GENESIS MINERALS LIMITED

# Gwalia Mine Licence Amendment L8337/2009/2 Supporting Document

Prepared for Genesis Minerals Limited

**Version:** 1.0

**Date:** 08/08/2025

Prepared by

astill consultants

## Revision Summary

| Document Name | Gwalia Mine Licence Amendment L8337/2009/2 Supporting Document | | | |
|---|---|---|---|---|
| Document Number | AC25-GMD-05(01) | | | |
| **Revision** | **Date** | **Author** | **Reviewer** | **Comments** |
| 1.0 | 08/08/2025 | [redacted] | | Final |
| 0.1 | 01/08/2025 | | | Draft issued to client |

# Project Overview

Genesis Minerals Limited (Genesis) acquired the Leonora Operations from St Barbara Limited in June 2023, which consists of the Underground Gwalia Mine and Processing Facility, and several legacy mines sites maintained as future gold prospects and for water management.

The keystone for the operations, The Gwalia Mine, is located approximately 4 km south of the town of Leonora and consists of:

- An underground sub-level open stope mine which is currently at depth of 1900 metres below surface.
- A three-stage crushing circuit and a ball mill feeding a Carbon in Leach (CIL) process for the extraction of Gold.
- The Gwalia power station; and
- The legacy mines including Tower Hill, Harbour Lights, McGraths, Jasper Flat. Jasper Hill, Harlech and Forgotten Four. Tower Hill is located approximately 2 km north of the Gwalia Mine and currently receives dewatering from the Gwalia underground mine. Tower Hill has commenced preparation for its incorporation into the mine schedule in FY27.

Genesis operates under licence **L8337/2009/2** issued by the *Environmental Protection Act 1986* (EP Act), which includes five categories (Category 5, 6, 52, 73 and 89), as described within Schedule 1 of the *Environmental Protection Regulations 1987*.

This document has been prepared to support an amendment application to licence **8337/2009/2** and outlines the background, existing environment and proposed amendments.

Proposed amendments are intended to address inconsistencies and ambiguous conditions within the current licence. The outcome of the proposed amendments will streamline monitoring and reporting and will benefit both DWER and Genesis.

A summary of the proposed changes to Licence **L8337/2009/2** conditions is provided in Error! Reference source not found. below.

*Table 1. Summary of Proposed Changes*

| Condition No. (where applicable) | Proposed amendments |
|---|---|
| Condition 8 (Table 3:) | Provide necessary compliance documentation to progress the Stage 3 lift of TSF4 and associated monitoring and production bore network. |
| | Permit provision of future Stage 4, 5, and 6 lifts of TSF 4 to be undertaken via submission of construction of infrastructure audit reports and compliance reports. |
| Schedule 1, Figure 1 | Amend Prescribed Premises boundary to encompass the Tower Hill project. |
| | Increase Category 5 to 1,600,000 Mtpa. |
| | Inclusion of Premise Category 12 to facilitate crushing and screening operations. |
| Condition 18 (Table 10 and Table 12) | Amend several discharge and abstraction locations for mine dewater, and pipeline relocations. |
| Condition 2 (Table 1) | Inclusion of a saline water dam and associated standpipe. |
| Condition 2 (Table 1) | Inclusion of two new washdown facilities. |
| Condition 11 (Table 6) | Include additional Category 57 to allow used tyre storage and disposal within current and proposed waste rock landforms. |

# Contents

# Attachment 1A: Proof of Occupier Status

# Attachment 1B: ASIC Company Extract

# Attachment 1C: Authorisation to act as representative of the occupier

# Attachment 2: Premises Maps

Figure 1 to replace Figure 1 (page 20) of Schedule 1; Licence **L8337/2009/2**

Figure 2 to replace Figure 6 (page 25) of Schedule 1; Licence **L8337/2009/2**

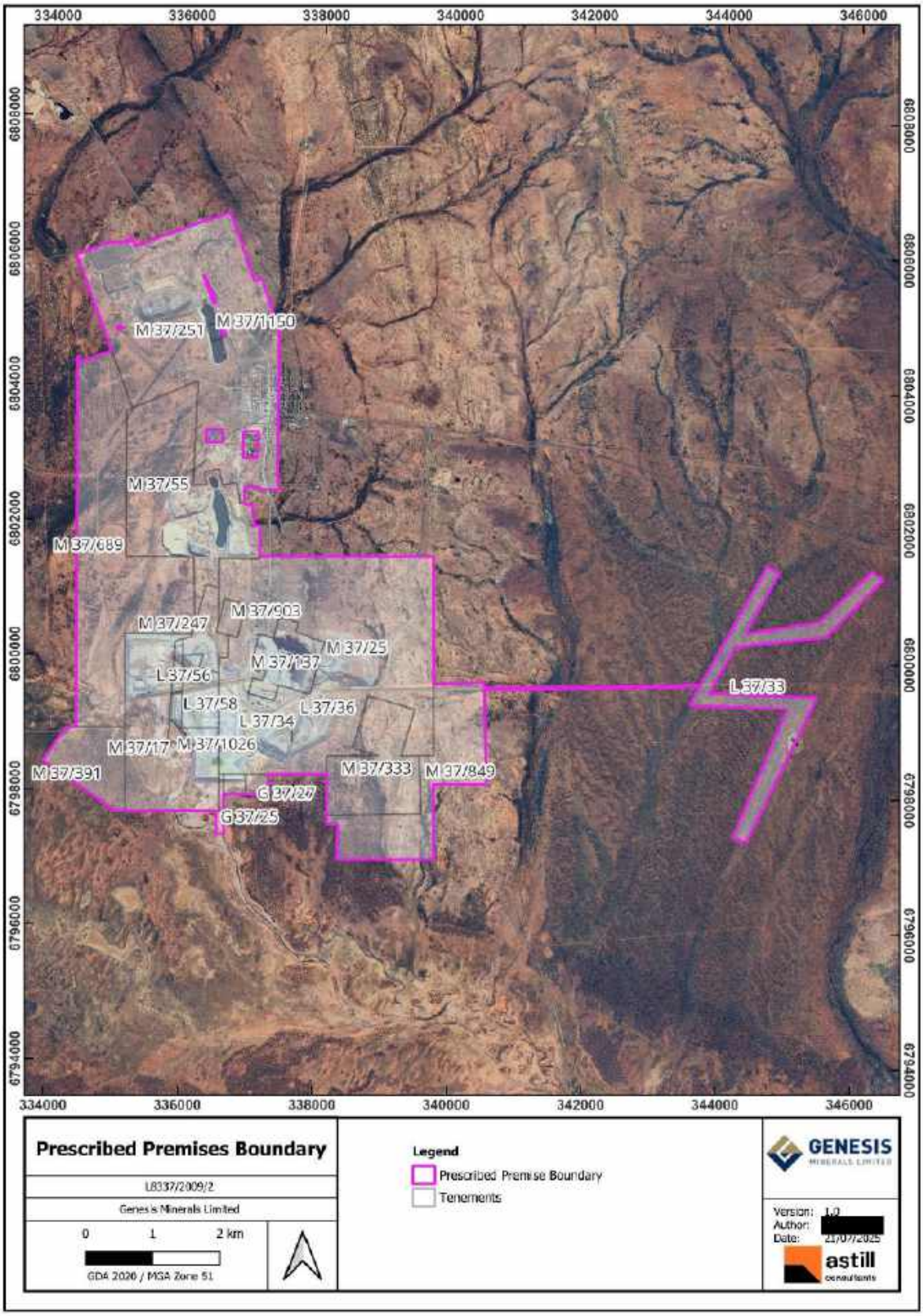


*Figure 1. Amended prescribed premises boundary*

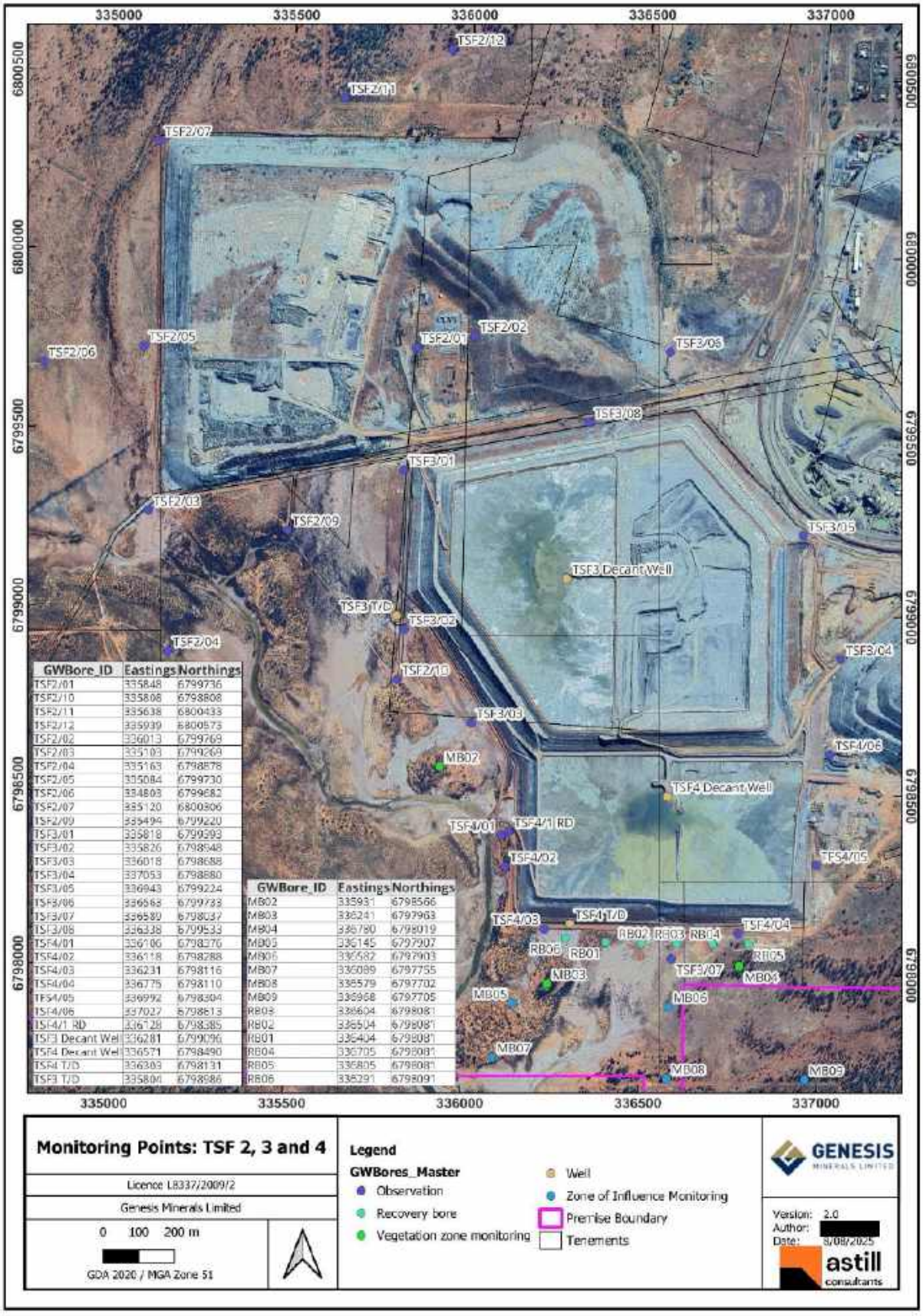


Figure 2. Monitoring Network TSF 2, 3 and 4

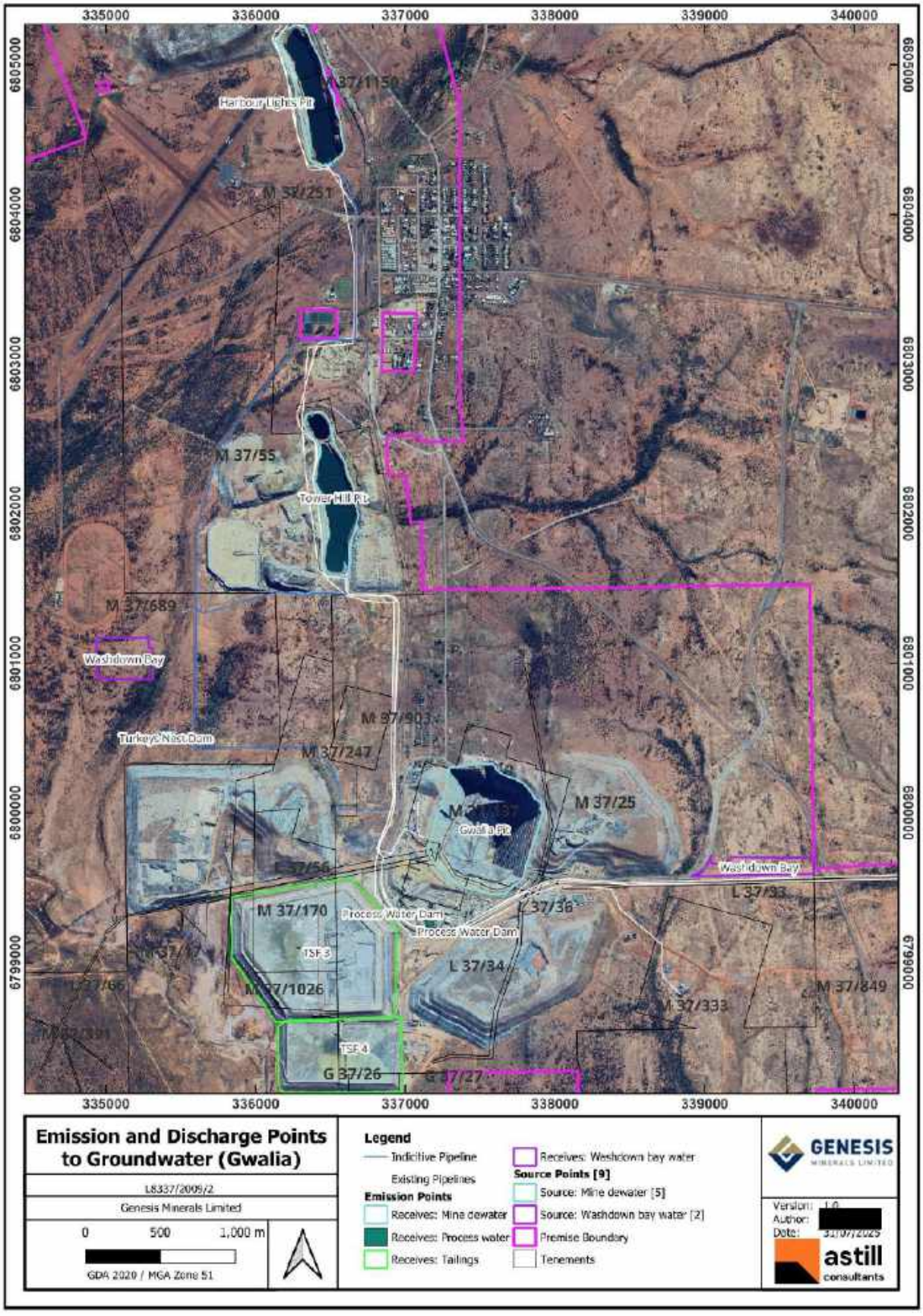


*Figure 3: Source and Emission Points to Groundwater*

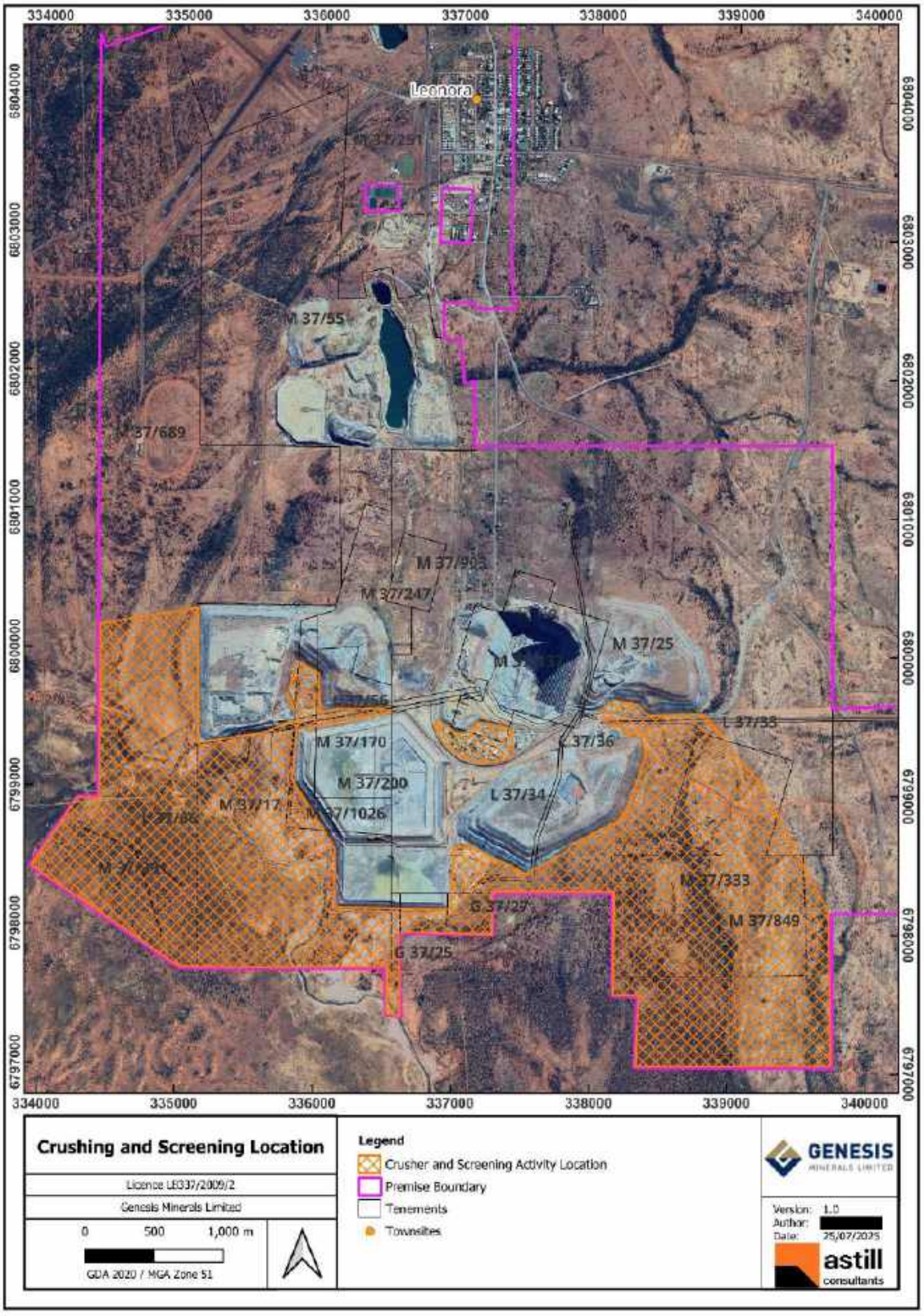


*Figure 4: Proposed Crushing and Screening Location*

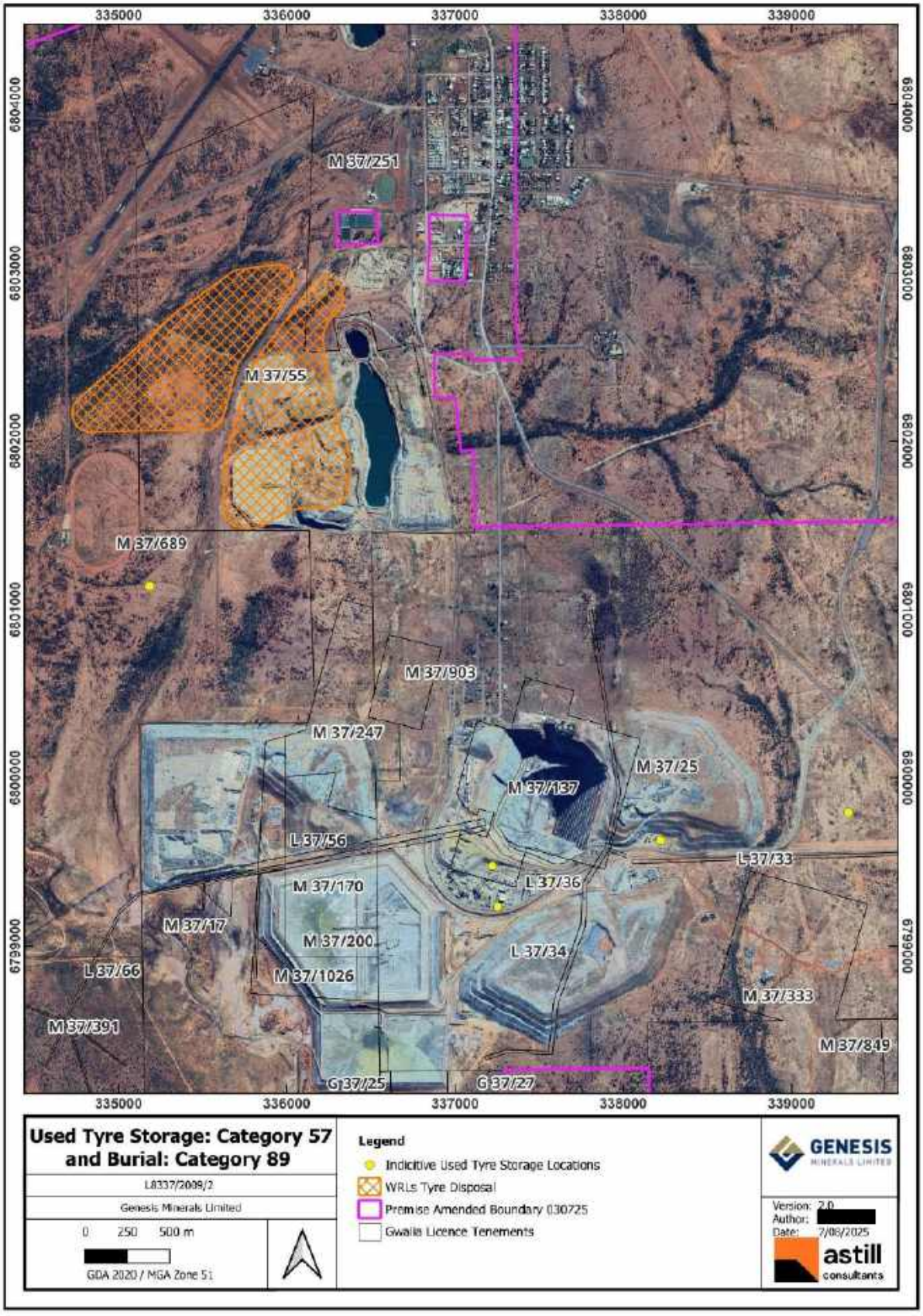


*Figure 5: Proposed Used Tyre Storage and Burial Locations*

# Attachment 3B: Proposed Activities

## 1.1 L8337/2009/2 Overview

Gwalia Mine is licenced under **L8337/2009/2**. **Table 2** shows the current tenements included in the premises boundary and proposed additional tenements.

This proposed premises boundary is shown in **Figure 1.**

*Table 2. Licenced Tenements*

| Tenements currently included in Licence: | Proposed changes to licence tenements |
|---|---|
| G37/25, G37/26, G37/27, M37/17, M37/25, M37/55, M37/137, M37/170, M37/200, M37/247, M37/251, M37/333, M37/391, M37/903, M37/1026, M37/1027, L37/33, L37/34, L37/35, L37/36, L37/56, L37/58 and L37/66 | Include M37/689, M37/849 and M37/1150<br>Remove L37/35 |

**L8337/2009/2** currently includes five categories, as described within Schedule 1 of the Environmental Protection Regulations 1987, outlined in **Table 3** below. This amendment serves to include two extra categories; Category 57 – used tyre storage (general) and Category 12 – Screening, etc. of material, and several requested amendments, discussed in the sections below.

*Table 3. L8337/2009/2 licence categories*

| Category Number | Category Description | Production or Design Capacity | New / Existing / Amendment |
|---|---|---|---|
| 5 | Processing or beneficiation of metallic or non-metallic ore | 1 600 000 tonnes per annual period | Amendment |
| 6 | Mine dewatering | 5 500 000 tonnes per year | Existing |
| 52 | Electric power generation | 23 MW | Existing |
| 73 | Bulk storage of chemicals, etc. | 1, 000 cubic meters | Existing |
| 89 | Putrescible landfill | 5,000 tonnes per annual period | Existing |
| 12 | Screening etc. of material | 300,000 tonnes per annual period | New |
| 57 | Used tyre storage (general) | Up to 500 tyres | New |

## 1.2 TSF4 Lift Commencement

Gensis submitted Works Approval application for TSF 4 construction in July 2015 (Refer Attachment 8: Additional Information), following assessment it was agreed with DWER to approve the TSF staged lift construction under licence amendment, as opposed to issuing separate works approvals. All Stage 6 lifts were approved for construction, but operation was limited to a maximum supernatant pond operating height.

Construction of Gwalia TSF4 commenced in 2016 under licence holder-initiated amendment issued on 8/12/2016. It permitted supernatant pond maximum operating height of 370.3m RL (Stage 1).

Stage 2, with a 2.5m embankment raise was approved on 12/12/2023 under licence holder amendment allowing supernatant pond maximum operating height to 372.8 metres. At the time of

this amendment DWER incorporated amendment notices 1 and 2 into the licence document. Stage 2 lift commenced 20 September 2023 and was completed 26 November 2023. The WSP Construction Completion Report for TSF 4 Stage 2 is provided as additional information (Attachment 8).

Genesis is now looking to progress Stage 3 – 6 TSF 4 embankment raise in this amendment, with priority being on Stage 3 to maintain operational continuity.

## 1.3 Dewatering Discharge

It is proposed to designate Gwalia, Tower Hill, and Harbour Lights pits as both dewatering abstraction and discharge points, as shown in **Figure 3**. This approach removes unnecessary restrictions and allows water sourced from within the prescribed premises to be discharged into any approved pit, providing operational flexibility without increasing environmental risk.

All pits listed as discharge points under this licence are located within the same aquifer system; therefore, the risk associated with dewatering and discharge is consistent across all locations.

To streamline operations and monitoring, and to accommodate changes in the mining schedule, it is requested that all approved discharge pits be authorised to receive water from any source within the prescribed premises. Pipeline alignments are indicative only and may be adjusted to suit operational needs.

Allowing unrestricted use of designated discharge pits ensures agility in mine planning without altering the overall risk profile.

Table 4: Summary of Proposed Changes

| Table 10: Point source emissions to groundwater | | |
|---|---|---|
| **Emission point reference on Premises map** | **Description** | **Source including abatement** |
| Tower Hill Pit | Dewater disposal (open) pits | Dewater from mining activities |
| Harbour Lights Pit | | |
| Gwalia Pit | | |

| Table 12: Monitoring of emissions to groundwater | | | |
|---|---|---|---|
| **Emission point reference** | **Parameter** | **Units** | **Frequency** |
| Tower Hill Pit, Harbour Lights Pit, Gwalia Pit | Volumetric flow | $m^3$ | Cumulative monthly |
| | pH | - | Six monthly during active discharge |
| | TSS, TDS, WAD-CN, Na, K, Ca, Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO3, HCO3, SO4, and NO3 | mg/L | |

## 1.4 Containment Infrastructure

Two new light and heavy vehicle washdown bay facilities are planned for construction, one at Tower Hill and one at Leonora (Figure 3: Source and Emission Points to Groundwater**Figure 3**). Note: these

locations are indicative and final placement will be within these areas. Water will be sourced from adjacent borefields and/or the RO plant. The wash bays will be concrete lined and include a sump for sediment and oil separation.

A turkey nest dam will be constructed to store saline water sourced from the borefields, Gwalia Underground, Tower Hill pit, Harbour Lights pits to be used for dust suppression on site. The dam will be HDPE lined and connected to local standpipes via pumps. Refer **Figure 6** for design details.

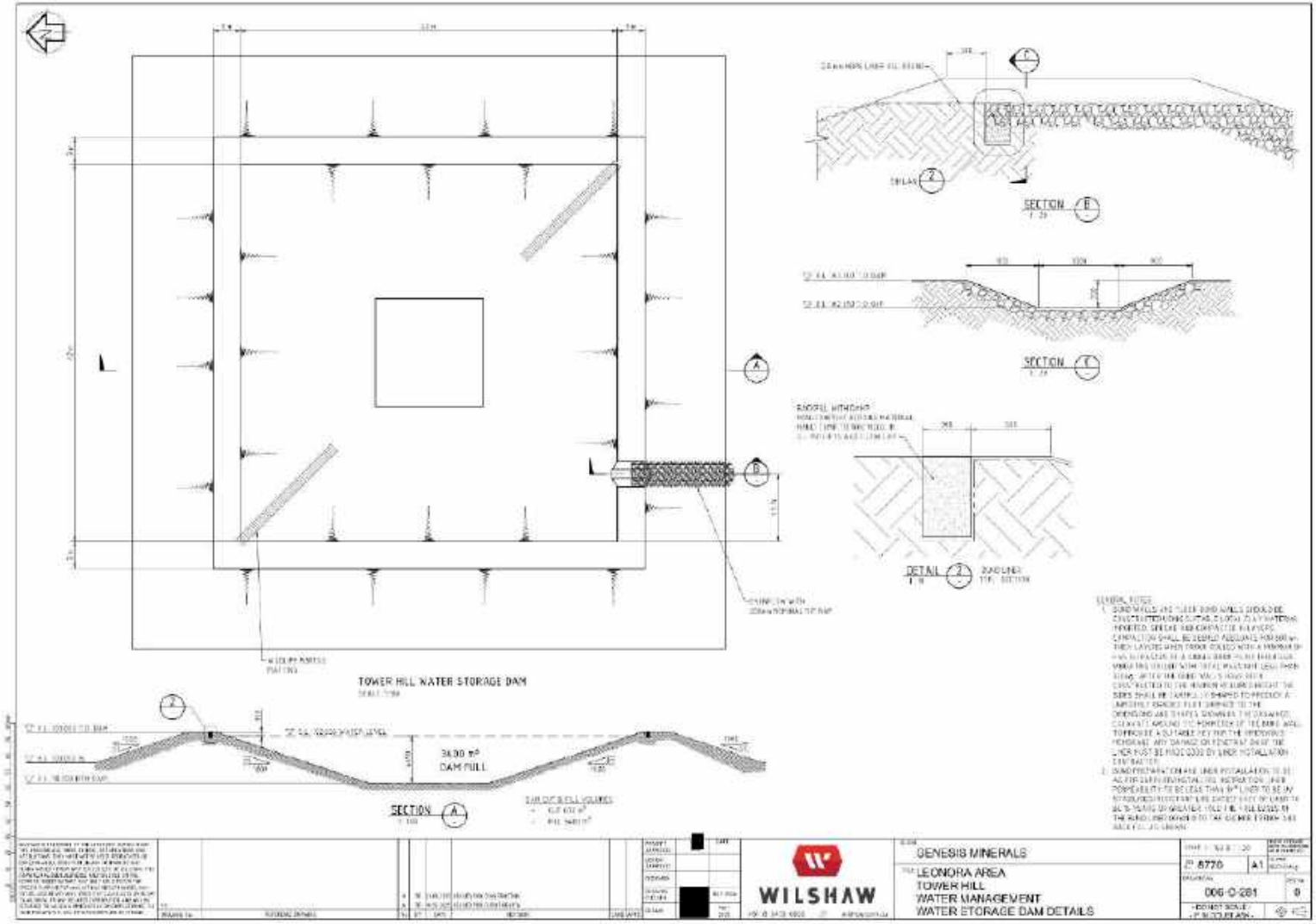


*Figure 6: Turkeys Nest Dam Design*

*Table 5. Summary of Proposed Changes*

| Table 1: Containment infrastructure | | |
|---|---|---|
| **Containment identification** | **Material** | **Infrastructure requirements** |
| Tailings Storage Facility 3 (TSF3) Eastern and Western Cells | Tailings | In-situ material |
| Tower Hill Pit | Dewatering water | |
| Harbour Lights Pit | | |
| Gwalia Pit | | |
| Tailings Storage Facility 4 (TSF4) | Tailings | Underlain by Grant's Patch TSF silty tailings; base permeability of $1 \times 10^{-9}$ m/s |
| Pastefill facility stockpile | Tailings from TSF3 | Bunded and drainage diverted into dedicated sediment pond |
| Process Water Dam | Decant water, reverse osmosis reject water and hypersaline water | HDPE lined |
| Turkey Nest Dam | Dust suppression water storage | HDPE lined |
| Site Drainage Pond | Contaminated stormwater from site-drainage | Unlined, historical site borrow pit |
| Fuel Bay Catch Pond | | HDPE lined pond, concrete wash bay |
| | | |
| | | |
| VR3 East Pond | Hypersaline water – formed from condensate from intersected groundwater within the ventilation shaft entrained by the fan suction | HDPE lined – surrounded by perimeter bund |
| VR3 West Pond | | |
| VR6 Pond | | HDPE lined |

## 1.5 Category 12 – Screening, etc. of Material

Genesis proposes to establish mobile crushing and screening campaigns - to be utilised to generate road base and hardstand material to support development of the project, and to also be used as stemming in drill and blast holes, if required. The crushing and screening unit will be mobilised to site and deployed for campaigns as required to process stockpiled materials.

Stockpiled waste rock material will be fed via front end loader into a feeding hopper which will be crushed by a jaw crusher and fed via conveyor to an adjacent screening unit. Crushed material will go through a secondary impact crusher before going through a vibrating screen, separating material into various sizes from approximately 5 mm to 300 mm.

The proposed crusher is, or will be similar to, a 250kW Metso Nordberg C160 Jaw Crusher. Typical crushing and screening plant that is anticipated to be used has an approximate capacity of 475 tonnes per hour, though actual throughput will be dependent on Genesis' requirements and stockpiled volumes of material.

There are no consumable reagents or chemicals used in the mobile plant. No hydrocarbons will be stored within the plant, except within a service truck that feeds the diesel engine (typically up to

1,500 L capacity). A watercart will be available during all crushing and screening activities with stockpiles watered down before crushing / screening on an as required basis to mitigate dust emissions.

The mobile crushing and screening plant location will be variable within the prescribed premises boundary, as campaign locations depend on mining activities being undertaken and require flexibility to move the plant as required (**Figure 4**). Location for these activities has been based on noise modelling conducted in April 2025 by Talis Consultants (Refer Attachment 8 Additional Information).

Predicted noise levels (LAeq) for the mobile crusher was demonstrated to meet the assigned LA10 noise levels at all sensitive receptors when located at two of five modelled sites (Bottom of ROM and West Laydown) under worse case conditions and when operated in isolation. When added to the existing facility, predictable noise levels from the crusher did not increase the cumulative noise levels by a reportable amount (≤0.1dB). For further details refer to Noise Report in Attachment 8 Additional Information.

An operational throughput of 300,000 tpa is being requested in this amendment application which is considered to adequately service the needs of the site.

### 1.5.1 Closure and Decommissioning

Establishing mobile crushing and screening equipment involves unloading the machine from transport, driving it at walking speed to various locations adjacent where material is required and extending conveyors and screens for the duration of use. Being a mobile plant, it can be brought to site for short campaigns as needed and transported back offsite or to different locations within the prescribed premises boundary. The proposed mobile crusher will be, or will be similar to, a 250kW Metso Nordberg C160 Jaw Crusher and a typical crusher setup is shown below in **Figure 7.**

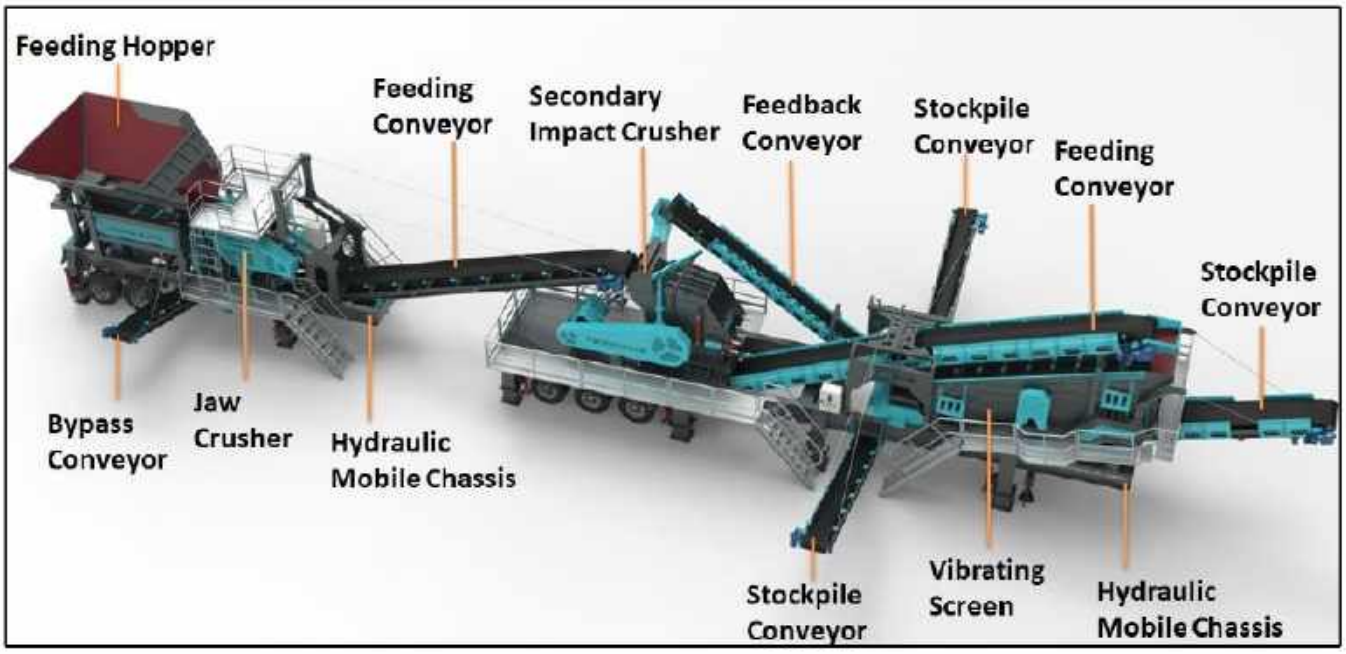


Figure 7: Typical Mobile Crusher and Screener Plant Design

## 1.6 Category 57 Used tyre storage (general)

Genesis are requesting to include Category 57 – Used tyre storage (general) to allow licenced storage of up to 500 tyres at the Gwalia Mine.

Tyres will be stored in various locations (workshops and associated laydown areas) within the prescribed premises boundary, depending on operational activities.

## 1.7 Category 89 Putrescible Landfill

Genesis are also requesting to permit burial of used tyres within waste rock landforms at the Gwalia Mine under existing licence Category 89 Putrescible Landfill Class I inert landfill site as an Inert Waste Type 2 in accordance with the Landfill Waste Classification and Waste Definitions 1996.

Tyres requiring disposal will be preferentially disposed of in active waste rock landforms (**Figure 5**).

Tyres will be covered in batches with at least 500mm of inert waste rock upon burial and *in batches separated by at least 100 mm of soil and at* locations of buried tyres recorded in Genesis' GIS database.

### 1.6.1 Tables for L8337/2009/2

*Table 6: Summary of Proposed Changes*

| Table 6: Management of waste | | |
|---|---|---|
| **Waste type** | **Management strategy** | **Requirements** [1] |
| Clean fill<br>Inert Waste Type 1<br>Inert Waste Type 2<br>Putrescible waste | Storage, handling and disposal of | All waste types<br>• No more than 5 000 tonnes per year of all waste types cumulatively shall be disposed of by landfilling;<br>• Less than 500 used tyres to be stored on the premises at any one time |

| | | |
|---|---|---|
| Uncontaminated Fill | waste by landfilling | • Disposal of waste by landfilling shall only take place within the landfill areas shown on the map of emission points in Schedule 1;<br>• Waste shall be placed in a defined trench, with the active tipping area restricted to a maximum linear length of 70 m and a width of 30 m and no higher than 2 m;<br>• The separation distance between the base of the landfill and the highest groundwater level shall not be less than 3m; and<br>• Must meet the acceptance criteria for Class II landfills.<br>• Watercart to be available to apply water for dust suppression as required. |
| Inert Waste Type 2 (Tyres only) | Storage, handling and disposal of waste by landfilling | (i) Tyres are only to be disposed of within an active WRL Landfill facility within the prescribed premises boundary as shown in Figure 1 of Schedule 1;<br><br>(ii) Tyres are to be buried in batches of 20 with a minimum of 1 m separation between tyres and a 10 m horizontal and 5 m vertical buffer zone between batches; and at 5 m or more from the landform outer surface. |

Note 1: as defined in Landfill Waste Classification and Waste Definitions 1996 (as amended 2019).

## 1.8 Category 5: Throughput Increase

It is proposed to amend the current operating licence to allow an increase in processing throughput at the processing mill from 1.5 million tonnes per annum (Mtpa) to 1.6 Mtpa. This proposed increase will be achieved without the construction of any new infrastructure or modifications to key mill components. Instead, the increase is supported by a series of process optimisation initiatives undertaken within the existing circuit. These include improved maintenance scheduling, enhanced reagent dosing controls, and streamlined material handling practices, all of which have contributed to greater operational efficiency and reduced downtime.

In addition to these internal optimisations, Genesis has recently acquired further consistent and reliable supply of ore from recent acquisitions. This ensures that the mill can be consistently fed at higher rates without exceeding design constraints or compromising metallurgical performance.

Importantly, environmental emissions (including noise, dust, and water usage) are not anticipated to increase materially, as no additional infrastructure is being introduced and operational controls will remain in place. This amendment seeks to formalise a throughput rate that reflects the site's evolving operational capability while remaining within the environmental and technical parameters already assessed under the existing licence framework.

# 2 Additional Supporting Information

## 2.1 Applicant Details

### 2.1.1 Applicant Name

The proponent is Genesis Minerals Limited (Leonora) Pty Ltd (ACN 667 073 681), a wholly owned subsidiary of Genesis Minerals Limited (Genesis).

### 2.1.2 Occupier Details

All tenements applicable to this licence amendment are fully owned by Saint Barbara Limited. Proof of tenement and occupier status of the tenements being added to this licence are included as **Appendix 3**.

Genesis Minerals Limited corporate office is located at Level 7, 40 The Esplanade, Perth WA 6000.

### 2.1.3 Authorised Representative

All correspondence and enquiries pertaining to this licence amendment application should be addressed to:

[redacted]

Attachment 1C in **Appendix 4** is provided as proof of authorisation to act as a representative on behalf of Genesis Minerals Limited Pty Ltd.

# Attachment 3A: Environmental Commissioning Plan

Genesis will undertake crushing and screening on a campaign basis if material is required for road base or stemming for drill and blast holes. If commissioning of a mobile crushing and screening plant is required, the following sections outline the emissions and inputs/outputs anticipated.

## 2.2 Emissions and Discharges

Anticipated emissions and discharges expected to occur if a mobile crushing and screening plant is established on site can be summarised in the following table:

| Activity | Inputs | Outputs (discharges / emissions) |
|---|---|---|
| Crushing and screening | Waste rock (through crushing and screening plant) | • Dust<br>• Hydrocarbon emissions (spills)<br>• Noise |

## 2.3 Management and Monitoring

The following management objectives will be assessed during the commissioning of mobile crushing and screening plant, if mobilised to site.

| Equipment | Emission / discharge | Commissioning objective |
|---|---|---|
| Earthmoving equipment & crushing/screening plant | Dust particulates | Dust generation is minimised as far as practicable during clearing activities, crushing and screening activities, and landfill cell construction |

Control and mitigation strategies during commissioning phase of mobile plant installation can be summarised as:

| Emission | Proposed controls | Frequency |
|---|---|---|
| Dust | • Visual dust monitoring<br>• Use of watercarts to provide dust suppression<br>• Mobile machinery to remain on established tracks<br>• Activities to cease if controls implemented are not deemed effective | Continuous, particularly during windy or very dry weather conditions |
| Diesel emissions/spills | • Equipment pre-started and used in line with manufacturer's specifications<br>• Spill kits available or nearby to areas where there is a risk of hydrocarbon spill | As required |

## 2.4 Incidents and reporting

All incidents during commissioning phases will be documented in Genesis' internal safety reporting system, and managed in accordance with incident management procedures, as outlined in the environmental management system (EMS).

Any incidents that cause environmental harm will be reported to DWER, as outlined in Section 72 of the EP Act.

A summary of all incidents during commissioning and operation will also be provided to DWER in the Annual Environmental Report.

# Attachment 5 – Other Approvals and Consultation

## 2.5 Relevant Approvals

Environmental approvals relevant to this licence amendment application are summarised in **Table 7** below.

Table 7: Relevant approvals to this licence amendment application

| Agency | Approval | Relevance |
|---|---|---|
| DWER | Licence | Genesis currently operates the Gwalia Mine under **L8337/2009/2** which must be amended prior to implementation of the proposed activities (i.e., this application). |
| | Groundwater well licence (GWL) | The Gwalia Mine is covered by **GWL110913(6)** which allows for an annual water entitlement of 4, 714, 500 KL. |
| DEMIRS | Mining Proposal | The Gwalia Mine and more broadly The Leonora Operations are covered by various approved mining proposals which have approved the mining disturbances currently in place. |
| | Mine Closure Plan | The Gwalia Mine is covered by a detailed plan for mine closure that includes post mining land use(s), closure outcomes, completion criteria and monitoring. The next Mine Closure Plan update is due in 2028. |

## 2.6 Stakeholder Consultation

Genesis is committed to undertaking proactive and transparent stakeholder engagement with all relevant parties in relation to the Gwalia Mine and the Leonora Operations. This includes ongoing consultation with key stakeholders including the Shire of Leonora, Leonora Community, Traditional Owners, and government agencies to identify, assess and mitigate potential impacts, address community needs, support partnership initiatives, and maintain mutually beneficial relationships.

# 3 Attachment 6A: Emissions and Discharges

## 3.1 Category 5: Processing and beneficiation of metallic ore

Genesis submitted a Groundwater Management Plan (GWMP), prepared by WSP, to the Department of Water and Environmental Regulation (DWER) in 2024 in support of the ongoing operation of tailings storage facility (TSF) cells TSF 3 and TSF 4 under Operating Licence **L8337/2009/2**.

In response to observed groundwater mounding and concurrent evaluation of a recently constructed toe drain along the southern and western boundaries of TSF 4, the GWMP recommended an expansion of the site's groundwater monitoring network. Specifically, the following additional infrastructure was proposed:

- Six (6) 150 mm ID seepage recovery bores adjacent to the TSF 4 toe drain, to assist in depressurisation and mitigate groundwater mounding in the immediate vicinity;
- Four (4) shallow vegetation monitoring piezometers (installed to 6 mBGL), located at least 300 m from the TSF wall, to assess potential impacts on terrestrial vegetation;
- Five (5) Zone of Influence (ZOI) monitoring bores, to evaluate the extent and lateral spread of water table mounding beyond TSF 4.

To support implementation of these recommendations, Genesis engaged hydrogeology specialists Pennington Scott to review proposed changes to this Operating Licence and provide technical advice regarding hydrogeology of the Leonora operation and surrounds.

New TSF bore completion and ground water level summary data for bores drilled late 2024 and pump tested January 2025 are provided in **Table 8** below.

Further details of the extension to the TSF groundwater monitoring network can be found in the Pennington Scott Addendum to Gwalia TSF 4 Groundwater Management Plan, refer Attachment 8: Additional Information.

*Table 8. Summary of Bore completion and groundwater monitoring data*

| Type | Bore ID | GDA 94 Easting | GDA 94 Northing | Completion Date | TDS (mg/L) | Ground Level RL (mAHD) | SWL (mBGL) |
|---|---|---|---|---|---|---|---|
| Seepage / Depressurisation | RB01 | 336,602 | 6,798,088 | 10/12/2024 | N/A | 358.1 | -0.02 to 0.1 |
| | RB02 | 336,504 | 6,798,089 | 12/12/2024 | N/A | 357.9 | 0.5 |
| | RB03 | 336,404 | 6,798,087 | 14/12/2024 | N/A | 358.07 | 0.29 to 0.41 |
| | RB04 | 336,705 | 6,798,082 | 13/12/2024 | N/A | 358.66 | 0.8 to 0.88 |
| | RB05 | 336,806 | 6,798,085 | 13/12/2024 | N/A | 359.22 | 1.82 to 1.96 |
| | RB06 | 336,260 | 6,798,091 | 9/12/2024 | N/A | 357.81 | -0.09 to 0.07 |
| Vegetation | MB01 | 335,817 | 6,798,750 | 30/11/2024 | 90,000 | 357.91 | 0.79 to 1.01 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **MB02** | 335,931 | 6,798,566 | 29/11/2024 | 44,000 | 358.36 | 0.78 to 1.14 |
| | **MB03** | 336,241 | 6,797,963 | 28/11/2024 | 59,000 | 358.79 | 1.79 to 2.2 |
| | **MB04** | 336,780 | 6,798,019 | 23/11/2024 | 88,000 | 359.28 | 2.1 to 2.28 |
| Zone of Influence Piezometers | **MB05** | 336,145 | 6,797,907 | 27/11/2024 | 89,000 | 357.31 | 0.35 to 0.57 |
| | **MB06** | 336,582 | 6,797,903 | 24/11/2024 | 81,000 | 357.79 | 0.7 to 0.86 |
| | **MB07** | 336,088 | 6,797,752 | 26/11/2024 | 120,000 | 357.32 | 0.66 to 0.89 |
| | **MB08** | 336,579 | 6,797,702 | 24/11/2024 | 120,000 | 358.06 | 1.36 to 1.48 |
| | **MB09** | 336,968 | 6,797,705 | 25/11/2024 | 88,000 | 359.93 | 3.2 to 3.42 |

*The ranges specified in the "SWL (mBTOC)" and "SWL (mBGL)" columns were recorded between December 2024 and June 2025.

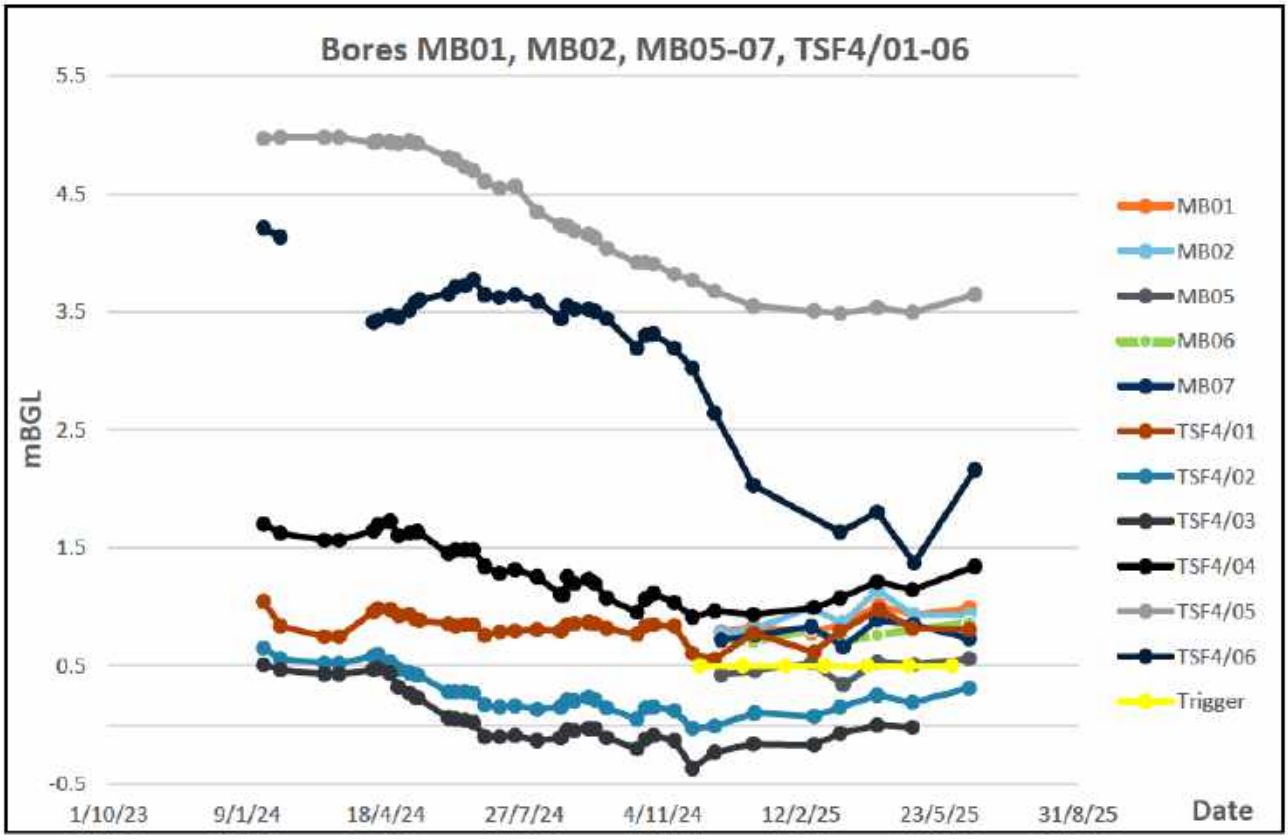


*Figure 8: SWL data for Bores with Recommended 0.5 mGBL Trigger*

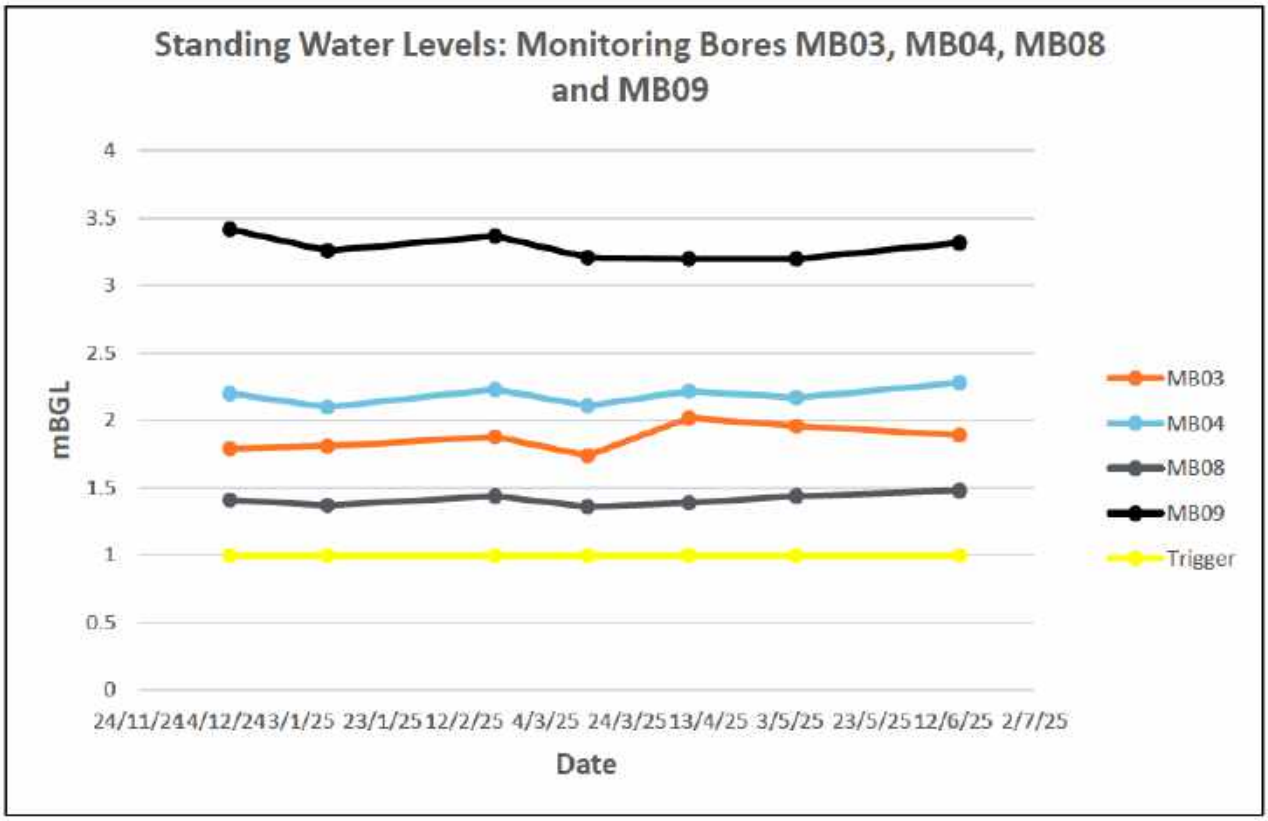


*Figure 9: SWL data for Monitoring Bores with Recommended 1.0 mBGL Trigger*

This licence amendment application has been provided as per DWER's recommendation that, following installation of the additional monitoring infrastructure, the updated monitoring network, along with bore-specific water level trigger values and corresponding management responses be incorporated into the licence. Based on the natural groundwater fluctuation ranges observed in all seepage recovery bores, vegetation monitoring bores, and zone-of-influence monitoring bores (as shown in **Table 8**) it is recommended a groundwater level trigger of 0.5 m below natural ground level (mBGL) be applied for all bores, except MB03, MB04, MB08, and MB09, where a trigger of 1.0 mBGL is more appropriate due to their deeper observed natural water level fluctuations.

**Figures 8** and **9** show the standing water level fluctuations of the bores over time against the 0.5 and 1.0 mBGL recommended trigger levels.

Current measurements indicate that groundwater levels in all six TSF seepage recovery bores along the southern wall of TSF 4 (TSF4/01 to TSF4/06) are at or exceed the recommended 0.5 mBGL trigger, confirming the need for active water table management response. The primary objective of the seepage recovery program is to reduce and maintain the water table in all seepage recovery bores at a management target of least 0.5 mBGL (**Figure 10**). To achieve this, Genesis will equip each recovery bore with an automated pump system that activates when the water level rises to within 0.6 mBGL (cut-on) and shuts off once the water level is drawn down to 7 mBGL (cut-off). Recovery bore equipping is scheduled, pending budgeting, in the coming months.

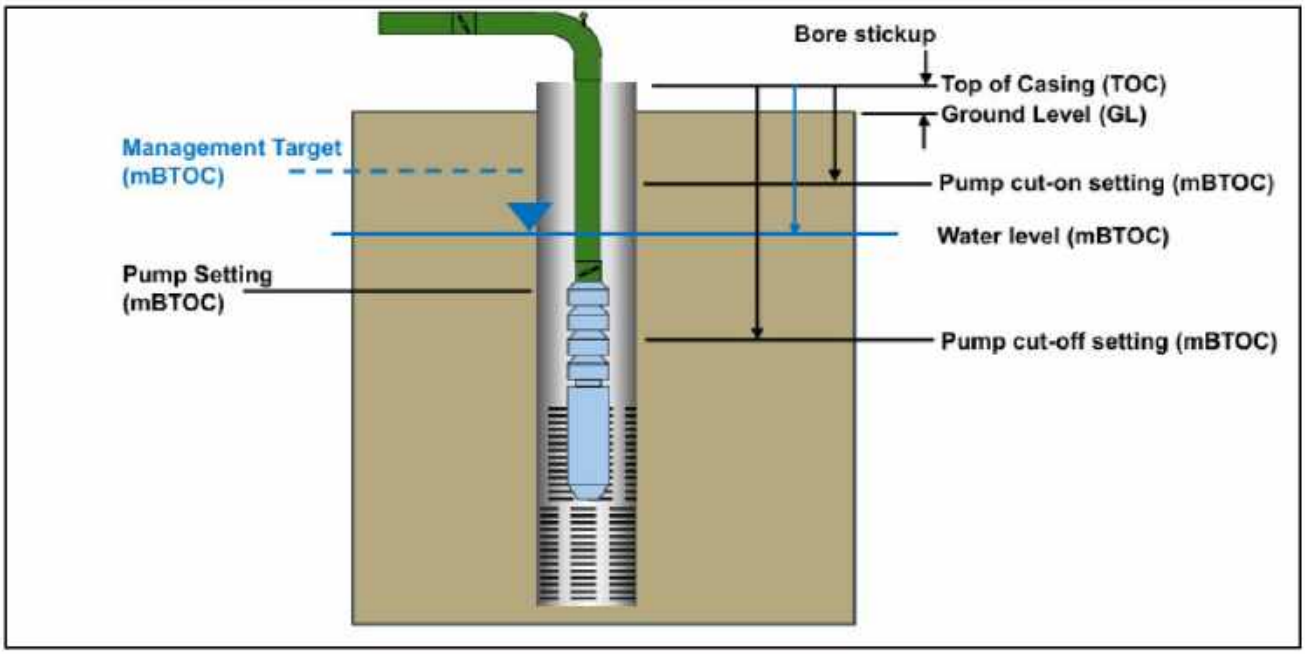


*Figure 10: Borefield Management Levels for TSF Seepage Recovery Bores*

**Table 9** shows the specific cut-on and cut-off switch levels (expressed in metres below top of casing), along with the recommended pump specifications, pump installation depths, and valve yield settings, based on bore-specific properties detailed in Error! Reference source not found.. The target bore yields and pump sizing have been optimised to achieve an initial well loss of 5 m (+/- 1 m) and a pump duty cycle of about 75%. Recovered seepage from borefield abstraction will be conveyed via pipeline to the Gwalia plant process water pond for reuse in mineral processing operations. Pump cooling shrouds are not required for any of the bores, given the selected pump settings and installation depths.

*Table 9: Trigger level values, pump triggers and pump specifications expressed in mBTOC*

| Type | Bore ID | TVL (mBTOC) | Target pump yield (L/s) | Pump setting (mBTOC) | Installed pump recommendation | Target pump cut-on (mBTOC) | Target pump cut-ff (mBTOC) |
|---|---|---|---|---|---|---|---|
| Seepage / Depressurisation | RBO1 | 2.08 | 3.8 | 18 | 5.5 KW Lowarra 16GS55 (98 mm O.D.) | 2.18 | 8.58 |
| | RBO2 | 2.10 | 0.6 | 12 | 1.5 KW Lowarra 8GS15 or Grundfos SP8A-10 (98 mm - 101 mm O.D.) | 2.2 | 8.6 |
| | RBO3 | 2.07 | 1.2 | 12 | 1.5 KW Lowarra 8GS15 or Grundfos SP8A-10 (98 mm - 101 mm O.D.) | 2.17 | 8.57 |
| | RBO4 | 1.38 | 1.4 | 12 | 1.5 KW Lowarra 8GS15 or Grundfos SP8A-10 (98 mm - 101 mm O.D.) | 1.48 | 7.88 |
| | RBO5 | 1.51 | 0.6 | 12 | 1.5 KW Lowarra 8GS15 or Grundfos SP8A-10 (98 mm - 101 mm O.D.) | 1.61 | 8.01 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **RBO6** | 1.9 | 9 | 24 | 11 KW Lowarra Z6-31/9 (146 mm O.D.) | 2 | 8.4 |

### 3.1.1 Tables for L8337/2009/2

Table 10: Summary of Proposed Changes

| Table 13: Ambient environmental quality monitoring | | | | | |
|---|---|---|---|---|---|
| **Monitoring point reference and location** | **Parameter** | **Limit/Trigger** | **Units** | **Averaging period** | **Frequency** |
| TSF 2/1 to TSF 2/12 Monitoring Bores | SWL | - | ~~Mbgl~~ mbgl ~~mAHD~~ | Spot sample | Six monthly |
| | pH | - | -pH units | | |
| | TDS | - | mg/L | | |
| | WAD-CN | - | | | |
| TSF 3/1 to TSF 3/7 Monitoring bores | SWL | - | ~~Mbgl~~ mbgl ~~mAHD~~ | Spot sample | Monthly, while the plant is operating; |
| | | | | | Quarterly while in care and maintenance |
| TSF 3/1 to TSF 3/8 Monitoring bores | pH | - | - pH units | | Quarterly while in care and maintenance |
| | TDS, WAD-CN, Na, K, Ca, Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO3, HCO3, SO4, and NO3 | 0.5 mg/L WAD-CN | mg/L | | |
| TSF 4/1 to TSF 4/6 Monitoring bores | SWL | 1.0 SWL Trigger | (mbgl) ~~mAHD~~ | Spot sample | Monthly, while the plant is operating; Quarterly while in care and maintenance |
| | pH | - | - pH units | | Monthly, while the plant is operating; Six monthly while in care and maintenance |
| | TDS, WAD-CN, Na, K, Ca, Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO3, HCO3, SO4, and NO3 | 0.5mg/L WAD-CN | mg/L | | |
| MBO1 to MBO4 Vegetation Monitoring Bores<br><br>and<br><br>MBO5 to MBO9 Zone of | SWL (mbgl) | 0.5 SWL Trigger for MBO1, MBO2, MBO5, MBO6, MBO7 | (mbgl) | Spot sample | Monthly, while the plant is operating; Quarterly while in care and maintenance |
| | | 1.0 SWL Trigger for MBO3, MBO4, MBO8, and MBO9, | | | |
| | pH | - | pH units | | Quarterly while plant is operating |

| | | | | | |
|---|---|---|---|---|---|
| Influence Monitoring Bores | TDS, WAD-CN, Na, K, Ca, Mg, As, Pb, Ni, Fe, Cd, Cr, Cu, Hg, Se, Zn, Cl, CO3, HCO3, SO4, and NO3 | | | | Six monthly while in care and maintenance |
| RB01 to RB06 Seepage Recovery Bores | SWL (mbgl) | 1.0 SWL Trigger | (mbgl) | Spot sample | Monthly, while the plant is operating; Quarterly while in care and maintenance |

Note 1: Monthly monitoring undertaken at least 15 days apart
Note 2: Quarterly monitoring is undertaken at least 45 days apart.

~~27. The licence holder must engage the services of a person qualified in the area of hydrogeology to develop a Groundwater Management Plan to manage groundwater mounding impacts around TSF3 and TSF4.~~

27. The licence holder shall manage groundwater impacts around TSF3 and TSF 4 in accordance with the Groundwater Management Plan, dated May 2024 (or as revised).

~~28. The Groundwater Management Plan required by condition 27 must, as a minimum include:~~

~~(a) An assessment of the existing groundwater monitoring bore network and whether it is adequate to monitor groundwater mounding and seepage impacts within the zone of influence of TSF3 and TSF4; and~~

~~(b) If the monitoring bore network is found to be inadequate, propose additional groundwater monitoring locations and bore designs (i.e. bore depths, screen interval) with relevant justification.~~

~~(c) A suitable monitoring program that includes bore specific triggers for standing water levels for existing and new (if required) bores; and~~

~~(d) management actions to reduce groundwater mounding if those triggers are breached. The licence holder must submit to the CEO the Groundwater Management Plan required by condition 27 no later than 31 March 2024.~~

### 3.1.2 Tables for L8337/2009/2

*Table 11. Summary of Proposed Changes*

| Table 3: Embankment Raise | | | | |
|---|---|---|---|---|
| | **Stages** | **Construction Height RL (m)** | **Supernatant Pond Maximum Operating Height (m)** | |
| TSF4 | Stage 1 | 371 | 370.3 | |
| | Stage 2 | 373.5 | 372.8 | |
| | Stage 3 | 376 | ~~Not authorised at this time~~ | 375.3 |
| | Stage 4 | 378.5 | ~~Not authorised at this time~~ | 377.8 |
| | Stage 5 | 381 | ~~Not authorised at this time~~ | 380.3 |
| | Stage 6 | 383.5 | ~~Not authorised at this time~~ | 382.8 |

# Attachment 7: Siting and Location

## 3.2 Siting Context

Gwalia Operations are located within the Shire of Leonora, Western Australia. The Gwalia Mine is located 4 kilometres (km) south of Leonora, Western Australia and south of the Laverton-Leonora Road.

## 3.3 Sensitive Land Uses

The closest human receptor to the Gwalia Project, is the town of Leonora, located immediately north of the operation.

Two small sections of the project are located on active pastoral stations running sheep and cattle (Melita pastoral lease and Clover Downs pastoral lease).

The project is located within 30 km of a Public Drinking Water Source Area: Leonora Water Reserve, to the north.

## 3.4 Topography

The project area lies in the Murchison IBRA bioregion, within the Eastern Murchison (MUR1) subregion, which totals over 21 million hectares. The Eastern Murchison comprises the northern parts of the 'Southern Cross' and 'Eastern Goldfields' Terrains of the Yilgarn Craton. The occluded paleodrainage system generates salt lake systems. Other features include broad plains of red-brown soils, breakaway complexes, and red sandplains (CALM, 2002).

## 3.5 Groundwater and Water Sources

Groundwater flow is towards the major palaeodrainages and modern playa lakes where the watertable is close to the surface. Hydraulic gradients along the palaeodrainages are generally very low with steeper gradients in the upper reaches of the catchments. Groundwater discharge is mainly by evaporation from playa lakes, and a relatively small amount by throughflow within the palaeochannels.

Groundwater discharge from the area is principally by evaporation from the salt lakes which form the regional surface water drainage system, with a relatively small amount of groundwater outflow to the palaeochannel sands. As the salt lakes generally overlie areas of bedrock, rather than overlying the palaeochannels, most of the discharge to the salt lakes is inferred to be through weathered bedrock. The groundwater outflow of the Raeside Palaeodrainage system is ultimately towards the Eucla Basin, which is about 350 km to the southeast of the area (Johnson, et al., 1999).

There are no permanent surface water resources within the immediate vicinity of Gwalia Operations. Waigen Lakes located approximately 20km to the west of the facility, with Lake Raeside approximately 20km to the southest.

# Attachment 8: Additional Information

## 1. Addendum to Gwalia TSF 4 Groundwater Management Plan (Pennington Scott, June 2025)

## 2. Gwalia TSF 3 and TSF Groundwater Management Plan (WSP, May 2024)

## 3. Gwalia Temporary Mobile Crusher Noise Assessment (Talis Consultants, 2025)

## 4. Construction Report Gwalia TSF 4 Stage 2 Embankment Raise to 373.5m (WSP, March 2024)

## 5. St Barbara Limited Gwalia Mine, Works Approval Application for TSF 4 (Coffey, 2015)

# Attachment 9: Category Specific Checklist

*Figure 11: Conceptual Site Model – TSF 4*

| Source / Activities | Potential emissions, pollutants, or contaminants of concern | Potential pathway | Potential receptors | Potential impacts | Proposed controls and contingencies |
|---|---|---|---|---|---|
| Deposition of tailings onto TSF | Tailings and decant water | Seepage/infiltration | • Groundwater | Reduced groundwater quality | • Bore monitoring program (Licence Condition 25).<br>• Gwalia TSF 3 and 4 Groundwater Management Plan (Recommended Licence Condition 27)<br>• Groundwater abstraction regulated under 5C licence<br>• Annual ZOI vegetation monitoring adjacent TSF (Licence Condition 6)<br>• TSF seepage interceptor drains maintained (Licence Condition 4)<br>• TSF seepage recovery bores to be equipped with individual automatic cut on/ cut offs<br>• Monthly water balance for TSF3 and TSF4 (Licence Condition 6)<br>• SWL Triggers 0.5 and 1.0m BGL recommended to be applied to bores (Licence Condition Table 13).<br>• Submission of TSF Lift Construction Completion reports (Licence Conditions 36 and 37). |
| | Decant water | Groundwater mounding | • Surrounding native vegetation<br>• Lake Raeside and Playa systems | Reduced vegetation health | |
| | | Pooling of decant water (containing WAD CN) ingested by fauna | | Illness/death in fauna and/or degradation of receptors. | |
| | Leachate | Seepage of leachate through ground or TSF walls to groundwater. | • Surrounding native vegetation<br>• Lake Raeside and Playa systems<br>• Priority flora | Groundwater mounding/surface expression impacting receptors | |
| Decant pipeline and/or tailings | Tailings of decant water spills containing concentrations of elements with environmental significance or cyanide | Direct discharge, infiltration into soil or groundwater | • Surrounding native vegetation<br>• Surrounding soil | Reduced vegetation health / | • Leak Detection Telemetry or automatic shutoffs |

| | | | | | |
|---|---|---|---|---|---|
| delivery pipeline failure | | | • Groundwater | soil contamination / reduced groundwater quality | • All pipelines contained within v-drains (secondary containment)<br>• Regular pipeline inspections (Licence Condition 7)<br>• Routine preventative maintenance<br>• All staff complete environmental inductions, training and education<br>• All spills are recorded and reported<br>• Adhere to Operating Licence L8337/2009/2 |
| Stormwater | Potentially contaminated stormwater runoff | Runoff from TSF facility during periods of rainfall | Surrounding vegetation | Reduced vegetation health | • Operational and total freeboard<br>• Stormwater diversion infrastructure/drainage |
| TSF overtopping or dam failure | Tailings spills containing concentrations of elements of environmental significance including cyanide | Unplanned direct discharge of tailings to the environment | Surrounding vegetation | Reduced vegetation health | • Dam break assessment<br>• Operational and total freeboard<br>• Operated in accordance with TSF Operations Manual<br>• Water balance<br>• Regular inspections of freeboard (Licence Condition 7)<br>• Submission of TSF Lift Construction Completion reports (Licence Conditions 36 and 37). |
| Dust | Dried tailings causing dust, potentially containing contaminants | Windblown dust transport through air, then deposition | Surrounding vegetation | Reduced vegetation health | • Dust suppression<br>• Daily visual inspections<br>• If required, suspending work in a particular area based on visual inspections, prevailing wind/weather conditions or public feedback. |
| | | Air/wind dispersion | Sensitive receptors – Gwalia and Leonora | Health/amenity impacts | |

| | | | | | |
|---|---|---|---|---|---|
| Construction activities | Noise | Noise from construction activities | Sensitive receptors – Gwalia and Leonora | Nuisance to sensitive receptors | • Compliance with Environmental Protection (Noise) Regulations 1997<br>• Scheduling works |

# Attachment 10 – Proposed Fee Calculation

The proposed licence amendment fee is calculated using the highest fee unit number corresponding to the prescribed premises categories and design capacity threshold which in the case of this proposal is Category 5 – Processing or beneficiation of metallic or non-metallic ore: more than 500 000 but not more than 5 000 000 tonnes per year. The current unit value is [redacted] as of 1 July 2022, which equates to a proposed amendment fee of [redacted]

*Table 12: Amendment Fee Calculation*

| Item | Value |
|---|---|
| Category | 5 (processing or beneficiation of metallic ore) |
| Throughput | [redacted] |
| Fee Units | |
| Rate per unit (amendment fee) | |
| **Total Amendment Fee** | |

# 4 References

CALM (2002). A biodiversity audit of Western Australia's 53 biogeographical subregions in 2002. Department of Conservation and Land Management, Perth, Western Australia.

Johnson, S. L., Commander, D. P., & Risely, C. L. (1999). *Groundwater resources of the Kalgoorlie–Boulder region*. Water and Rivers Commission, Hydrogeological Record Series, Report HG 3.