Responsible management of tailings

Does Eramet manage tailing dams?

Only one out of the 3 Eramet's mining subsidiaries involves tailing dams: SLN (New Caledonia) and GCO (Senegal) do not use any tailing dams facilities.

In COMILOG (Gabon), Eramet is operating 11 tailings dams facilities. Eramet is also managing one tailings dam associated with its metallurgical plant in Marietta (USA).

The size of these facilities is limited compared to those involved in recent catastrophic events in Brazil (2015, 2019). Eramet has never used the controversial "upstream" raising method.

Facilities characteristics

Schlamms storage impoundments - COMILOG mine (Gabon, plateau of Bangombé)

10 facilities (B1 to B10), average of 16m height and 1.0-1.5 Mm3 of storage each.

Storage impoundments are not raised, new sites are built each 18-24 months. Residues stem from the separation of the manganese ore from its clayed gangue by using a simple mechanical / washing process. No added chemical is used in that regard. Consequently, as proven by leaching tests performed, the "schalmms" can be considered as "inert" according to French Standards.

Tailings storage impoundment – CIM ore beneficiation plant - Gabon

Low grade products (an inert sand fraction (1-20 mm) and a finer sludge (schlamms < 1 mm) are stored in a compacted stack, with an integrated internal sludge pond. From an initial 10m high dyke (where the finer fraction is pumped), sand fraction has been deposited and compacted in the outside perimeter to raise the dam and continuously comfort dyke stability ("downstream method").

Current dry stack size is about 100 m width from the pond area, and about 30 m high, for a volume of 5 Mm3 sand fraction and 3.6 Mm3 fine fraction.

Tailings dam metallurgical plant Marietta (USA)

This facility was designed to store residues from past industrial activities, which are now closed. Eramet is still operating the dam but with a much reduced deposition rate. The maximum height of the dam is 35.8 m above foundation level. This facility was raised in 4 steps, last one in 2000, always using the safest "downstream" method. Total volume actually stored is 4.3 Mm3. The Ohio Department of Natural Resources (last audit in 2018) regularly audits the dam.

What is doing Eramet to prevent risks associated with these facilities?

While they are still modest in size compared to those elsewhere in the world, Eramet is committed to ensure the safest operations conditions of its tailing facilities.

These structures are continuously monitored for their stability. Yearly external reviews are carried out. Furthermore, in 2016, in the framework of its risk prevention initiative, a specific audit of these dykes was commissioned by geotechnical and environmental experts of the Group. The audit found a good level of risk control by respecting the design and operation standards of these structures; an action plan to further strengthen this level of control has been established and fully implemented. In 2019, a new audit will be performed, using the latest EU Best available technologies report about mining waste (2018) as reference framework.

Eramet is willing to participate to sectoral initiatives aimed at increasing the safety of dams in the mining industry, such as The Church of England Pension Board's.

Please see below the detailed disclosure for The Church of England Pension Board's initiative regarding COMILOG Moanda (Gabon).

1. "Tailings Facility" Name/identifier 2. Location	Industrial Bassins B1 to B10 (Lat: -1.541367° Long: 13.247780°) Dam CIM (Lat: -1.505945° Long: 13.267704°)
3. Ownership	Owned
4. Status	B1 to B9: Inactive B10: Active CIM: Active
5. Date of initial operation	B10: 2019 CIM: 2001
6. Is the Dam currently operated or closed as per currently approved design?	B1 to B9: Closure pending (top cover), idle till residues trafficability is adequate. B10: Yes CIM: Yes
7. Raising method	B1-B10: Storage impoundments are not raised, new sites are built. An exception was made for a 2m raise performed on B8 only (now closed since 2017), using a centerline method. CIM: From an initial 10m high dyke (where the finer fraction is pumped), sand fraction has been deposited and compacted in the outside perimeter to comfort dyke stability. Current dry stack size is about 100 m width from the pond area, and about 30 m high.
8. Current Maximum Height	B1-B10: average of 16 m, with locally 18 m height.(maximum) CIM: 30 m high dry stack, with an integrated sludge pond.
9. Current Tailings Storage Impoundment volume	B1-B9: average of 1-1.5 Mm^3 each B10: just started on 02/2019 CIM: 5 Mm^3 sand fraction (04/2017), 3.6 Mm^3 fine fraction (03/2018)
10. Planned Tailings Storage Impoundment Volume in 5 years' time.	B10: planned 0.975 Mm^3 over 12 Ha B11: 1.07 Mm^3 (2020); B12: 2.275 Mm^3 (2021); B13: 10.7 Mm^3 (2022-28);

	CIM: extra 0.6 Mm^3 sand fraction, 0.2 Mm^3 fine fraction until 2023
11.Most recent Independent Expert Review	B10: 2018 (External engineering designer, yearly audit) CIM: 2018 (External engineering designer, yearly audit)
12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	B1-B9: yes B10: yes CIM: yes
13. What is your hazard categorisation of this facility, based on the consequence of failure?	B1-B9: Classe C (French Decree N°2007-1735 of 11/12/2007) B10: Classe C CIM: Classe A
14. What guideline do you follow for the classification system?	French Decree N°2007-1735 of 11/12/2007 « relatif à la sécurité des ouvrages hydrauliques et au comité technique permanent des barrages et des ouvrages hydrauliques et modifiant le code de l'environnement »
15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	B1-B9: no B10: no CIM: no
16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	B1-B9: external B10: external CIM: external
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	B10: A risk analysis report was issued in 02/2018 (MC-18-111-COM-03, along with the technical report), which included scenarios such as potential dyke rupture simulation, extreme weather events, human errors, etc. … CIM: A PFS report for a dry stack expansion scenario was issued 01/2019 (MC-18-183-COM-18-R01-B), including stability analysis and liquefaction analysis.

18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	B1-B9: yes B10: yes CIM: yes
19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	An audit of all COMILOG facilities is planned in 2019 according to EU *Best Available Techniques (BAT) Reference Document for the Management of Waste from Extractive Industries* (EUR 28963 EN), which include climate change aspects amongst other things.
20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	Nothing to report

Please see below the detailed disclosure for The Church of England Pension Board's initiative regarding Eramet Marietta Ohio (USA).

1. "Tailings Facility" Name/identifier 2. Location	Northern Impoundment (Latitude 39 deg 22'42.598" N, Longitude 81 deg 31'18.603" W)
3. Ownership	Owned
4. Status	Active
5. Date of initial operation	1977
6. Is the Dam currently operated or closed as per currently approved design?	Operating
7. Raising method	Downstream The embankment dam is zoned with an internal inclined and vertical chimney drain connected to a horizontal drainage blanket, impervious core and random fill zones.
8. Current Maximum Height	The maximum height of the dam is 35.8 m (117.5 ft) above foundation level.
9. Current Tailings Storage Impoundment volume	4.3 Mm^3 (5,636,270 cu.yds)
10. Planned Tailings Storage Impoundment Volume in 5 years' time.	0.2 Mm^3 at a rate of 0.04 Mm^3/yr.
11.Most recent Independent Expert Review	2016: Internal Audit 2013: Ohio Department of Natural Resources, File Number 9314-004 Eramet Waste Retention Dam: Dam Safety Inspection Report.
12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance, and/or closure?	Yes
13. What is your hazard categorisation of this facility, based on the consequence of failure?	Classe I

14. What guideline do you follow for the classification system?	OAC Rule 1501 :21-13-02
15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	No
16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	External
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	Yes A flood routing expertise is available, and integrated in the Emergency Action Plan (2015)
18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	No
19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	No
20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	No

ABOUT ERAMET

Eramet, a global mining and metallurgical group, is a key player in the extraction and valorisation of metals (manganese, nickel, mineral sands) and the elaboration and transformation of alloys with a high added value (high-speed steels, high-performance steels, superalloys, aluminium and titanium alloys).

The Group supports the energy transition by developing activities with high growth potential. These include lithium extraction and refining, and recycling.

Eramet positions itself as the privileged partner of its customers in sectors that include carbon and stainless steel, aerospace, pigments, energy, and new battery generations.

Building on its operating excellence, the quality of its investments and the expertise of its employees, the Group leverages an industrial, managerial and societal model that is virtuous and value-accretive. As a contributive corporate citizen, Eramet strives for a sustainable and responsible industry.

Eramet employs around 13,000 people in 20 countries with sales of approximately €4 billion in 2018.

For further information, go to www.eramet.com