

Report on

WINU HDTSF 5H 10 Mtpa PRE- FEASIBILITY ERD CLOSURE REPORT

Prepared for

WINU

REPORT NO. 127-029-1 ERD Rev B

NOVEMBER 2025



* *Tailings dam engineering and management*

* *Landform engineering and erosion assessment*

* *Geotechnical engineering*

* *Flood assessment*

* *Dam break assessment*

* *Construction verification*

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A	12 Nov 25	Draft report issued for discussion	GMcP
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WINU HDTSF 5H PRE-FEASIBILITY ERD DESIGN REPORT

1 INTRODUCTION

The Winu Tailings Storage Facility (TSF) closure project is a comprehensive effort to ensure that, once mining operations conclude, the site is rehabilitated to a safe, stable, and environmentally sustainable condition. This project adheres to rigorous environmental, geotechnical, and hydrological standards, with a primary goal of transforming the TSF into a stable landform that integrates with the surrounding environment. The rehabilitation process will incorporate both traditional land management knowledge and modern engineering practices to ensure long-term sustainability.

2 PROJECT BACKGROUND

The Winu TSF has been designed to safely contain mining waste from copper and gold processing operations. The facility consists of four tailings storage cells: two designated for Low Sulfur Tailings (LST) and two for High Sulfur Tailings (HST). Figure 1 shows a schematic of the ore processing and tailings storage process.

The closure plan follows relevant regulatory, industry and internal Rio Tinto guidelines, including compliance with:

1. Department of Mines, Petroleum and Exploration (DMPE, formerly DMIRS).
2. Global Industry Standard for Tailings Management (GISTM).
3. International Council on Mining and Metals (ICMM) Guidelines.
4. Rio Tinto's Closure Standard.
5. Rio Tinto's own D5 standard for the management of tailings and water storage facilities.

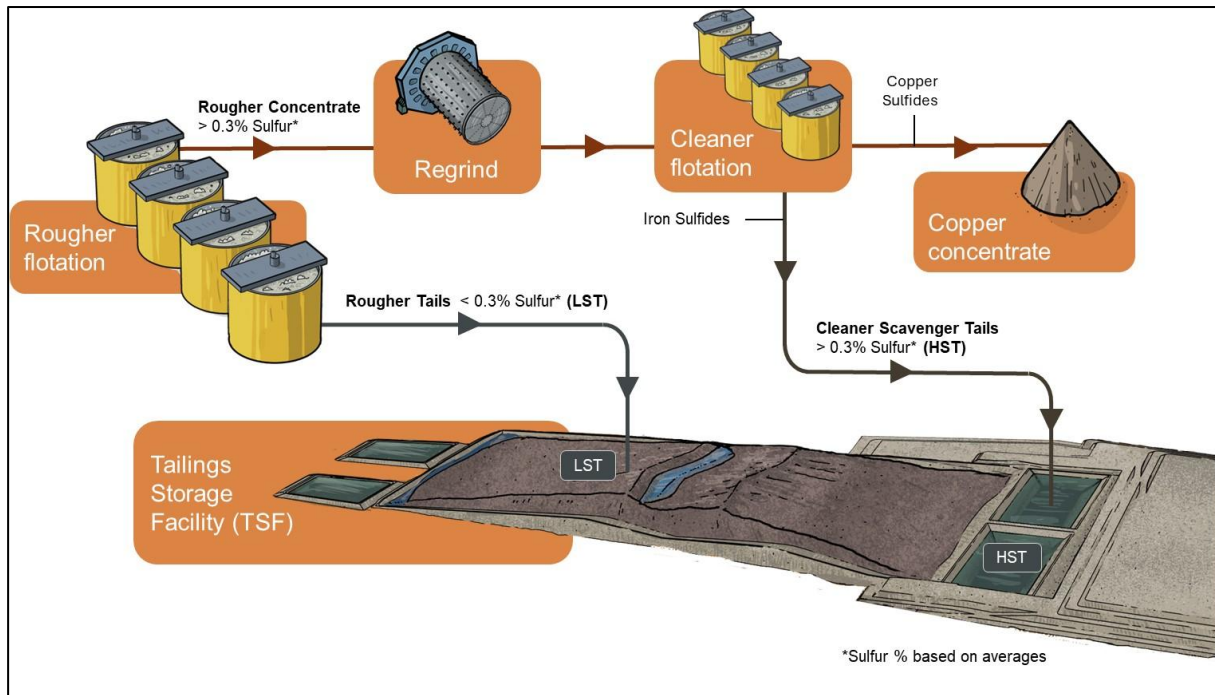


Figure 1: Schematic of ore processing

3 KEY CLOSURE OBJECTIVES

The closure of the TSF aims to:

- Minimize dust generation from the tailings surface.
- Prevent acid generation from the oxidation of sulphides.
- Protect surface and groundwater from contamination.
- Ensure embankment stability and minimize erosion risks.
- Reduce long-term maintenance requirements.
- Obtain approval from Regulators.
- Revegetate where technically appropriate.

4 FACILITY DETAILS AND VOLUMES

The tailings to be stored are as follows:

- **Total capacity:** 283 million tonnes (Mt) split between two tailings products:
 - **Low Sulfur Tailings (LST):** Approximately 94% of total tailings.
 - **High Sulfur Tailings (HST):** Approximately 6% of total tailings.
- **Operational Deposition Method:**
 - **LST:** deposited as slurry, thickened using high-rate thickeners before being stored.

- **HST:** deposited sub-aqueously as a low-density slurry (to avoid oxidation and acid formation).

5 CLOSURE DESIGN AND CONSTRUCTION

Closure measures are tailored to the specific characteristics of LST and HST due to their acid generating potential and management requirements.

5.1 LOW SULFUR TAILINGS (LST) CLOSURE MEASURES

The LST cells have been designed as water shedding landforms.

Long term storm water runoff management incorporates:

- **Final Top Cover System:**
 - 0.5m of metasediments (hard, non-acid forming rock) to minimize erosion.
 - 0.2m of topsoil (that has been stored during mining operations) ripped into the metasediments to encourage vegetation growth.
- **Spillways:** Engineered to manage stormwater and prevent uncontrolled overflow.
- **Retention Bunds:** Detain runoff and reduce peak flow rates.
- **Embankment slopes:** 1(v): 3(h) against which a 1(v): 6(h) rockfill wedge is formed around the entire outer perimeter
- **Drainage System:** Continued operation post closure execution, to facilitate consolidation and prevent manage infiltration water until closure completion criteria are met.

The above features are illustrated in Figure 2.

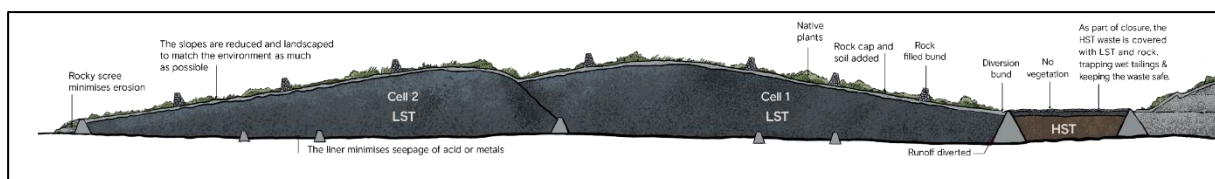


Figure 2: Schematic cross section through the TSF at closure

5.2 HIGH SULFUR TAILINGS (HST) CLOSURE MEASURES

The intent of the closure design for the HST is to:

- Ensure that the HS tailings remain saturated after closure.
- Ensure that runoff from extreme storm events can drain off the HST without overtopping the embankments.

- **Final Capping:**
 - 6m of LST to maintain saturation. It is proposed that the first 2m of LST will be placed hydraulically and the balance mechanically. This approach will be trialled and modified as necessary during operations.
 - 0.5m surface layer of metasediments on top of LST to control surface erosion.
- **Spillway System:** Designed to direct runoff away from the HS tailings cells into LST1 and out via the LST1 spillways.
- **Vegetation:** This will be discouraged by not providing growth medium to the metasediment cover rock. Limiting the vegetation will reduce the risk of desaturation of the tailings, however it is noted that volunteer vegetation recruitment is possible.

6 FINAL LANDFORM CHARACTERISTICS

At the completion of closure execution and when the completion criteria are met, the TSF will form a stable landform with the following features:

- **Gentle Slopes (1(v): 6(h)):** Designed to minimize erosion and vegetated to blend with the surrounding terrain.
- **Controlled Drainage:** Spillways and drainage systems will ensure sustainable water management.
- **Ecological Rehabilitation:** Topsoil and revegetation efforts on the top of the LST cells and all outer slopes to promote establishment of native plant species. Top of HST cells will not be revegetated.
- **Stable Embankments:** Engineered to withstand seismic activity and long-term environmental changes.

Figure 3 shows the layout of the TSF prior to closure and the locations of spillways.

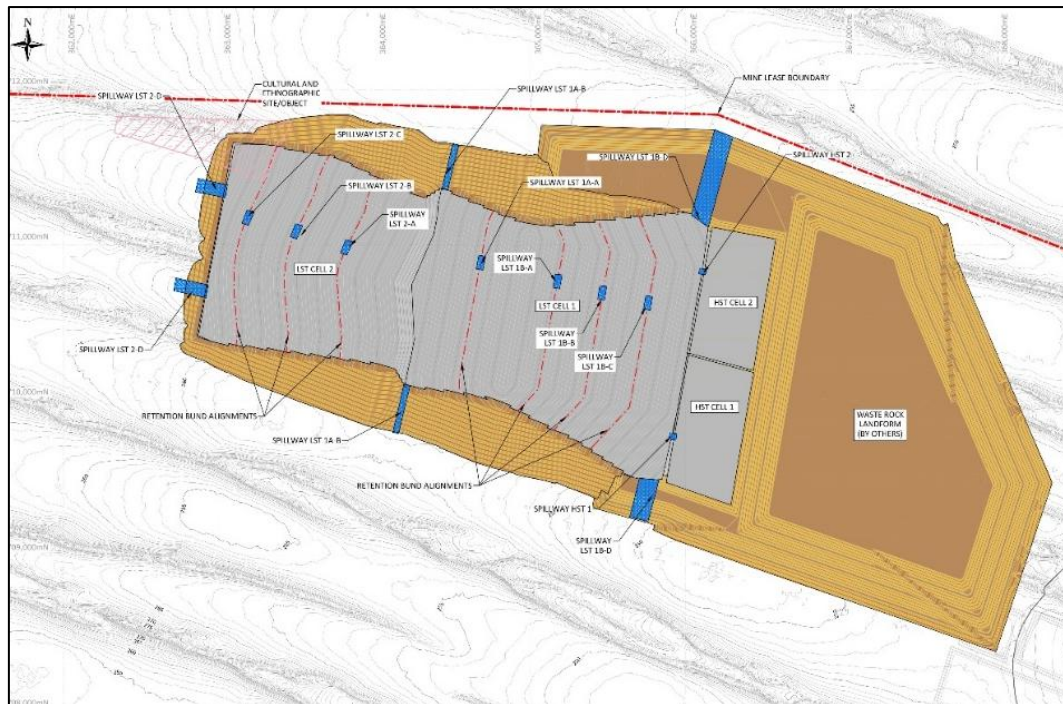


Figure 3: Layout of TSF prior to Closure showing spillways

Figure 4 shows the drainage directions from the Waste Rock Landform (WRL), the HST cells and the LST cells through the spillways. The reclaim ponds are backfilled after removal of the liner and pumping systems.

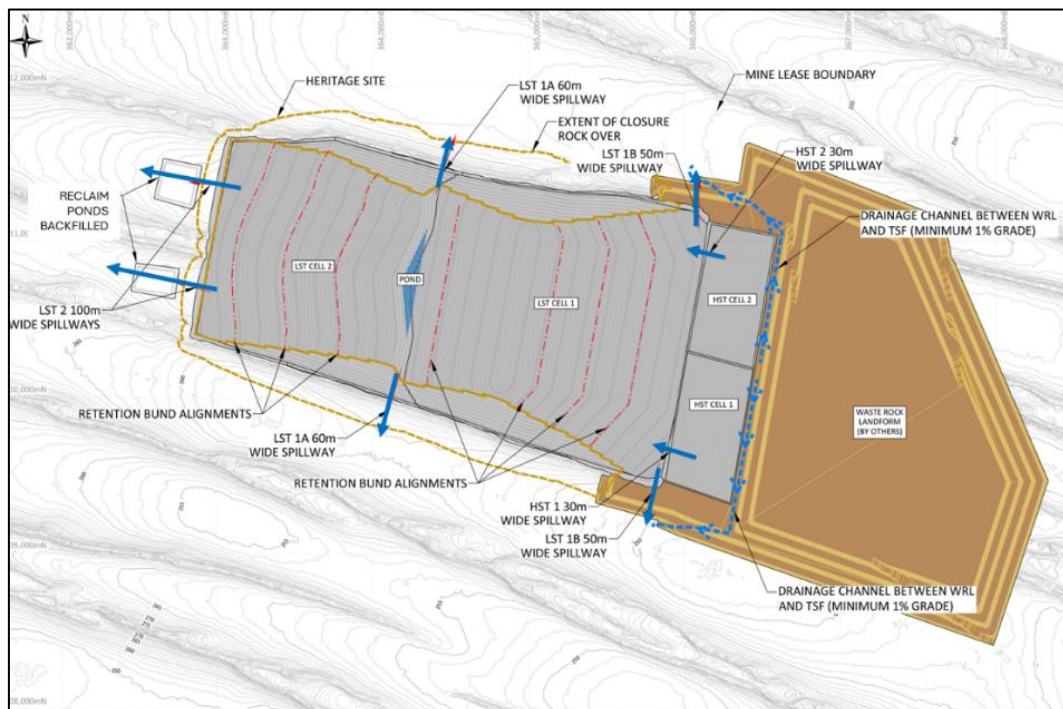


Figure 4: Drainage directions after closure

Surface water modelling to assess flood extents has been carried out by Worley and documented in their Memorandum dated 3 September 2024 titled “*Winu Closure: Surface Water Management Plan Update 2023 Memorandum*”. The flood areas predicted for the critical 1:5,000 year flood, inclusive of runoff from the TSF via the spillways, is indicated in Figure 5. Some water will pond against the TSF, with no significant impacts predicted due to the closure landform design and rapid infiltration due to geology of the area.

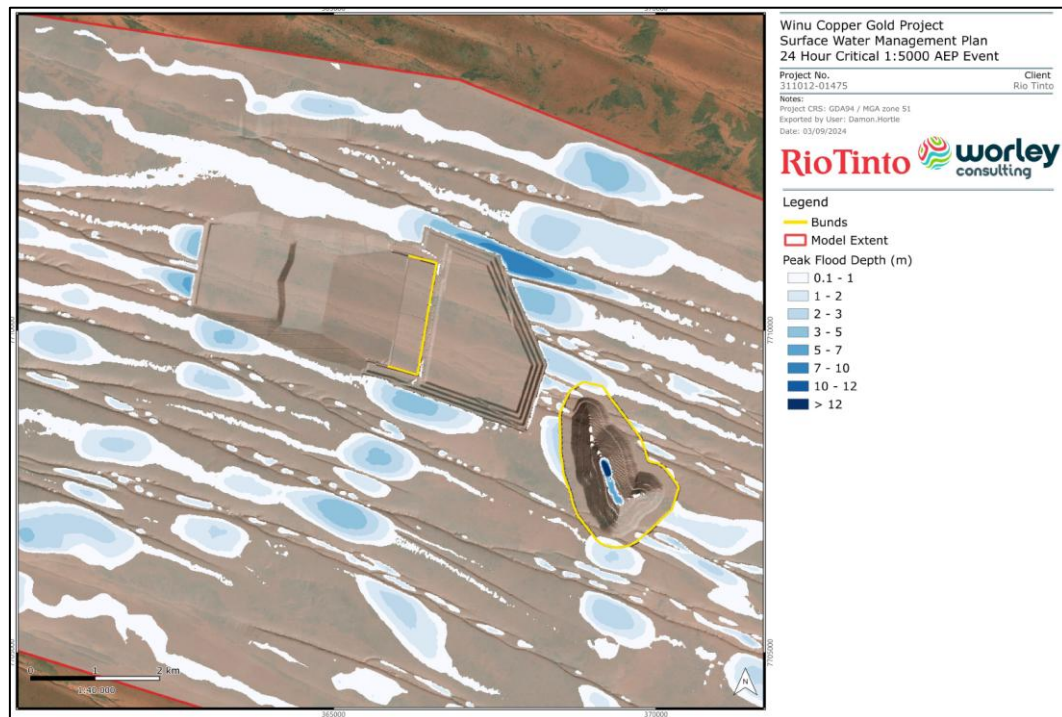


Figure 5: Flooding around the TSF after the 24 hour 1:5,000 AEP rainfall event

Figure 6 shows the areas around the TSF, inclusive of discharge via the spillways, that will be flooded in the critical Probable Maximum Precipitation (PMP) event that is of 120 hour duration. Again, some water will pond against the TSF, with no significant impacts predicted due to closure landform design and rapid infiltration due to geology of the area.

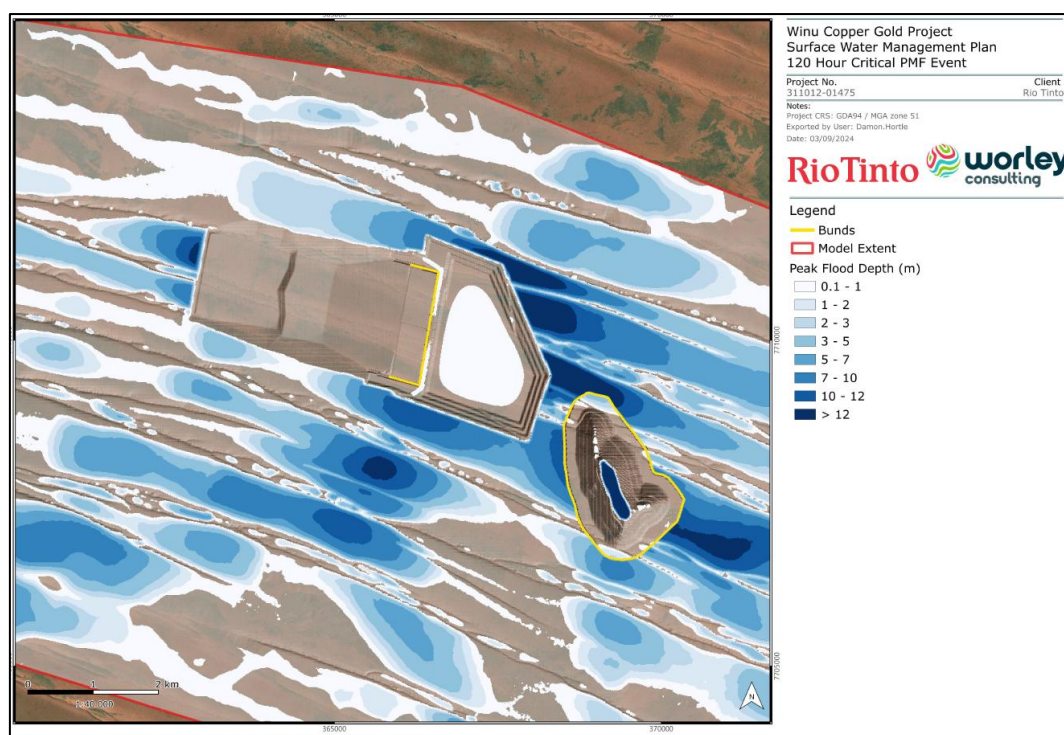


Figure 6: Flooding around the TSF after the 120 hour PMP rainfall event

7 HYDROLOGICAL AND HYDROGEOLOGICAL CONSIDERATIONS

The following hydrological and hydrogeological controls have been incorporated:

- **Erosion Control:** Hard rock metasediment covers, detention bunds and vegetation on the LS cells and all outer slopes reduce sediment transport.
- **Seepage Control:** Tailings consolidation and engineered liners to prevent groundwater contamination. If the liners degrade over the long-term seepage will flow to pit lake, which is predicted to retain all seepage from the TSF.

8 LONG-TERM MONITORING

Post-closure monitoring regime will be established to determine the effectiveness of executed closure activities in meeting the agreed completion criteria. This may include groundwater borehole monitoring, erosion monitoring and mapping revegetation success.

9 COMMUNITY AND STAKEHOLDER ENGAGEMENT

The following activities are envisaged:

- **Traditional Owner Involvement:** Consultation on post mining land use and ecological rehabilitation.
- **Local Community Engagement:** Transparent communication to address concerns and expectations.

- **Regulatory Oversight:** Collaboration with government agencies to ensure compliance with relevant laws.

10 CONCLUSIONS

The Winu TSF closure project ensures responsible mine closure that meets environmental, safety, and stakeholder expectations. The final rehabilitated landform will be safe, stable, and non-polluting. Post mining land uses will be limited to preserve the executed closure measures.

Dr G I McPHAIL MIEAust CPEng

For and on behalf of

Water, Waste and Land Australia Pty Ltd

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