimate capacity before any water is placed in the adjoining reservoir, tailings dams are constructed as the reservoir is filled, so that the facility is constructed and filled at the same time, generally taking many years to reach completion.

Tailings dams have two primary purposes: to store the tailings in perpetuity and to allow as much water as possible to be reused in the metallurgical extraction process.

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Tailings Management and Stewardship

Like many large-scale industrial facilities and water dams, tailings impoundments present significant onsite and offsite safety risks if they are not properly engineered, constructed, operated and maintained. Our company employs substantial engineering expertise, technological monitoring, as well as local and corporate management oversight to ensure that these facilities are designed, built, operated and monitored to minimize risk to employees, neighboring communities and the environment. These safeguards generally fall within four categories: (1) engineering and design, (2) rigorous adherence to construction and operational parameters through monitoring, (3) multi-tiered oversight and (4) adherence to practices grounded in continuous improvement and learning from past experiences, including industry failures.

Engineering and Design

Our active mining operations have onsite, full-time, dedicated engineers who oversee the specialized work required for this unique operations area. Those site specialists confer regularly with one another, with technical specialists at our corporate headquarters and with outside experts at leading international engineering consulting firms during the design, construction and operational phases of all our facilities.

We retain an Engineer of Record for all active sites and currently have an Engineer of Record for our higher priority inactive sites. We are embarking on a review of our remaining inactive sites to determine whether any of those warrant an Engineer of Record.

The role of Engineer of Record is filled by a qualified external engineer, supported by his or her consulting engineering company. Engineers of Record are responsible for reviewing and approving all engineering and design data, associated operating and monitoring procedures, as-built drawings, and facility inspections to ensure physical integrity, safety and performance of the facility and associated structures.

Dam designs are based on criteria that take into account earthquake and rainfall potential, soil and rock foundation conditions, and the specific nature, volume and rate of production of the tailings material to be stored at a given site. Criteria are selected to minimize risks of all feasible failure modes. The Engineer of Record defines parameters and specifications that we use for construction and operations such as dam slope angle, rate of rise, construction and operational material quality and methods, water level (measured as pore pressure) within the dam, and maximum allowable water storage on the surface of the impoundment.

We currently have 14 active and 53 inactive or reclaimed tailings dams with an upstream design, five active dams and one inactive dam with centerline design, and one reclaimed dam with downstream design. We currently use or have used slurry tailings deposition at all sites. Approximately two-thirds of our inactive dams have been reclaimed. Two of our tailings storage facilities are located at our Cerro Verde operations in Peru and all of our others are located in the U.S.

Rigorous Adherence through Monitoring

Operations personnel at each site are required to adhere to the parameters set forth in the design process described above. They are supplied with the latest tools and technology available to achieve these goals and have no incentive to compromise our standards.

Monitoring takes many forms, including the use of piezometer wells to provide information about water level (pore pressure) conditions within the dam structure. We also monitor the size of the surface water pond and the extent of the "beach" between the outer edges of the pond and the dam crest. We perform construction quality control and assurance through material testing and methods inspections, and we monitor the operational condition of pipes and conveyances with pressure sensors designed to identify pipe breaks or malfunctions. These systems employ the latest technology, and much of the data is collected in real time through wireless networks. We also use internal movement monitoring equipment (inclinometers) and monitor any anomalous external movement through use of satellite-based radar and other systems.

Trained site engineers conduct inspections of our active tailings storage facilities at least monthly, and our Engineers of Record inspect our operating tailings storage facilities at least quarterly (monthly in some cases). A scorecard is completed and reviewed every month to track impoundment construction and operations progress against parameters and specifications.

Our inactive sites are inspected quarterly by either site personnel or external consultants.

Multi-Tiered Oversight

Oversight is multi-tiered and starts with the operational management and engineering teams at our sites. We use an escalating hierarchy of warning levels for parameters that require increased attention to address the conditions that trigger warnings and ensure they are resolved before they become an actual problem. In addition, we have a tailings management team at the corporate level, which serves as a dedicated technical resource for the site operators and engineers, as well as an additional layer of oversight. The corporate team does not have day-to-day operating pressures and exists solely to provide oversight of our tailings dams. The corporate team communicates its activities and any findings directly to senior corporate management, which maintains active involvement and oversight with respect to our company's tailings management and stewardship.

Our tailings stewardship team, which is comprised of third-party engineers and internal experts, physically inspects all of our tailings facilities, reviews associated documents and monitoring data to identify potentially significant deficiencies and recommends corrective actions. In addition, we have commissioned Technical Review Boards (generally four-person panels comprised of internationally known experts, typically PhDs with more than 30 years of experience in their respective areas of specialization). These Boards provide

independent opinions and guidance on the physical integrity, safety and performance of our tailings storage facilities and associated management systems. Each Technical Review Board has direct access to the Chief Operating Officer, and each member has a responsibility to report any concerns not being adequately addressed by line management.

Our tailings stewardship team has inspected all active tailings storage facilities within the past 12 months and has visited almost all facilities within the past three years. Members of our Technical Review Boards visit our active and select inactive tailings storage facilities at least every four years. We track recommended actions from inception to completion.

Commitment to Continuous Improvement

Our tailings experts are highly qualified and trained, and they participate with other industry experts in relevant conferences and forums to enhance their technical knowledge and to learn from the experiences of others. The recent tragedies in British Columbia and at the Samarco mine in Brazil produced robust post-failure analyses that we have embraced. At this time, the 2019 Brumadinho dam failure in Brazil is under review. Our tailings management and stewardship program complies with, and exceeds in certain respects, the Tailings Position Statement adopted in December 2016 by the International Council on Mining and Metals (ICMM). As a long-standing member of ICMM, Freeport-McMoRan is a leading advocate for long-term sustainability practices in the mining industry.

FREQUENTLY ASKED QUESTIONS

How many tailings storage facilities do you manage? What percentage are active and inactive?

The corporate affiliates of Freeport-McMoRan Inc. currently manage 19 active and 55 inactive tailings storage facilities. Approximately two-thirds of our inactive facilities have been reclaimed. The following table provides a summary as of February 15, 2019:

Inventory of Tailings Storage Facilities			
	US	PERU	TOTAL
Active	17	2	19
Inactive/Reclaimed	55	-	55

Our subsidiary PT Freeport Indonesia operates a controlled riverine tailings management system in Indonesia. Information regarding this system can be found at: https://www.fcx.com/sites/fcx/files/documents/sustainability/riverine.pdf

Are your tailings storage facilities upstream, downstream or centerline design?

- Upstream: 14 active / 53 inactive or reclaimed
- Centerline: 5 active / 1 inactive
- Downstream: 1 reclaimed

Do your tailings storage facilities use a wet stack or dry stack method?

The corporate affiliates of Freeport-McMoRan Inc. currently use or have used slurry tailings deposition at all sites.

Have you had any failures or major environmental incidents with your tailings dams in the last three years?

No, we have not had any failures or major environmental incidents with our tailings dams in the last 3 years and have not had any significant incidents in many years.

Do you have an emergency action plan for potential failures? How often is the plan reviewed?

Yes, the corporate affiliates of Freeport-McMoRan Inc. implement the elements of the ICMM Position Statement on Preventing Catastrophic Failure of Tailings Storage Facilities published in December 2016: accountability, responsibility and competency; planning and resourcing; risk management; change management; emergency preparedness and response; and review and assurance. We review and update our response plans on at least an annual basis.

How often do you inspect your tailings storage facilities?

Trained site engineers and other site personnel conduct inspections of our active tailings storage facilities at least monthly. We have our inactive sites inspected quarterly by either site personnel or external consultants. We also employ qualified external Engineers of Record for geotechnical investigations, analyses, designs, inspections and reviews for stability at all of our active and select inactive sites. Our Engineers of Record inspect our operating tailings storage facilities at least quarterly (monthly in some cases).

Our tailings stewardship team, a multi-disciplinary group of internal and external experts, has inspected all active tailings storage facilities within the past 12 months and has visited most facilities within the past three years. We also seek the advice of Technical Review Boards for all of our active tailings storage facilities in North America and South America and select inactive sites. Board members visit our active and select inactive tailings storage facilities at least every four years.

What are the regulatory requirements for your active tailings storage facilities?

- We have active tailings storage facilities at our U.S. operations in Arizona, Colorado and New Mexico, and at our Cerro Verde mine in Peru. The environmental or mining agencies in those states have responsibility for tailings storage facilities as part of hard rock mining and groundwater discharge regulatory programs. These programs are principally focused on environmental impacts during operations and the implementation of post-mining closure and reclamation measures.
- In New Mexico, tailings dams also are regulated, along with water dams, by the Office of the State Engineer, Dam Safety Bureau (OSE). The OSE inspects existing tailings storage facilities and reviews and approves plans and specifications for new dams. Under these regulations, tailings storage facilities at our at New Mexico operations must be inspected at least every five years (in many cases at least quarterly) by a professional engineer licensed in the state of New Mexico and qualified in the design and construction of dams.
- Tailings storage facilities in Peru are regulated by the Peruvian Ministry of Energy and Mines (MINEM), which oversees safety and occupational health in mining as well as the implementation of standards, procedures and practices for all the mining activities related to tailings disposal. The tailings storage facilities are constructed and operated according to the technical dossiers, and the construction and operation permits issued by the Mining General Director or Regional Government. The regulations require that a stability assessment of a tailings storage facility be conducted every two years by a third party and presented to the regulators to guarantee the safe operation of the facility.

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