Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Works Approval Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W6832/2023/1
Works Approval Holder	Talison Lithium Australia Pty Ltd
ACN	139 401 308
File Number	DER2023/000532
Premises	Talison Greenbushes Lithium Mine – Village Wastewater Treatment Plant 1130 Maranup Ford Road GREENBUSHES WA 6254 Legal description – Mining tenements L70/232, L70/244, M01/3, M1/06 and M01/7 As defined by the Premises map attached to the Revised Works Approval
Date of Report	21 May 2024
Decision	Revised works approval granted

Sonya Poor

Digitally signed by Sonya Poor
Date: 2024.05.21 11:23:53 +08'00'

SENIOR ENVIRONMENTAL OFFICER, INDUSTRY REGULATION
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Table of Contents

1. Decision summary

Works Approval W6832/2023/1 is held by Talison Lithium Australia Pty Ltd (Works Approval Holder) for the Talison Greenbushes Lithium Mine – Village Wastewater Treatment Plant (the Premises), located at L70/232, L70/244, M01/3, M1/06 and M01/7.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during construction and operation of the Premises. As a result of this assessment, Revised Works Approval W6832/2023/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

On 01 March 2024, the Works Approval Holder submitted an application to the department to amend Works Approval W6832/2023/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act).

The amendments being sought consist of construction activities associated with the expansion of the Wastewater Treatment Plant (WWTP) increasing the design capacity for Category 54 from 125 cubic metres per day (m^3/day) to 187.5 m^3/day.

The WWTP expansion consists of an additional containerised Membrane Bioreactor (MBR) module and an additional influent equalisation (balance) tank (1 x 50 kL) (Talison Lithium, 2024) increasing the existing design capacity by 62.5 m^3/day.

The WWTP expansion merges with the original WWTP and has the same treated effluent outlet.

The increase in design capacity will sustain the expansion of the permanent Village within the premises from a 500-persons accommodation to 750 persons.

2.2.1 Background

The original WWTP was constructed under Works Approval W6832/2023/1 with a design capacity of 125 m^3/day. The WWTP design allows treated wastewater (TWW) to be deposited into the Mine Water Circuit (MWC) (as licenced by L4247/1991/13) within the premises boundary, then directly to Tailings Storage Facility 4 (TSF4) decant pond and then into decant ponds of other operational TSFs within the premises (Talison Lithium, 2024), where this wastewater is incorporated as reuse process water.

The original WWTP is currently being commissioned with the commissioning period commencing on 26 February 2024 for a period of 90 calendar days.

2.2.2 Wastewater treatment capacity

The wastewater flow for the WWTP with the expansion was calculated for an average occupancy rate of 750-person Village is as follow:

750 personnel/day (p/day) x 200 litres/p/day = 150 m^3/day

Minimum load = 57.7 m^3/day

Maximum load = 187.5 m^3/day

No changes are proposed for the treated effluent quality from the original WWTP design.

The Works Approval Holder submitted the WWTP expansion design to the Department of Health (DoH) and is currently waiting for approval. The DoH approval will be required prior to construction.

2.2.3 Environmental commissioning and Time Limited Operations

The Works Approval Holder has requested to commission the WWTP expansion under Works Approval W6832/2023/1 (which allows for a period of 90 calendar days). The commissioning activities are expected to last up to two weeks and WWTP effluent stabilisation can take up to 12 weeks before maintaining an effluent quality according to the specification (Talison, 2024).

Once the WWTP effluent reaches the expected quality, discharge is intended to be conveyed into TSF4. The construction of TSF4 (under W6618/2021/1) fulfilled the construction requirements. Nevertheless, the licence amendment L4247/1991/13 to allow the discharge of WWTP effluent into TSF4 is currently under assessment.

The Works Approval Holder is not authorised to discharge treated water to TSF4 or the MWC until that amendment is granted and all relevant approvals obtained including the approval from DoH and Shire of Bridgetown-Greenbushes.

The WWTP expansion will be authorised to undertake 180 calendar days of time limited operations following submission of the commissioning report and to allow Licence L4247/1991/13 to be amended.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 1 below. Table 1 also details the proposed control measures the Works Approval Holder has proposed to assist in controlling these emissions, where necessary.

Table 1: Works Approval Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Installation/ construction expansion WWTP	Air / windborne pathway	Plan activities and implement management actions with consideration given to existing licence conditions, weather forecast and real-time dust monitoring. Dust monitoring for the broader mine site is

Emission	Sources	Potential pathways	Proposed controls
			undertaken in accordance with Licence L4247/2019/13. Review earthworks program schedule to minimise periods that surfaces are bare/open and progressive rehabilitation of disturbed areas. Application of dust suppressing stabilisers on appropriate surfaces and spray-on dust suppressants. Operation of water carts during dry/windy conditions and during summer months. Ceasing non-essential activities during excessively windy, high-risk conditions if dust cannot be adequately controlled. Speed limits in relevant work areas of 40 km/h.
Noise		Air / windborne pathway	The use of modern, low noise emission equipment to ensure the amenity of camp residents and neighbouring land users. Restricting construction activities to during normal working (daylight) hours. Mobile equipment used for construction will be operated and serviced in line with the manufacturer's specifications.
Contaminated or potentially contaminated stormwater		Seepage of hydrocarbon contaminated water impacting groundwater quality Direct discharge	Routine facility inspection and maintenance programs to identify and remediate areas of increased risk. Stage ground preparation/improvement activities to avoid large unsealed/cleared expanses. Install and maintain construction drainage systems to manage stormwater flows.
Commissioning and Time Limited Operations			
Odour	Odours emitted from WWTP (leaks and other faults)	Air / windborne pathway	WWTP maintenance will be undertaken in accordance with manufacturer specifications. (DWER, 2023)

Emission	Sources	Potential pathways	Proposed controls
Sludge and treated/ untreated wastewater/ chemicals	Leak and/or spill from WWTP/pipelines/ tanks/ tanks overflow	Overland runoff Seepage to soil and groundwater	The WWTP is fitted with a series of alarms to alert the operator to scenarios where the WWTP is outside of the design operating parameters. Emergency overflow from operational storage tanks directed to the 380 kL emergency storage tank (Talison, 2024a). In the event of a leak/spill, the source is isolated, and any contaminated soil remediated or disposed of to an appropriately licensed facility. Spills reported as an environmental incident and investigated and reported. Spill kits in the vicinity of reagent storage areas. The system is fully automated to shut off to prevent overflow when circumstance required. The high-level (float) alarm in the irrigation tank stops the decant pump from adding more to the tank. No fuel storage or refuelling is proposed at the WWTP. Sludge is removed by a suitably licenced contractor likely via a vacuum truck offsite to a suitably licenced facility (DWER, 2023) <u>Construction requirement from Works Approval:</u> Above ground WWTP infrastructure is located on compacted earth pad with a surrounding earthen bund to contain spills and contaminated stormwater. All sewage storage and treatment tanks, transfer pipelines and conveyance infrastructure must be impermeable and free of leaks and defects. The WWTP is fitted with a series of alarms to alert the operator to scenarios where the WWTP is outside of the design operating parameters (e.g., excessively high/low pressure/flow, pump failure, backwash/filter operating incorrectly, insufficient/excessive chlorine/pH, excessive turbidity).
Wastewater discharges	TWW not meeting specifications contaminates MWC	Overland runoff Seepage to soil and groundwater	Additional wastewater balancing storage with a capacity of 50 kL installed. This storage allows to buffer against peak flows into the WWTP. The total storage with the four tanks (200 kL) will have a capacity of ~107% of the peak daily flow rate, or ~26 hours of storage at the peak flow rate (Talison, 2024c).

Emission	Sources	Potential pathways	Proposed controls
			The existing WWTP is equipped with a 100 kL of TWW storage (2 x 50 kL tanks) for balancing outflows and to allow sufficient chlorine contact time, and an additional 380 kL of emergency storage (1 x 380 kL tank) for use should the TWW disposal system be shut down or the TWW be out of specification (Talison, 2024c). The 380 kL emergency storage tank is sufficient to provide operational flexibility to allow for arranging the logistics to secure an alternative TWW disposal option in the event of out of specification effluent or operational problems with the TWW conveyance system (Talison, 2024c). Dosing of TWW with chlorine is undertaken prior to the operational storage tanks and the stored TWW is recirculated through the chlorine dosing system to allow sufficient contact time for deactivation or killing of pathogenic microorganisms. Realtime monitoring of the chlorine residual is also undertaken to adjust dosing rates to ensure that there is sufficient chlorine in the TWW during convenience to the MWC (Talison, 2024a). <u>Conditions from original W6832/2023/1 DWER (2023):</u> The WWTP is fitted with a series of alarms to alert the operator to potential leaks and other scenarios where the WWTP is outside of the design operating parameters. Continuous online monitoring will be undertaken for chlorine, pH, and turbidity to ensure it meets disposal criteria. TSF4 Cell 2 to be lined with an impervious membrane and TSF4 Cell 1 to be clay lined. Seepage controls include Seepage Sump 1 (located at toe of TSF2), Seepage Sump 2 (located at toes of TSF2), Secondary Recovery Seepage Sump (collects seepage from TSF2 and Tin Shed Dam) and Seepage Sump 3 (collects seepage from TSF2 southern embankment) that prevents seepage discharge offsite.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Works Approval Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

The Mine Camp is located 230 m east of the WWTP. As the camp is operated by the Works Approval Holder it will not be considered a sensitive receptor for this assessment.

Table 2 and Figures 1, 2 and 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Residential Premises	Receptor A: 550 m south of WWTP. Receptor I: 1,700 m east of WWTP.
Downstream water users	Nearest about 600 m south from premises boundary/TSF4. WWTP 2 km south-east of TSF4.
Environmental receptors	**Distance from prescribed activity**
Superficial waterbodies	Woljenup Creek – 500 m east from WWTP (Figure 1). Woljenup Creek tributaries running through proposed TSF4 footprint.
Groundwater	The water table is close to surface (1 m) towards the base of the valley and within 100 m of the main drainage line. Works Approval Holder mentions avoiding these areas for the WWTP and associated infrastructure.
Department of Biodiversity, Conservation and Attractions (DBCA) Legislated land	Hester State Forest – 20 m north of the WWTP. Greenbushes State Forest – 490 m north of the WWTP. Wastewater pipeline cross both forest (Figure 3 shows pipeline way from WWTP to TSF4).
Aboriginal and other heritage sites	Blackwood River - Place ID: 20434, Mythological – 500 m east.

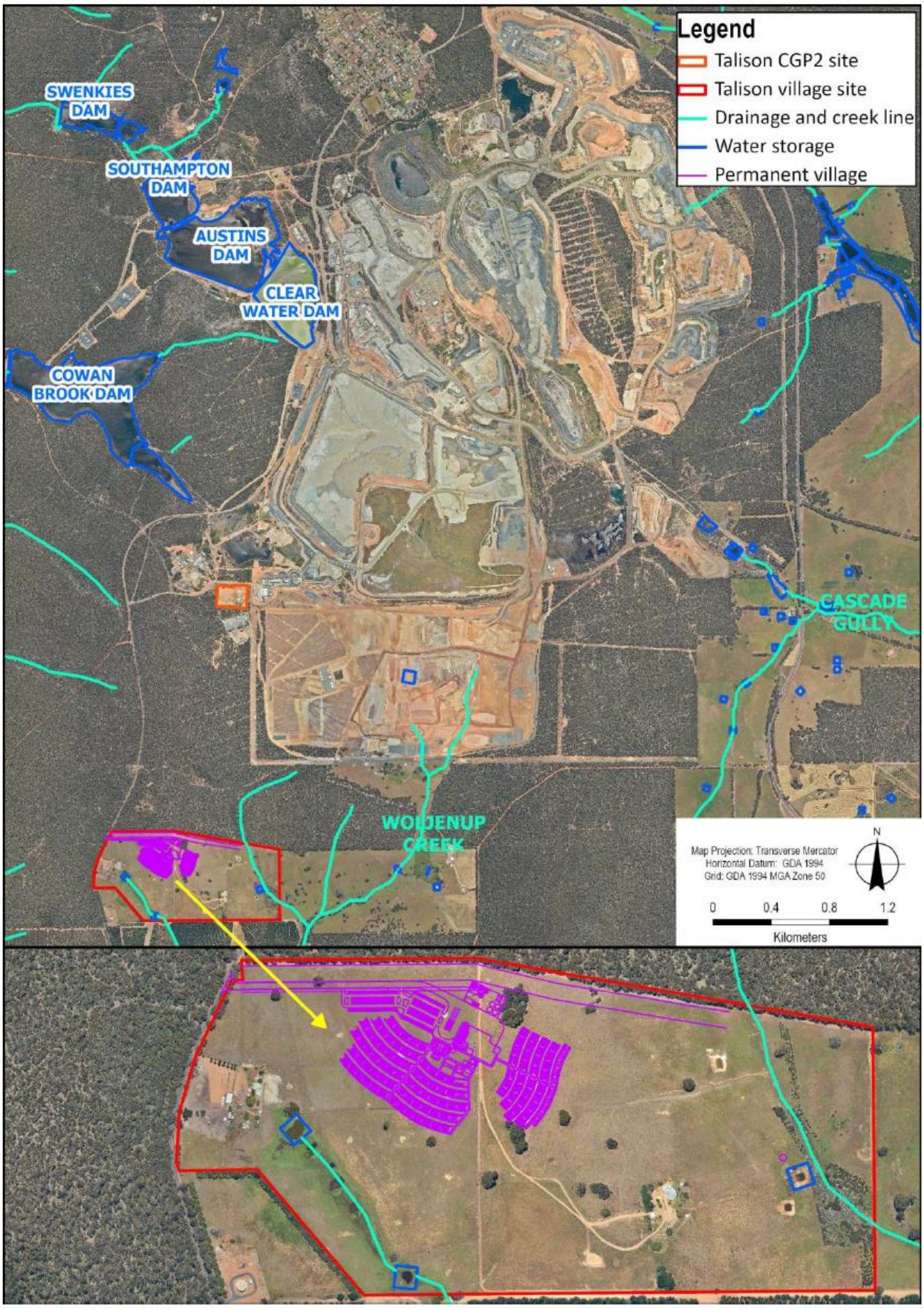

Figure 1: Distance to sensitive receptors

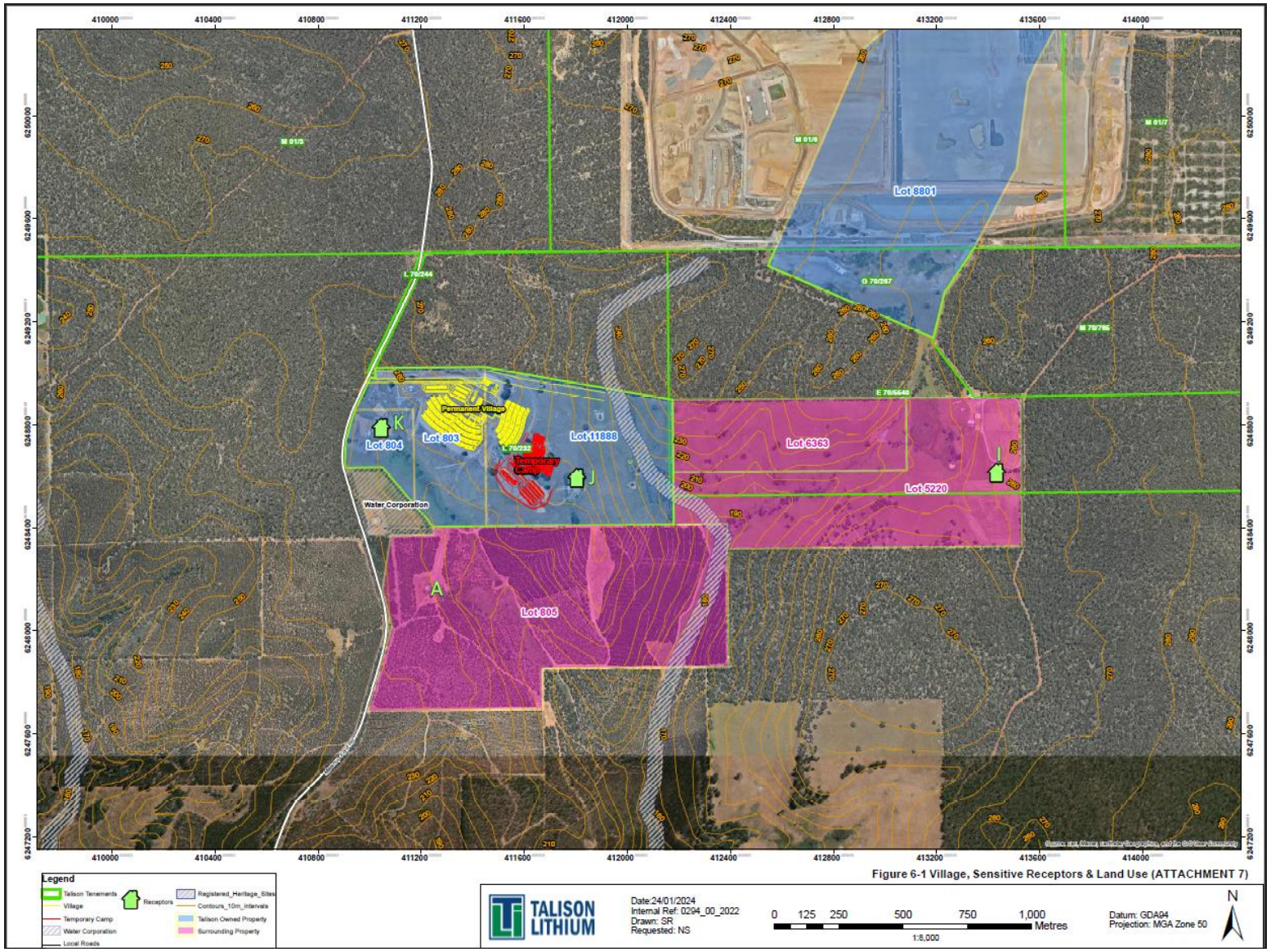

Figure 2: Village, Sensitive receptors and Land use

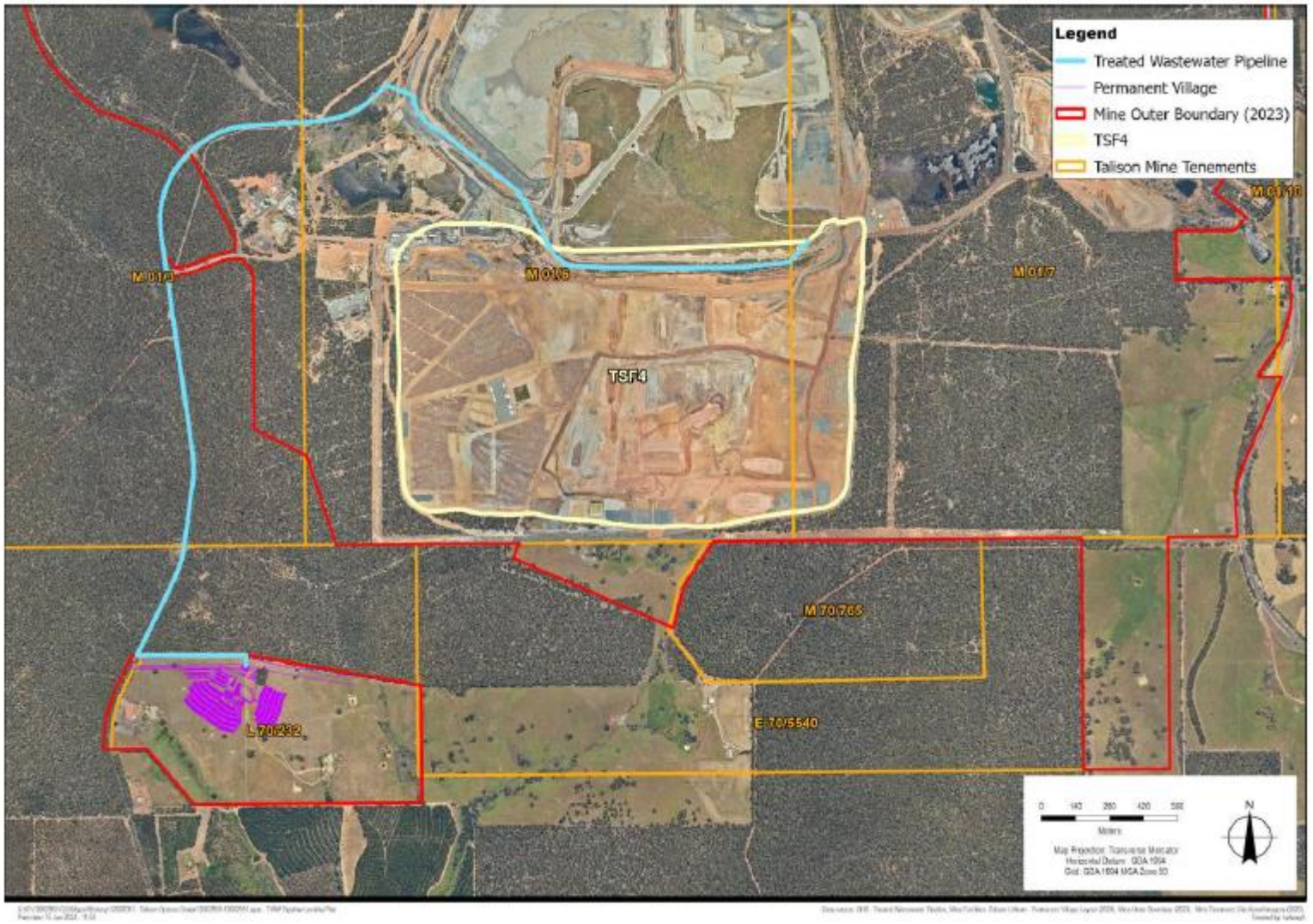

Figure 3: WWTP treated wastewater pipeline

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the Works Approval Holder has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Works Approval Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the Works Approval Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

The Revised Works Approval W6832/2023/1 that accompanies this Amendment Report authorises construction and time-limited operations. The conditions in the Revised Works Approval have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

An amendment to licence L4247/2019/13 is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the Premises i.e. wastewater treatment and discharge activities. A risk assessment for the operational phase has been included in this Amendment Report, however licence conditions will not be finalised until the department assesses the licence application.

Table 3. Risk assessment of potential emissions and discharges from the Premises during construction, commissioning and time limited operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Works Approval Holder's controls**				
Construction								
Installation/construction expansion WWTP	Dust	Air/windborne pathway causing impacts to health and amenity	Residential Premises (A and I)	Refer to Section 3.1	C = Minor L = Possible **Medium Risk**	Y	NA	NA
	Noise			Refer to Section 3.1	C = Minor L = Possible **Medium Risk**	Y	NA	NA
	Contaminated or potentially contaminated stormwater	Seepage of hydrocarbon contaminated water impacting groundwater quality Direct discharge	Superficial waterbodies Soil	Refer to Section 3.1	C = Slight L = Possible **Low Risk**	Y	Condition 1 – Construction requirements for the WWTP expansion	During this amendment the department has conditioned the construction requirements for the WWTP expansion
Commissioning – Time limited operations								
Operation of WWTP	Odours emitted from WWTP (leaks and other faults)	Air/windborne pathway causing impacts to health and amenity	Residential Premises (A and I)	Refer to Section 3.1	C = Minor L = Possible **Medium Risk**	Y	Condition 5 – Environmental commissioning requirements; and Condition 12 – Time Limited Operations relating to the following: • Sludge containment and disposal; and • Treated effluent that does not meet design specification to be removed by a licensed Controlled Waste Carrier or to	NA

Risk Event					Risk rating[1] C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Works Approval Holder's controls**				
							be re-circulation back through the WWTP.	
	Spills and leaks of sludge and treated/ untreated wastewater/ chemicals	Overland runoff Seepage to soil and groundwater	Superficial waterbodies Groundwater Soil DBCA legislated land	Refer to Section 3.1	C = Minor L = Possible **Medium Risk**	Y	Condition 5 – Environmental commissioning requirements; and Condition 12 – Time Limited Operations requirements relating to: • WWTP daily inspections; and • Specific actions toward treated effluent that does not meet design specification. Condition 7 – Monitoring during environmental commissioning and time limited operations – Weekly during commissioning and monthly during time limited operations.	NA
	WWTP tank overflows and potentially contaminated stormwater		Superficial waterbodies DBCA legislated land	Refer to Section 3.1	C = Moderate L = Possible **Medium Risk**	Y	Condition 1 – Construction requirements – WWTP has an alarm system of audible and visual alarms. Condition 5 – Commissioning activities requirements. Condition 12 – Time Limited Operations requirements.	NA
	TWW not meeting specifications contaminates MWC		Superficial waterbodies DBCA legislated land	Refer to Section 3.1	C = Moderate L = Possible **Medium Risk**	Y	Condition 1 – Construction requirements for the WWTP expansion and to meet output standards. Condition 5 – Environmental commissioning requirements; and Condition 12 – Time Limited Operations requirements:	NA

Risk Event					Risk rating[1] C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works Approval Holder's controls				
							requirements relating to: • WWTP daily inspections; and • Specific actions toward treated effluent that does not meet design specification.	

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed Works Approval Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal on 19 March 2024	DEMIRS provided comments on 25 March 2024. "[…] As waste water is managed under Part V of the *Environmental Protection Act 1986*, DEMIRS has no comment. However, we can confirm that the wastewater treatment plant was included in the approved Greenbushes Lithium Operation Cowan Brook Dam Raise and Accommodation Village Mining Proposal – Revision 1 Version 2 Reg ID 115689, and the Greenbushes Lithium Operation Cowan Brook Dam Raise and Accommodation Village Mining Proposal – Revision 2 Version 1 Reg ID 122355, which is currently under assessment".	Noted
DoH advised of proposal on 19 March 2024	DoH provided comments on 09 April 2024: "[…] Water Supply and Wastewater Disposal The disposal of wastewater generated on site is required to comply with the Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974. Any non-drinking water (i.e., water that is not intended or suitable for drinking) must be managed to ensure it cannot be confused with or contaminate the drinking water supply. This requires satisfactory labelling of non-drinking water taps and, depending on system configuration and suitable backflow prevention arrangements in accordance with Australian/New Zealand Standards AS3500 – Plumbing and Drainage. Sewage intended to be recycled for beneficial purposes such as landscape and garden bed irrigation, toilet flushing or other purposes, will require prior approval from the Department of Health. Information on the application for approval can be accessed via the following link: https://ww2.health.wa.gov.au/Articles/A_E/Application-process-for-approval-of-recycling-water-scheme [...]".	Noted
Works Approval Holder was provided with draft amendment on 02 May 2024	The Works Approval Holder provided the following comments on 21 May 2024 and waived the remaining comment period: As per Figure 3 in the draft Works approval the current WWTP has three balance tanks (3 x 50 kL). The expansion will involve the addition of a fourth tank. Table 1, a, ii only lists two balance tanks instead of three. The Works Approval Holder would like to request Table 1,a,ii is amended to align with Figure 3. In the draft amendment report it is noted there is a misspelling of the Shire of Bridgetown-Greenbushes in section 2.2.3.	Table 1,a,ii updated to 3 x balance tanks (50 kL each) Corrected

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Works Approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 5 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Works Approval as part of the amendment process.

Table 5: Summary of works approval amendments

Condition no.	Proposed amendments
Cover page	Date of amendment added, and design capacity increased from 125 to 187.5 m^3 per day.
Works Approval history	Current amendment added.
Condition 1 – Table 1	Construction requirements for the WWTP expansion added. Administrative updates.
Condition 5 – Table 2	Environmental commissioning requirements for the WWTP expansion added.
Condition 6 – Table 3	Administrative updates.
Condition 12 – Table 5	Infrastructure and equipment requirements during time limited operations for the WWTP expansion added.
Condition 14 – Table 6	Emission and discharge limits during time limited operations updated from 125 to 187.5 m^3 per day. Administrative updates.
Figures	Figure 2 updated. Inclusion of Figure 4 for the WWTP expansion design.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. DWER 2023, *W6832/2023/1 Decision Report,* Perth, Western Australia.
5. Talison Lithium (Talison) 2024*, Part V Works Approval (W6832/2023/1): Amendment Supporting Document*, Perth, Western Australia (REF: DWERDT819694, Talison Lithium Village WWTP - Works Approval Amendment Supporting Document_Rev0).
6. Talison Lithium (Talison) 2024a*, Recycled Water Quality Management Plan*, Perth,

Western Australia (REF: DWERDT819694, Appendix F).

7. Talison 2024b, *Talison Village WWTP: Environmental Risk Assessment of Treated Wastewater Disposal to Mine Water Circuit (187.5 kl/day Option)*, Perth, Western Australia (REF: DWERDT819694, Appendices RWQMP 187kL).
8. Talison 2024c, *Recycled Water Quality Management Plan: Treated Wastewater Disposal to Mine Water Circuit (187.5 kl/day Option)*, Perth, Western Australia (REF: DWERDT819694, Appendices 12628130-RPT-1-Talison - MWC Disposal RWQMP 187 kL).