

Overview

Lundin Mining employs a comprehensive and integrated approach to tailings management. This provides us with confidence that potential safety, environmental and social impacts can be reliably identified and minimized.



Candelaria tailings facility at Candelaria, Chile

Efficient mining and mineral processing, along with disposal underground where practicable, allow our operations to minimize the quantities of tailings stored on surface. Our operations aim to minimize associated risk with a clear understanding of the tailings characteristics, the facility construction materials, and the final settings in which they are placed.

Lundin Mining’s Tailings Facilities

Lundin Mining operates five mines with five active tailings facilities and uses two widely accepted methods of tailings disposal:

5	Active tailings facilities
6	Inactive/closed tailings facilities

(1) underground disposal involves mixing tailings with products, such as sand or cement, followed by disposal as a paste backfill or hydraulic backfill in previously mined areas of

underground mines; and

(2) surface disposal involves placement in engineered surface impoundments or, in the case of Eagle, in a previously mined open pit.

Of the five Lundin Mining operations, Eagle Mine is the only operation that does not have a constructed tailings impoundment with dams.

Across the other operations, the active tailings facilities use various construction techniques for the main and secondary or perimeter dams, but none use upstream construction. Lundin Mining also maintains

and monitors six inactive/closed tailings facilities, one of which is a rockfill combination centreline and downstream design followed by rockfill upstream raises and buttresses (Enemossen tailings facility at Zinkgruvan).

All tailings facilities are operated or closed as per the currently approved design. Full and complete engineering records including design, construction, operation, maintenance and/or closure exist for all tailings facilities except for the inactive Enemossen facility at Zinkgruvan, and closed San Esteban and Ojos del Salado facilities at Candelaria. San Esteban has an updated detailed design closure plan and the three Ojos del Salado tailings facilities are legacy sites that ceased operations in the 1960s. The Ojos del Salado tailings facilities were fully closed in 2012 as per an approved engineered closure plan.

A full list of tailings facilities that Lundin Mining manages, including information on construction method, maximum dam height and volume, can be found in the table on pages 4 and 5.

Tailings Management at Lundin Mining

Surface tailings impoundments can represent some of the most significant safety and environmental related risks for the mining industry. Lundin Mining takes considerable care to ensure our tailings facilities are well-designed, built in accordance with leading industry practices and standards, well operated and maintained, inspected, independently reviewed, and carefully monitored.



Chapada tailings facility at Chapada, Brazil

Policies and Standards

Lundin Mining’s Responsible Mining Policy and Responsible Mining Management System (RMMS) include tailings specific principles and standards. All Lundin Mining’s operations manage their tailings in accordance with the Tailings Management Standard,

developed in 2015, and recently updated to align to the Global Industry Standard on Tailings Management (GISTM).

The updated Tailings Management Standard requires that for all tailings facilities throughout the entire lifecycle, from planning and design, construction, operation, closure, and post-closure, implementation of leading practices will be carried out to ensure:

- Zero harm to people and the environment;
- All aspects comply with Lundin Mining policies and standards and accepted international practice;
- All aspects comply with commitments to stakeholders; and
- Leadership, personal commitment, and accountability from all employees, consultants, and contractors is embedded throughout all aspects of tailings management.



Cerro do Lobo tailings facility at Neves-Corvo, Portugal

Monitoring and Surveillance

A requirement of the Tailings Management Standard is for all operations to conduct regular geotechnical, hydrogeological and environmental monitoring to meet regulatory requirements and prevent the uncontrolled release of tailings and/or water to the environment.

All operations employ monitoring and surveillance systems which may include surface prisms, piezometers, inclinometers, remote sensing and other technologies to monitor tailings dams and water levels. Trigger action response plans (TARPs) provide clear guidance on how to respond to pre-determined trigger levels for surveillance activities.

All tailings facilities have a closure plan which includes long-term monitoring requirements. The monitoring plan for the closed Ojos del Salado tailings

facilities was reviewed in 2021 and additional dam safety instrumentation was installed. Plans to expand monitoring activities will be completed in 2022.

Responsible Person

All operations are required to identify a responsible person to ensure ownership and proper management of the tailings facility. The responsible person ensures procedures for each facility, including an Operating, Maintenance, and Surveillance (OMS) Manual and Emergency Preparedness and Response Plan, are regularly documented, and made available to operations personnel. The responsible person is an appropriately qualified, experienced and site-dedicated individual employed directly by the operation.

Staff Inspections

Tailings dams are regularly inspected by trained operators and technical staff, sometimes as frequently as several times daily, with formal documented staff inspections at least quarterly.

Engineer of Record

Each tailings facility has an appropriately qualified, licensed and experienced third-party geotechnical engineer to act as an Engineer of Record in the relative jurisdiction.

Dam Safety Inspections

Formal dam safety inspections are conducted at least annually by the Engineer of Record, and reports are issued to the responsible person for action on recommendations.

Independent Reviews

A component of the Tailings Management Standard is the requirement for regular independent third-party tailings reviews, which are recognized as a leading practice for effective tailings and water dam stewardship.



Enemossen tailings facility at Zinkgruvan, Sweden

Independent Tailings Reviews

- Requires annual reviews by independent qualified engineering specialists for all tailings facilities.
- Reviews are to provide an expert, independent opinion as to whether the tailings facility design and performance meet accepted international practice from a geotechnical and hydrogeological perspective.
- Includes all tailings facilities and water retention structures at each operation.
- Program performance is reported quarterly to the Board-appointed HSEC Committee.

Annual site visits for the independent tailings reviews were completed at all operations last year except for Chapada which is planned in early 2022. In addition, online progress meetings with the independent reviewers and Engineer of Record were completed throughout the year to closely track progress made on outstanding recommendations.



Humboldt tailings facility at Eagle, USA

Continuous Improvement

Enhanced Tailings Governance, Monitoring, and Reporting Initiative

Lundin Mining is evaluating enterprise-wide business intelligence solutions for real-time monitoring, data management, tailings governance, and critical controls reporting. A current landscape review was completed across all operations in 2021 with plans to define a viable solution in 2022.



Geotechnical Monitoring Center at Chapada, Brazil

Global Industry Standard on Tailings Management (GISTM)

Lundin Mining is committed to the implementation of the GISTM, which is the first global standard on tailings management.

Briefing workshops and information sessions were completed throughout 2021. The RMMS Tailings Management Standard was recently updated, and the existing Responsible Mining Policy will be updated to align with the GISTM requirements in early 2022.

Formal external gap analyses started in June 2021. Corporate and operation-level implementation action plans will be developed in 2022 for all tailings facilities based on the results of the gap analyses.

Lundin Mining plans for tailings facilities that are classified as having 'Extreme' or 'Very high' potential consequences of failure, as defined by the Standard, to be in conformance with the GISTM within three years of August 5, 2020, and all other facilities within five years.

/s/ Peter Rockandel

Peter Rockandel
President, CEO and
Director

Lundin Mining Tailings Facility Inventory

Operation	Tailings Facility	Current Number of Tailings Dam Structures	Location	Ownership	Status	Years of Operation	Construction Method	Current Max Dam Height (September 2021)	Current Tailings Storage Volume (September 2021)	Planned Tailings Storage Volume in 5 Years (September 2026)	Most Recent Independent Tailings Review	Most Recent Breach Analysis
Candelaria	Candelaria Tailings Facility	One main dam and three perimeter dams	Latitude: 27°30'21.90"S Longitude: 70°18'41.96"W	Owned (80%)	Inactive	1994 to 2019	Downstream	170 m	312 Mm ³	Same as current	November 2021	February 2017 with update planned in 2022.
	Los Diques Tailings Facility	One main dam and two perimeter dams	Latitude: 27°32'13.74"S Longitude: 70°19'8.37"W	Owned (80%) and Operated	Active	2018 to Present	Downstream	82 m	42 Mm ³	119 Mm ³	November 2021	December 2014 with updated planned in 2022.
	San Esteban Tailings Facility	One main dam and one secondary dam	Latitude: 27°29'7.11"S Longitude: 70°17'29.97"W	Owned (80%)	Closed	2006 to 2010	Centerline	45 m	2 Mm ³	Same as current	November 2021	Closed facility with no water cover. Credible failure/flow potential to be evaluated.
	Ojos del Salado Tailings Facility – North	Two rehabilitated legacy dams	Latitude: 27°29'25.18"S Longitude: 70°15'43.60"W	Owned (80%)	Closed	Operated until the 1960s and closed in 2012	Centerline	22 m	less than 1 Mm ³	Same as current	November 2021	Closed facility with no water cover. Credible failure/flow potential to be evaluated.
	Ojos del Salado Tailings Facility – Central	One rehabilitated legacy dam	Latitude: 27°29'40.43"S Longitude: 70°15'41.26"W	Owned (80%)	Closed	Operated until the 1960s and closed in 2012	Centerline	20 m	less than 1 Mm ³	Same as current	November 2021	Closed facility with no water cover. Credible failure/flow potential to be evaluated.
	Ojos del Salado Tailings Facility – South	Three rehabilitated legacy dams	Latitude: 27°29'45.59"S Longitude: 70°15'36.44"W	Owned (80%)	Closed	Operated until the 1960s and closed in 2012	Centerline	34 m	less than 1 Mm ³	Same as current	November 2021	Closed facility with no water cover. Credible failure/flow potential to be evaluated.
Chapada	Chapada Tailings Facility	One main dam and two perimeter dams	Latitude: 14°13'4.18"S Longitude: 49°24'13.37"W	Owned and Operated	Active	2007 to Present	Centerline	48 m	213 Mm ³	298 Mm ³	August 2021 ⁽⁵⁾ Site visit planned for February 2022.	December 2021
Neves-Corvo	Cerro do Lobo Tailings Facility	One main dam, seven perimeter dams, and six internal berms	Latitude: 37°33'36.99"N Longitude: 7°56'6.43"W	Owned and Operated	Active	1988 to Present	Downstream ⁽²⁾	42 m	33.2 Mm ³ ⁽⁴⁾	40.5 Mm ³	October 2021	May 2021
Zinkgruvan	Enemossen East Tailings Facility	Two main dams	Latitude: 58°46'38.28"N Longitude: 15°6'24.23"E	Owned and Operated	Active	2017 to Present	Centerline	15.5 m	2.0 Mm ³	5 Mm ³	October 2021	August 2019
	Enemossen Tailings Facility	Two main dams and six perimeter dams	Latitude: 58°46'41.76"N Longitude: 15°5'48.58"E	Owned	Inactive ⁽¹⁾	1977 to 2017	Hybrid combination of Centerline & Downstream / Upstream ⁽³⁾	35 m	12 Mm ³	Same as current	October 2021	March 2016
Eagle	Humboldt Tailings Facility	Zero dams, tailings stored sub-aqueously in an old open pit	Latitude: 46°29'26.57"N Longitude: 87°54'8.70"W	Owned and Operated	Active	2014 to Present	N/A	N/A	2 Mm ³	3.5 Mm ³ (Current mine plan ends in 2025)	November 2021	July 2021

Notes:

- (1) Active deposition occurs periodically to assist in the establishment of final cover surfaces
- (2) Includes internal upstream thickened tailings discharge rockfill berms
- (3) Rockfill combination centerline and downstream design followed by rockfill upstream raises and buttresses
- (4) Combined volume of co-disposed tailings and mine waste rock
- (5) Online progress workshop with independent technical reviewers

Lundin Mining Tailings Facility Inventory

Operation	Tailings Facility	Consequence Classification	Classification System	Internal/in-house Engineering Specialist Oversight of this Facility; or, External Engineering Support	Extreme Design Flood Event	Past Incidents of Note
Candelaria	Candelaria Tailings Facility	Chile: Class C GISTM: Extreme ⁽¹⁾	Chile: SERNAGEOMIN DS 248/2007 and DGA Decreto 50 (2015) GISTM – Global Industry Standard on Tailings Management (2020)	Both	Facility is designed to store the Probable Maximum Precipitation (PMP) flood event	
	Los Diques Tailings Facility	Chile: Class C GISTM: Extreme ⁽¹⁾	Chile: SERNAGEOMIN DS 248/2007 and DGA Decreto 50 (2015) GISTM – Global Industry Standard on Tailings Management (2020)	Both	Facility is designed to store the PMP flood event	
	San Esteban Tailings Facility	GISTM: TBD	Global Industry Standard on Tailings Management (2020)	Both	Facility closed with a dry cover	
	Ojos del Salado Tailings Facility – North	GISTM: TBD	Global Industry Standard on Tailings Management (2020)	Both	Facility closed with a dry cover	
	Ojos del Salado Tailings Facility – Central	GISTM: TBD	Global Industry Standard on Tailings Management (2020)	Both	Facility closed with a dry cover	
	Ojos del Salado Tailings Facility - South	GISTM: TBD	Global Industry Standard on Tailings Management (2020)	Both	Facility closed with a dry cover	
Chapada	Chapada Tailings Facility	Brazil: Class B GISTM: Extreme	Brazil: Tailings Dam Classification System - Departamento Nacional de Produção Mineral (DNPM) Portaria No 70.389 (May 17, 2017) Global Industry Standard on Tailings Management (2020)	Both	Emergency spillway is designed to pass the 1/10,000 year flood event	In 2009, erosional features and internal drainage issues were identified. Mitigation measures were successfully implemented.
Neves-Corvo	Cerro do Lobo Tailings Facility	Portugal: Class I GISTM: Very High ⁽¹⁾	Portugal: Decreto_Lei nº. 344/2007, amended by Decreto_Lei nº. 21/2018, which establishes the Regulamento de Segurança de Barragens (RSB) Global Industry Standard on Tailings Management (2020)	Both	Emergency spillway is designed to pass the 1/10,000 year flood event	
Zinkgruvan	Enemossen East Tailings Facility	Sweden: GruvRIDAS Dam Class 1 and DSK Dam Class B GISTM: High ⁽¹⁾	Sweden: GruvRIDAS Dam Class (2012) and Environmental Code Dam Safety Class "Dammsäkerhetsklass" (DSK) (2016) Global Industry Standard on Tailings Management (2020)	Both	Emergency spillway is designed to pass the PMP flood event	
	Enemossen Tailings Facility	Sweden: GruvRIDAS Dam Class 1 and DSK Dam Class B GISTM: High ⁽¹⁾	Sweden: GruvRIDAS Dam Class (2012) and Environmental Code Dam Safety Class "Dammsäkerhetsklass" (DSK) (2016) Global Industry Standard on Tailings Management (2020)	Both	Emergency spillway is designed to pass the 1/10,000 year flood event	Between 1977 and 2019, a total of 14 incidents were reported on the two main tailings dams which required action. These included localized failures, crest settlement and the formation of localized sinkholes on the downstream shell of the two main dams. All have since been successfully repaired. In addition, dewatering wells and pumps were installed on the two main dams to maintain a depressed phreatic surface and low seepage gradients, and the supernatant water surface was pushed away from dam crests with tailings beaches. The Enemossen tailings facility is inactive having been replaced by Enemossen East in 2017. Enemossen East is buttressing one of the Enemossen main tailings dams and the planned Enemossen North tailings facility will buttress the other Enemossen main tailings dam.
Eagle	Humboldt Tailings Facility	GISTM: Low	Global Industry Standard on Tailings Management (2020)	Both	Facility is designed to store the snowmelt PMP flood event	

Notes:

(1) GISTM Consequence Classification subject to verification.