

# **Tailings Storage Facility Disclosure Report**

**Carmen de Andacollo Tailings Management Facility**

**July 2023**

The Teck logo is positioned in the bottom right corner of the page. It consists of the word "Teck" in a bold, dark blue, sans-serif font. The background of the page features a large, dark blue geometric shape on the left side, which is a trapezoid with a diagonal cutout on its right edge, creating a dynamic, modern look.

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## 1. Tailings Facility Description

The Carmen de Andacollo (CdA) Tailings Management Facility (TMF) is an active facility that is a part of the Compañía Minera Teck Carmen de Andacollo (CMTCdA) operations. It is owned and operated by Teck Resources Chile Ltda (TRCL).

The site is located in the foothills of Los Andes Mountain range, 2,000 m from the town of Andacollo and 56 km southeast of the city of La Serena, in the IV Region of Coquimbo, Chile. CdA is at an elevation of 1,050 meters above sea level, in a semi desertic zone with a 100 times negative natural water balance.

The CdA TMF is located upstream of the concentrator facility at CdA, about 1,000 m south of the current mine pit in the area called Llano de Chepiquilla. Construction started in 2007 on the Northeast Containment Structure (MNO), and in 2009 on the North Containment Structure (MN) with operations starting in 2010. The CdA TMF has a designed total storage capacity of 297 Mm<sup>3</sup> or 416 Mt of tailings.

The CdA TMF occupies a total area of approximately 553 ha and has a minimum crest elevation of 1,162.5 m. The CdA TMF is composed of high natural topography to the west and six containment structures. The structures comprising the CdA TMF include:

- North Containment Structure (MN)
- Northeast Containment Structure (MNO)
- East Containment Structure (MO)
- East-South Containment (MO(S))
- South Containment Structure (MS)
- West Containment Structure (MP)

A short description of the CdA TMF is summarized in the table below.

Table 1: Description of CdA TMF

TMF Design Summary	Description
Status	Active
Number of tailings embankment structures	6
Type of Construction	Downstream-constructed zoned earth fill
Most recent Annual Facility Performance Review	2022 <a href="http://www.teck.com/tailings">www.teck.com/tailings</a>
Independent Review Board	Yes

*Note: Further details regarding the TSF configuration can be found in our facility inventory at [www.Teck.com/tailings](http://www.Teck.com/tailings).*

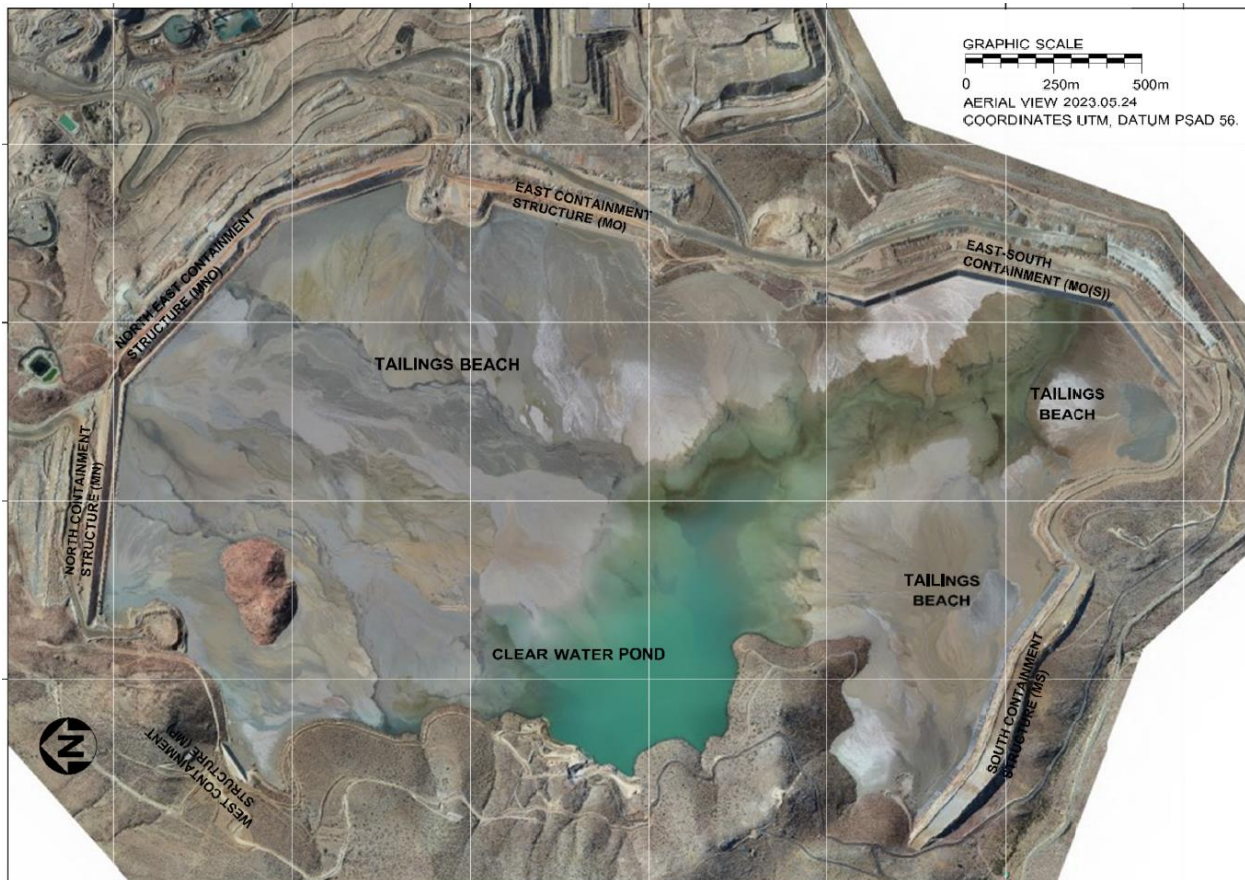


Figure 1: Carmen de Andacollo TMF Site Plan

## 2. Consequence of Failure

All Teck tailings facilities are assessed for credible failure modes, and the impacts from these credible failure scenarios inform our risk management activities. For the purposes of assigning a facility classification, the downstream consequences of *potential* failure modes (not considering whether they are credible or not) are used, as per the Canadian Dam Association (CDA) guidelines and the requirements of the jurisdictions in which we operate. The Global Industry Standard on Tailings Management (GISTM) bases consequence classification on credible failure modes only, which may result in a lower stated classification.

Consequence classification should not be confused with risk, as risk also requires the consideration of the likelihood of the event occurring. To better understand the risk that a tailings facility presents, it is necessary to consider both the likelihood of a failure event, and the consequence of the event, which is performed through our risk assessment process described in the next section.

The CdA TMF is classified as an ‘Very High’ consequence facility under the CdA guidelines and as “Category C” in the Chile Dam Classification system. Using the GISTM classification, the consequence classification of the facility is “Low”, as there are no credible catastrophic failure modes. Regardless of classification, these facilities have been designed to resist extreme loads, resulting in no credible catastrophic failure modes.

### 3. Summary of Risk Assessment Findings

Teck applies risk-based design approaches, whereby risk assessments are used to demonstrate the resilience of our facilities to extreme loading criteria, and to inform decisions to manage risks to as low as reasonably practicable (ALARP). This approach focuses our efforts on credible failure modes, reducing risks at our facilities by reducing the likelihood of occurrence and mitigating downstream impacts, regardless of the consequence classification from hypothetical embankment failures.

The most recent risk assessment for the CdA TMF was conducted in 2023 for the Stage 4 configuration, assessing potential failure modes for hazards up to and including extreme events (i.e., an event that occurs once in 10,000 years). As part of this assessment, failure modes are deemed as credible or non-credible, considering the greatest combination of events or operational errors, and then the risks of such events are evaluated.

All failure modes are sorted according to Teck's risk matrix, with risk mitigation controls identified and tracked. These failure modes are also described in the publicly available Annual Facility Performance Reports. These risk assessments are prepared with assistance from the Engineer of Record and are reviewed by the Independent Tailings Review Board. Teck regularly updates these detailed risk assessments.

The outcome of the assessment is that the TMF does not have any credible catastrophic<sup>1</sup> failure modes (CCFMs), including flow failure scenarios that could impact the integrity of the Teck CdA TMF, causing the loss of water and/or tailings downstream of the TMF.

The potential risks, whether credible or not, are well managed and well understood. The potential and credible risks, and the results of the performance monitoring and surveillance program to monitor for these risks are described in more detail in the Annual Facility Performance Report for the CdA TMF at [www.teck.com/tailings](http://www.teck.com/tailings).

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<sup>1</sup> Catastrophic events typically involve numerous adverse impacts, at different scales and over different timeframes, including loss of life, damage to physical infrastructure or natural assets, and disruption to lives, livelihoods, and social order. (GISTM, 2020)

#### **4. Summary of Impact Assessments and of Human Exposure and Vulnerability to Tailings Facility Credible Flow Failure Scenarios**

The most recent risk assessment for the CdA TMF was conducted in 2023 for the Stage 4 configuration. As part of this assessment, failure modes are deemed as credible or non-credible. The outcome of the assessment was that the TMF does not have any credible catastrophic failure modes (CCFMs), including flow failure scenarios. Nevertheless, by regulatory requirements in Chile a formal inundation study (Distancia Peligrosa) was conducted in 2019 and reported to the regulator.

#### **5. Description of the Design for all Phases of the Tailings Facility Lifecycle**

General design information regarding the design of the six retaining structures for the operational phase is summarized in the table below. The current closure plan for the CdA TMF was prepared in 2018 and approved in 2019, where the closure measures have been defined to ensure the physical and chemical stability of the facility in the long term. Work is currently underway to further define a post-closure vision for CdA to achieve Teck's long-term closure objective of achieving landform status.

Table 2: CdA TMF Design Information Summary

Structure	Containment or Design Type	Estimated Crest El. [m]	Current Embankment Height [m] (on centerline)	Initial Operation	Final Permitted Embankment Height [m] (on centerline)	Current Tailings Volume [m <sup>3</sup> ]	Final Permitted Tailings Capacity [m <sup>3</sup> ]	Crest Length [m]	Overall Downstream Slope	Design Storm Event	Design Earthquake
North Containment Structure (MN)	Rockfill structure with a 4 m wide upstream compacted low permeability face and HDPE liner for Stage 2 (of 6); Construction started in 2009 and has been raised 4 times (of a total of 6 stages) with the last raise occurring in 2021.	1,162.5	44.5	2010	86	132 Mm <sup>3</sup>	297 Mm <sup>3</sup>	729	1.8 (H) / 1 (V) (29 degrees)	Probable Maximum Flood (PMF): 3.69 Mm <sup>3</sup>	Maximum Credible Earthquake (MCE): (1) Thrust Mw 8.8 – 1.00 g; (2) Intraplate Mw 8.0 – 1.04 g
Northeast Containment Structure (MNO)	Rockfill structure with a 4 m wide upstream compacted low permeability face and HDPE liner for Stage 1 (of 6) Construction started in 2007 and has been raised 4 times (of a total of 6 stages) with the last raise occurring in 2022.	1,162.5	109.5	2010	151			994			
East Containment Structure (MO)	Rockfill structure with a 4 m wide upstream compacted low permeability face and HDPE liner for Stage 1 (of 6) Construction started in 2010 and has been raised 4 times (of a total of 6 stages) with the last raise occurring in 2022.	1,162.5	62.5	2010	104			715			
East-South Containment (MO(S))	Rockfill structure with a 4 m wide upstream compacted low permeability face and HDPE liner Construction started in 2013 and has been raised 2 times (of a total of 4 stages) with the last raise occurring in 2021.	1,162.5	16.4	2016	58			1,198			
South Containment Structure (MS)	Rockfill structure with a 4 m wide upstream compacted low permeability face and HDPE liner Construction started in 2013 and has been raised 2 times (of a total of 4 stages) with the last raise occurring in 2021.	1,162.5	7.5	2016	49			855			
West Containment Structure (MP)	Rockfill structure with a 4 m wide upstream compacted low permeability face and HDPE liner Construction started in 2021 and has been raised 1 time (of a total of 3 stages) with the last raise occurring in 2022.	1,162.5	-	2022	33			134			

## **6. Summary of Material Findings of Annual Performance Reviews (AFPR) and Dam Safety Reviews (DSR)**

Annual Facility Performance Reports (AFPRs) are compiled each year by a third-party Engineer of Record to summarize the past year's monitoring and surveillance information into a concise review. Dam Safety Reviews (DSRs) are performed every 5 years by an independent reviewer in order to provide an independent assessment of the design and performance of the tailings facility. These reports document the safe operation, maintenance, and surveillance of the facility and identify and make any recommendations for continual improvement. Recommendations from these reports are tracked in the site tailings management system through to completion.

The recommendations from the AFPRs and DSRs are considered 'material<sup>2</sup> findings' when the observation relates to credible failure modes of the facility that could result in a very high or extreme consequence, regardless of the likelihood of such an occurrence. It is important to note that a 'material finding' does not mean a high probability of occurrence. The urgency with which recommendations are to be addressed are defined by the Engineer of Record or independent reviewer by assigning a priority rating, which then informs the timeline to complete the action.

The most recent AFPR for this facility was completed for the period of January through December 2022 and the most recent DSR was performed in 2018. There were no material findings in the 2022 AFPR or 2018 DSR that would indicate any tailings facility safety issues.

## **7. Summary of Material Findings of the Environmental and Social Monitoring Program**

There were no material findings associated with the CdA TMF from the 2022 social monitoring program. Key indicators of interest include leading indicators such as the completion of human rights, human exposure, and vulnerability assessments relative to the risks described in section 3. A socio-economic profile update is planned for 2023 to ensure the mine has the latest knowledge base from which the CdA TMF is located. Work is under way to engage project affected people and assess local responder capacity to respond to emergencies. Lagging indicators include an increase in concerns reported through the site's Response Mechanism related to the tailings facility. All concerns were processed and closed.

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<sup>2</sup> Material: Important enough to merit attention or having an effective influence or bearing on the determination in question. For the Standard, the criteria for what is material will be defined by Operator, subject to the provisions of local regulations, and evaluated as part of any audit or external independent assessment that may be conducted on implementation. (GISTM, 2020)



CdA has implemented an Environmental Management System (EMS) that is certified to the ISO 14001:2015 standard and applicable Teck corporate standards for health, safety, environment and community (HSEC) management. Teck is committed to environmental management best practices and to achieve continual improvement in our environmental performance. Through this policy CdA commits to:

- Complying with applicable legal, regulatory and other requirements which relate to the operations' identified environmental aspects.
- Ensuring effective implementation, maintenance, and documentation of the EMS.
- Setting environmental objectives which measure progress towards continual improvement and utilizing accepted assessment processes.
- Prevention of pollution.
- Minimizing environmental impacts of activities and services related to mining operations.
- Making this policy available to employees, persons working on Teck's behalf and the public.
- Raising the environmental awareness of employees and those working on Teck's behalf.

Monitoring and review requirements are defined in the EMS in order to track the overall effectiveness in controlling environmental impacts, verifying conformance with operational controls, tracking regulatory compliance status, and progress toward achieving objectives and targets. Audits are also conducted at least annually from external or third parties.

Material findings from the environment monitoring program include a clear water spring (~ 0.2 L/s) downstream of MO(S) that was detected on June 13, 2022, without turbidity, and with no evidence of fines. This seepage stopped on July 23, 2022, then reappeared after a rain and snow storm from July 9 to 16, 2022. The seep also reappeared in mid-October and has continued intermittently. It is important to highlight that since it appeared, the seepage has been contained and controlled within the mining property, and it has been conducted, handled, monitored, and surveyed on a daily basis, with no off-site impact.

## **8. Summary of the Mine Emergency Response Plan (MERP)**

The CdA TMF has no credible failure modes. Regardless, information regarding the facility is contained in the site-specific Andacollo Mine Emergency Preparedness Plan (EPP), Mine Emergency Response Plan (MERP) and Plant General Emergency Plan (GEP). These plans identify emergencies that may arise from various hazards across the mine site and describe actions to prepare for and respond to emergencies arising from those hazards. The CdA EPP, MERP and plant GEP includes a site risk analysis, describes roles and responsibilities of site personnel, alerting and notification procedures, an inventory of emergency response equipment, and training requirements for site personnel.

The Emergency Response Plan (MERP) program is linked to the PAS Activation Protocol, which is associated with the tailings surveillance and monitoring program. The objectives of the MERP are:

- Establish procedures for emergency preparation, including escalating levels of response,
- Respond to developing, imminent or actual emergency scenarios in a way that reduces potential consequences; and,
- Identify training and testing requirements for effective implementation of the MERP.

In the highly unlikely event of emergency on site, response actions would be taken to save human lives and reduce potential consequences. The actions identified in the MERP generally include:

- Immediate physical actions that could potentially be taken in response to an unexpected triggering event to prevent further deterioration of the situation or condition.
- Emergency call out procedures to establish internal and external communication lines. These contact lists are verified annually to confirm accurate contact information. The groups that would be contacted include, but are not limited to:
  - Servicio Nacional de Prevención y Respuesta ante Desastres SENAPRED
  - Potentially affected downstream communities
  - Teck Corporate Crisis Response Team
  - The Engineer of Record
- Procedures for coordination with SENAPRED in order to conduct an evacuation of downstream potentially affected areas. For this purpose, evacuation maps have been prepared.

The CdA EPP, MERP and plant GEP notification list includes internal and external contacts. External contacts include regulators, community members and province emergency response providers.

As part of Teck's preparation for emergencies, simulations and training exercises are conducted annually, and include participation by emergency preparedness agencies and representatives of the downstream project affected people. Specifically, the CdA EPP, MERP and plant GEP contain emergency response measures that apply to project affected people, including joint emergency simulations and training exercises between the company, project affected people and public sector agencies. Further, the capability of emergency response services of project affected people to respond to emergencies is assessed, and a plan is in progress with project affected people to improve their preparedness for emergencies. As part of our commitment to continuous improvement, the EPRP will continue to develop over time in collaboration with project affected people to improve the state of preparedness for emergencies.

The CdA EPP, MERP and plant GEP are tested and reviewed yearly. The last test was in 2022.

## **9. Independent Reviews**

The last Independent Geotechnical Review Board (GRB) took place in July 2023. The next Independent Geotechnical Review Board review is scheduled for May 2024.

## 10. Financial Capacity

Teck confirms that it has adequate financial capacity to cover estimated costs of planned closure, early closure, reclamation, and post-closure of the CdA TMF and its appurtenant structures. These costs are disclosed annually in aggregate form in our annual financial statements contained within our [Annual Report](#). These cost estimates are based on the tailings facility closure designs described in Section 5.

Further, Teck maintains insurance for our tailings facilities to the extent commercially available.

## 11. Conformance to the Global Industry Standard on Tailings Management

Teck has performed a self-assessment of conformance to the Global Industry Standard on Tailings Management (GISTM) for the CdA TMF. This self-assessment has been performed in accordance with the ICMM Conformance Protocols issued in May 2021.

Categories of conformance for individual Requirements in the GISTM are set out below. These take into account guidance from ICMM. Where some requirements represent ongoing community engagement or other ongoing activities, and the systems and/or practices are substantively implemented such that the intended outcome is functionally achieved, and there is no physical risk to tailings facility safety, then these requirements can be considered conformance with the GISTM.

Table 3: Categories of Conformance

Conformance Level	Description
Meets	Systems and/or practices related to the Requirement have been implemented and there is sufficient evidence that the Requirement is being met.
Meets with plans in place	Where an Operator is required to undertake engineering work or other measures to conform to some Requirements (e.g., for Requirements 4.7 or 5.7, which might include remedial engineering measures for existing facilities), the expectation is that these shall be carried out as soon as reasonably practicable. It is not necessary for such measures to be complete by the implementation deadlines for an Operator to be in conformance, but both the measures and associated timelines should be clearly documented by an Accountable Executive.
Partially meets	Systems and/or practices related to meeting the Requirement have been only partially implemented. Gaps or weaknesses persist that may contribute to an inability to meet the Requirement, or insufficient verifiable evidence has been provided to demonstrate that the activity is aligned to the Requirement.
Does not meet	Systems and/or practices required to support implementation of the Requirement are not in place, are not being implemented or cannot be evidenced.
Not applicable	The specific Requirement is not applicable to the context of the asset.

For the CdA TMF, all requirements have been met, or are met with a plan in place, for Principles 1 through 15. The facility was designed and built to meet extreme loading criteria, and as such has a robust design with no credible failure modes. Further, appropriate tailings management and governance systems are in place, with established independent reviews and ongoing community engagement.