



Application for Licence Amendment

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

Licence Number	L4247/1991/13
Licence Holder	Talison Lithium Australia Pty Ltd
ACN	139 401 308
File Number	2012/0071641
Premises	Talison Lithium Mine Maranup Ford Road GREENBUSHES WA 6254 Legal description – Mining tenements M01/3, M01/6, M01/7, M01/8, M01/9, M1/16, L70/232 and L70/244 and General-purpose lease G01/1 and G01/2 As defined by the Premises maps in Schedule 1 and coordinates in Schedule 3 of the revised Licence
Date of Report	1 August 2024
Decision	Revised licence granted

MANAGER, PROCESS INDUSTRIES

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L4247/1991/13 is held by Talison Lithium Australia Pty Ltd (Licence Holder) for the Talison Lithium Mine (the Premises), located at Maranup Ford Road, Greenbushes 6254, within Mining Tenements M01/3, M01/6, M01/7, M01/8, M01/9, M1/16, L70/232 and L70/244 and General-purpose lease G01/1 and G01/2.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L4247/1991/13 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 22 December 2023, the Licence Holder submitted an application to the department to amend Licence L4247/1991/13 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Updates to the prescribed premises boundary to include L70/232 and L70/244 (as depicted in Figure 1);
- Authorise ongoing operation of wastewater treatment plant (WWTP) constructed under W6832/2023/1;
- Authorise ongoing operation for Tailings Storage Facility 4 Cell 1a (to 1261 m RL embankment height) constructed under W6618/2021/1;
- Increase of amount of tailings deposition from 5 to 5.2 million tonnes per annual period (Mtpa); and
- Administrative amendments to remove redundant conditions.

This amendment is limited only to changes to Category 5 activities from the existing licence and the addition of Category 54.

Table 1 below outlines the proposed changes to the existing Licence.

Table 1: Proposed throughput capacity changes

Category	Current throughput capacity	Proposed throughput capacity
5	7,100,000 tonnes beneficiated per annual period 5,000,000 tonnes of tailings deposited per annual period	7,100,000 tonnes beneficiated per annual period 5,200,000 tonnes of tailings deposited per annual period
54	N/A	187.5 m ³ per day

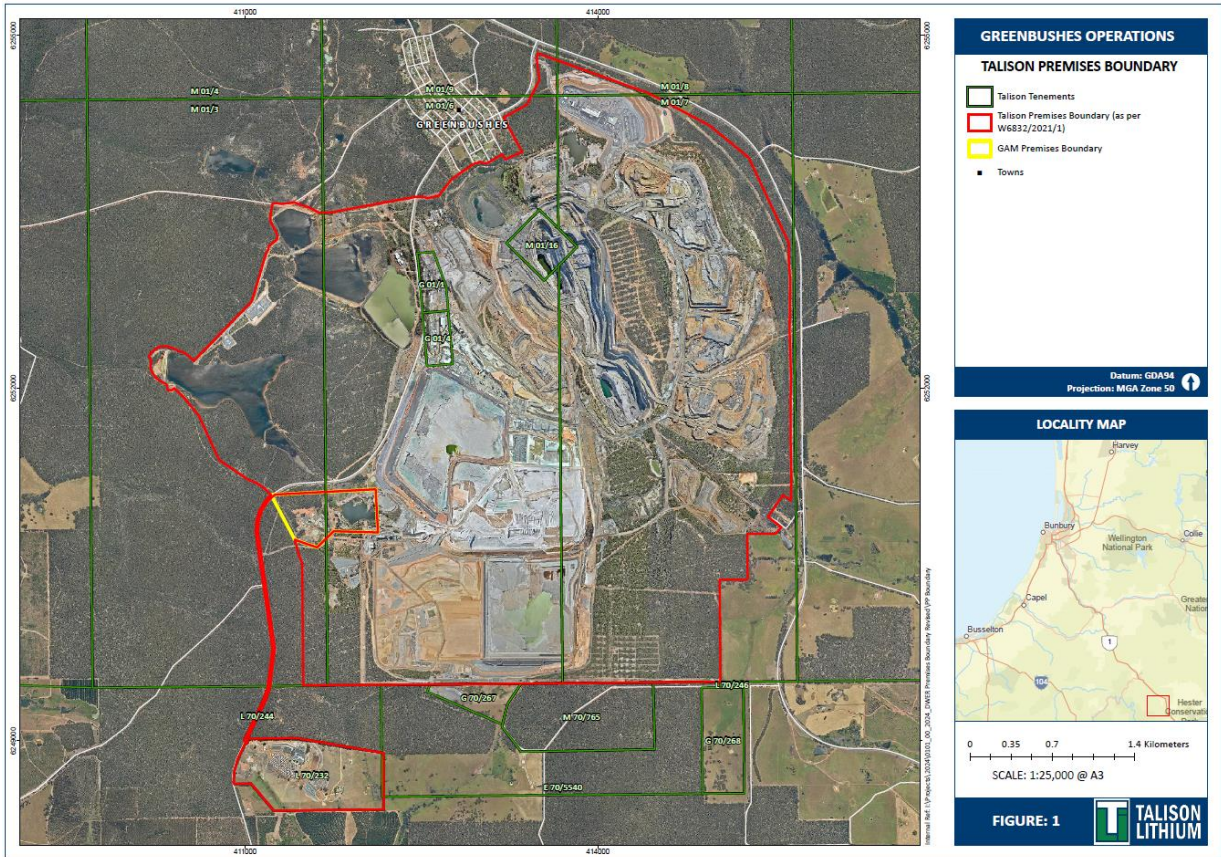


Figure 1: New proposed prescribed premises

2.2.1 Works approval W6618/2021/1

Works approval W6618/2021/1 originally granted on 8 March 2022, authorised the construction of a two cell, centerline constructed Tailings Storage Facility (TSF) known as TSF4, designed to accommodate approximately 68.2 million tonnes (Mt) of tailings at an average density of 1.4 tonnes per cubic meter.

In addition to this, the works approval required the construction of additional monitoring bores located south of TSF4 footprint. The construction of the monitoring bores was deemed compliant with a report submitted to the department on 10 November 2022.

The works approval was amended several times since the granting for the following changes:

- 4 July 2023 – authorisation for staged construction of Cell 1 starter embankment into Stage Cell 1a (stage 1) and 1 (stage 2) for heights 1261m RL and 1265m RL respectively. This will include subsequent staged submission of two Critical Containment Infrastructure Reports (CCIR) and two staged periods of Time Limited Operations (TLO);
- 1 September 2023 – authorisation to allow the final section (20%) of the TSF2 cell 1 liner to be constructed with bituminous geomembrane material (BGM) liner rather than the clay liner; and
- 27 March 2024 – authorisation to construct all of TSF4 Cell 2 with BGM liner.

2.2.2 Tailings Storage Facility 4

The TSF4 is located within mining tenements M01/6 and M01/7 abutting the southern embankment of TSF1 which forms majority of the northern boundary. TSF4 was designed to utilise the existing topography and adjacent to TSF1 where possible. TSF4 footprint will cover

an area of approximately 230 hectares (ha) at its final embankment height.

TSF4 was assigned a consequence category of “High B” and Category 1 in accordance with the Code of Practice for Tailings Storage Facilities in Western Australia (Department of Mines and Petroleum, 2013) and the Australian National Committee On Large Dams (ANCOLD) (2019) guidelines. The slope stability undertaken for the facility concluded that all cases and cross sections analysed would meet the Factors of Safety recommended in the ANCOLD (2019) guidelines.

TSF4 was designed with the inclusion of an underdrainage system that lowers the phreatic surface of the TSF and generally increases the stability of the facility.

The currently approved construction stages for TSF4 under W6618/2021/1 include two starter embankments for cell 1, to heights 1261 m RL and 1265 m RL for stage 1a and 1b respectively. Cell 2 starter embankment will begin at 1265 m RL. The storage of Cell 1a is expected to be 1.9 million m³.

The deposition rate into Cell 1 is expected to be 3.8 million m³ / year and therefore, the storage into the Cell 1a of an embankment height of 1261m RL is expected to be exhausted in 6 months and 12 months during stage 1b with an embankment height 1265m RL. The predicted tailings production and storage requirements are summaries in Table 2.

Table 2: Predicted tailings production from 2022 until 2031

Year	Technical Grade (t)	Chemical Grade (t)	TSF1 retreatment (t)	Total
2022	216,648	3,009,374	1,397,541	4,623,564
2023	218,422	3,165,037	1,719,264	5,102,722
2024	217,698	3,170,953	1,688,317	5,076,968
2025	218,436	4,725,281	1,692,392	6,636,110
2026	218,442	5,039,364	1,687,742	6,945,548
2027	197,941	6,474,879	194,021	6,866,841
2028	197,941	6,783,407	-	6,981,348
2029	197,941	6,799,283	-	6,997,224
2030	197,941	6,799,283	-	6,997,224
2031	197,941	6,799,283	-	6,997,224

Constructed design

The CCIR for the TSF4 Cell 1a was submitted to the department on 1 December 2023 (Figure 2). During the internal assessment of the report, the department identified several deviations to the constructed design as opposed to what was previously approved in the works approval. The following deviations were identified:

- Embankment between TSF1 and TSF4. The works approval design required a minimum 7.5 m wide clay lining on the outside of the TSF1 embankment, below the construction for TSF4 embankment. Instead, a modified design was built with this structure primarily constructed from mine waste material, with a thin clay lining facing TSF4;
- Changes to the construction of the divider embankment between the two cells. The works approval design required this embankment to be constructed with a low-permeability clay core, buttressed on the eastern (cell 1) side with mine waste and instead the core was built with mine waste, with a thinner layer of clay facing the western (cell 2) side;
- Permeability of the clay liner was taken as an average. The requirement was for 3 layers of 200 mm of engineer clay with a permeability of less than 1x10⁻⁹ m/s. 10 samples were taken and of those, eight met the required permeability, one was equal and another was 3x10⁻⁹ m/s which is three times more permeable than the minimum requirement. The

Department notes that the conditioned permeability was to be as a minimum and not an averaging value; and

- The clay-tie was not constructed, and the High Friction Angle (HFA) BGM was not used on a large portion of the embankments instead the non-HFA range of BGM was used.

The Department considered in its assessment that these deviations may have the potential to change the risk of the facility with the following concerns:

- The clay lining along the northern embankment was considered to be a significant structure to reduce exacerbating seepage from TSF1 with the construction and operation of TSF4;
- The changes to the divider embankment means that in the following stages the embankment will not have a clay core and can therefore results in seepage through this embankment. Due to the centreline construction, there will not be a continuous core throughout the divider embankment of the two cells;
- Due to the inconsistent permeability of the clay liner, this may allow for the formation of weak spots in the liner that undermine the integrity of the entire liner and has the potential to increase risk of seepage from the facility;
- The clay liner and the HFA BGM liner was used, these requirements were intended to ensure that the BGM liner stays in place during tailings deposition and doesn't fail. At the time of the assessment, it was unclear the whether the level of risk of the liner failing has increased.

As part of the compliance assessment, the department requested further information from the Licence Holder to provide explanation for these identified deviations. The Licence Holder provided additional information on 22 December 2023 and 15 January 2024, with the following comments:

- It was advised that the TSF1 facing embankment was replaced with BGM liner for most of the northern embankment and where there is no BGM liner, the clay liner was built to 7.5 m thickness to prevent the cumulative impacts of seepage from TSF1. It was advised that 90% of the embankment is lined with BGM which has a lower permeability (reduced by 6 order magnitude);
- Licence Holder has stated that the changes to the divider embankment were previously communicated with the department, noting that the clay facing on the western side is a width of 8 m which is thicker than the original clay core. It was advised that at around mid-height this deviation will decrease the seepage travel time through the divider embankment from 130 to 90 years. Noting also that cell 2 will be fully lined with BGM extending to the western side of the divider;
- Licence Holder confirmed that scarification did occur to key in clay facing on the embankment to the clay liner on the floor to minimise horizontal separation and bind the two. The part of the northern embankment which is lined with clay is constructed in 300 mm horizontal layers which are keyed into each layer. The BGM liner of Cell 2 has been constructed to extend past the intersection of the northern and divider embankment;
- The Licence Holder considers that the variability to permeability in the base clay liner is acceptable since sensitivity analysis undertaken during the facility design suggested that applying a permeability of 1×10^{-7} m/s to the clay liner does not result in discernible difference in environmental risks, and therefore the most permeable measure taken of 3×10^{-9} m/s should be sufficient.

On 29 January 2024, the department advised that noting the deviations to design, which will be assessed under the subsequent licence amendment (this assessment), the Licence Holder was able to commence deposition into TFS4 under time limited operations (TLO).

Underdrainage constructed design

Underdrainage for the facility included:

- Sand drainage blanket constructed downstream of the clay core that runs through the mine waste outer shell of the embankment to the perimeter tow drains;
- Upstream perimeter toe drains above and below the clay liner;
- Grave finger drains that discharge to the sand blanket along the southern boundary; and
- Downstream toe drains that will collect seepage from underdrainage and sand drainage blanket and also collect runoff from embankment and surrounding external catchment.

All the underdrainage design were constructed to report to the seepage collection sumps.

Seepage collection sumps

There are two constructed seepage collection sumps (Sump A and Sump B) associated with Cell 1, located at low points along the final embankment toe. The sumps were sized to accommodate approximately 2-3 hours of seepage and will also accommodate runoff from the embankment. They have been sized for the allowance of a 10% Annual Exceedance Probability (AEP) 24-hour storm event. The valves on Sump A are programmed to close automatically if the water level in the sumps increase above the maximum elevation or if there is a pump failure.

In a letter dated 25 October 2023, the Licence Holder advised the department that there was a change to the valve system for sump B and that automatic input valves are not considered a necessary control function.

The Licence Holder advised that with the change in the base liner of Cell 1 to have 20% BGM liner, the likely seepage to be directed to sump B would reduce the vertical seepage through this liner and a greater volume would be retained above the liner. The total seepage to report to Sump B was similar, but the volume suggested a revised design of ~900 m³. Table 3 shows the comparison between the original and revised design volumes.

Table 3: Comparison between original and revised design

Parameter	Unit	Volume (original design)	Volume (revised design)
Seepage to underdrains 3 hours duration	m ³	36	62
Storm runoff in 24 hours for 10% AEP event (starter embankment)	m ³	665	665
Storm runoff in 24 hours for 10% AEP event (final dam height)	m ³	832	832
24 hour storm and 3 hour seepage (starter embankment)	m ³	701	727
24 hour storm and 3 hour seepage volume (final dam height)	m ³	868	894

As additional controls to negate the necessity for automatic valves, sump B was constructed with a capacity of 2,250 m³ and other controls including, level sensors fitted with low, high and high-high operating level alarms for water level, and duty and standby pumps activated by the level sensors with the standby pump to provide additional pumping if the 'high' water level is reached and diesel back up pump that is automatically activated in the event of loss of power. The delegated officer considers that the capacity of the sump with the additional controls are sufficient that automatic valves for this sump are not crucial.

2.2.3 Tailings Storage Facility 4 operation

Tailings into TSF4 will be pumped from the Centralised Tailings Pumping Station located on the embankment of TSF2 and will be deposited sub-aerially from a slurry ring, containing multiple spigots located on the perimeter embankment. The spigots will be spaced approximately 50 m along the tailings distribution pipe. The spigot off takes and valve assemblies will discharge into conductor pipes to deliver tailings to the beach level to reduce embankment erosion. As advised

by the Licence Holder, *the deposition strategy will be to maximise evaporation, promote densification and control the location and extent of the decant pond with the aim to maximise the return of water and minimise the footprint to reduce seepage, enhance sub drying and desiccation of tailings.*

For the operation of Cell 1, tailings will be deposited from three sides (south, west and eastern embankment) to control the location of decant pond away from the northern embankment against TSF1. Deposition into Cell 2 is understood to take place around the full perimeter.

Decant system

The decant infrastructure will comprise of skid mounted pumps located on an access ramp constructed from the north embankment. Decant water will be pumped back into the mine water circuit through to Clear Water Dam.

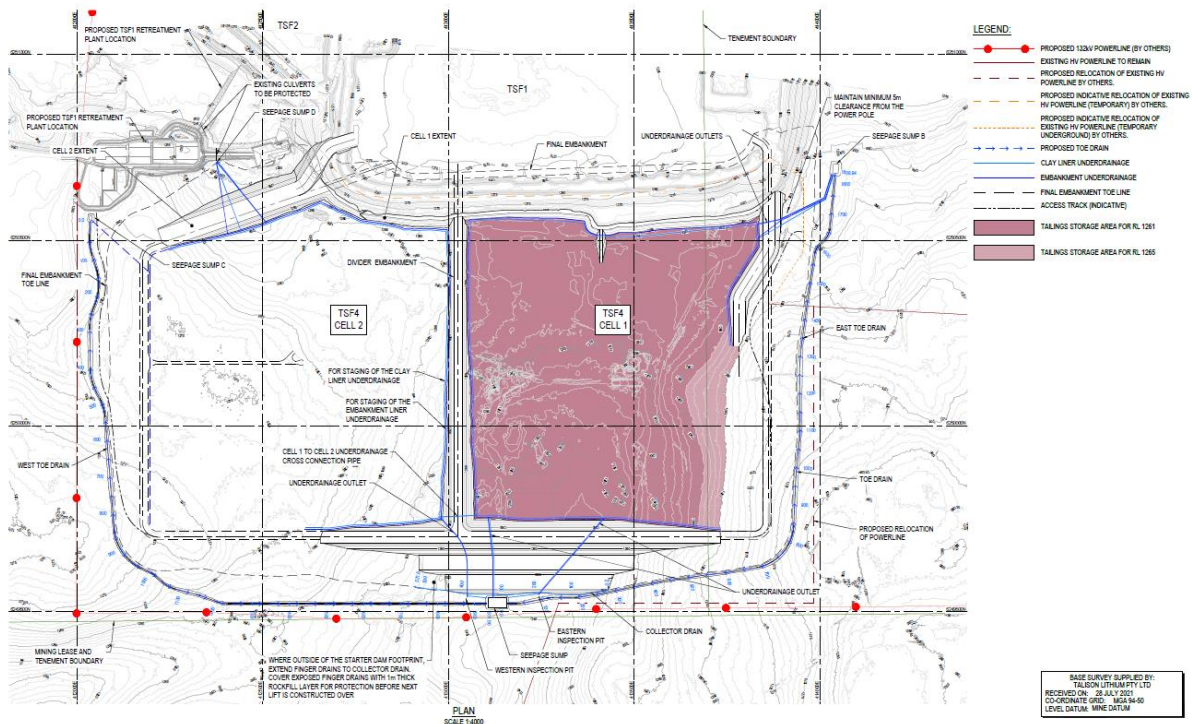


Figure 2: Tailings Storage Facility 4 Cell 1a (RL 1261 m)

Pipelines

Pipelines for the tailings and return water will be made from HDPE and installed in earthen/rock bunds except part of the pipelines that are in plant areas which are installed in pipeline corridors. The inspection of the pipeline will be taken once a shift, and the Department has confirmed that the pipelines have been constructed in accordance with conditions of the Works Approval W6618/2021/1 requiring them to be equipped with process monitoring, alarms and indicators to alert operator of abnormal conditions.

2.2.4 Emergency Dump Pond

The licence holder has advised through the submission of this amendment application that they have constructed and are requesting authorisation to operate the Emergency Dump Pond (EDP), constructed south of TSF2.

Currently, waste streams from the processing facilities on the premises are first pumped towards the Centralised Tailings Pump Station (CTPS) located on the embankment of TSF2. From the CTPS, tailings are pumped to available active TSFs. The EDP is constructed downgradient of CTPS where it forms part of the tailings process and pipeline bund infrastructure. The EDP will

receive tailings by gravity flow and is constructed on a platform on the southern embankment of TSF2, as depicted in Figure 2.

Mine waste rock was placed to form the EDP embankments. The base of the EDP is designed to be permeable to allow water in the dumped tailings slurry to seep through the pond for collection by a series of underdrains that discharges via open channel drain to Seepage Sump 3 (SS3). The permeable foundation comprises of a 500mm lining of <70mm size gravel along the floor and walls, allowing for seepage (and runoff from the TRP ROM pad) to penetrate the base and be collected in underdrains.

The underdrainage of the consists of the existing drains from the ROM pad that were extended beneath the EDP footprint and additional perforated pipes were installed to maintain drainage of the TSF3 southern tow – underdrains gravity-feed to SS3.

The EDP has been designed to allow access by earthmoving machinery for consolidated tailings removal.

The Licence Holder has advised that the construction of this EDP was constructed to satisfy pipeline requirements in W6618 and the Licence that required *“all pipelines containing environmentally hazardous substances are provided with secondary containment adequate to contain any spill for a period equal to the time between routine inspections”*.

The licence holder has advised that the EDP will receive tailings in the event of tank rupture, or site wide power failure to avoid tailings settling in the pipelines and causing blockages, and is additional to, and improves upon, standard containment bunds as it increases containment capacity to allow for controlled breaking of the lines in the event of an emergency while preventing discharge to the environment.

The EDP has been designed to receive tailings slurry from CTPS in the event of an emergency (e.g. rupture of a tank in the CTPS and the volume of tailings material within the pipeline). Tailings will be discharge into EDP through five DN 315 HDPE tailings delivery pipes secured by an anchor block. The tailings will be allowed to seep and dry out prior to excavation.

The EDP includes embankments heights of less than 4 m internally and 11 m externally and includes the storage capacity of 1,340 m³ (excluding 250 mm freeboard), as per Table 3.

The department notes that the construction of this infrastructure (as a disposal location for tailings) potentially constitutes a non-compliance with section 53 of the EP Act (for constructing a waste storage facility without approval). This matter has been referred to the department’s assurance team for further investigation. Notwithstanding this, the department intends to assess the risks associated with the operation of the EDP under this licence amendment.

Table 4: Emergency Dump Pond Storage Requirements

Location	Description	Volume (m ³)
Tailings slurry	Volume of full pipelines reporting to the CTPS	440
Allowance for major leaks, tank rupture at CTPS	Equivalent to the volume of one mixing tank.	900
Total storage capacity		1340



Figure 3: Location of the Emergency Dump Pond, including detail of the installed underdrainage

2.2.5 Wastewater Treatment Plant

Works approval W6832/2023/1 was granted on 17 November 2023 to approve the construction, commissioning and time-limited operations of the Wastewater Treatment Plant (WWTP) with an assessed design capacity of 125m³, to be located and service the new worker village accommodation that has been built on licence holder purchased land, south of the main premises. The WWTP capacity has been designed in accordance with Regulation 29 of the *Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974*.

The WWTP includes a three-stage Membrane Bioreactor (MBR) which is equipped with submerged flat sheet membranes. This process allows for an anoxic zone, aerobic zone with mixed liquor recycle and aerobic MBR zone with return activated sludge (RAS) return to aerobic zone to provide a high level of nitrate removal.

An Environmental Compliance Report (ECR) for the WWTP was submitted to the department on 26 February 2024 in support of the scope for this licence amendment application. As per condition 4 of the works approval, commissioning of the WWTP was authorised to begin with the submission of the ECR. Evidence of the construction of the WWTP was provided to the department as part of the ECR. Additional information was provided during the assessment that confirmed that the WWTP was constructed in accordance with the construction requirements in W6832/2023/1.

Subsequent to the submission of the ECR, works approval W6832/2023/1 was amended, authorising additional wastewater treatment infrastructure and an increase to the maximum throughput for the WWTP to 187.5m³/day. The additional infrastructure constructed as part of the WWTP expansion included a containerised anoxic-aerobic bio reactor with associated diffused air aeration system, additional balance tank, aerobic tank, MBR tank and sucrose and poly-aluminium chloride dosing system, adding an additional 62.5 m³/day of capacity to WWTP.

Following construction of the additional wastewater treatment infrastructure, the Licence Holder submitted a secondary ECR as required by W6832/2023/1. The department has reviewed this ECR and determined that it also meets the general requirements specified in condition 1, Table 1 (item 2) of W6832/2023/1.

The overall calculated continuous wastewater flow from the village is calculated to be 150m³/day (750 persons x 200L/person/day of wastewater) with a minimum load of 57.7m³/day and a maximum load of 187.5m³/day.

The treated effluent will be stored in the treated effluent storage tanks prior to disposal into the mine water circuit via the TSF4 decant pond. It is expected that the contribution of treated wastewater into TSF4 represents an additional 0.6% water input to the overall slurry stream entering TSF4.

The treated effluent is expected to meet the wastewater quality prior to deposition into TSF4 are listed in Table 5. As conditioned in the works approval and subsequently will be conditioned as an operational requirement for the WWTP on the licence that treated wastewater must meet these requirements prior to deposition into TSF4.

Table 5: Expected treated wastewater quality

Parameter	Unit	Value
Biochemical Oxygen Demand	mg/L	≤10
Total Suspended Solids	mg/L	≤10
Turbidity	NTU	<2 (95 percentile)
Total Nitrogen	mg/L	≤15
Ammonia as N	mg/L	<1
Organic Particulate N	mg/L	1
Soluble non-biodegradable N	mg/L	2
Soluble nitrate as N	mg/L	11
Total Phosphorus	mg/L	L ≤2
Particulate P	mg/L	minimal
Soluble Orthophosphate	mg/L	~2
pH	pH units	6.5-8.5
E. coliforms	cfu/100mL	≤1
Free chlorine	mg/L	0.2-2.0

The HDPE treated effluent pipeline is buried alongside Maranup Ford Road until reaching TSF4 where it will be disposed of in the decant pond. The Licence Holder has advised that pipeline inspections will be undertaken twice daily with sumps located at low points along the pipeline route to contain material from leaks and ruptures. As per the conditions of the works approval, the licence holder will be required to ensure that the treated effluent waste meets the design specifications prior to disposal into TSF4.

As noted in the works approval assessment for the WWTP, the disposal of this treated effluent will be entering the mine water circuit which is acknowledged as requiring a holistic review. The department intends on initiating this review in the near future and will include an assessment of the various contributors and process flows within the mine water circuit, including the disposal of treated effluent.

2.2.6 Osiris Monitors

The Licence Holder had originally proposed the removal of the Osiris monitors as part of the submission of the Trigger Action Response Plan on 31 October 2023. As previously communicated to the Licence Holder at the time, the removal of the Osiris monitor required a

separate review. During the draft consultation for this application, the Licence Holder reiterated the request to the removal of the Osiris monitors.

The Licence Holder has advised that the reason for removing these monitors are:

- The implementation of the TARP and use of the Australian Standard (AS) monitors are considered more appropriate and accurate in monitoring dust from the premises, and the subsequent procedures are adequate to replace the dust management currently associated with the Osiris monitor triggers; and
- The TARP system (utilising the AS monitors) and the system for the Osiris monitor alerts are separate and running them concurrently provides little advantage or increase in effectiveness / response time for dust management measures.

The Licence Holder advised in correspondence dated 11 July 2024, that moving to the AS monitors as the primary dust monitoring and compliance tool will:

- Provide more robust, reliable data;
- Allow the Licence Holder to run a single dust monitoring control system, streamlining administrative tasks and responsiveness; and
- If the 15 minutes exceedance triggers are incorporated into the AS monitor requirements, this results in no loss of the “early warning” function that the department has indicated is important.

A summary of the department’s decision regarding this request is provided in section 5.

2.2.7 Administrative amendments

Condition 17 and 18

The Licence Holder has requested to remove the specified action conditions 17 and 18 as the requirements for these conditions have been satisfied.

The Clear Water Dam Emissions Management Plan was submitted on 29 September 2023, with subsequent information provided on 15 December 2023. The department has assessed the submitted documents and confirmed to the Licence Holder on 19 January 2024 that it meets the requirements of condition 17 and 18. As a result, Condition 17 and 18 will be removed as part of this amendment, however it is noted that the submitted plan is still subject to ongoing technical review which may result in further assessment or the implementation of proposed management plan within the conditions of the licence in future amendments.

2.2.8 DWER initiated amendments

In addition to the amendments requested by the Licence Holder, the department has also updated the Licence for the following:

Annual Ecological Assessment

In the amendment to the licence dated 19 December 2022, the department added an additional regulatory control requiring the Licence Holder to develop a new proposal for undertaking the Annual Ecological Assessment with the minimum specifications set out in Schedule 2 of the previous licence and recommended monitoring locations that were determined with the assistance of the department’s aquatic science branch.

On 30 June 2023, the Licence Holder submitted to the department an Annual Ecological Assessment Program Review and proposed updates to the requirements of the conditions, as well as new locations for the monitoring to be undertaken.

This was assessed against the requirements of the condition with support from the department’s aquatic science branch.

On 11 September 2023 the department advised the Licence Holder that the submission of the updated ecological assessment was sufficient to meet the requirements of that condition, and with the advice of the department’s aquatic science branch, provided the proposed draft condition. The department requested the Licence Holder conduct this monitoring to the specifications in this draft condition for the spring of 2023 as it was advised that an amendment to include the condition was unable to be progressed by the department in time for the seasonal sampling to be conducted.

To formalise this ongoing monitoring, the department will amend the condition specifying the requirements for Annual Ecological Monitoring as proposed in letter dated 11 September 2023 as part of this licence amendment. The sufficiency of this condition regarding the activities within the scope of this application is discussed further in section 3.4.5.

Trigger Action Response Plan

In the amendment to licence dated 12 July 2023, the department added an additional regulatory control requiring the Licence Holder to develop a Trigger Action Response Plan (TARP) as a holistic approach to managing dust emissions at the premises.

The Licence Holder submitted the TARP on 31 October 2023, and a review by the department determined that submitted TARP met the requirements of the conditions specified in the Licence. The Licence Holder was advised of this outcome in a letter dated 11 December 2023.

As part of this amendment, the department intends to update the conditions relating to dust triggers and management actions to appropriately include components of the TARP to further improve dust management at the premises. A summary of the department’s decision to update these conditions is provided in section 5.

Constructed infrastructure

The department has received confirmation of construction for an item under condition 9, Table 6 and will remove this item as it is now considered redundant. Table 6 lists this amendment. The following has been determined to be compliant with conditions 9, 10 and 11.

Table 6: DWER initiated amendments of constructed / installed infrastructure

Infrastructure	Construction / installation requirements	DWER assessment
Water treatment facility	<ul style="list-style-type: none"> a) Ability to treat minimum 590,000 m³/year effluent streams from the WTP and ARU; b) Constructed to allow manual monitoring of high tank levels; and c) To be built in an earthen bunded area to contain leaks/spills – with overflow directed to Clear Water Dam. 	<p>The Licence Holder submitted the report on 20 November 2023 to demonstrate the installation requirements.</p> <p>The department assessed this information and provided confirmation on 14 February 2024 that the submission was compliant with the requirements of this condition.</p>
Clear Water Dam Austins Dam Southampton Dam Cowan Brook Dam	<ul style="list-style-type: none"> a) Install visual markers along embankment for freeboard monitoring. 	<p>The Licence Holder submitted the report on 8 August 2023 to demonstrate the installation requirements.</p> <p>The department assessed this information and provided confirmation on 24 June 2024 that the submission was compliant with the requirements of this condition.</p>

Continuous AS PM₁₀ Monitor North

On 30 July 2024, the Licence Holder provided evidence of the siting audit undertaken for the current interim location of the AS Continuous Monitor North. The department has reviewed this

audit and confirmed that the location of the monitor meets the siting requirements as specified in condition 9, Table 6 of the licence.

Noting that this monitor is intended to be re-located (once a permanent location is secured), specifications regarding the construction and installation requirements detailed in Table 6 for this monitor will remain on the Licence until works are completed.

TSF 2 outstanding construction

On 14 February 2024, the department provided notification to the Licence Holder that the document *TSF2 RL1280 m Raise Construction Report, August 2023* has been assessed and determined that it met the requirements of (since deleted) condition 46 and partially met the requirements of (since deleted) condition 47.

As part of the draft comments the department queried with the Licence Holder regarding the outstanding information, specific to the underdrainage construction requirements previously specified in Table 1 as follows:

1. One upstream drainage trench positioned 25 m and 35 m from the raise centreline along the southern and western walls at RL 1270 m (blue line, Figure 8); and
2. One upstream drainage trench positioned 25 m from the raise centreline along the southern, western and northern wall (red line, Figure 8)

The Licence Holder advised that there was a deviation to the design where the trench was not constructed along the northern wall, due to the backfill and construction of the Chemical Grade Processing Plant #3, and that this work was conducted as part of the 1,275 m RL embankment raise.

The department considers that this deviation is acceptable and has removed the conditions requiring the construction of TSF2 embankments, as it has now reached the final height of 1,280 m RL. The department has also updated Table 1 and Figure 8 of the licence to accurately reflect the constructed design of TSF2.

2.2.9 Other matters

Pipeline improvement – condition 13

On 30 June 2023, the Licence Holder submitted the document for the pipeline improvement plan as required by condition 13 of the licence.

The department assessed the document and determined that it meets the requirements of condition 13 for pipeline assessment/retrofit which consisted of an audit of all pipelines to determine which of them do not meet the following requirements:

- i. Equipped with telemetry systems and pressure sensors to allow the detection of leaks and failures; and
- ii. Equipped with automatic cut-outs in the event of a pipe failure; and
- iii. Provided with secondary containment sufficient to contain any spill for a period equal to the time between inspections.

This audit determined that of the 66 mine water pipelines at the premises all did not have adequate leak detection. As part of the submission the Licence Holder proposed a schedule of works to rectify, which the department notes that these works are ongoing, and has advised the Licence Holder to provide compliance documentation for these works to upgrade the pipelines as they are completed. The existing condition within the Licence has been updated to reflect to the requirement to provide compliance documentation for this pipeline improvement activities as they are completed.

As discussed in section 2.2.4, the Licence Holder has constructed the EDP and advised that the purpose of this infrastructure was to satisfy the requirement to “provide secondary

containment sufficient to contain any spill for a period equal to the time between inspections”.

Silica – condition 36

During the licence amendment granted on 12 July 2023, after advice from Department of Health and the department’s air quality branch, this condition was added for the investigation into the silica as a potential pollutant in the dust due to the spodumene nature of the ore.

On 9 May 2024, Talison provided the results from this sampling to the Department. The Department is undertaking an expert technical review of these results which will inform future assessments related to dust emissions at the premises. As the requirements to provide the analysis reports of the sampling has been satisfied, this condition will be removed.

2.3 Mining Act 1978

Department of Mines, Energy, Industry Regulation and Safety (DEMIRS) has advised that the Licence Holder has Mining Proposals Reg ID 1156889 (subsequent amendment 122355) and 927728 (subsequent amendment 121397) for the approval of the WWTP and TSF4 respectively. In addition to conditions enforced under the EP Act, the Licence Holder is also required to comply with requirements under other legislation (i.e. the *Mining Act 1978*) and tenement conditions for M01/6 and M01/7 on which TSF4 lies upon. DEMIRS advised that the construction report submitted by the Licence Holder for TSF4 is still under assessment by the Geotechnical Inspector.

The delegated officer notes that during the review of the CCIR for TSF4, advice was sought from DEMIRS regarding the as constructed deviations to design (as specified in section 2.2.3) and any associated implications of those deviations to the expected operation of TSF4.

On 4 June 2024, DEMIRS provided advice on this request with comments summarised in Table 7.

Table 7: Summary of DEMIRS comment on key design deviations (starter embankment cell 1)

Design deviations with implications for seepage management	DEMIRS comment to DWER – 4 June 2024
<p>General design changes:</p> <ul style="list-style-type: none"> • Change from clay liner to bituminous geomembrane (BGM) liner (to assist in construction timeframe). • Clay core in embankments to clay facing embankments (lack of clay resource). • Seepage system (underdrainage above and below the liner) appears to be adjusted with outlets realigned, finger drains extended. • Removal of rip rap on the perimeter embankment on the proviso that tailings coverage will be in place within 6 months. 	<p>General comment regarding design changes:</p> <p>Any deviations to design appear to have had full approval by the design engineers during the construction process.</p> <p>Additional independent testing was completed of the clay liner (permeability). Test results for the clay liner appear to have met compliance to the specifications.</p> <p>Vibrating wire piezometer (VWP) monitoring was completed in the southern embankment foundation and results found a rise in water level due to construction loading which then dissipated to background levels.</p> <p>Based on the information received, it does not appear the walls are at risk of catastrophic failure provided the facility is operated to design.</p> <p>In regard to seepage, the underdrainage appears comprehensive, having been constructed above and below the clay/BGM liner.</p>
<p>Non-compliant clay liner thickness across base of TSF.</p>	<p>Non-compliant locations with respect to the clay liner thickness represent 0.26% of the clay floor. No geotechnical issues are raised based on the supplied information.</p>

<p>Part of the 7.5 m clay facing between the existing TSF 1 embankment and the TSF 4 cell 1 was omitted and replaced with waste rock.</p>	<p>The change in design for the TSF4 / TSF1 interface and removal of 7.5 m of clay facing was confirmed by Talison as applying only to the BGM liner sections. The 7.5 m of clay facing continued to apply where the BGM was not installed. No geotechnical issues were noted regarding the above.</p>
<p>The divider embankment between cell 1 and cell 2 was designed to be built with a clay core, with waste rock facing on the eastern side, however, it has instead been constructed with a mine waste rock core and clay facing on the western side.</p>	<p>Further information from Talison confirmed the divider embankment with the clay face (now BGM liner) on the western face (cell 2) controls seepage between the cells (given that cell 2 low points are along that divider wall based on surface topography).</p> <p>The eastern side (cell 1) of the divider embankment is mine waste and more resistant to erosion (also noting the decant pond storage is towards the middle of cell 1). The BGM is lower permeability than the initial clay layer design and meets the same intent as the initial design of clay core and mine waste facing.</p>
<p>The clay facing on the embankment of TSF 1 was not keyed into the clay liner on the floor of the TSF 4 cell 1. Instead, they have “scarified the top of the clay liner” to join it with the clay facing on the embankment of TSF 1.</p>	<p>DEMIRS was unable to find the reference to TSF1/4 interface clay liner tie-in/scarification.</p> <p>It was requested Talison provide further detail to demonstrate that the facility/liner/seepage is not impacted by the change.</p> <p>Further information provided by Talison confirmed that there was no design change, as the design did not include the need for keying in the two clay liners given that the TSF1/4 embankment is an inner embankment. Given the two clay liners are scarified together, building the clay layer on the embankment is an extension of the clay liner on the floor and as such no geotechnical stability issues were raised (provided the QA/QC was followed as required - and appears to be the case given the information provided in the construction report). This query is specific to the areas without BGM.</p>

2.4 Part IV of the EP Act

The Greenbushes Lithium Mine Expansion was referred by the Licence Holder to the Environmental Protection Authority (EPA) under section 38 of the EP Act and assessed (Assessment No: 2172) at the level of Public Environment Report (PER), with EPA report 1635 published on 8 May 2019 (EPA, 2019). The Ministerial Statement (MS) 1111 was published on 19 August 2019. This included the TSF4 and village WWTP.

It is noted that the effluent pipeline for the WWTP is not within the current development area MS1111. The Licence Holder has advised that they do not consider that an amendment to MS1111 was required for the installation of the pipeline and that the construction and operation of this pipeline does not involve any activity/impacts requiring assessment under Part IV of the EP Act, most notably no clearing of vegetation outside the development area is proposed for this pipeline. The Shire of Bridgetown-Greenbushes was consulted and approved the installation of the pipeline within the road reserve and the Licence Holder has obtained a miscellaneous licence (L70/244) over the pipeline route within the road reserve.

During the draft comment period, the Licence Holder advised that a section 45c application was submitted on 18 June 2024 to include the pipeline corridor within the Mine Development Envelope to be consistent with the new Part V prescribed premises boundary.

2.5 Environmental Protection and Biodiversity Conservation Act 1999

The Licence Holder has been assessed under the EPBC Act and holds approvals EPBC 2018/8206 and EPBC 2013/6904. The delegated officer notes that it is the responsibility of the Licence Holder to ensure that all appropriate approvals are obtained for this premises, including any relevant amendment to these.

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 operation which have been considered in this Amendment Report are detailed in Table 8 below. Table 8 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 8: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Operation (Category 5) – Tailings Storage Facility 4 cell 1a			
Noise	Operation of TSF4	Air / windborne pathway	None proposed. Advised that noise emissions are regulated under Regulation 17.
Dust	Surface of TSF4	Air / windborne pathway	<ul style="list-style-type: none"> • tailings deposition managed to maximise wet areas; • deposition in rotation through perimeter spigots to minimise period of dry surfaces; • tailings left to dry for prolonged periods, dust suppression by aerial application of dust suppressant; • implementation of Dust Management Plan: <ul style="list-style-type: none"> ○ application of dust suppressions 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 <p><u>Existing licence conditions:</u></p> <ul style="list-style-type: none"> • monitoring of PM₁₀ at AS and Osiris monitors, with associated triggers levels which will instigate identification, investigation and remediation of the dust emissions as soon as reasonably practicable. • monitoring program includes: <ul style="list-style-type: none"> ○ two Osiris monitors (monitoring PM₁₀ and Total suspended particulates (TSP)); ○ two Tapered element oscillating microbalance (TEOM) monitors (PM₁₀); and • High Volume (Hi-Vol) Dust sampler monitor (Dust composition and short-term monitoring).
Seepage	Operation of TSF4	Seepage through base / embankment of TSF4	<ul style="list-style-type: none"> • construction and design of TSF4 to reduce seepage: <ul style="list-style-type: none"> ○ constructed with a clay liner with an average permeability of $<1 \times 10^{-9}$ m/s , consisting of three layers of nominal 200 mm compacted thickness and minimum distance between highest maximum groundwater level and base of TSF to be 1m; ○ location of TSF4 base 15 to 25m above low permeability heavy soils; ○ sandy soils removed from TSF4 footprint of embankment; ○ embankment constructed with low permeability core which is keyed through the alluvial material and into underlying clay; ○ upstream underdrainage and downstream seepage toe drain capturing and diverting seepage water to mine water circuit; ○ rock-lined downstream toe drains will capture runoff from embankment and surrounding catchment;

Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> ○ finger drains and collector pipes above the soft clay layer on the southern wall; double pipe internal drainage system above and below liner; ○ each drain has duplicate pipes and gravel surround to give alternate flow paths and each section has two spaced outlets in case one gets blocked; • additional groundwater monitoring bores downgradient (including permeability testing) to inform effectiveness of seepage underdrainage system; • surface water monitoring of Woljenup Creek during construction and operation (offsite location – SW20/02); • seepage monitoring network installed: <ul style="list-style-type: none"> ○ including multi-level monitoring bores (within saprolitic, weathered bedrock and unoxidized bedrock) in downgradient of TSF4; ○ trigger values developed based on baseline/background concentration; • seepage recovery drains, sumps and pumps return potentially contaminated water to mine water circuit: <ul style="list-style-type: none"> ○ 3 seepage collection sumps at low points along final embankment toe; ○ Installation of sand and gravel seepage collection blankets in higher seepage areas; ○ Captured seepage treated by Water Treatment Plant to improve elevated lithium and arsenic concentrations; ○ Remotely operated pumps and standby and/or back up pumps for seepage recovery systems to prevent overflow; • minimise decant pond size to reduce seepage; • implementation of Seepage Management Plan with the following key objectives: <ul style="list-style-type: none"> ○ maintain groundwater quality attributable to TSF4 seepage below water quality guidelines; ○ maintain the surface water quality in Woljenup Creek attributable to TSF4 seepage below defined baseline quality threshold.
	Underdrainage of TSF4	Overtopping of seepage collection ponds	<ul style="list-style-type: none"> • All seepage ponds to have freeboard for allowance of a 10% AEP 24-hour storm event; • Pumps in ponds to direct water back to Clear Water Dam; and • Automatic valves close off if water level is too high or if there is pump failure.
	Pipeline from seepage ponds back to mine water circuit	Pipeline rupture in seepage return water system	<ul style="list-style-type: none"> • pipeline corridors within earthen bunds; • daily pipeline inspections; and • in the event of a leak tailings or process water will drain to sedimentation basins or to existing sump 3.
	Storage of decant water in onsite water	Direct infiltration	<ul style="list-style-type: none"> • Arsenic remediation unit and water treatment plant to reduce lithium and arsenic concentrations in process water

Emission	Sources	Potential pathways	Proposed controls
Process water	storage dams	Overtopping of storage dams	<ul style="list-style-type: none"> Water balance monitoring for the mine water circuit.
Tailings	Deposition into TSF4	Overtopping of TSF4	<ul style="list-style-type: none"> freeboard of 0.9m, allowing for storage of an extreme storm event (1 in 100 year, 72 hours, 217 mm).
		Pipeline rupture	<ul style="list-style-type: none"> pipeline corridors within earthen bunds; and daily pipeline inspections.
Decant water	Water return system	Overtopping of TSF4	freeboard of 0.9m, allowing for storage of an extreme storm event (1 in 100 year, 72 hours, 217 mm).
		Pipeline rupture	<ul style="list-style-type: none"> pipeline corridors within earthen bunds; and daily pipeline inspections.
Operation (Category 5) – Emergency Pond			
Seepage	Operation of Emergency Dump Pond	Seepage through unlined based	<ul style="list-style-type: none"> underdrainage including extension of existing drains from ROM pad beneath the EDP footprint and additional perforated pipes to maintain drainage of the TSF2 southern toe. Underdrainage to gravity-feed to SS3.
Tailings	Operation of Emergency Dump Pond	Overtopping of pond	<ul style="list-style-type: none"> 250 mm freeboard; Licence holder advised that pond will only be used for emergencies and for infrequent pipeline flushing.
		Disposal of excavated tailings sludge	<ul style="list-style-type: none"> Dried tailings removed from the Emergency Dump Pond will be disposed of into TSF4.
Operation (Category 54) – Wastewater Treatment Plant			
Noise	Operation of WWTP	Air / windborne pathway	<ul style="list-style-type: none"> None proposed. Advised that noise emissions are regulated under Regulation 17.
Odour	Operation of WWTP (from leaks and other faults)		<ul style="list-style-type: none"> 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); and WWTP maintenance will be undertaken in accordance with manufacturer specifications;
Spills and leaks of sludge and treated/untreated wastewater		Overland runoff Seepage to soil and groundwater	<ul style="list-style-type: none"> WWTP is fitted with series of alarms to alert the operator to scenarios where the WWTP is outside of the design operating parameters; The plant will have sludge production of 0.5 m³ per day. As such, the 50 m³ sludge storage tank will need to be emptied approximately monthly;

Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> The sludge will be removed by a suitably licensed contractor likely via a vacuum truck offsite to a suitably licensed facility.
WWTP tank overflows and potentially contaminated stormwater			<ul style="list-style-type: none"> WWTP 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); WWTP maintenance will be undertaken in accordance with manufacturer specifications; The system is fully automated to shut off to prevent overflow when circumstances require (e.g. when effluent tank is full); The high-level (float) alarm in the irrigation tank stops the decant pump from adding more to the tank
Spills and leaks of chemicals			<ul style="list-style-type: none"> The maximum amount of chemicals to be stored and utilised to support the operation of WWTP include 100L each of Sodium hypochlorite (chlorine) and Polyaluminium chloride (flocculant); and Spill kits will be in the vicinity of reagent storage areas; and No fuel storage or refueling is proposed at the WWTP.
Wastewater	Treated effluent pipeline spill		<ul style="list-style-type: none"> the pipeline is tagged to indicate that it contains treated effluent; and twice daily inspections will be conducted on the pipeline.
	Treated effluent deposition into TSF4	Seepage through TSF	<ul style="list-style-type: none"> WWTP fitted with series of alarm to alert the operator to potential leaks and other scenarios where the village WWTP is outside of the design operating parameters; Continuous monitoring will be undertaken for chlorine, pH and turbidity to ensure it meets disposal criteria; Effluent monitoring including as per Recycled Water Quality Management Plan for water quality criteria confirmation (Refer to Table 5): <ul style="list-style-type: none"> Continuous monitoring of pH, turbidity and disinfection (chlorine) parameters; and Monthly monitoring of E.coli, nitrogen and phosphorus; 2 x 50m³ effluent storage tanks to recirculate non-compliant effluent or allow transport offsite for disposal via a licensed waste contractor; 380kL storage tank used if water quality issues accumulate and disposal is not able; Entire WWTP system has a total of 480m³ of effluent storage (~92 hours capacity). Treated effluent will be stored for a minimum of 30 minutes in the effluent storage tanks prior to disposal; Recirculation of treated effluent when stored will provide mixing and allow for sampling of the chlorine residual and additional dosing of sodium hypochlorite if required;

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence 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.

Table 9 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 9: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity	
	Operation of TSF4 cell 1a	Operation of village WWTP
Residential Premises	600m south of TSF4 and others >1km from premises boundary. Greenbushes town ~3.2km northeast of TSF4.	840m south-southwest of the proposed WWTP location (Refer to ‘A’ in Figure 4) and 2km east of proposed WWTP location (Refer to “I” in Figure 4)
Surface water and groundwater users	600 m south of TSF4 and additional further downstream of TSF4 Most recent survey (2024) conducted by Licence Holder advised of downstream users shown in Figure 5	Nearest about 600 m south from premises boundary/TSF4. Proposed WWTP 2km south-east of TSF4.
Environmental receptors	Distance from prescribed activity	
Surface water receptors – Woljenu Creek, Blackwood River and associated tributaries.	Woljenu creek tributaries running through TSF4 footprint. Woljenu creek immediately downstream of TSF4.	Woljenu Creek tributary; 500m east from WWTP location.
Aboriginal Heritage Site – Blackwood River and Woljenu Creek listed under <i>Aboriginal Heritage Act 1972</i> .	See above.	See above.
Groundwater	Shallow aquifers underlying the premises.	The water table is close to surface (~1m) towards the base of the valley and within 100m of the main drainage line. Proposed WWTP location to avoid these locations. Shallow and deep aquifer beneath TSF4 footprint. Surface water-groundwater interaction.

Hester State Forest	These receptors have been addressed in the EPA report and is regulated under Part IV and therefore is not considered further in this risk assessment.
Greenbushes state forest	
Threatened / priority flora and fauna	

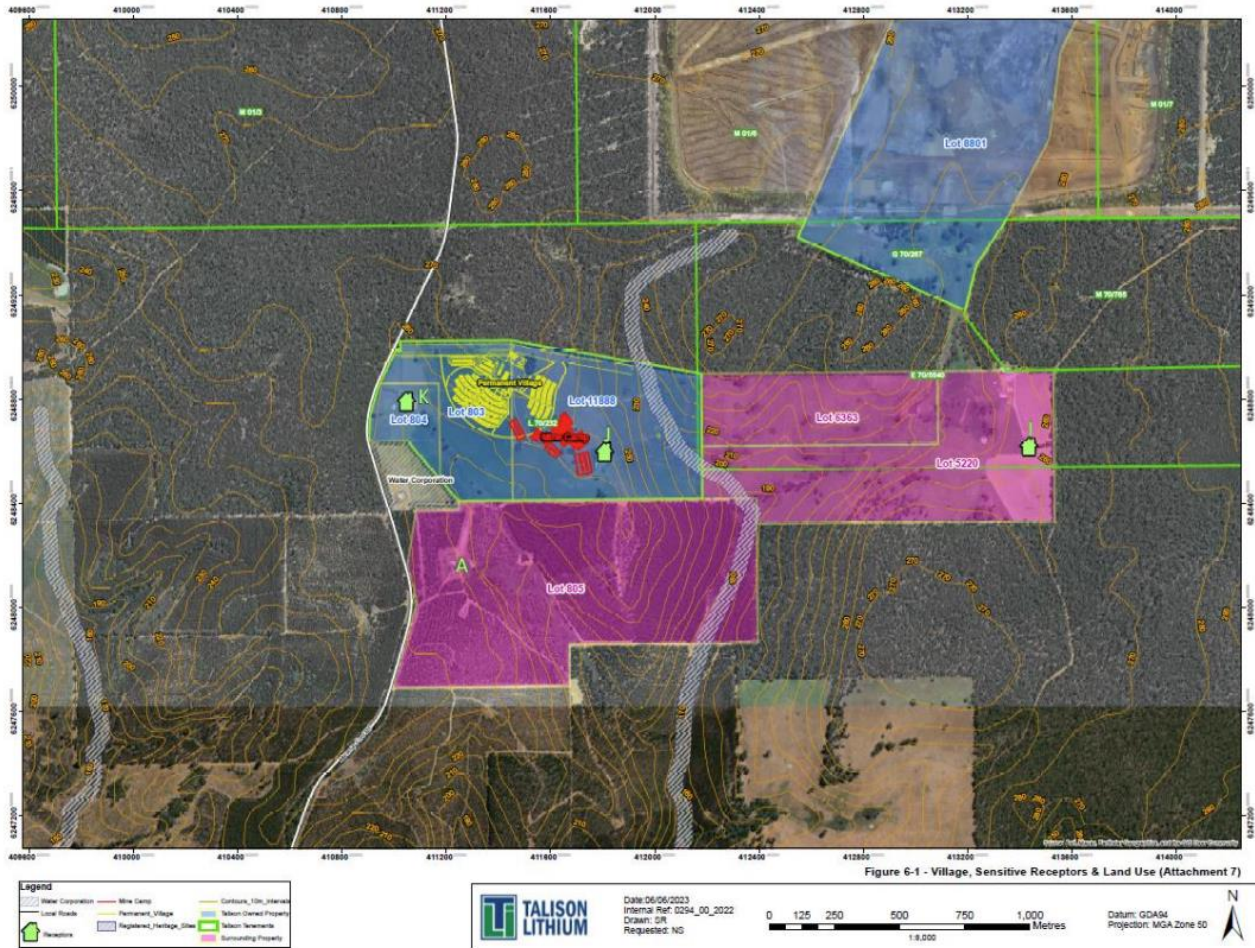


Figure 4: Distance to sensitive receptors from the Village Wastewater Treatment Plant

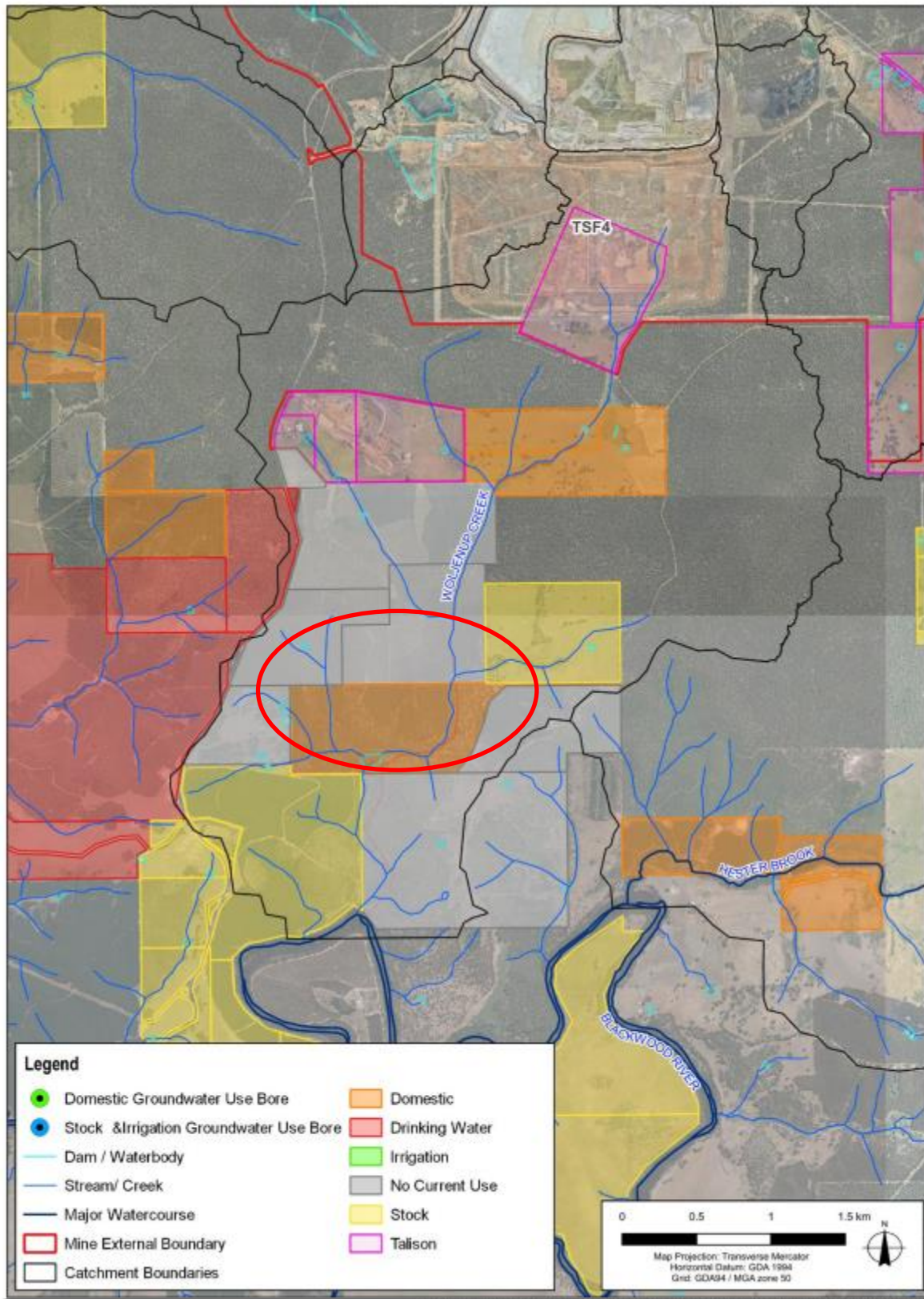


Figure 5: Sensitive receptors downstream of TSF4 (Talison, 2024)

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 Licence 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 Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 10.

The Revised Licence L4247/1991/13 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. category 5 and category 54 activities.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 10. Risk assessment of potential emissions and discharges from the Premises during operation

Risk Event						Risk rating ¹	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways	Potential impacts	Receptors	Licence Holder's controls	C = consequence L = likelihood			
Operation									
Operation of TSF4 cell 1a (including the increase to tailings deposition to 5.2Mtpa)	Dust	Air / windborne pathway	Adverse impacts to health and amenity	Residences within 1km of the TSF	Refer to section 3.1.1	C = Slight L = Unlikely Low Risk	Y	Condition 1 [Table 1]: operational requirements for TSF4	The Delegated Officer considers that the proposed controls regarding deposition into TSF4 and general dust suppression at the premises is adequate to manage any risk of dust emissions from these operations, particularly during deposition.
	Seepage	Seepage through the base of the TSF	Contamination and deteriorating the quality of local groundwater and surface water	Surface waters in the Blackwood River catchment with ecological and aboriginal heritage values	Refer to section 3.1.1	C = Moderate L = Possible Medium Risk	N	Condition 1 [Table 1]: operational requirements for TSF4 Condition 25 and 26: monthly water balance monitoring Condition 30 [Table 17]: groundwater monitoring Condition 32 [Schedule 2]: annual ecological monitoring	See section 3.3.
				Potential impacts to downstream residential groundwater and surface water users (drinking water and consumption of aquatic species)	Refer to section 3.1.1	C = Major L = Possible High Risk			
				Potential impacts to downstream residential groundwater and surface water users (stock, irrigation, domestic use)	Refer to section 3.1.1	C = Moderate L = Possible Medium Risk			
		Mounding of local groundwater to adversely impact native vegetation	Nearby vegetation	Refer to section 3.1.1	C = Moderate L = Possible Medium Risk				
	Overtopping of seepage collection ponds	Contamination and deteriorating the quality of local groundwater and surface water	Shallow aquifers below the pond that discharge to downstream surface waters	Refer to section 3.1.1	C = Minor L = Unlikely Medium Risk	Y	Condition 1 [Table 1]: operational requirements for TSF4	The Delegated Officer considers that the freeboard and automatic valves for the seepage collection ponds are sufficient in mitigating risks of overtopping.	
			Surface waters in the Blackwood River catchment with ecological and aboriginal heritage values	Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1 [Table 1]: operational requirements for TSF4	The controls for the constructed pipelines, to be equipped with process monitoring, alarms and indicators, and installed bunding with secondary containment are considered sufficient in managing and containing spills from pipeline rupture.	
	Pipeline rupture in seepage return water system		Potential impacts to downstream residential groundwater and surface water users	Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1 [Table 1]: operational requirements for TSF4		
	Process water	Infiltration from storage of decant water in onsite water storage dams	Contamination and deteriorating the quality of local groundwater and surface waters	Surface waters in the Blackwood River catchment with ecological and aboriginal heritage values	Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 23 [Table 11]: process monitoring – water quality	The Delegated Officer considers that the existing licence conditions to maintain the water quality of the mine water circuit is sufficient to manage any risks from addition of TSF4 process water.
		Overtopping of onsite water storage dams	Adverse impacts to vegetation	Nearby vegetation	Refer to section 3.1.1	C = Minor L = Unlikely Medium Risk	Y	Condition 8 [Table 5]: inspection of freeboard Condition 24 [Table 12]: water balance monitoring of mine water circuit	The Delegated Officer considers that the existing licence conditions for maintaining the adequate freeboard will adequately manage risks from overtopping due to inputs from TSF4 process water.
	Tailings	Overtopping the TSF	Contamination and deteriorating the quality of local surface water and vegetation	Onsite vegetation (Greenbushes State Forest) surrounding the TSF	Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1 [Table 1]: operational requirements for TSF4	The freeboard limit for the TSF is considered sufficient in managing the risks of over topping.
		Pipeline rupture		Offsite vegetation (Greenbushes State Forest) surrounding the TSF					
				Surface waters immediately south of the TSF in the Blackwood River catchment with ecological and aboriginal heritage values	Refer to section 3.1.1	C = Minor L = Unlikely Medium Risk	Y	Condition 1 [Table 1]: operational requirements for TSF4	The controls for the constructed pipelines, to be equipped with process monitoring, alarms and indicators, and installed bunding with secondary containment are considered sufficient in managing and containing spills from pipeline rupture.

Risk Event						Risk rating ¹	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways	Potential impacts	Receptors	Licence Holder's controls	C = consequence L = likelihood			
	Decant water	Pipeline rupture	Contamination and deteriorating the quality of local surface water and vegetation	Surface waters in the Blackwood River catchment with ecological and aboriginal heritage values	Refer to section 3.1.1	C = Minor L = Unlikely Medium Risk	Y	Condition 1 [Table 1]: operational requirements for TSF4	
		Overtopping the TSF		Nearby vegetation (Greenbushes State Forest)	Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1 [Table 1]: operational requirements for TSF4	The freeboard limit for the TSF is considered sufficient in managing the risks of over topping.
Operation of the Emergency Dump Pond (EDP)	Seepage	Seepage through the unlined base of the pond	Contamination and deteriorating the quality of local groundwater and surface water	Surface waters in the Blackwood River catchment with ecological and aboriginal heritage values	Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	N	Condition 1 [Table 1]: EDP operational requirements	See section 3.4.
				Potential impacts to downstream residential groundwater and surface water users (drinking water and consumption of aquatic species)	Refer to section 3.1.1	C = Major L = Unlikely Medium Risk		Condition 1 [Table 1]: EDP operational requirements	
				Potential impacts to downstream residential groundwater and surface water users (stock, irrigation, domestic use)	Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk		Condition 1 [Table 1]: EDP operational requirements	
				Direct contamination and impacts to "swampland" area	Refer to section 3.1.1	C = Minor L = Possible Medium Risk		Condition 1 [Table 1]: EDP operational requirements	
	Tailings	Overtopping of pond	Contamination and deteriorating the quality of local surface water and vegetation	"Swampland" within the premises boundary that the pond is sited on	Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1 [Table 1]: EDP operational requirements	Noting that the pond has been sized to adequately accommodate for the volume of all pipelines and for a 250 mm freeboard, the Delegated Officer considers that the risk of overtopping will be managed sufficiently.
		Pipeline rupture			Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1 [Table 1]: EDP operational requirements	Noting that the pond is immediately down gradient from the CTPS (pipeline origin) and within 100 m, the volume from a pipeline rupture will be relatively small and likely to be captured within the pond.
Disposal of pond sludge		Contamination of surface water, soil and groundwater from incorrect disposal of tailings material	Refer to section 3.1.1		C = Moderate L = Unlikely Medium Risk	N	Condition 1 [Table 1]: EDP operational requirements	The Delegated Officer will require the sludge from the pond be disposed within an active TSF to ensure ongoing emissions associated with the deposited tailings (leachate, seepage) will be correctly captured in the TSF.	
Operation of WWTP	Odour	Air / windborne pathway	Adverse impacts to health and amenities	Residential premises 840 m south-southwest and 2km east.	Refer to section 3.1.1	C = Slight L = Unlikely Low Risk	Y	Condition 12 [Table 7]: WWTP operational requirements	The Delegated Officer considers that the constructed design and proposed controls are sufficient in managing odour emissions to nearby residential receptors.
	Noise				Refer to section 3.1.1	C = Slight L = Unlikely Low Risk	Y	N/A	The Delegated Officer considers that noise emissions from the activities are unlikely to cause impacts to nearby receptors, noting that the premises has a Regulation 17 under the <i>EP (Noise) Regulations 1997</i> .
	Spills and leaks of sludge and treated/untreated wastewater	Overland runoff Seepage of contaminated water	Disturbance of ecosystems and impact of surface water quality Contamination of groundwater	Drainage line (tributary of Woljenu Creek) 500m east from proposed WWTP location (also a heritage site)	Refer to section 3.1.1	C = Slight L = Unlikely Low Risk	Y	Condition 12 [Table 7]: WWTP operational requirements	Proposed controls for spill management are considered sufficient to manage this risk event and have been conditioned within the licence.
	WWTP tank overflows and potentially contaminated stormwater				Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 12 [Table 7]: WWTP operational requirements	Tanks has been constructed to be enclosed and bunded to prevent stormwater entering the system, and overflow controls have been implemented on the licence. The Delegated Officer considers these controls to be adequate in managing the risk of overflow.

Risk Event						Risk rating ¹	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways	Potential impacts	Receptors	Licence Holder's controls	C = consequence L = likelihood			
	Spills and leaks of chemicals				Refer to section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 12 [Table 7]: WWTP operational requirements	Licence Holder's proposed controls are sufficient and spills and leaks of chemicals are regulated under the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> .
Discharge of treated wastewater to TSF4 decant pond	Treated Wastewater	Pipeline rupture of treated wastewater to TSF	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Nearby vegetation (Greenbushes State forest) Drainage line (tributary of Woljenup Creek) 500m east from proposed WWTP location (also a heritage site)	Refer to section 3.1.1	C = Slight L = Unlikely Low Risk	Y	Condition 12 [Table 7]: WWTP operational requirements incl. inspection requirements for effluent pipeline	The pipeline has been installed to be buried whilst alongside Maranup Ford Road to prevent collision with vehicles and has been placed in a bunded corridor for disposal into TSF4. The Licence Holder's proposed controls for inspections of leaks and these installation details, are considered by the Delegated Officer to be sufficient in managing risks from pipeline rupture.
		Seepage from TSF of contaminated water	Contamination of groundwater and impacting groundwater quality	Shallow aquifers below the pond that discharge to downstream surface waters Surface waters in the Blackwood River catchment with ecological and aboriginal heritage values Potential impacts to downstream residential groundwater and surface water users	Refer to section 3.1.1	C = Minor L = Rare Low Risk	Y	Condition 12 [Table 7]: WWTP operational requirements Condition 23 [Table 11]: wastewater discharge monitoring	Due to the Licence Holder's proposed controls to monitor the quality of treated wastewater for deposition, and the expected increase to the overall mine water circuit is considered acceptable and sufficient to manage the risks of additional volume and any nutrient loading as a result of this deposition. However, it is acknowledged that an additional assessment into the over mine water circuit at the premises is required, and will be assessed in a future DWER initiated licence amendment.

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

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

3.3 Detailed risk assessment for tailings storage facility seepage

3.3.1 Overview of potential risk events

Tailings storage facility seepage has the potential to impact groundwater quality and cause water table mounding. This may result in the following risk events which will be further assessed in the sections below:

- flow of seepage impacted groundwater may result in contamination of downstream surface waters Woljenup Creek (directly south of TSF4) and Blackwood River (~4.5 km south of TSF4);
- flow of seepage impacted groundwater may result in contamination of downstream surface waters impacting downstream residential groundwater and surface water users; and
- water table mounding may adversely impact the health of adjacent native vegetation.

3.3.2 Source: characterisation of emission

Tailings characterisation

Seepage of contaminated pore water as a result of leaching from chemical constituents from tailings material is considered to be a significant exposure pathway for environmental receptors near this tailings storage facility.

An analysis of five decant water quality samples were taken from TSF2 and used for the derivation of site-specific water quality guidelines (see section 3.3.4). It is considered that these samples are likely to be reflective of the decant water to form on TSF4 due to the same source ore and processing facilities. Results indicated that there were elevated levels of lithium (9.07 – 10.5 mg/L), arsenic (0.058 – 0.101 mg/L), rubidium (0.384 – 0.458 mg/L), antimony (0.004 – 0.035 mg/L) and caesium (0.074 – 0.109 mg/L), among others (see Table 11).

Table 11: TSF2 decant water quality (sampled in 2018)

			Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Sulfate (filtered)	Fluoride	Silicon as SiO2 (filtered)	Aluminium (total)	Antimony (total)	Arsenic (total)	Barium (total)	Beryllium (total)	Boron (total)
		Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		Talison Greenbushes site specific WQG, Drinking water				180	250	250	1.5		0.2	0.003	0.01			
		Talison Greenbushes site specific WQG, Freshwater ecological						429	1.3		0.055*	0.09*	0.013*			
		Talison Greenbushes site specific WQG, Irrigation							1		5		0.1			
		Talison Greenbushes site specific WQG, Livestock						1000	2		5	0.15	0.5	2	0.06	4
		Talison Greenbushes site specific WQG, Recreational							30		4	0.06	0.2			
Sample	Date	Lab report														
Decant 1	26/09/2018	EP1811787	36	18	192	9	198	206	0.6	5.54	0.03	0.035	0.101	0.003	<0.001	12
Decant 2	26/09/2018	EP1811787	30	19	204	9	228	155	0.5	5.55	-	0.004	0.068	0.005	<0.001	0.12
Decant 3	26/09/2018	EP1811787	31	19	201	9	213	177	0.6	5.51	0.02	0.014	0.074	0.004	<0.001	0.12
Decant 4	26/09/2018	EP1811787	32	18	198	9	206	196	0.6	5.79	0.02	0.027	0.091	0.004	<0.001	0.11
Decant 5	26/09/2018	EP1811787	31	18	199	9	209	179	0.6	5.73	0.03	0.021	0.082	0.004	<0.001	0.11

			Cadmium (total)	Caesium (total)	Chromium (III + VI)	Cobalt (total)	Copper (total)	Iron (total)	Lead (total)	Lithium (total)	Manganese (total)	Mercury (total)	Molybdenum (total)	Nickel (total)	Rubidium (total)	Strontium (total)
		Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		Talison Greenbushes site specific WQG, Drinking water	0.002	0.07	0.05 (VI)		2			0.007	0.5		0.05	0.02	0.014	
		Talison Greenbushes site specific WQG, Freshwater ecological	0.003*	0.50*			0.0014*			2*	1.9*		0.034*	0.049*	0.017*	
		Talison Greenbushes site specific WQG, Irrigation	0.01		0.1		0.2			2.5	0.2		0.01	0.2		
		Talison Greenbushes site specific WQG, Livestock	0.01	2	1		0.5	0.3		0.82	10		0.15	1	0.26	
		Talison Greenbushes site specific WQG, Recreational	0.04	1.4	1		40			0.14	10		1	0.4	0.28	
Sample	Date	Lab report														
Decant 1	26/09/2018	EP1811787	<0.001	0.109	0.002	<0.001	<0.001	0.1	<0.001	3.96	0.314	<0.001	0.004	0.003	0.458	0.096
Decant 2	26/09/2018	EP1811787	<0.001	0.074	0.001	<0.001	0.002	0.09	<0.001	3.81	0.132	<0.001	0.003	0.003	0.384	0.091
Decant 3	26/09/2018	EP1811787	<0.001	0.088	0.002	<0.001	0.001	0.05	<0.001	10.5	0.265	<0.001	0.004	0.003	0.424	0.095
Decant 4	26/09/2018	EP1811787	<0.001	0.101	0.004	<0.001	<0.001	0.08	<0.001	3.88	0.457	<0.001	0.003	0.003	0.456	0.098
Decant 5	26/09/2018	EP1811787	<0.001	0.094	0.001	<0.001	<0.001	0.08	<0.001	3.07	0.392	<0.001	0.003	0.003	0.434	0.096

Note: IV is for hexavalent chromium only
 * the value applies to the constituent in a filtered sample

Short term LEAF¹ leach tests were undertaken on tailing solids collected from four individual tailings streams² from TSF2 active tailings depositional areas (GHD, 2023d). Metals that leached at elevated concentrations included aluminum, antimony, arsenic, cadmium, caesium, chromium, copper, fluoride, lithium, manganese, molybdenum, nickel, rubidium, thallium, uranium, vanadium, and zinc (Figure 6). General findings from the test were:

- Metal concentrations decrease through the leaching events, which GHD has stated indicates that the residual decant within the pores is the primary source of contamination in tailings and is subject to flushing during leach testing and that these findings indicate that the tailings solids should not contribute to dissolved metal concentrations above the relevant guidelines (freshwater aquatic and drinking water) post-closure.

¹ Leaching Environmental Assessment Framework (LEAF) method 1313 (for evaluating partitioning of constituents over a wide range of pH values) and method 1314 (to evaluate constituent releases from solid materials as a function of cumulative liquid-to-solid ratio). The aim of the leach testing is to mimic the leaching of contaminants of potential concern from the tailings under infiltrating rainfall conditions and under differing pH conditions should the pH of the tailings change over time.

² CGP1: Chemical grade plant 1 (spodumene ore processing)
 CGP2: Chemical grade plant 2 (spodumene ore processing)
 TGP: technical grade plant (spodumene ore processing)
 TRP: Tailings reprocessing plant (reprocessing of historic tailings from TSF1)

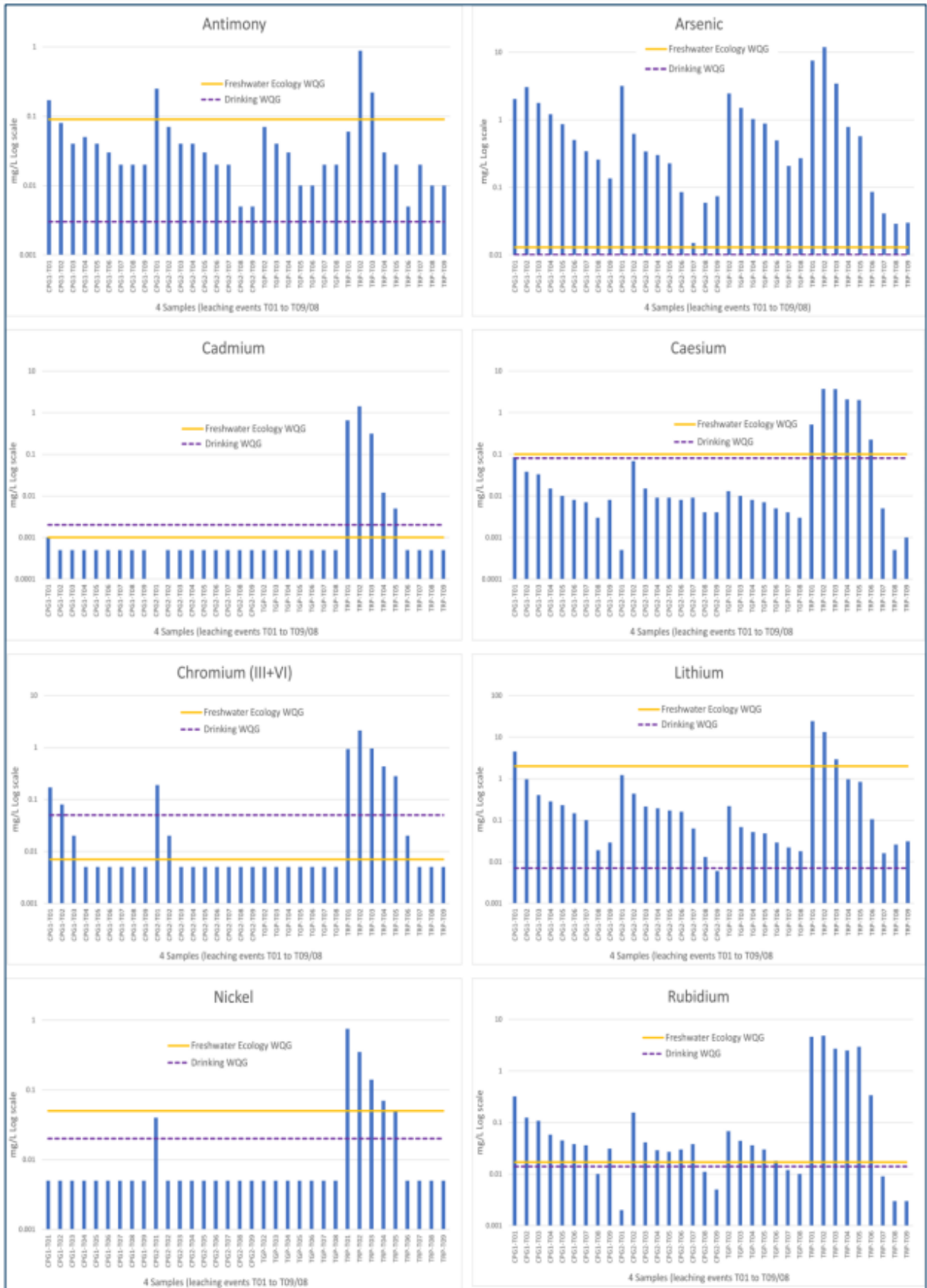


Figure 6: Cumulative flow leach testing results (LEAF 1314) - logarithmic scale of mg/L

It is noted that arsenic, antimony and lithium exceeded Australian Drinking Water Guidelines at the 8th/9th leach event. Arsenic also exceeded freshwater aquatic guidelines at the 8th/9th leach event;

- In general, metal concentrations (apart from iron and manganese) are stable across the pH range. GHD states that these findings are consistent in supporting that tailings are not susceptible to increased dissolution outside of a neutral pH range.

Arsenic concentrations were elevated at the higher pH range (pH test 9) and lithium concentrations were elevated at a lower pH range (pH test 5.5) for the TRP sample.

Higher concentrations of metals were found in leach from the TRP samples in comparison to the other samples. The TRP had more acidic and saline initial leach (as shown in Table 10). GHD states that the cause of this is not clear but may reflect more localised evaporative concentration from exposure of previously saturated tailings to the atmosphere. It was recommended that further investigation is needed to determine the cause of the high salinity and acidic result.

Table 10: Summary of cumulative flow leach test results (from first leaching event) GHD 2023d

Sample ID	pH	EC (uS/cm)	Salinity TDS mg/L ⁵
CGP1	7.7	336	150
CGP2	6.9	24	16
TGP	6.9	52	25
TRP	1.3	37,300	10,697

DWER assessment of leach tests and tailings acidity

In reviewing the submitted leach test results, the department considers that the leach testing of only three grab samples of tailings material is likely to be insufficient to adequately characterise the leaching behaviour of tailings material. Expert technical advice received has recommended that additional sampling for leach testing is likely to be required to better understand the likely contaminants associated with the tailings and short-term leach testing should be carried over the operational life of the facility to provide information in the development of mine closure strategies. The department notes that since the submission of this application, the Licence Holder has conducted long-term leach testing. The results and department’s assessment of the results are detailed under the current works approval W6901/2024/1.

With regards to the indicated acidity of the tailings material, the risk assessment considers the acidity of the tailings and any adverse impacts on the clay liner beneath the TSF. Due to the large thickness of the liner, the likely predominant clay mineral beneath TSF4 (kaolinite) and generally slow rate of movement of chemical reaction-fronts through a clay matrix, it is considered that it could take many decades for significant changes to the structural integrity and the permeability of the TSF4 liner to take place.

It is considered that the local presence of highly acidic tailings material will not significantly alter the structural integrity of the clay liner or the water leakage rate through the liner. It would be important however, that the TSF is capped in an appropriate manner at the end of its operational life to ensure that significant amount of seepage cannot be percolate through the clay liner after closure. The level of acidity in the tails is likely to be manageable and not require any special conditioning.

Estimated seepage

GHD (2023e) indicates that ~80% of seepage from TSF4 is expected to migrate southward and be collected by Sump A, which is immediately adjacent to the southern embankment, between

the two cells. Without continuous pump back to the mine water circuit, the seepage collected at the sump would overflow directly into the upper catchment of Woljenup Creek. The Licence Holder has advised that the return of this water back to the mine water circuit will continue after closure until the water quality is considered sufficient to release to the environment.

TSF4 cell 1a received tailings from the Chemical Grade Plant 2, the Tailings Retreatment Plant and the Technical Grade Plant (TGP) during time limited operations (TLO) under works approval W6618/2021/1. Densities and quantities for each of the tailings streams are provided in Table 11.

Table 11: Tailings deposited in TSF4 during TLO

Source	Density (% solids)	Mass (tonnes) deposited - 29 Jan 2024 to 17 March 2024
Chemical grade plant 2	25%	1,816
Tailings retreatment plant	32%	1,524
Technical grade plant	3%	398

Approximately 270 m³ of water was collected from sump A between 29 January 2024 and 17 March 2024, representing only a short depositional period. GHD 2023e conducted modelling for expected flow to the sumps surrounding the TSF4. Modelled seepage collection from sump A ranges between 790 – 850 m³/day for initial tailings deposition and 240 – 430 m³ per day for on-going operation. The total seepage modelled to be collected by all TSF4 sumps is expected to be ~3,500 m³/day (Table 12). The sumps have been designed and constructed to accommodate 3 hours of seepage from the facility, perimeter embankment toe drain runoff and an additional 10% annual exceedance probability for a 24-hour storm event.

Table 12: Calculations from two model for simulated flow into TSF4 sumps (GHD 2022b)

TSF sump	Initial deposition to TSF	During TSF operation (peak)	As mg/L	Li mg/L	Fate of residual discharge at closure
Model Tallson2022NWT_024T					
Sump A (southern drain)	850 m ³ /day	430 m ³ /day	0.028	1.1	Woljenup Creek
Sump B (north-eastern drain)	Not provided	3,000 m ³ /day	0.46	5.3	Open pit
Sumps C & D (north-western drains)	300 m ³ /day	71 m ³ /day	0.16	3.3	Cowan Brook Dam
Model Tallson2022NWT_025T					
Sump A (southern drain)	790 m ³ /day	240 m ³ /day	0.077	1.6	Woljenup Creek
Sump B (north-eastern drain)	Not provided	3,000 m ³ /day	0.51	5.32	Open pit
Sumps C & D (north-western drains)	240 m ³ /day	28 m ³ /day	0.21	3.6	Cowan Brook Dam

3.3.3 Pathway

Hydrogeology

GHD 2022b states that seepage from TSF4 will flow predominantly in a southerly direction through the saprolitic clays and underlying weathered bedrock (see Figure 7). Approximately 80% of shallow and deep groundwater is expected to flow with topography and discharge in a southerly direction into the upper catchment of Woljenup Creek. GHD 2023e state that groundwater may discharge into Woljenup creek line approximately 750 m down gradient of TSF4. A smaller component of seepage (around 20%) is inferred to migrated to the north-west towards tin-shed dam.

The groundwater seepage rates in the geological profile beneath and surrounding TSF4 were calculated using aquifer parameters including porosity, hydraulic gradient and measured hydraulic conductivity (GHD 2022b). GHD state that where seepage migrates through the saprolitic clay profile, it will be subject to long residence times (>1,000 years) before discharging to the inferred Woljenup creek discharge location (~750 m south). Where seepage migrates through weathered bedrock, it will have a lower residence time (~250 years) before discharging to Woljenup creek.

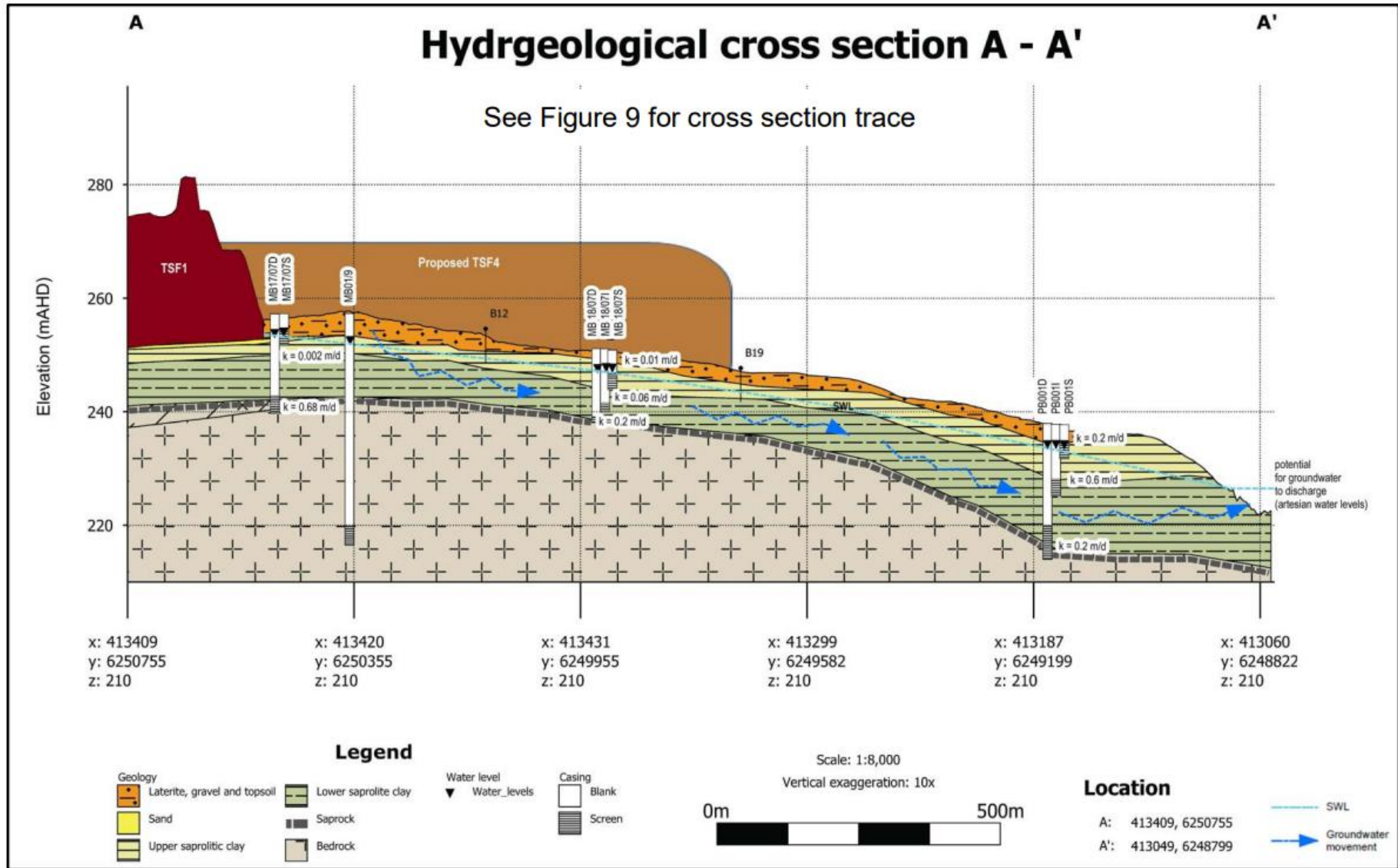


Figure 7: Hydrogeological cross section for TSF4

Licence: L4247/1991/13

The Licence Holder drilled approximately 400 sterilisation boreholes within and adjacent to the TSF4 footprint to confirm that there is no ore underlying the facility. Although the boreholes are understood to have been backfilled, these may still present a preferential flow path for TSF4 derived seepage to migrate downwards into weathered bedrock horizon (saprock), which is characterised as nearly five times more permeable. GHD indicate that it is likely that only a small increase in seepage flow (~2.5%) is likely from these boreholes.

The GHD study considered that groundwater contamination caused by seepage from the TSF4 is likely to be constrained in the immediate vicinity of this facility.

DWER assessment of seepage migration

Internal technical advice provided by the department's principal hydrogeologist indicates that groundwater flow rate between TSF4 and Woljenup Creek is likely to be much higher than indicated by GHD and that local flow rates along currently unidentified bedrock fractures could be much higher, meaning that the contaminants could be transmitted to the groundwater discharge area more rapidly and with less attenuation than predicted.

Based on the results of slug tests that were undertaken on boreholes near TSF4, GHD appears to have assumed that the average hydraulic conductivity of the saprock/fractured bedrock aquifer in the area is about 10^{-3} m/d. However, this value is considered implausibly low, and is inconsistent with hydraulic conductivity results that have been measured in other saprock/fractured bedrock aquifers within Western Australia which typically lie in the range of about 0.1 to 0.6 m / day (Martin, 1989; George, 1992; Clarke et al., 2000; Wilkes et al., 2004).

If an average hydraulic conductivity of 0.3 m/day for weathered bedrock aquifers is assumed, then groundwater should flow at about 10 metres per year and take about 75 years to flow from TSF4 to Woljenup Creek.

This calculated groundwater travel time does not consider the time it would take for contaminants to percolate from the land surface through the low-permeability saprolite that overlies the saprock/fractured bedrock aquifer near TSF4. However, published hydraulic information for saprolite elsewhere on the Yilgarn Craton (see e.g., Martin, 1989; George, 1992; Clarke *et al.*, 2000) suggests that the hydraulic conductivity of saprolite near TSF4 will be about a factor of 10x higher than hydraulic conductivities for this material that have been measured by GHD.

Although the use of slug tests to measure hydraulic conductivity is a useful technique in some situations, this method of testing only provides an estimate of hydraulic conductivity of regolith within a few metres of each tested borehole and cannot provide estimates of this parameter at larger scales. For this reason, the estimates of hydraulic conductivity of saprolite and the saprock aquifer may not be correct at a broader scale in the subsurface near TSF4 – they are also not consistent with measurements made in these materials in the region by some other studies. Other studies on groundwater recharge to aquifers in granitic weathering profiles have indicated that the only effective way of identifying the effects of recharge through preferred pathways in saprolite is by using regionally extensive water-balance assessment methods (i.e. as referred to in Cuthbert and Tindimugaya (2010) and Grigg and Kinal (2020)).

Additionally, published information (Dell et al., 1983) indicates that root channels created by trees can create preferred-pathways through the saprolite to depths of up to 40 metres, and that these features can persist for long periods of time. As it is likely that these features would persist long after land clearing for agriculture, there would be a significant risk that contaminants could be rapidly transmitted from the land surface to groundwater through relict root-channels near TSF4.

It is also considered unlikely that preferred pathways through clayey saprolite would be detected in a standard drilling investigation (as undertaken by Talison). This is because their density in the landscape is very low (about 1% of a horizontal surface at a depth of 6 metres – refer to Dell et al., 1983). Consequently, it would be highly unlikely that a borehole would penetrate an old

root channel. Even if a borehole were to directly penetrate an old root channel, it would not be detected due to clay smearing during drilling.

Given the uncertainty regarding the hydrogeological investigations and subsequent conceptual model developed by the Licence Holder, it would be important that these consider the possibility that the hydraulic characteristics of the weathered granitic profile could be similar to results obtained from other studies in the region. DWER will consequently take a precautionary approach to the assessment of hydraulic conductivity and potential seepage pathways and considers that hydraulic conductivity and the potential for seepage pathways may be higher than indicated by GHD and Talison.

3.3.4 Groundwater and surface water data

Groundwater level

Conditions of the works approval W6618/2021/1 required the installation of additional monitoring bores around TSF4 indicated in Figure 8 as: MB01, MB08, MB21, MB22 and MB23. Groundwater monitoring locations included three nested bores for shallow, intermediate and deep. The Licence Holder has noted that the bore labelled PB001 was in replacement of MB24 as required in the works approval. Baseline monitoring (GHD, 2023a) was conducted in these bores over a period between May 2022 and October 2023.

All shallow, intermediate, and deep bores at locations MB08 and MB21 were dry throughout the sampling period. Groundwater levels in the other bores appeared to fluctuate seasonally, with variations exceeding one metre within the three-month period between October 2022 and January 2023. Figure 9 depicts the standing water levels in metres below ground level (mbgl) for bores, noting that only shallow screened bores were compared to demonstrate standing water levels in aquifer likely to cause inundation to root zones of vegetation.

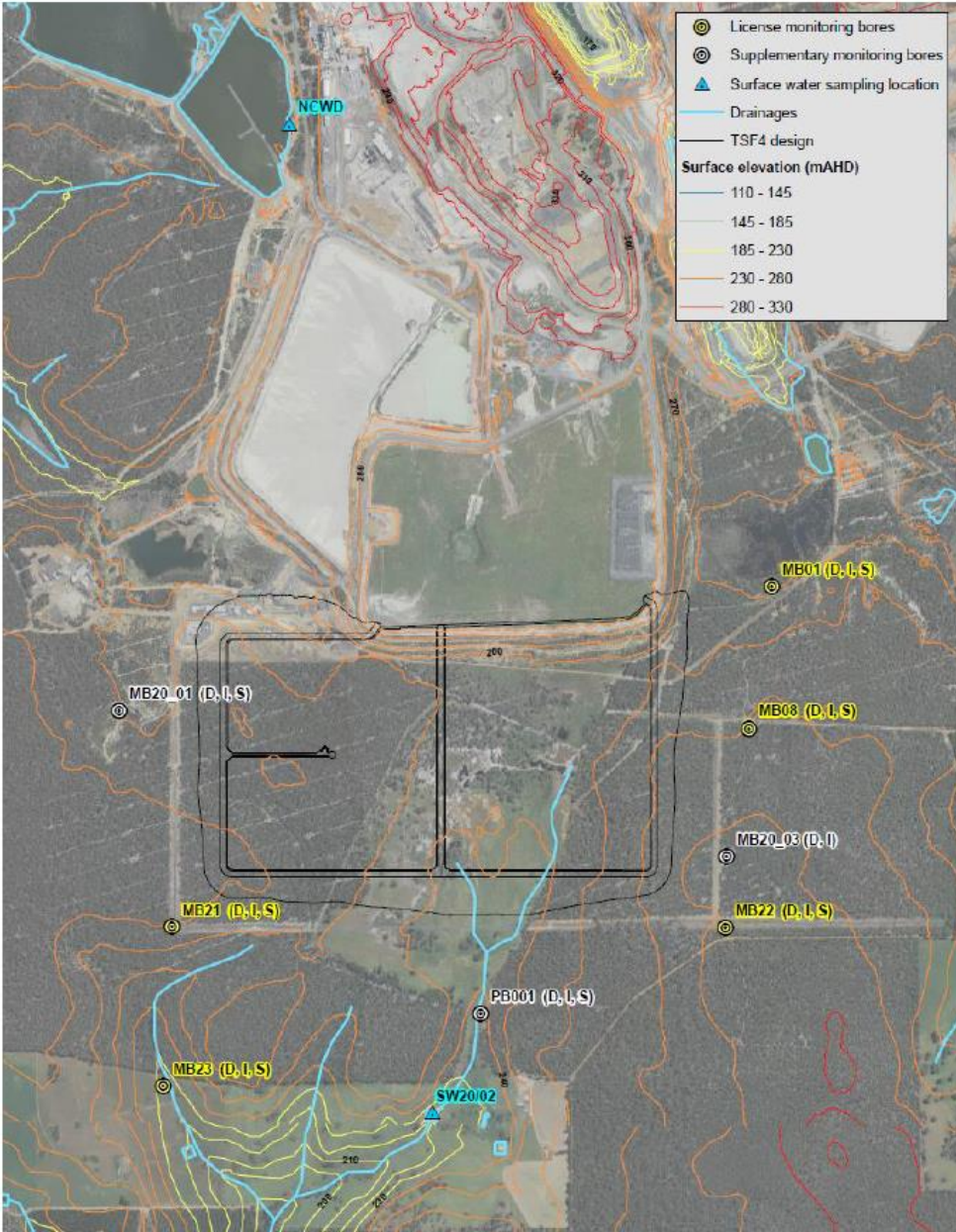


Figure 3: Locations of Monitoring Sites

Figure 8: Sampling locations in baseline monitoring program for groundwater location (yellow and white locations) and surface water locations (blue locations)

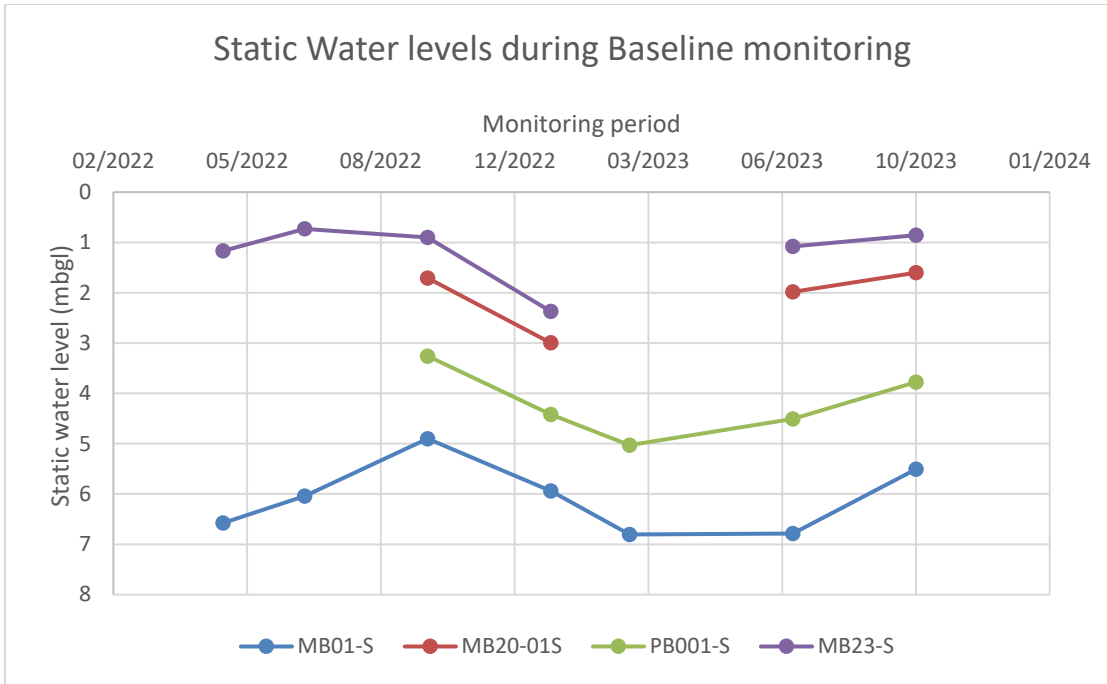


Figure 9: Static water level of (shallow) groundwater bores during baseline monitoring (in mbgl)

Note 1: Bore MB23 recorded one value (data point omitted) above the top of the casing indicating artesian flow. This is consistent with recordings of the intermediate and deep bores at this location.

Note 2: Bores PB001 and MB20-01 were not monitored prior to October 2022.

Comparing the static water levels in units of mAHD across the shallow bores indicates that there is some variability in groundwater levels across the spatial distribution of the bores (shown in Figure 10) and appear to be related to the variability of the ground elevation.

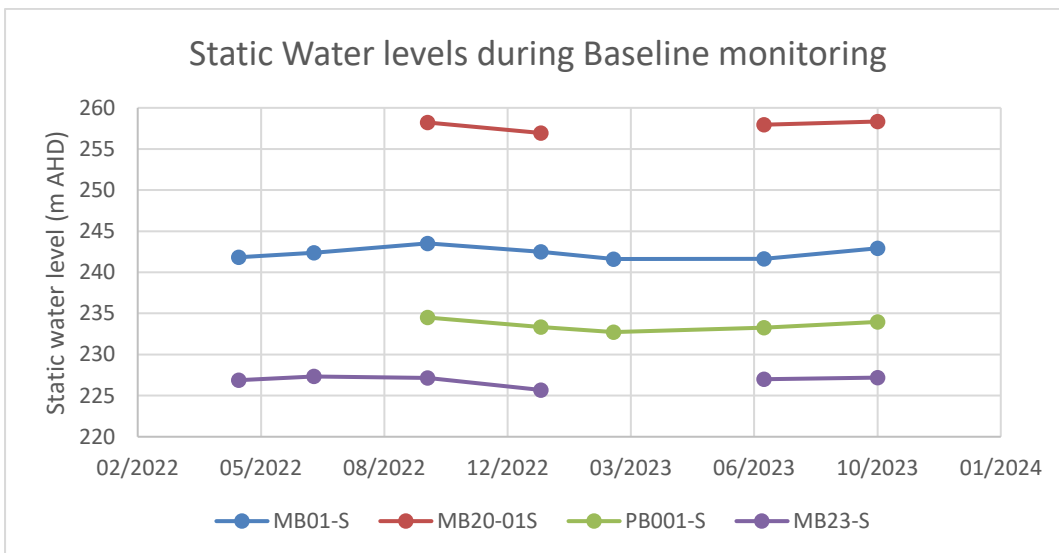


Figure 10: Static water level of (shallow) groundwater bores during baseline monitoring (in mAHD)

Groundwater quality

From the data collected during baseline monitoring, the water quality prior to construction and deposition into TSF4 indicates:

- pH ranging from weakly acidic to circumneutral of pH 4.47 within bore MB20_01I, to

pH 6.86 and 6.62 for bores MB20-01D and MB01-D respectively;

- Results showed that groundwater in shallow bores were typically more oxidising than the intermediate bores, whilst the deeper bores oxidation-reduction potential varied significantly between location from high reducing (mean value of -81.3 mV at bore MB01-D) to highly oxidising (mean value of 208.4 mV at bore MB20_01D);

Salinity was highly variable across the premises ranging from 304 mg/L (MB20_01 in January 2023) to 4,360mg/L (MB01-D in October 2023). GHD 2023a proposed that the patterns of groundwater salinity were generally higher in areas of low elevation compared to high elevations, and this is likely due to the relative elevation of the water table in low lying areas (which may result in evapo-concentration of groundwater);

- There was detection of several heavy metals and metalloids detected in the groundwater samples, discussed further below.

Site-specific guideline values

Submitted as part of the CCIR for TSF4 Cell 1a, the Licence Holder has proposed site-specific water quality guideline (SSWQG) values for groundwater and surface water in the area as shown in Table 13. The Licence Holder determined these values based on an assessment conducted on surface water (specifically Woljenup Creek and Blackwood River) which involved water quality monitoring (data shown in Table) and an evaluation of the associated riparian vegetation.

Table 13: Licence Holder proposed Site-specific Water Quality Guidelines (GHD, 2023a) derived from GHD 2023c

Contaminant (filtered)	Water quality guidelines (mg/L)				
	Agricultural use - Livestock	Agricultural use - Irrigation	Aquatic Environment	Potable use	Non-potable use
Aluminium	5	5	0.055	0.2	NR
Antimony	0.15	NR	0.09	0.003	0.06
Arsenic	0.5	0.1	0.013	0.01	0.2
Cadmium	0.01	0.01	0.001	0.002	0.04
Caesium	2.0	NR	0.1	0.08	1.6
Chromium (III+VI)	1.0	0.1	0.004	0.05	1.0
Copper	0.5	0.2	0.0014	2.0	40
Lithium	0.82	2.5	2.0	0.007	0.14
Manganese	10	0.2	1.9	0.5	10
Molybdenum	0.15	0.01	0.034	0.05	1.0
Nickel	1.0	0.2	0.05	0.02	0.4
Rubidium	0.39	NR	0.017	0.014	0.28
Thallium	0.13	0.001	0.00003	0.00004	0.0008
Uranium	0.2	0.01	0.0005	0.02	0.4
Vanadium	0.1	0.1	0.0006	0.0002	0.004
Zinc	20	2	0.04	3	60
Sulphate	1000	NR	429	250	NR
Nitrate (as N)	90	NR	2.4	50	NR

Several exceedance of metals and chemical constituents of potential concern (CCoPC) were identified³ against the Licence Holder proposed SSWQG as shown in Table 14.

Table 14: Baseline groundwater quality comparison the proposed Site-specific water quality guidelines

Water Quality Guideline		Total Dissolved Solids			Arsenic (filtered)			Lithium (filtered)			Rubidium (filtered)			Manganese (filtered)			Nickel (filtered)		
Units		mg/L			mg/L			mg/L			mg/L			mg/L					
LOR		10			0.001			0.001			0.001			0.001			0.001		
Drinking Water					0.01			0.007			0.014			0.5			0.002		
Freshwater Ecological					0.013			2			0.017			1.9			0.08		
Irrigation					0.1			2.5						0.2			0.2		
Livestock					0.5			0.82			0.39			10			1		
Recreational					0.2			0.14			0.28			10			0.4		
Bore ID ⁷	No. of samples	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
MB01-D	7	3222	2120	4360	0.005	0.004	0.006	1.384	0.928	1.940	0.062	0.054	0.069	4.485	1.580	8.84	0.077	0.002	0.112
MB01-I	7	1039	558	1800	0.001	<0.001	0.002	0.282	0.098	0.512	0.013	0.007	0.019	1.131	0.874	1.430	0.047	0.015	0.072
MB01-S	7	831	702	994	0.0006	<0.001	0.001	0.433	0.148	0.936	0.006	0.004	0.010	0.123	0.103	0.146	0.018	0.006	0.030
MB20_01D ⁸	5	319	304	334	0.002	0.002	0.002	0.364	0.299	0.429	0.018	0.015	0.016	0.040	0.036	0.044	0.008	0.002	0.013
MB20_01I ⁸	5	826	821	830	<0.001	<0.001	<0.001	0.019	0.018	0.020	0.010	0.009	0.011	0.294	0.273	0.315	0.047	0.014	0.080
MB20_01S ⁸	5	362	362	362	0.0005	<0.001	<0.001	0.054	0.054	0.054	0.004	0.004	0.004	0.055	0.055	0.055	0.009	0.009	0.009
MB20_03D ⁸	5	404	398	410	0.0013	0.001	0.002	0.669	0.504	1.000	0.081	0.080	0.081	0.496	0.434	0.527	0.020	0.014	0.032
MB22-D	4	680	307	1250	0.0245	0.008	0.04	1.287	0.318	2.610	0.065	0.043	0.089	1.010	0.536	1.850	0.007	0.004	0.011
MB23-D	6	1312	1100	1490	0.0373	0.031	0.042	0.055	0.019	0.147	0.004	<0.001	0.015	1.017	0.800	1.640	0.041	0.031	0.058
MB23-I	6	1805	1730	1910	<0.001	<0.001	<0.001	0.014	0.012	0.017	0.022	0.020	0.023	0.592	0.464	0.757	0.031	0.027	0.039
MB23-S	6	1290	342	2150	<0.001	<0.001	<0.001	0.117	0.034	0.215	0.011	0.004	0.018	0.616	0.123	0.904	0.016	0.004	0.028
PB001_D ⁸	5	620	612	628	0.001	0.001	0.001	0.037	0.032	0.042	0.002	0.002	0.002	0.722	0.716	0.727	0.012	0.001	0.023
PB001_I ⁸	5	642	622	662	<0.001	<0.001	<0.001	0.067	0.025	0.108	0.004	0.002	0.006	0.462	0.433	0.491	0.008	0.002	0.013
PB001_S ⁸	5	932	813	1050	<0.001	<0.001	<0.001	0.021	0.014	0.027	0.002	0.001	0.002	0.699	0.487	0.910	0.017	0.006	0.027

Particular contaminants of concern to the environment include lithium and arsenic shown in Figure 11 and Figure 12.

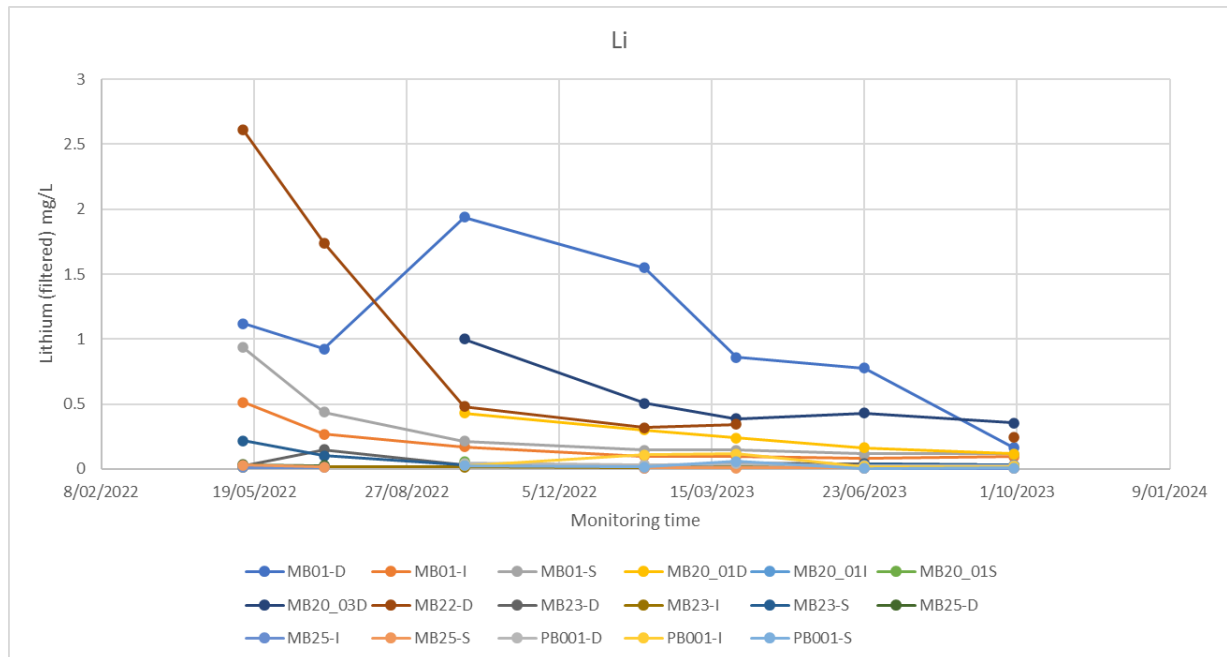


Figure 11: Lithium (filtered) concentrations across monitoring program

³ Exceedances included: Aluminium, Arsenic, Copper, Lithium, Manganese, Nickel, Rubidium, Thallium, Uranium.

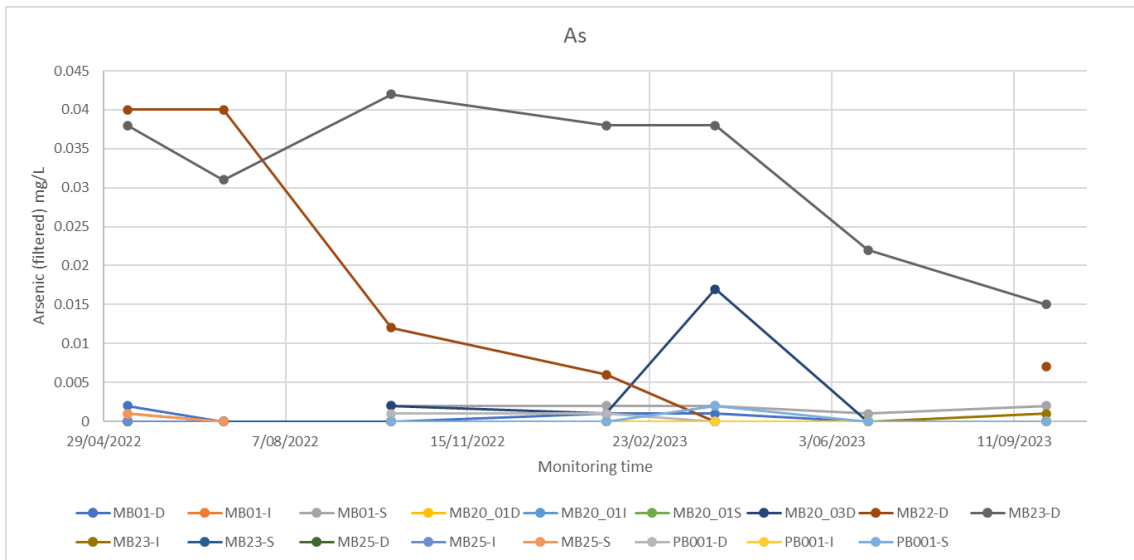


Figure 12: Arsenic (filtered) concentrations across monitoring program

The GHD report advised that it is unlikely that the elevated concentrations of metals measured in groundwater sampled from bore MB01 could be related to mining activities due to the large distance and the slow rate of groundwater aquifer flow in the saprock and bedrock fractures as discussed in section 3.3.3. As also noted in though in section 3.3.3, the delegated officer considers that due to possible underestimations made of the hydraulic conductivities of the area that it is possible that the elevated metal concentrations measured in this bore and others would be derived from mining activities in the area.

As observed in Table 14 and shown in Figure 11, elevated levels of lithium are present in all monitored bores with varying degrees of concentrations. Elevated concentration of lithium in groundwater is often considered a good indicator of the presence of lithium mineralisation in pegmatites. This occurs due to the ease at which lithium can be leached from lithium-rich mica minerals in granitic rocks (Jancsek *et al.*, 2023) and the general high mobility of lithium ions in groundwater. As lithium is not commonly measured in groundwater samples outside a mine project area, it is difficult to determine the natural background levels of lithium in the area. Limited data (Matthess, 1982) suggests that lithium concentrations in natural groundwater rarely exceed 0.5mg/L even in regions that are known to be underlain by lithium-bearing pegmatites (Kavanagh *et al.*, 2017). By contrast, lithium concentrations in groundwater near TSFs and other mine waste landforms at spodumene mines commonly exceed 1 mg/L (Roy *et al.*, 2022) and may exceed 10 mg/L at some mine sites ((USGS, 2010).

Based on the baseline data provided by the Licence Holder, and noting the above considerations regarding likely or expected lithium concentrations in the environment, the delegated officer considers that the high concentrations identified in Table 14 are more likely due to the effects of mining activities rather than natural background levels, however there is currently insufficient data to determine this with certainty.

Surface water quality

Noting the high connectivity between groundwater and surface water in the area, and the potential for seepage from TSF4 to disperse contaminants into the groundwater, the Delegated Officer has considered that impacts from the operation of TSF4 to surface water receptors. The Delegated Officer has considered several downstream surface water receptors, more specifically those along Woljenup Creek which is directly downstream from TSF4 and is a tributary to the larger Blackwood River and other connected river systems. It is noted that there are several downstream water users from Woljenup Creek that use this source for livestock, irrigation, household uses, with one resident confirming that this water is used for drinking water

purposes.

The assessment conducted by the Licence Holder to develop the proposed SSWQG involved a single monitoring event for water quality from eight sampling locations (results shown in Table 15). Of the eight sampling locations, four were located in Woljenup Creek (SW01-04), and the remaining four for obtained along the Blackwood River (SW05-08), noting that the most northern sampling location (SW01) was located downstream of the Jones Dam monitoring location SW20/02 (shown in Figure 8).

Table 15: Results from single monitoring event (July 2022) over 8 sampling locations along Woljenup Creek and Blackwood River (GHD, 2023c)

Parameter	Sampling Locations							
	SW01	SW02	SW03	SW04	SW05	SW06	SW07	SW08
Ammonia as N	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate (as N)	2.44	0.32	0.45	0.14	0.01	0.02	0.02	0.02
Nitrite (as N)	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrogen (Total Oxidised) (as N)	2.46	0.32	0.45	0.14	0.01	0.02	0.02	0.02
Nitrogen (Total)	3.3	0.6	0.8	0.3	1	1	1	1
Kjeldahl Nitrogen Total	0.8	0.3	0.4	0.2	1	1	1	1
Phosphorus (Total)	0.01	0.02	<0.01	<0.01	0.01	0.02	0.01	0.02
Sulfur as S	23	26	27	29	118	115	118	118
Dissolved Organic Carbon	5	4	5	4	18	18	19	19
Total Organic Carbon	5	4	5	4	19	19	18	19
Aluminium (Filtered)	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Antimony (Filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (Filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (Filtered)	0.047	0.036	0.04	0.054	0.161	0.16	0.153	0.164
Boron (Filtered)	<0.05	<0.05	<0.05	<0.05	0.08	0.07	0.09	0.08
Caesium (Filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (III+VI) (Filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (hexavalent) (Filtered)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium (Trivalent)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium (Trivalent) (Filtered)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt (Filtered)	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (Filtered)	0.004	0.003	0.004	0.004	0.005	0.006	0.003	0.007
Iron (Filtered)	0.16	0.05	<0.05	<0.05	0.08	0.05	<0.05	<0.05
Lithium (Filtered)	0.006	0.002	0.002	<0.001	0.004	0.004	0.004	0.004
Manganese (Filtered)	0.58	0.046	0.044	0.01	0.028	0.025	0.026	0.025
Molybdenum (Filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel (Filtered)	0.004	<0.001	<0.001	<0.001	0.002	0.001	0.001	0.001

As part of the development of the proposed SSWQG, the Licence Holder undertook a receptor characterisation process to identify and classify the nature of the receptors downstream of TSF4. This characterisation process identified that:

- the upper reaches of Woljenup Creek catchment (immediately downstream of TSF4 and north of SW01) is considered to be a “highly disturbed system” and therefore a lower level of species protection may be appropriate. The middle and lower reaches of Woljenup Creek were classified as moderately disturbed ecosystems; and
- The middle Blackwood River, downstream of the confluence with Woljenup Creek, is a moderately disturbed ecosystem, with a predominantly cleared rural catchment, degraded foreshore condition, and high salinity levels, influenced by flow from the extensively cleared upper catchment.

Baseline monitoring (under W6618/2021/1) required the Licence Holder to conduct monitoring at one surface water location downstream of TSF4. Samples were taken from a residential farm property located ~960 m south of the TSF4 Cell 1 footprint (labelled as SW20/02 in Figure 8). Of the sampling results (detailed in Table 16) values for filtered copper and manganese exceeded the proposed SSWQG.

Table 16: Water Quality results from sampling at Jones Dam (GHD, 2023a)

Analyte (mg/L)	12/05/2022	5/07/2022	5/10/2022	1/02/2023	30/03/2023	26/06/2023
Aluminium (filtered)	0.04	0.01	0.02	0.04	0.03	<0.01
Antimony (filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic (filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium (filtered)	0.104	0.052	0.009	0.093	0.146	0.078
Boron (filtered)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Caesium (filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (filtered)	0.003	0.001	<0.001	0.003	0.003	0.002
Copper (filtered)	0.001	0.005	0.002	0.001	0.002	0.001
Iron (filtered)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium (filtered)	0.005	0.005	0.004	0.004	0.004	0.006
Manganese (filtered)	1.1	0.242	0.004	1.69	1.56	0.325
Molybdenum (filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel (filtered)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Rubidium (filtered)	0.009	0.004	0.003	0.01	0.011	0.006
Silicon (filtered)	5.61	3.86	1.81	3.06	4.16	6.05
Strontium (filtered)	0.133	0.073	0.049	0.136	0.16	0.116

3.3.5 Proposed Licence Holder controls

Existing licence conditions

There are existing licence conditions which have been considered to mitigate and manage the risk of seepage from TSF4 cell 1a:

- Condition 29 [Table 17] – requirements for ambient groundwater monitoring, specifically bore MB22 (shallow, intermediate and deep) which is located off the south-eastern corner of TSF4 cell1;
- Previous condition 33 [Schedule 2] – requirements for ecological monitoring. As noted in section 2.2.8, the department has conditioned updates to the annual ecological monitoring condition.

Proposed controls and monitoring

The Licence Holder proposes the following additional controls to manage seepage from TSF4 cell 1:

- Constructed aspects of the TSF (as discussed in section 2.2.2) including lining of TSF4 and underdrainage components; and
- Ongoing monitoring of bores around and downstream of TSF4 constructed under works approval W6618/2021/1 and those listed in the baseline monitoring.

The department notes that since the submission of this licence amendment application, the Licence Holder has submitted to the department a proposed Seepage Management and Monitoring Plan that includes proposed trigger values for monitoring bores south and around TSF4 and also three surface water monitoring locations along Woljenup Creek (noting that the one closest to TSF4 (SW02-02) was sampled for baseline data in section 3.3.4). Associated with these trigger values are management actions in order to response to what is considered seepage contamination events/data.

It is noted that the contents of this management plan, specifically the adequacy of the proposed trigger values, and their relationship to the SSWQG, to appropriately act as a response level for contaminants and potential impacts to Woljenup Creek, and the associated management plans will be considered under the separate works approval assessment for the TSF4 embankment lift (new works approval W6901/2024/1) that is currently with the department. In the assessment for this works approval, the Licence Holder has also proposed the construction of additional perimeter bores located along the southern embankment.

3.3.6 DWER assessment and regulatory controls

Proposed site-specific water guideline values

In reviewing the proposed SSWQG values the delegated officer has noted for the upper reaches of Woljenup Creek, the Licence Holder's assessment outcome generated the proposed site specific guideline values relevant to highly disturbed aquatic environments. ANZG (2018) states that these systems should not be regarded as 'pollution havens' and that adopting these system specific guidelines should be done in conjunction with recommendations for management and strategy. The delegated officer considers that assigning a separate disturbance category to these upper reaches section of the creek line seems somewhat arbitrary given the high connectivity with the lower reaches, especially considering the assigned disturbance category is being used to set water quality thresholds.

The lower reaches (below SW01) are agreed to be in the slightly-moderately disturbed category, and as such, the 90% species protection (toxicants) and 20-80th percentiles (physical/chemical parameters) should be applied to the entire creek unless alternate site specific guideline values exist. A higher level of disturbance in respect to water quality control levels can be applied to the upper section (likely only appropriate within and above Jones Dam) if treatment systems ensure contaminants level leaving the area can be controlled to the requirements of the lower section (noting that whilst the parameters used to define disturbance may suggest a possible loss to sensitive species, this should not mean that the remaining tolerant species (that may be sensitive to elevated metals) are exposed to unacceptable levels due to different guidelines).

Advice from internal technical experts suggests that results from this investigation conducted by the Licence Holder are considered more appropriate for informing future risk and management instead of the current risk, noting that the limited spatial-temporal dataset for water quality (one sample per site, for one winter sampling period) is not considered sufficient to confidently assess current surface water quality, and the benefit will lie in ongoing monitoring efforts. This includes data on toxicity modifiers (e.g., hardness), which (as with several other contaminants) may vary significantly with rainfall (dilution/runoff/sediment disturbance). Notwithstanding, current levels of some contaminants are elevated, and some exceed environmental guidelines (Cu, Al, Mn).

There is also indication of elevated levels in groundwater that will need to be considered and monitored.

Based on this, and following expert technical advice, the current SSWQG are accepted as interim values for the purpose of reporting and evaluation but are expected to be reviewed⁴ over time. The appropriateness of these values should be reviewed frequently, including the use of the new sensitive species distribution tool (SSDtools software) in accordance with the national water quality guidelines (ANZG 2018).

Groundwater monitoring:

The delegated officer considers that the most appropriate approach to monitoring and managing potential impacts from seepage is a robust surface water and groundwater monitoring program with the objective of promptly identifying any seepage and actively managing it (for example in the form of recovery bores) prior to impacts to sensitive receptors.

Whilst the current spatial distribution of bores (those constructed under the works approval) appears reasonable, it is not yet clear whether the location of these are adequately sited in areas likely to be preferential pathways of seepage. It is noted that in particular, bores MB23 and PB001 are located in the upper reaches of the Woljenup Creek catchment and may not be positioned with regards to be bedrock fractures or within paleodrainage features on the underlying bedrock.

Internal technical advice suggests that although a hydrogeological model for the area near TSF4 was provided, the presented schematic cross section did not provide sufficient information regarding the spatial distribution of potential bedrock fractures and palaeodrainages that could be significant groundwater pathways. It is considered that additional work such as a detailed geological map of basement rocks and their structural characteristics in the area, and a ground-based geophysical survey using electrical and/or electromagnetic techniques on transects around the toe of TSF4 would identify the presence of conductive zones in the bedrock. These conductive anomalies in the bedrock would provide suitable target for the construction of additional monitoring bores.

Notwithstanding this, the delegated officer considers that the proposed monitoring bores are sufficient in the interim, and that the addition of reportable criteria (derived from the Licence Holder's proposed SSWQG) will provide comparable values to the data detected in these bores during operation.

The delegated officer also considers that the Seepage Management and Monitoring Plan submitted with the recent works approval W6901/2024/1, in particular the additional perimeter monitoring bores proposed as part of this application, will continue to improve on the control and monitoring suite to manage potential seepage from TSF4 during ongoing operations.

Deviations to the design

As detailed in section 2.2.2, the submitted CCIR for TSF4 included declaration of deviations from the original design to the embankment construction and liner compaction. Following the commencement of time limited operations, the Licence Holder also reported scouring that occurred to the liner of the TSF during initial deposition. A review of these deviations generally considers that TSF4 can be managed without causing significant environmental impacts, despite some of these deviations. This is partially due to the removal of the shallow sandy material beneath the facility that would have acted as a potential pathway for rapid transport of contaminants to nearby waterways (for liner variations), the alternate materials installed (for embankment variations), and the repairs conducted on the liner to address the scouring event.

⁴Multiple lines of evidence (MLE) approach to assess appropriateness to maintain ecosystem health is considered applicable for this review.

Liner compaction

The clay lining was considered a critical component in reducing seepage from the facility. As noted in section 2.2.2, two of the samples testing did not meet the permeability requirement of less than 1×10^{-9} m/s. One sample was equal to this factor, whilst the second was 3×10^{-9} m/s which is three times more permeable than the minimum requirement.

Whilst it is acknowledged that a percentage of the clay liner does not meet the required permeability, the delegated officer considers that the risks associated with this deviation can be adequately managed by the sufficiently installed underdrainage components and additional monitoring conditions relating to seepage impacts from the facility.

Liner thickness

The review undertaken by the department considered that the deviations to design may not necessarily increase the risk associated with the presence of acidic tailings (as described in section 3.3.2), as it relates to seepage, provided that the compacted clay liner was constructed in a suitable manner and did not contain a significant number of cracks that would be preferred-pathways. Water Quality Protection Note (WQPN) 27 (DoW, 2013) specifies recommendations for clay liners (particularly liner construction items 11 and 12), which state that liners should be installed in at least two layers of equal thickness, and that the compacted liner should have a minimum thickness of 600 mm. The Licence Holder has advised that of the 5,000 survey points obtained on the liner, 13 had a clay liner thickness of less than 600 mm, varying from 485 mm to 569 mm, which equates to a non-conformity rate of 0.26%. This is generally considered acceptable and meets the design intent.

Northern embankment

The delegated officer considers the deviations in design to include BGM lining over the majority of the northern embankment (~90%), with the remaining constructed in the approved design (a 7.5 m wide clay lining) are acceptable and not considered to increase the risk of the facility due to the low permeability of the BGM material.

Divider embankment

Whilst the delegated officer notes that the divider was not constructed with the 'clay core' as originally approved, it is considered acceptable for the following reasons:

- The original width of the clay core was 7.5 m at the crest, whilst the constructed clay facing on the western side has a width of 8 m;
- Cell 2 will be fully lined with BGM liner extending to the western side of the divider; and
- As an internal embankment, even if seepage transfer between the two cells were to increase, it is unlikely to increase the overall seepage from the facility footprint.

Notwithstanding this, the department considers that the change in material for the core of the embankment may have implications for future lifts and proposes that this design will be assessed under subsequent works approvals and licence amendments.

BGM liner and clay tie in

The delegated officer considers the changes to the BGM liner installed are acceptable and also considers that the additional information provided in the Licence Holder regarding the keying in of clay liner and BGM liner is acceptable and demonstrates the intent of the design. The additional controls imposed in this licence amendment will manage any increases to risk of seepage.

Scouring event

In addition to this variability in liner specifications, the Licence Holder advised that a scouring event occurred during TLO and deposition of tailings into cell 1. This occurred in three locations in the NW corner of the cell, of which one caused erosion through the clay liner. This occurred during uncontrolled deposition when flushing the tailings pipeline. The Licence Holder has

stated that the repair of the affected areas included re-laying clay in 200 mm layers in accordance with the construction specification and that these areas were tested and verified by consultants.

As part of the draft comments for this amendment, the Licence Holder has provided the scour remediation report (GHD, 2024). The report advised that remediation efforts were implemented immediately after the scouring was observed with waste rock strategically placed in the affected zones to redirect the tailings and surface water flows to isolate the work area to be rehabilitated.

After allowing drying, the work area was excavated and reinstated with the specified Type 1A Clay material and the construction quality assurance was maintained as per the technical specification. The area was backfilled to the original floor level in compacted 3 x 200 mm thick layers. A 4 m wide x 300 mm deep tie-in key was excavated along the perimeter of the repair backfill area.

Compaction testing resulted in a dry density ratio ranged between 96.5 % and 99.5 % and the moisture variance varied from -0.5 to 1 % fulfilling the specifications. No additional permeability testing was undertaken over the remediated areas, as it was advised that due to the confirmation of the material used and the results from the compaction testing. The material used for the remediation was advised to have a similar grading to the clay core in-situ material which give a desired permeability of 1×10^{-9} m/s. The conclusions of the report advised that the remediation meets the technical specifications issued for the construction of TSF4 Cell 1 and fulfills the design intent of the facility.

Whilst noting the conclusions of the report, as the permeability was not specified as meeting the construction requirements under W6618/2021/1, the delegated officer will maintain a precautionary approach regarding any potential implications to integrity of the liner.

Given the above conclusions, the delegated officer has assessed the risk for the following risk events:

1. Flow of seepage impacted groundwater resulting in contamination of downstream surface waters Woljenup Creek (directly south of TSF4) and Blackwood River (~4.5 km south of TSF4).

The consequence rating for contamination of downstream surface water is considered **moderate** as it can lead to impacts to ecological receptors (aquatic fauna species and habitats).

Whilst the constructed elements of the TSF4 such as the clay lining, BGM lining and underdrainage/seepage recovery infrastructure provides some seepage mitigation, the exact implications from the deviations to design (in particular the variability in the permeability of the clay liner) and impacts of the scouring event to the integrity of the liner remain somewhat unknown.

The delegated officer notes that since the granting of the associated works approval (W6618/2021/1), the Licence Holder has undertaken and submitted further hydrogeological modelling to anticipate areas of likely concern and potential preferential pathways, however as noted by in the review undertaken by the department, the information did not provide a clear understanding about the spatial distribution of potential bedrock fractures or palaeodrainages that could be significant groundwater pathways. Additionally, the expected hydraulic conductivity of the area is likely to be higher than modelled. For these reasons, the department has taken a precautionary approach with the likelihood rating of **possible**.

The overall risk rating for potential impacts to downstream surface water is therefore **medium**.

It is acknowledged that the improvements regarding the seepage management from this and future operations are an ongoing process and further assessment of operations of TSF4, specifically the proposed Seepage Management and Monitoring Plan will be assessed under the current works approval (W6901/2024/1) with the department.

2. Flow of seepage impacted groundwater impacting downstream surface water users (drinking water and consumption of aquatic species).

The consequence rating for contaminated surface water to downstream users is considered **major** due to the possible adverse impacts to human health as result of drinking straight from the impacted surface water (Woljenup Creek) or through consumption of aquatic species that have been exposed to bioaccumulation.

Whilst the distance to the nearest drinking water user is ~2.5 km south of TSF4 (i.e. Lot 4 Daniels Road, Greenbushes), the same conclusions regarding uncertainty of design deviations and actual hydraulic conductivity of the area are relevant and the high connectivity to the higher sections of the creek warrants a precautionary likelihood rating of **possible**.

The overall risk rating for potential impacts to downstream surface water users is therefore **high**.

3. Flow of seepage impacted groundwater impacting downstream groundwater and surface water users (stock, irrigation, domestic use).

The consequence rating for contaminated surface water to downstream users is considered **moderate** due to the composition of the tailings and likely seepage (metals such as arsenic and lithium).

For the same conclusions discussed above, the likelihood for this rating is **possible**.

The overall risk rating for potential impacts to downstream surface water users is therefore **medium**.

4. Water table mounding may adversely impact the health of adjacent native vegetation.

Baseline results indicate that the water table within the site is already shallow and seepage from TSF4 could increase water table around the vicinity of the facility. Due to the potential for plant roots to access groundwater for long periods of time and contamination of this water as a result of TSF4 seepage (containing elevated levels of contaminants), the consequence rating for water table mounding is considered **moderate**.

Considering the current water table, the likelihood of seepage and close proximity to vegetation, the likelihood to impact native vegetation is **possible**.

The overall risk rating for potential impacts to native vegetation from mounding is therefore **medium**.

Conditioning Licence Holder proposed controls

The delegated officer has determined to include the proposed additional monitoring bores (from the baseline monitoring program and included from the works approval) as part of the groundwater monitoring program to the Licence as part of this assessment.

As part of these proposed controls, the results from the Licence Holder's site specific water guidelines investigation will be included as reportable criteria values to the groundwater monitoring program, as it has been determined that as an interim, these values are reasonable. It is noted however that further investigation and review is required on the proposed SSWQG, and these values conditioned in the Licence as part of this assessment are likely to change, including when published specific regional guidance is published.

Additional regulatory controls:

Groundwater monitoring suite

In addition to the updated monitoring controls proposed by the Licence Holder, the delegated officer considers that beryllium be added to the suite of parameters for groundwater monitoring to improve the understanding of risk associated with potential seepage from premises activities. Advice obtained during the assessment indicates that beryllium is often highly enriched within minerals in Lithium-Caesium-Tantalum Pegmatites (USGS, 2010) such as the pegmatite that forms the orebody at the premises. At low concentrations this element in surface water bodies

can be highly toxic to aquatic organisms and therefore considered as important additional parameter to the existing monitoring suite. An interim guideline value of 0.13 µg/L is included to protect aquatic receptors.

In reviewing the existing monitoring program, the delegated officer has also included an additional requirement that iron and aluminium be analysed for both filtered and total metal concentrations. Whilst monitoring of metal concentrations in filtered form are generally considered acceptable, expert advice obtained during the assessment of the Licence has suggested the groundwater sampling on the premises be improved with the addition of total metal concentration of iron and aluminium to assist with determining any sampling error and minimise inaccuracies with interpreting sample analysis.

In addition to the analytes noted above, the delegated officer has considered results from leach testing and recommendations made in consultant reports “*TSF4 Seepage Assessment Site-Specific Water Quality Guidelines*” (GHD, 2023c) and “*TSF4 Seepage Assessment: Human Health and Environment Risk Assessment*” (GHD, 2023b) indicate that additional parameters that should be considered are antimony, cadmium, caesium, thallium and vanadium.

The delegated officer considers that a conservative approach is appropriate for the operation of a new facility, however notes that future reductions to the monitoring suite may be considered if groundwater results are consistent and supportive of the change.

Surface water monitoring

As noted in section 2.2.8, the delegated officer will condition the updated requirements for the Annual Ecological Assessment. The updated sampling locations (two along Woljenup Creek and six along Blackwood River), parameters, associated data collection and analysis methods are considered appropriate and adequate to assess risks from TSF4. The only addition the delegated officer has included to the previously drafted condition is the addition of “Hardness” as a parameter for water quality monitoring. This parameter is required to be reviewed over time and is considered a toxicity modifier for several metals and metalloids and will enable the interpretation of risk at the time of sampling.

Whilst the Licence Holder is required to sample water and sediment quality once annually as part of the Annual Ecological Assessment, the delegated officer considers that more frequent surface water monitoring may be considered appropriate to manage future risks to downstream receptors. As part of the recently granted works approval W6901/2024/1, the Licence Holder is required to undertake surface water monitoring at downstream locations. The delegated officer considers that these monitoring requirements will likely be transferred onto the licence in due course.

Water balance monitoring

The delegated officer considers that additional monitoring controls should be implemented at TSF4 to enable changes in the seepage rate from the facility to be detected in a timely manner. The most important of these monitoring measures is considered to be improving the way in which the water balance is measured and is tracked over time for the facility. This is because an accurate water balance that accounts for all water inputs to and outputs from the TSF can enable the seepage rate to be estimated, provided that the overall amount of water that is stored in pore-spaces in an operational TSF remains approximately constant (*i.e.*, the facility can be said to be operating under steady-state conditions).

Currently, the overall accuracy of the water balance for TSF4 is limited by the inaccuracy of evaporation estimates for the facility. Although all other components of the water balance (other than the seepage rate) are directly measured on an ongoing basis for the facility, the average monthly evaporation rates throughout the year have been estimated once using data from a regional database, rather than being measured directly on an ongoing basis at the site.

Consequently, to improve this situation, the delegated officer has conditioned the requirement for monthly evaporation rates to be measured directly at TSF4 using methodologies and

procedures that are outlined in McJannet *et al.* (2022), which are considered to be best management practices for carrying out these measurements.

3.4 Detailed risk assessment for the operation of the Emergency Dump Pond

3.4.1 Overview of potential risk events

The Emergency Dump Pond (EDP) has the potential to impact groundwater quality. This may result in the following risk events which will be further assess in the sections below:

- flow of seepage impacted groundwater resulting in contamination of downstream surface waters Woljen Creek (tributaries 1.8 km south of EDP);
- flow of seepage impacted groundwater resulting in contamination of downstream surface waters impacting downstream residential groundwater and surface water users; and
- flow of seepage directly impacting the “swampland” area on which the EDP lies directly on top of.

3.4.2 Source: characterisation of emission

Noting that EDP is likely to receive tailings from all CGP1, CGP2, (future) CGP3 and Tailings Retreatment Plant, section 3.3.2 provides details to characterise these materials.

3.4.3 Pathway

The EDP is situated upon the buttress of TSF2 which was constructed to facilitate the approved raise to the embankment of TSF2 to RL 1275 m. This involved the preloading of the swampy area beyond the toe of the TSF2 south wall to accommodate the buttress and also included additional underdrainage and an additional open drain to assist with drainage of the area. As part of these works, the Licence Holder has advised that the material used for the preloading of the swamp area contained significant clay content and is therefore not conducive with allowing drainage from the EDP. Specific details regarding this construction, and the permeability of the clay material placed at this location has however not been provided. As the EDP is constructed unlined, it is considered that any failure of the underdrainage below the EDP will result in seepage to this infill clay material, and to groundwater.

3.4.4 Ground water data

Standing water levels (in metres below ground level) from the nearest monitoring bore (MB17_06) approximately ~100 m west from the EDP is shown in Figure 13. Standing water levels in relation to the elevation of the EDP is shown in Figure 14 and indicates that the distance to the water table from the base of the EDP is approximately 7 to 9 metres.

Refer to section 3.3.4 for groundwater and surface water data for the area south of the EDP (south and surrounding TSF4).

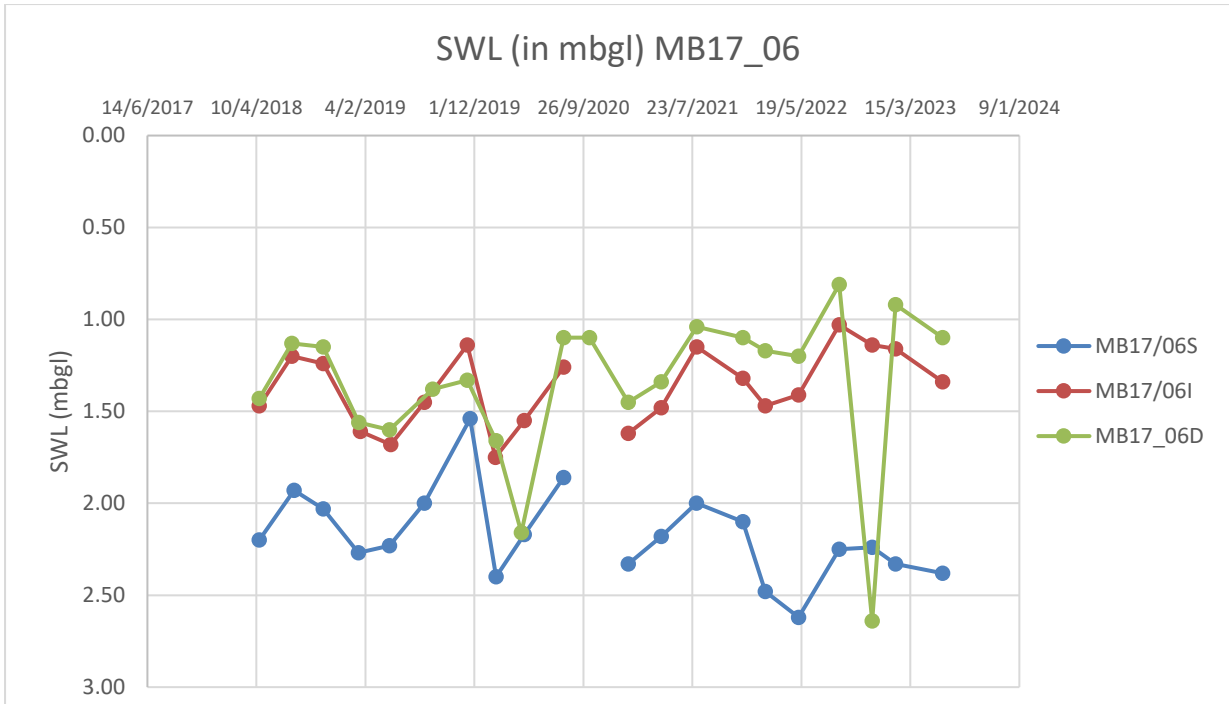


Figure 13: Standing water levels (SWL) near location of EDP

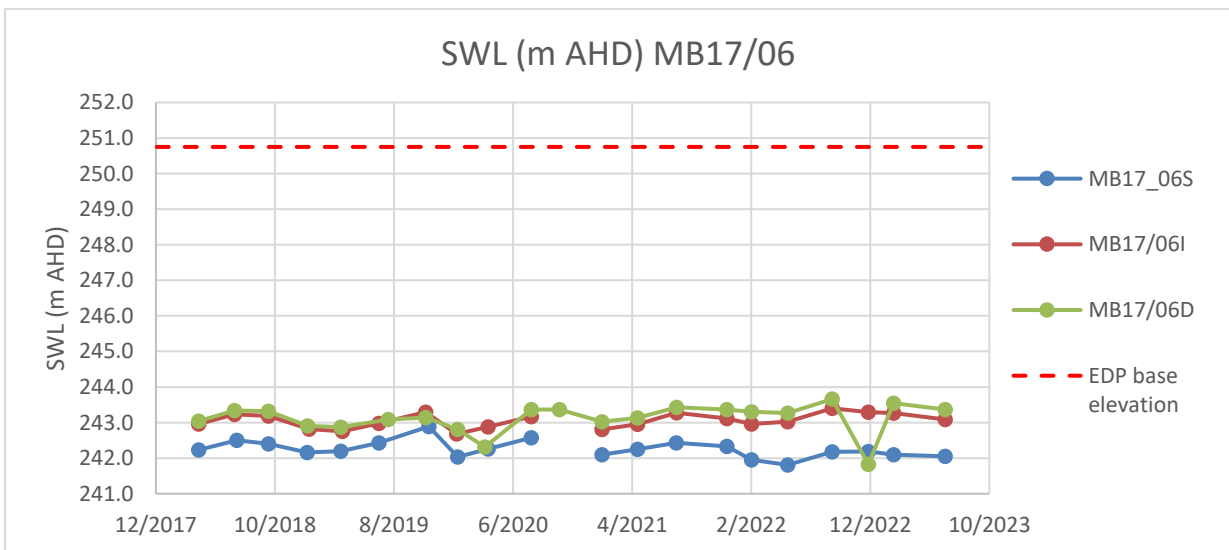


Figure 14: Elevation of standing water level near EDP

3.4.5 Proposed controls

The Licence Holder has proposed that the EDP is designed to allow seepage and facilitate the drying of the deposited tailings. This seepage is expected to be captured in the underdrainage and gravity fed towards Seepage Sump 3 (SS3) located northwest of the EDP along the TSF2 embankment. The overall underdrainage design is detailed in Figure 15.

Underdrainage design

- Three TRP ROM underdrainage pipes that originally discharge into an open drain at the toe of TSF2 has been extended as solid pipes from the TRP ROM to discharge into the open channel drain approximately 120 m further west;

- Two additional perforated pipes were installed to maintain drainage along TSF2, this channel was backfilled with permeable material;
- Open channel drain also collects drainage from the south wall rockfill, surface runoff and some runoff from the swamp – these flows end up in SS3;
- Noting that the fill material used for the reclamation activities within the adjacent swamp contained significant clay content, and that this clay would prevent drainage from EDP reaching the two perforated pipes in the buried drain at the toe of TSF2, additional drainage (consisting of two rows, of four 100 mm perforate pipes) is included on top of this fill material, and beneath the EDP area to ensure drainage.

The Licence Holder confirmed advised on 17 July 2024 that the EDP underdrainage was designed with consideration given to the maximum tailing’s slurry volume in the tailings pipeline, and generally in accordance with the GHD (2022) design (Figure 15).

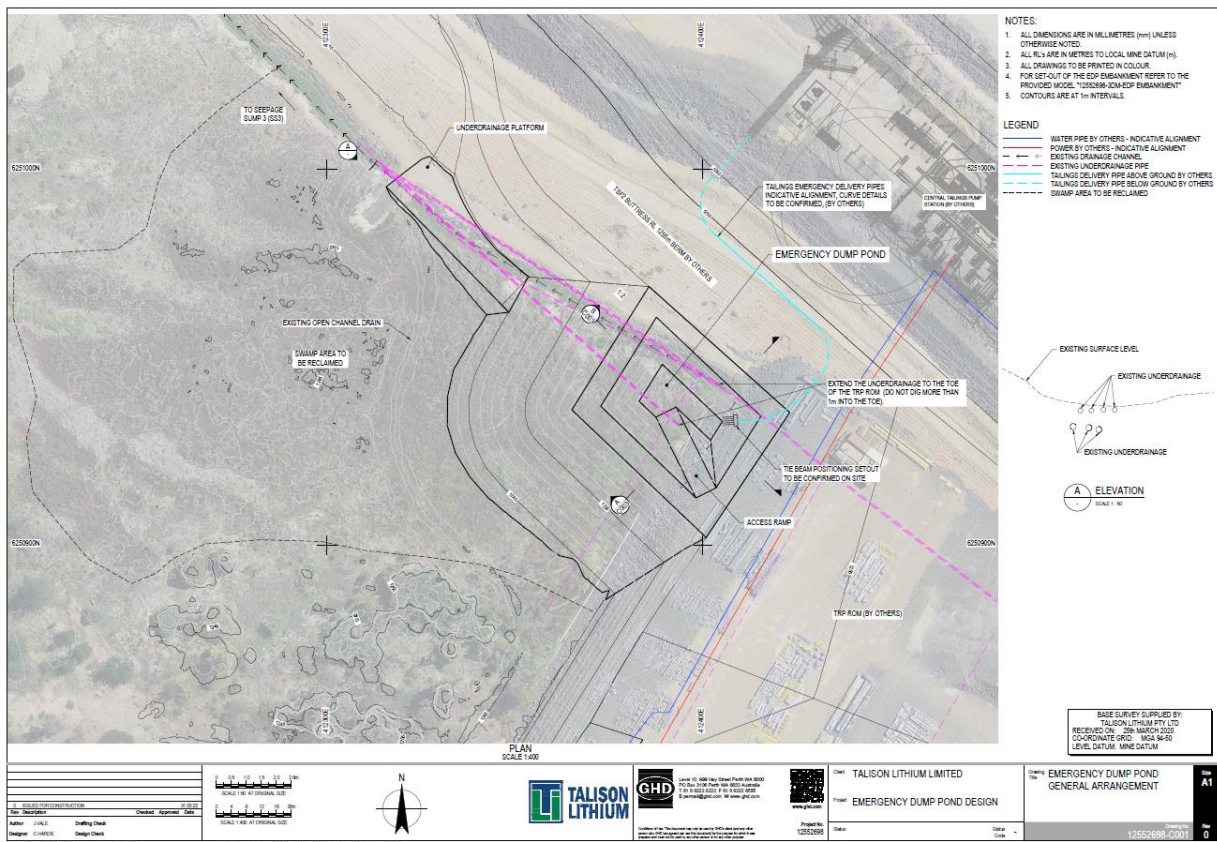


Figure 15: Design features (including underdrainage work) for the Emergency Dump Pond

3.4.6 DWER assessment and regulatory controls

DWER has assessed the risk of the following:

1. Flow of seepage impacted groundwater resulting in contamination of downstream surface waters Woljenu Creek (tributaries 1.8 km south of EDP);

The consequence rating for contamination to downstream receptors is considered **moderate** due to the likely contaminants within in any seepage as a result of tailings deposited into this pond and this can lead to impacts to ecological (aquatic fauna species and habitats) of downstream surface water.

As the only constructed control to prevent seepage entering the environment and groundwater is the installed underdrainage, should this drainage be less than 100% effective, seepage has

the potential to enter the environment. As the effectiveness of this underdrainage has not been clearly demonstrated and it is unlikely that 100% of seepage will be collected the likelihood of seepage from the EDP is considered possible. The delegated officer notes however, that given the distance to the nearby groundwater table and distance to the surface water receptors, the likelihood of this risk event has been determined to be **unlikely**.

The overall risk rating for potential impacts to downstream surface water is therefore **medium**.

2. Flow of seepage impacted groundwater may result in contamination of downstream surface waters impacting downstream residential groundwater and surface water users (drinking water and consumption of aquatic species):

The consequence rating for contamination of downstream surface water is considered to be **moderate** due to the likely contaminants in any seepage as a result of tailings deposition into this pond, the estimated volume of tailings material deposited in the EDP, and the adverse impacts to human health from the potential consumption of this contaminated water. Due to the distance to downstream surface waters and the additional distance to downstream users (~4.2 km south of EDP), the likelihood has been determined to be **unlikely**.

The overall risk rating for potential impacts to downstream surface water users is therefore **medium**.

3. Flow of seepage impacted groundwater may result in contamination of downstream surface water impacting the downstream residential surface water users (stock, irrigation, domestic use):

The consequence rating for contamination of downstream surface water is considered **moderate** due to the likely contaminants in any seepage as a result of tailings deposition into this pond.

With the same considerations made above and due to the distance and the additional distance to downstream users (nearest is ~2.2 km south of EDP), the likelihood has been determined to be **unlikely**.

The overall risk rating for potential impacts to downstream surface water users is therefore **medium**.

4. Flow of seepage directly impacting the "swampland" area on which the EDP lies directly on top of:

The consequence rating for the contamination due to seepage is considered **minor** as the swampland area is directly adjacent to the buttress of the TSF2 and the installed EDP and is likely to be degraded. Although the distance to the water table in the area of the EDP is approximately 7 to 9 metres, the swampland is likely connected to the groundwater at this location, and therefore the likelihood has been given a rating of **possible**.

The overall risk rating for potential impacts to the existing swampland area is therefore **medium**.

Additional regulatory controls:

Based on the risk assessment, the delegated officer considers that the deposition into this pond is acceptable, noting that the potential alternative involving uncontrolled discharges to the environment during emergencies. Notwithstanding this, the disposal into this pond is considered to be only necessary as an emergency discharge, and as a result discharge into this pond will be conditioned that it is only authorised in the event of an emergency that would require tailings pipelines to be emptied.

The delegated officer also considers that additional management actions are required to be implemented in the event that tailings material is discharged to EDP. These include visual inspections for seepage and seepage recovery, removal of any deposited tailings material, and requirements to report on those events when tailings material is discharged to the EDP.

4. Consultation

Table 15 provides a summary of the consultation undertaken by the department.

Table 15: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website 4 April 2024.	None received.	N/A.
Application advertised in The West Australian on 15 April 2024.	None received.	N/A.
Application advertised in the Manjimup Bridgetown Times on 17 April 2024.	None received.	N/A.
Local Government Authority (Shire of Bridgetown-Greenbushes) advised of proposal on 4 April 2024.	None received.	N/A.
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal on 4 April 2024.	<p>DEMIRS provided a response on 7 May 2024 with the following comments:</p> <ol style="list-style-type: none"> Confirmation that a WWTP with 187.5kL / day capacity has been confirmed under Mining Proposal Reg ID 1156889 (subsequent amendment Reg ID 122355); Confirmation that construction of TSF4 approved under Mining Proposal Reg ID 927728 (subsequent amendment Reg ID 121397); and 	<p>Noted.</p> <p>With regards to the ongoing assessment by DEMIRS on the construction report for Cell 1a, the department considers that advice from the Geotechnical Inspector is important in the overall understanding of operational risks associated with TSF4. The delegated officer notes that on receipt of this advice, the department take into consideration any comments provided, which may result in further review of TSF4 operations under the Licence.</p>

	<p>3. DEMIRS has received construction report for TSF4 Cell 1a and is currently still under assessment by Geotechnical Inspector.</p> <p>On 4 June 2024, DEMIRS provided additional comments on the constructed design (detailed in section 2.3).</p>	
<p>Department of Health (DoH) advised of proposal on 4 April 2024.</p>	<p>DoH provided a response on 24 April 2024 with the following comments:</p> <ol style="list-style-type: none"> 1. Disposal of wastewater generated on site is required to comply with the <i>Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974</i>; 2. Labelling of non-drinking water taps and depending on system configuration, suitable backflow prevention arrangements in accordance with <i>Australia/New Zealand Standards AS3500 – Plumbing and Drainage</i>. Additionally, DoH approval is required prior to the use of recycled sewage water for beneficial purposes; 3. Series of comments raised regarding dust modelling for the expansion and this model predicting increased emissions and exceedances; 4. Reference to previous comments provided during associated works approval W6618/2021/1 for TSF4, specifically the need for careful management and stringent licence controls to prevent the deterioration of surface/groundwater from TSF4 discharges and to prevent dust emissions that may impact health and amenities for the community of Greenbushes. 	<ol style="list-style-type: none"> 1. Noted. The delegated officer recognises that the applicant is required to comply with all regulatory requirements under separate legislation and approvals, including those under the <i>Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974</i>. 2. Noted. As per the response to dot point 1 above, the applicant is responsible for ensuing all necessary approvals are obtained regarding the re-use of recycled sewage water. 3. Noted. The delegated officer acknowledges the comments regarding the management of dust at the premises, and specifically in this instance regarding dust modelling. The delegated officer notes that an assessment of dust emissions and recent dust modelling provided by the applicant is the subject of the assessment for works approval W6283/2019/1, currently also with the department. The delegated officer considers it more appropriate that comments relating to dust and dust modelling are considered within the assessment for W6283/2019/1 and has therefore provided this feedback for use in that separate assessment. 4. The delegated officer acknowledges the comments regarding the management of TSF4 and potential impacts to surface and groundwater. These aspects have been considered as part of the risk assessment for the Licence amendment application (Section 3.3).

<p>Department of Education (DoE) advised of proposal on 4 April 2024.</p>	<p>DoE provided a response on 19 April 2024 with the following comments:</p> <ol style="list-style-type: none"> 1. Emissions such as noise, odour, pests (increased standing water and wastewater effluent may increase mosquito/fly populations), and others may cause nuisance; 2. Pollutants associated with dust emissions such as heavy metals and naturally occurring asbestos; 3. Chemicals and contaminants associated with wastewater processing such as chlorine, acids and <i>E.coli</i> may become vapourised and aerosolised; <p>Increase in production of mine and operations, increases risk to negative outcomes or unforeseen circumstances occurring. DoE requests assurance from DWER, on the advice of DoH that the amendment is compliance with all relevant regulations; and confirmation that the health and the safety of the staff and students and their learning environment of the primary school will not be negatively impacted by the approvals and continued operation of the Licence Holder.</p>	<ol style="list-style-type: none"> 1. The delegated officer acknowledges the comments regarding potential odour, noise and other emissions from the premises activities and considers that these emissions have been considered within the risk assessment for this Licence. Due to the distance to from residential receptors, it is considered unlikely that odour and noise emissions from the WWTP will impact these receptors. Due to the significant dilution that will occur with the discharge of treated wastewater in the premises mine water circuit, risks associated with mosquitos and flies are also considered to be low. 2. The delegated officer acknowledges that understanding the nature of dust emissions from premises activities, as well the management and control of these emissions require ongoing oversight. The department is currently undertaking a separate assessment for activities associated with works approval W6283/2019/1, with this assessment primarily assessing risks associated with dust emissions. Notwithstanding that assessment, the department is undertaking further analysis of recently provided dust composition information for ore and tailings materials processed at the premises, and has updated the Licence as part of this amendment to include the Trigger Action Response Plan, submitted by the Licence Holder as a requirement of the Licence (as discussed in section 5). The Licence also requires ongoing monitoring for dust emissions, including depositional analysis of dust for asbestos, crystalline silica and metals. 3. The delegated officer considers that the risks associated with the treatment of sewage, including the use of treatment chemicals and chlorine are adequately mitigated. Sewage is treated within an enclosed treatment system, and treated sewage is required to meet discharge specifications to mitigate both human health and environmental risks. This includes risks factors associated with vapours and <i>E.coli</i>. As per dot point 1 above, treated wastewater will be significantly diluted within the premises mine water circuit, and any re-use of treated wastewater is
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		<p>subject to <i>Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974</i>.</p> <p>4. The risk assessment for this Licence amendment, as well as previous assessments for premises, continues to assess the risks associated with premises activities. Risks events associated with this current amendment are detailed in Table 8 and section 3.3 and 3.4 of this amendment report. The controls implemented to manage these risks are considered appropriate.</p>
Greenbushes Primary School advised of proposal on 4 April 2024.	None received.	N/A.
Residents identified as direct interest stakeholders advised of proposal on 4 April 2024.	None received.	N/A.
Licence Holder was provided with draft amendment on 31 May 2024.	Refer to Appendix 1.	Refer to Appendix 1.
Licence Holder was provided with the second draft amendment on 22 July 2024.	Refer to Appendix 2.	Refer to Appendix 2.

5. Conclusion

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

Ongoing operation of TSF4

As noted in section 3.3, the risk assessment has determined that the ongoing operation of TSF4 can be included and managed through the premises Licence. As noted in the assessment however, the ongoing monitoring of seepage and the ongoing review of interim water quality guideline values will be required. This will also include the additional aspects under consideration with works approval W6901/2024/1 (that includes review and implementation of the Seepage Management Plan, and likely addition of further monitoring bores downstream of TSF4).

Ongoing operations of the WWTP

Noting the submission of Environmental Compliance Reports for the WWTP during the assessment process for the Licence (and that risks associated with the ongoing operation of the WWTP and additional infrastructure as part of the WWTP expansion were assessed via work approval W6832/2023/1 and amendment granted 21 May 2024), the delegated officer considers it acceptable that ongoing operation of the WWTP to throughput capacity of 187.5m³/day be conditioned within the Licence. It is noted however, that environmental commissioning of the additional WWTP infrastructure remains a requirement of W6832/2023/1, and the Licence will restrict throughput of the WWTP to 125m³/day until such time that the Environmental Commissioning Report required under W6832/2023/1 is submitted to the department.

The ongoing operation of the permanent WWTP is considered acceptable and is conditioned within the Licence. As noted in this amendment report, and previously within W6832/2023/1, the department intends to conduct a detailed review the premises mine water circuit to ensure sufficient management controls are in place to manage risks associated with process flows and discharges of mine related water.

Inclusion of Trigger Action Response Plan

In addition to the risk assessment within the scope of the application (as detailed in section 2), this licence amendment included DWER initiated amendment to incorporate the components of the TARP into the current dust trigger and management action conditions of Licence. The delegated officer recognises the need for continuous review and where necessary, improvement of dust management at the premises. In this regard, inclusion of the TARP at this stage is considered relevant, noting that the preliminary review of the Licence Holders TARP determined that it is generally reasonable and appropriate. The basis for this includes:

- The trigger levels proposed in the TARP (for wind speeds and monitored dust trigger concentration) are more conservative than those in the current licence;
- The proposed wind arcs appear reasonable and appropriate considering the location of the sensitive receptors (N-W and S-E) with respect to current and potential emission sources;
- The TARP includes trigger action response based upon Australian Standard installed PM₁₀ monitors.

It is considered that the TARP should be reviewed regularly to ensure that it achieves its intended purpose. The implementation of the TARP should be documented, and trigger values reviewed regularly. Any changes to the trigger values or response actions by the Licence Holder should be reported and supported with data analysis.

The delegated officer has conditioned certain aspects of the TARP under general conditions

regarding dust management in the event of visible dust, and the requirements for additional dust suppression.

In addition to the implementation of the TARP, the delegated officer has conditioned that the Licence Holder regularly reviews on the effectiveness of the TARP, and provide these reviews to the department.

Removal of Osiris monitors for management triggers

As part of the review and inclusion the TARP to the Licence and as discussed in section 2.2.8, during the assessment of the Licence, the Licence Holder confirmed the appropriate installation of the continuous AS PM₁₀ Monitor North. With this, and noting the request by the Licence Holder to remove the Osiris monitors from the management actions on the licence conditions, the department considers that the management trigger actions can be appropriately transferred to the continuous AS PM₁₀ monitors and is consistent with previous reviews regarding the ongoing effectiveness and use of the Osiris monitors at this premises.

Existing triggers (as conditioned for the Osiris monitors) have been transferred to the continuous AS PM₁₀ monitors ensuring that the existing (and additional requirements as established by the TARP) will continue to be required. This includes the existing trigger of 100µg/m³ (for a 15-minute rolling average) to ensure an early response to dust events, and additional dust management actions included as part of this amendment.

More broadly, the delegated officer considers that continual review of dust management practices and the dust monitoring network (on and off the premises) is required. This is in addition to the improvements undertaken to date, as part of a process of continual review and improvement. Inclusion of the TARP and the requirement to review its effectiveness will form part of this review, along with ongoing future improvements expected to be required, particularly as expansion activities at the premises continue. Future reviews will also consider the need for additional boundary dust monitors to improve the identification of, and response to dust events, as part of holistic dust management practices at the premises.

5.1 Summary of amendments

Table 16 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 16: Summary of licence amendments

Relevant section or condition no.	Proposed amendments
Throughout document	Condition numbering and referencing has been updated with the addition and removal of conditions and figures.
Cover page	Changes include: <ul style="list-style-type: none"> • Updates legal description to include new tenements for change in prescribed premises boundary; • Update Category 5 assessed production / design capacity for tailings deposited per annual period from 5,000,000 tonnes to 5,200,000 tonnes; and • Addition of Category 54 for 187.5 m³ per day.
Licence History	Addition of the scope of this amendment
Condition 1 [Table 1]	Addition of: <ul style="list-style-type: none"> • TSF4 cell 1a infrastructure and operating requirements; and • Emergency Dump Pond infrastructure and operating requirements.

Condition1 [Table 1] line item 2	Updates to the description of TSF2 infrastructure, specifically the drainage trenches to be consistent with the actual construction.
Condition 1 [Table 1] line item 5, column 2	Removal of item (b) that restricts the discharge of decant water from WTP, lithium concentrated effluent from the WTP and arsenic concentrated effluent from ARU until 30 June 2024. As Licence Holder has demonstrated disposal of these inputs into Clear Water Dam are acceptable, this item removed and inputs listed as accepted material into Clear Water Dam.
Condition 8 [Table 5]	Requirements for inspections to tailings pipelines associated with TSF4.
Condition 9 [Table 6]	<ul style="list-style-type: none"> Removal of item labelled "Water treatment facility" as it has been determined to be constructed / installed to be compliant with requirements of the condition; and Removal of item that required the installation of visual markers along embankment freeboard for mine water circuit water storage locations as this has been deemed compliant.
Condition 12 [Table 7]	Addition of WWTP operating requirements.
Condition 13	<p>Update of this condition as the assessment for pipeline works identification has been completed and the department has confirmed compliance with this portion of the condition.</p> <p>Condition updated to require pipelines to be retrofitted in accordance with this assessment, for compliance documentation submitted to the department, and for it to be completed prior to 01 July 2025 (original completion date for condition).</p>
Removed ~ previous Condition 14	Removed as the requirements of this condition have been satisfied.
Removed ~ previous Condition 17	Removal of condition as requirements has been met and determined to be compliant.
Removed Condition 18	Removal of condition as requirements has been met and determined to be compliant.
New Condition 16	Inclusion of additional regulatory control, adapted from the Licence Holder's proposed Trigger Action Response Plan (TARP)
Condition 23 [Table 11]	Addition of water quality monitoring for WWTP outlet prior to discharge into TSF4.
New Condition 25	Addition of monthly water balance monitoring for TSF4.
New Condition 26	Condition to specify method for calculating site evaporation for water balance monitoring (condition 25).
Condition 27 [Table 13]	Removal of the requirements for monitoring of PM ₁₀ for the Osiris (North) and Osiris (Southeast) monitors.
Condition 29 [Table 15]	<p>Updates include:</p> <ul style="list-style-type: none"> Removal of trigger values associated with meteorological station as these have been updated with the inclusion of TARP components in Table 20; Removal of Osiris (North) and Osiris (Southeast); and Addition of PM₁₀ (15-minute rolling average) with a trigger value of 100 µg/m³ for the Continuous AS PM₁₀ Monitor North and South.
Condition 30 [Table 17]	<p>Updates include:</p> <ul style="list-style-type: none"> Removal of reference to table footnote for "Deep Bores". This was an error and should have been removed as part of a previous amendment;

	<ul style="list-style-type: none"> • Addition of new monitoring bores associated with TSF4; and • Addition of Aluminium, Rubidium, Beryllium, Antimony, Cadmium, Caesium, Thallium and Vanadium in monitoring suite for new bores.
Removed ~ previous Condition 33	Removed condition as redundant a replaced with updated condition 32.
New Condition 32	New condition for annual ecological assessments referencing requirements in Schedule 2.
Removed ~ previous Condition 36 [previous Table 19]	Removed condition as the specified requirements have been satisfied.
Condition 35 [Table 19]	<p>Updates for:</p> <ul style="list-style-type: none"> • Trigger values for the Continuous AS PM₁₀ Monitors South and North dust monitors and associated management actions incorporated from the TARP; and • Transfer of previous Osiris monitor triggers and management actions to Continuous AS PM₁₀ Monitors South and North.
Condition 36	New condition that requires the Licence Holder to conduct a review on the effectiveness of the TARP in relation to limit exceedances.
Condition 41 [Table 20]	Addition of results from TSF4 water balance monitoring to be included in annual environmental report.
Condition 43 [Table 21]	Addition to specify the format in which the ambient groundwater quality should be reported in the quarterly reports, specifically that concentration values should be compared against interim site specific water quality guideline values listed in Schedule 6.
Condition 44 [Table 22]	<p>Additional data required in exceedance report:</p> <ul style="list-style-type: none"> • Wind directions; and • PM₁₀ data from AS PM₁₀ Monitors South and North monitors.
Removed ~ previous condition 46	Condition removed as construction of TSF2 embankments up to 1,280 m RL have been confirmed.
Removed ~ previous condition 47	Condition removed as construction of TSF2 embankments up to 1,280 m RL have been confirmed.
Figure 1	Updated Figure to show new prescribed premises.
Figure 2	Updated Figure to show new prescribed premises (no updates to location of surface water storages, emissions and monitoring points).
Figure 3	Updated Figure to show new prescribed premises and additional TSF4 monitoring bores.
Figure 4	Updated Figure to show new prescribed premises (no updates to location of noise monitors).
Figure 5	Updated Figure to show new prescribed premises and indicative location of noise monitors) noting a new Figure to be sought when installation of condition 9, Table 6 monitors are confirmed.
Figure 6	Updated Figure to show new prescribed premises (no updates to location of CGP2 key water containment infrastructure).

Figure 8	Updated Figure to show the constructed drainage trenches at TSF2.
New Figure 16	New Figure to show location of following infrastructure: <ul style="list-style-type: none"> • TSF4 Cell 1a; • WWTP and effluent pipeline; and • Emergency Dump pond.
Schedule 2	Updates to: <ul style="list-style-type: none"> • Requirements for Annual Ecological Assessment (condition S1 [Table 25] and S2); • New Table 26 to specify locations of monitoring; and • New Figure 17 to show locations of monitoring.
Schedule 3	Updated list of coordinates to match updated prescribed premises boundary.
Schedule 6 [Table 28]	New schedule to include Licence Holder's proposed site specific water quality guideline values.

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Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions (Draft 1)

Item	Condition / Section	Summary of Licence Holder's comment	Department's response
1.	Cover page of Licence Licence History Throughout Amendment Report (AR)	Licence Holder is requesting the throughput for category 54 – wastewater treatment plant (WWTP) be updated from 125m ³ to 187.5m ³ per day throughput to be consistent with the amended works approval W6832/2023/1 for the village WWTP that included the expansion to support the larger throughput. The Licence Holder are requesting that this change to throughput is caveated with the fact that they are only allowed a throughput of the originally 125m ³ until such time that the Environmental Compliance Report for the expansion under W6832 is submitted to the department. The Licence Holder considers this change will reduce administrative burden of a licence amendment following time limited operations under the works approval.	The department considers that whilst the works approval has been amended to this updated throughput, as it was not within the original scope of the application, that this change be requested in the next amendment to the licence. [Note: response updated in Appendix 2].
2.	Table 1	For the acceptable materials for the following containment cell or dam number(s): <ul style="list-style-type: none"> TSF2; and TSF4 cell 1a to remove the specifics for tailings from TSF1 tailings retreatment plant.	The department agrees that removing this wording is administrative. Under separate conditions of the licence (condition 12, Table 7), the Licence Holder is only authorised to excavate dried tailings from TSF1 for the purpose of tailings retreatment at the currently plant and therefore changing the wording for the materials listed in Table 1 has no implications to currently approved and authorised activities.
3.	Table 1, line item 3, column 3	The Licence Holder is requesting that item (b) be amendment to specify the authorised pond height of 1260.1 m RL to allow for a 0.9 m freeboard, and tailings beach height authorised to 1260.7 m RL (0.3 m below crest level).	The department accepts this change and considers that the wording to specify the decant pond freeboard and tailings beach height does not change the risk or intent of the condition.
4.	Table 1, line item 5 (column 2)	The Licence Holder is requesting that item (b) be updated to allow for continued discharge from "decant water from the WTF, lithium concentrated effluent from the WTP and arsenic concentrated effluent from the ARU" as the department has determined that the requirements of the former conditions relating to the discharge from the WTP, ARU and WTF into Clear Water Dam have been met.	The department notes that the Licence Holder was deemed compliant with former conditions 17 and 18 and provided sufficient information to allow the continued discharge into Clear Water Dam. The department has amended this wording of this condition.
5.	Table 1, line item 5 (column 3)	The Licence Holder is requesting to remove the requirement for "freeboard to allow for a 1% annual exceedance probability 72-hour event" for Clear Water Dam.	The department considers that this request is out of scope for this application and whilst the Licence Holder suggests the environmental risk is low for overflows into Austins Dam, this request will need to be properly considered and assessed by the department prior to making any changes. The department recommends the Licence Holder apply for this aspect during the next amendment to allow adequate time for review and consideration,
6.	Table 1, line item 7 (column 2)	The Licence Holder is requesting to include the material "water directly from Cowan Brook Dam" to be accepted into Southampton Dam for the purpose of maintaining water quality and dam levels.	The department considers that this request is out of scope for this application and will require an additional review and possible assessment of current water qualities of both Cowan Brook Dam and Southampton Dam. The department recommends the Licence Holder apply for this aspect during the next amendment to allow adequate time for review and consideration,
7.	Table 1, line item 7 (column 3)	The Licence Holder is requesting to remove the requirement for "freeboard to allow for a 1% annual exceedance probability 72-hour event" for Southampton Dam.	The department considers that this request is out of scope for this application and whilst the Licence Holder suggests the environmental risk is low for overflows into Austins Dam, this request will need to be properly considered and assessed by the department prior to making any changes/ The department recommends the Licence Holder apply for this aspect during the next amendment to allow adequate time for review and consideration,
8.	Condition 3	The Licence Holder is requesting to remove this condition that requires inspection of surface water infrastructure are managed in accordance with "Surface Water Management Plan, 23 September 2015 (v5) considering that condition 8 of the licence already specifies requirements for inspection of this infrastructure and therefore is a duplication.	Whilst the department acknowledges this may be a duplicate condition, removal of this condition requires a review of the conditioned sections of the SWMP to ensure all aspects are adequately captured in the other conditions of the licence. The department recommends the Licence Holder apply for this aspect during the next amendment to allow adequate time for review and consideration.
9.	Table 7, line item 1 (column 3), item (d)	The Licence Holder is requesting to remove this line item as this condition is ambiguous in meaning and that the total area of TSF1 to be mined (excavated) exceeds 9 ha. The Licence Holder suggested that the purpose of this condition was to control dust and considers that TSF1 mining areas are adequately controlled through other licence conditions and particularly those relating to the TARP.	The department considers that removal of this condition is not administrative and will require further review. The delegated officer recommends requesting this change in a future amendment.
10.	Table 7, line item 1 (column 3), item (e)	The Licence Holder is requesting this text to be changed to 1 ha considering the mining block 100m ² grid.	The department considers this request out of scope for the application and that the requested change will require further investigation into past assessment and conditioning of this item on the licence. The department recommends that this change is sought in a future amendment. [Note: response updated in Appendix 2].
11.	Table 7, line item 3 (column 3), item (c)	The Licence Holder is requesting to remove this item as they advised that the front-end loader activities on the Tailings Retreatment Plant Run of Mine pad have not been shown to contribute significantly to site dust emissions and the conditioning of the TARP includes specific management actions relating to the TRP operations.	Whilst the department recognises that additional dust controls have been conditioned on the licence as part of this amendment, as noted previously, given that the effectiveness of the TARP has not yet been confirmed and that the operation of dust emissions specifically from the Tailings Retreatment Plant were out of scope for this amendment, the department will take a precautionary approach in not reducing or removing any existing dust control measures until it can be demonstrated that dust emissions from the premises are being adequately controlled to the point where NEPM exceedances are not recorded at receptors (Town of Greenbushes).
12.	Table 9, line item 3, column 5	The Licence Holder has requested to update this text to be "no later than 01 July 2026", as it has been advised that the construction of this dam wall raise will not occur by the time specified in the original condition.	In recent a compliance assessment, the department noted this delay and advised that this licence condition is amended to reflect the revised date, therefore change is accepted.
13.	Table 13	The Licence Holder is requesting to amend Table 13 with the changes proposed in the letter sent to the department on 4 June 2024 as the current methodologies are unsuitable or incorrect for the intent of the condition. The request is to update those for the PM10 high-volume sampler requirements.	As noted by the Licence Holder in the response, the department is currently consulting with internal air quality experts regarding the letter provided on 4 June 2024. As this may take some time, the department will not alter the condition at this stage, however should it be identified that the condition requires updating, a CEO initiated amendment may be actioned to update where required.

Item	Condition / Section	Summary of Licence Holder's comment	Department's response
14.	Table 13, Table 15, Table 19 and Table 22	<p>The Licence Holder is requesting to remove their "Osiris monitors" as part of the management trigger and actions associated with the conditions of the Licence.</p> <p>The Osiris monitors are utilised by Talison for internal monitoring and trigger identification in accordance with the TARP. Even so, they are not recognised by the relevant Australian Standard. They are not appropriate for statutory (licence) compliance monitoring. The Continuous PM₁₀ (Australian Standard or TEOM) monitors are essentially co located with Osiris, and measure the same parameters as the Osiris monitors, with more robust methodology (recognised by Australian Standards).</p>	<p>The department met with the Licence Holder on 11 July 2024 to discuss their position further and understand the request to remove the Osiris monitors. The departments review and response regarding this requested is summarised in section 5.</p>
15.	Table 19	<p>The Licence Holder has made the following comments regarding the draft Table 19 that the department amended to incorporate some aspects of the TARP:</p> <p>a) removal of the Osiris monitors as conditioned management tools;</p> <p>b) the management actions relating to the wind speeds do not align with the TARP actions. Wind speeds and directions need to be separated from the triggers associated with dust concentrations.</p>	<p>The department's response:</p> <p>a) see item 14 and section 5 of the Amendment Report for the department's decision making on this proposed amendment; and</p> <p>b) the revision to this item specifically for the management actions associated with meteorological (wind speed and direction) have been reviewed by the department and appear consistent with the assessment of the TARP. The department considers these changes to be appropriate and have updated Table 19 to more accurately represent the correct management actions associated with the triggers.</p>
16.	Condition 25	<p>The Licence Holder is requesting that the new TSF4 water balance monitoring condition be changed to a frequency of quarterly from monthly. The Licence Holder has advised that monthly calculations are unnecessarily frequent as the seepage rate is unlikely to vary significantly and suggests that quarterly is sufficient to identify any trends of interest/concern early enough to implement any management response required.</p> <p>Following further consultation during the draft period, the Licence Holder also provided comments disagreeing with the requirement for evaporation to be measured using the McJannet <i>et al</i> (2022) methodology for the purpose of calculating the TSF4 water balance, and in particular, deriving an estimate of seepage past the liner. The Licence Holder has advised that the water balance will include (informed, justifiable) estimates and assumptions, resulting in an unavoidable, typically immaterial, degree of uncertainty. During preparation of the TLO report, the estimated seepage appears to be in the order of 10,000 to 15,000 m³ of seepage which is in range of the estimated TLO seepage in the model (33,800 m³).</p> <p>The Licence Holder suggests that it is unlikely that increasing evaporation monitoring accuracy will meaningfully or materially improve the accuracy of the water balance for the purpose of estimating seepage past the liner, as the estimated seepage (calculated for the TLO water balance) is so small a proportion of the TSF total water cycle that it is likely less than the total water balance uncertainty ('error bar'). Increased evaporation measurement accuracy therefore would not validate the seepage modelling or estimate seepage during operations with materially or usefully greater precision than 'traditional' measurement methods.</p> <p>Talison proposes that evaporation for the purpose of the TSF4 water balance is estimated using measurements from Talison's existing meteorological monitoring station. Talison would review the water balance, including assessing accuracy and significance of evaporation values, and implementation of the McJannet <i>et al.</i> (2022) methodology, should water balance monitoring indicate that seepage past the liner exceeds the assessed and approved modelled rate or volume.</p>	<p>The department considers that due to the risk of seepage to downstream receptors and that TSF4 is a new facility, that monthly water balance monitoring will be required, at least until seepage risks are better understood.</p> <p>In a similar manner, the comments made regarding the use of specific methodology in measuring evaporation for the water balance have been noted, however the department does not consider at this stage that there exists sufficient certainty with regards to the water balance for TSF4, and to improve this certainty, the additional accuracy from the proposed evaporation method is warranted.</p>
17.	Condition 36	<p>The Licence Holder has requested that instead of a six-monthly review on the implementation of the Trigger Action Response Plan (TARP) as specified in the draft condition, that this review is to be submitted with the 2024-2024 Annual Environmental Report (AER) in order to allow review of a full year of data, including a full dry season.</p> <p>In line with their other request to remove the Osiris monitors from the licence conditions, they are requesting that the data provided in this report are for the continuous AS PM10 monitors.</p>	<p>The department is supportive of a 12-month review in order to capture seasonal deviations to dust data and considers that the submission of the TARP review as part of the 2024-2025 AER is acceptable, with following annual reviews required. The department notes that the frequency and/or specifications of this review may be re-considered in future amendments.</p> <p>As noted in section 5, the department considers that following this review of the TARP that the proposed amendments may be considered for the current licence conditions.</p>
18.	Condition 45 and 46	<p>The Licence Holder provided a Certificate of Compliance for the construction of the 1,275 m RL raise to TSF2. They advised that the outstanding information for this item of infrastructure, as requested by the department in letter dated 14/2/24, are provided in this report. Specifically, that the upstream drainage trenches were installed in accordance with the technical specifications apart from the northern wall as this area was backfilled as part of the ground works for Chemical Grade Plant 3.</p>	<p>The department has reviewed the construction report for embankment raise to 1,270 m RL and can confirm that the underdrainage system was installed during this lift. The department has noted the deviation to design where the inner drain coil trench was not installed along the northern embankment.</p> <p>With this confirmation, the department will remove condition 45 and 46. The department has also replaced Figure 8 with the as-constructed drawing that clearly indicates the installed trenches. Additionally, the department has amended the text in Table 1 to correctly reflect what has been constructed.</p>
19.	Table 6	<p>The Licence Holder is requesting to remove the line item relating to the installation of visual freeboard markers on the embankment of premises surface water dams since this has been completed.</p>	<p>Since the sending of draft package, the department has assessed the report submitted by the Licence Holder and has deemed it compliant with the requirements of the condition and therefore will remove it from Table 6.</p>
20.	Table 7, line item 8 (b)	<p>The Licence Holder has advised that not all the discharge specifications are continuously monitoring by the WWTP and therefore it is not possible to determine whether the effluent meets all the criteria listed in the draft Table 7 at all times. The Licence Holder advised that pH, residual chlorine, turbidity are the key parameters that indicate if the WWTP is operating within specifications.</p> <p>Noting that the effluent will be monitored in accordance with Table 11 (that requires monthly monitoring of the other parameters) it is unlikely that the parameters will exceed that of the limits listed in Table 11 and therefore the effluent discharge to TSF4 should meet all requirements of Table 11.</p>	<p>The department accepts this change to remove the requirement with the understanding that demonstrating compliance with this would be difficult given the frequency of the monitoring for all the parameters listed in the draft condition and considers that the monitoring under Table 11 will be sufficient. However, with the removal of these parameters in Table 7, the department has amended Table 11 that requires an investigation and increased frequency to monitoring if any of the parameters exceed the limit specified in that table.</p>
21.	Table 7, line item 4 (b)	<p>The Licence Holder is requesting to remove the condition for operation of tailings retreatment plant settlement pond that specifies that "any overflow events are to be recorded with date, duration and volume". The Licence Holder advises that the TRP settlement pond overflows into Tin Shed Dam via overland drainage and states that although this is an off-premises discharge, it is not a discharge to the environment as it is contained with the Global Advanced Metals Greenbushes Pty (GAM) premises and that potential impacts associated with Tin Shed Dam are monitored via other Part V instruments and that the environmental risks associated with TRP settlement pond overflows into Tin Shed Dam are therefore immaterial.</p>	<p>The department considers that this request is out of scope for this application and whilst the Licence Holder suggests the environmental risk is immaterial for overflows into Tin Shed Dam, this request to remove the recording of these overflows events will need to be properly considered and assessed by the department prior to making any changes.</p>

Item	Condition / Section	Summary of Licence Holder's comment	Department's response
22.	Throughout draft Licence and AR	The Licence Holder provided comments on sections where hyperlinking and referencing were in error.	Noted, the department has made the proposed changes and double checked the final page for any issues.
23.	Figures in the Licence New Figures 1, 2, 3, 4, 5, 6 and 16	The Licence Holder has provided updated figures that demonstrate the updated prescribed premises.	Noted, the department have checked the Figures provided to ensure they correctly capture all existing activities / infrastructure and will update in the licence if considered accurate.
24.	Schedule 2 and AR section 2.2.7	<p>The Licence Holder has requested several amendments to the draft condition for the annual ecological assessment program:</p> <ol style="list-style-type: none"> 1. Removal of dissolved concentrations for several analytes for water quality monitoring; 2. Removal of the item that specifies the development of site-specific guidelines, and if appropriate a revised suite of analytes from the table, and move this to the condition S2; 3. Reduction of samples required for parameters: pH, temperature, turbidity, EC and DO; 4. Changes to the requirements for sediment quality sampling and the requirements for the concentrations required for the analytes; 5. Changes to item (b) for macroinvertebrate diversity and abundance; 6. Inclusion to allow release of specimens (fish/crayfish) that will not be retained for bioaccumulation study; and 7. Request to remove potassium and add vanadium for bioaccumulation study. <p>The Licence Holder is also requesting a reduction of monitoring sites and specifically a reduced suite of locations for bioaccumulation study. It was advised that due to land access issues they would not be able to conduct monitoring at all the nominated locations as landowner agreement of access are yet to be obtained.</p>	<p>The department has the following response:</p> <ol style="list-style-type: none"> 1. Unless the Licence Holder can provide adequate justification (in response to second draft) why analysis of dissolved parameters should be removed, these will be retained as it is considered that analysis of dissolved parameters are more reflective level of risk; 2. This change is accepted, with the addition that any changes to suite of analytes must be requested through a licence amendment prior to implementation; 3. This change is accepted. 4. The change is not accepted. Further advice obtained from the departments Aquatic Science Branch indicates that the proposed sampling requirements are required and appropriate. 5. The delegated officer has liaised with the departments Aquatic Science Branch and also the Licence Holder and has amended the condition slightly; 6. This change is accepted; 7. The addition of vanadium is accepted, but the removal of potassium is not as it was considered a minimum requirement in the previous schedule 2. <p>In response to the changes in locations, the delegated officer liaised with the departments Aquatic Science Branch regarding the reduction to locations (specifically along Woljenup Creek and Blackwood River) and the removal of bioaccumulation monitoring along Woljenup Creek.</p> <p>On 17/7/24 the Licence Holder provided an updated Figure of monitoring locations which includes two along Woljenup Creek and re-instates those along Blackwood River. The department will also require the Licence Holder to conduct bioaccumulation studies at the locations proposed along Woljenup Creek.</p>
25.	Schedule 3	As per the department's request, the Licence Holder has provided an updated list of coordinates for all relevant GPS points that represent the updated premises boundary. An excel workbook containing these coordinates and a shapefile of the updates premises boundary have been provided.	Noted.
26.	AR 2.2.2	Fix typo from "cell 2 started embankment will begin at 1265 m RL" to "cell 2 starter embankment will begin at 1265 m RL".	Noted and corrected.
27.	AR 2.2.2	The Licence Holder is requesting that the department remove the dot point pertaining to the deviation regarding HFA BGM liner noting the Licence Holder's justification that non-HFA BGM was placed on the slopes to avoid the introduction of horizontal seams on the embankment slopes and calculations have confirmed that the as-constructed crest anchor trench is sufficient to secure all non-HFA and HFA grades of BGM.	The department has noted the Licence Holder's justification to the changes in grade of BGM liner used for the embankment slopes, this change is still considered a deviation to the original design. The department has assessed this change further with the consideration of comments made by the Licence Holder and advice received from DEMIRS in section 3.4.6.
28.	AR 2.2.2	The Licence Holder is requesting that the department remove the dot point pertaining to the perceived deviation to design regarding the construction of the divider embankment between the two cells. The Licence Holder advised that the revision of this divider embankment design was introduced in the July 2023 with the amendment application to W6618/2021/1 to authorise staged construction of Cell 1 (Appendix D (GHD 2023e, Figure 3). The Licence Holder has advised that this has been assessed and approved by DWER and DEMIRS.	<p>The department has reviewed this document and whilst it is acknowledged that the divider embankment design in the July 2023 document is different to what was originally approved (with the clay core), it does not appear that the Licence Holder specifically requested this change as part of the amendment. As note in the Amendment Report (dated 7 July 2023) the scope of the application was limited to the staged construction and operation of Cell 1 (into 1a and 1b) and that the "overall TSF4 design concept was unchanged and construction of Cell 1 will be undertaken in accordance with the design".</p> <p>Notwithstanding this, the department has reviewed this constructed design and sought out advice from DEMIRS and determined that it is acceptable.</p>
29.	AR 2.2.2	The Licence Holder is requesting the department update its wording regarding TSF1 seepage. They advised that as surface water monitoring indicates that TSF1 seepage has not impacted nearby surface water (Cascades and Woljenup creeks, the seepage does not current pose an adverse risk to receptors. Studies indicated that a few monitoring bores were inferred as exhibiting impacts (concentrations above 0.1 mg/L), the limited distribution of impacts despite the operational duration of TSF1 (several decades) is considered due to the attenuation of metals in the underlying aquifers.	The department notes the Licence Holder's comments regarding spatial distribution of the seepage and any observed impacts to surface water receptor. The department has updated the wording slightly with consideration of these comments.
30.	AR 2.5	As per the department's request, the Licence Holder provided additional information on any updates of the status of the EPBC referral that they advised was submitted with the original application. During this comment period the Licence Holder advised that this pipeline corridor did not require any clearing or triggers under the EPBC Act and as such was not included in the referral. However, the request to update the MS development envelope was included in the most recent s45c application that pertained to other matters including clearing for the purpose of other activities at the premises (increase the embankment height of surface water dams).	Noted and wording amended to reflect this update.
31.	AR 3.3.2	<p>The Licence Holder has proposed that the department's assessment that 15-30 samples of additional leach testing is likely to be excessive, and whilst it is agreed that further work is required to improve confidence, this degree is not necessary.</p> <p>The following reasoning was provided: "<i>variability in the ore processed and the nature of ore processing (how that ore and its inherent variability is amalgamated or split in the process) must be considered to determine the number of samples required. Talison has approached the sampling and testing with both in mind and question how DWER has assessed the same to arrive at their judgement</i>".</p>	<p>The department has considered the Licence Holder's comments on this matter and agree that whilst 15-30 may not be necessary, additional investigation to some degree is.</p> <p>Additionally, since the draft was provided to the Licence Holder with this statement, additional long term leach testing results have been provided to the department and are being considered in the assessment under the works approval W6901/2024/1.</p> <p>Whilst the department has agreed to amend the wording regarding additional work to be considered, it is noted this additional leach testing is not conditioned under this licence and therefore has no implications to the requirements under this licence.</p>

Item	Condition / Section	Summary of Licence Holder's comment	Department's response
32.	AR 3.3.6	The Licence Holder provided additional commentary regarding the highly disturbed areas of the Woljenup Creek catchment area and advised that a lower level of species protection may be appropriate for these areas. The Licence Holder commented that TSF4 represents a negligible fraction of both the catchment area and catchment contribution to the moderately disturbed ecosystem of the middle Blackwood River and therefore it is inappropriate to assess TSF4 impacts and risk using criteria applicable to a moderately disturbed ecosystem and that the proposed guidelines values are appropriately conservative and precautionary.	The department has noted these comments made by the Licence Holder but maintains its position that the text in this section is relevant and reflects advice provided from the department's aquatic science experts. The department has noted several times within the report that these site specific water quality guidelines are accepted as an interim. The department does not accept the Licence Holder's request to remove wording from this section.
33.	AR 3.3.6	The Licence Holder has provided the "Tailings Storage Facility 4 Cell 1 Clay Liner Scour Remediation (GHD, 2024b) is enclosed in the response to provide evidence that the scouring event was repaired appropriately as to not be a significant preferential pathway for seepage through the TSF liner.	The department has reviewed the report and have made additional comments regarding the information and conclusions.
34.	AR 3.4.5	The Licence Holder confirmed that the EDP underdrainage was constructed generally in accordance with the GHD (2022) design report.	Noted, the department reviewed the design report as part of the assessment and has amended wording to include this confirmation from the Licence Holder.
35.	AR Table 6	Following up on the department's request, the Licence Holder has confirmed that the disposal location for the dried tailings removed from the Emergency Disposal Pond will be in TSF4.	Noted and wording updated.
36.	AR 3.3.2	The Licence Holder provided comments on the DWER assessment of seepage migration to clarify the hydrogeology of the area and the aquifers below and surrounding the TSF4 area. The Licence Holder has provided comment on the DWER's review of the hydraulic conductivity and references to potential preferential pathways that may exist in the aquifers below TSF4.	DWER has re-engaged the internal principal hydrogeologist to address and review the additional commentary made by the Licence Holder. DWER has included this additional information and response to comments made in section 3.3.2 of the Amendment Report.
37.	AR Table 8 and section 3.3.4 & 3.3.6	In the response to a Request for Further Information (as part of assessment for W6901/2024/1 and received 5 June 2024) the Licence Holder has advised that Woljenup Creek water is not used for potable purposes. Due to this, the Licence Holder is proposing that the department's assessment for this risk event, specifically the consequence rating and any wording reflects this new information.	The department has conducted its own additional external consultation with residents along Woljenup Creek and have received recent comment from those at the previously indicated drinking water receptor and have confirmed that the surface water along Woljenup Creek is used for potable purposes. Due to this confirmation, the department does not support any changes to the risk rating for this event.
38.	AR 3.3.6 and Table 17 of the Licence.	The Licence Holder has provided comments on the proposed suite of analytes for the ambient groundwater monitoring for the new downstream monitoring bores. 1. The Licence Holder has advised that extensive site-specific risk assessment, including laboratory analysis and waste samples has not identified aluminium, beryllium or iron as contaminants of potential concerns; and 2. The Licence Holder has advised that detailed technical studies based on both material test work (compositional analysis and leach testing, as well as extensive surface and groundwater monitoring) to characterise the potential contaminants of concern associated with materials being mined (waste rock, ore and tailings). Beryllium, cobalt, iron, magnesium, radium and thorium have not been identified as contaminants of potential concern associated with potential discharges.	Whilst the department notes the Licence Holder's comments requested a reduced suite of analytes for groundwater monitoring bores associated with TSF4, it is considered that this suite is appropriate for monitoring at this new facility and is consistent with the suite for the other monitoring bores around the site. The department disagrees with this request and suggests that monitoring be undertaken in accordance with the draft condition (and suite of analytes) until such time that a review of site groundwater monitoring can be undertaken and a reduction of the suite can be requested if the risk profile demonstrates this to be acceptable. Upon review of this request and results derived regarding contaminants of concern, the department considers that there were several analytes that were missed in the first draft. Justification for the changes made to the suite are further discussed in amended wording in section 3.3.6.

Appendix 2: Summary of Licence Holder's comments on risk assessment and draft conditions (Draft 2)

Item	Condition / Section	Summary of Licence Holder's comment	Department's response
1.	Cover page of Licence Licence History Throughout Amendment Report (AR)	The Licence Holder has requested the same change as item 1 of Appendix 1. On 25 July 2024, the Licence Holder has submitted the Environmental Compliance Report for the expansion to WWTP to stage 2 187.5 m ³ /day. The Licence Holder is requesting this to avoid additional licence amendment for this change and administrative burden. The Licence Holder has advised that they will only begin disposing treated effluent from the expanded WWTP once the Environmental Commissioning Report is submitted to DWER.	The department has accepted this request noting that the construction and operational aspect associated with these works have been assessed and authorised under W6832/2023/1, and that following the provision of the 1 st draft, the Licence Holder submitted the Environmental Compliance Report for the stage 2 works. Noting that environmental commissioning activities are ongoing, the Licence Holder will only be authorised to discharge to a throughput of 125m ³ /day until such time that the Environmental Commissioning Report under W6832/2023/1 is submitted to the department.
2.	Table 1, row 3, column 2	Licence Holder is requesting to fix a typographical error.	Noted and corrected.
3.	Table 7, line item 1 (column 3), item (d)	The Licence Holder is requesting again to remove this condition for the reasons as noted in item 9 of Table in Appendix 1 for the excavation of over 9 ha from TSF1.	As part of the initial request, the department conducted a preliminary review and determined that the removal of this condition will require further review and in the interests of efficiency at this time, that this review be conducted separately to this current Licence amendment. The delegated officer recommends requesting this change in a future amendment where the department will be able to investigate the origins of this condition to determine whether the requested change is acceptable.
4.	Table 7, line item 1 (column 3), item (e)	The Licence Holder is requesting again to update this text to be changed to 1 ha. The Licence Holder states that it is not possible to mine a 10 x 10 m block and confirmed again that the mining block sizes have been 100 m x 100 m (1ha).	The department has acknowledged the Licence Holder's comments and reviewed past supporting documentation provided regarding this activity and has determined that this was likely to be an error. The department has updated this accordingly.
5.	Condition 25	The Licence Holder reiterated comments made for first draft that monthly water balance monitoring is unnecessarily frequent, and that quarterly monitoring will be sufficient. However, monthly monitoring is accepted. The Licence Holder requested for water balance monitoring to be required to be begin in September 2024 to allow for sufficient time to install and commission the hardware and software required. The Licence Holder also requests additional time to source, install, commission and calibrate evaporation measurement in accordance with the McJannet <i>et al</i> (2022). To be specific, the Licence Holder confirmed that they will continue to monitor water balance but request additional time to implement the revised evaporation method.	The department has accepted the Licence Holder's request regarding the request for additional time. The Licence Holder is only required to begin water balance monitoring from 30 September 2024, and the use the McJannet <i>et al</i> (2022) methodology for calculating evaporation from 31 January 2025.
6.	Table 13	The Licence Holder is requesting to remove the requirements to monitor at the Osiris North and Osiris South-Southeast monitor. The Licence Holder has advised that the Osiris monitors are used for internal monitoring and trigger identification but are not appropriate for statutory (licence) compliance monitoring and that the TEOM monitors are capable of measuring the same parameters with more robust methodology (recognised by Australian Standards).	The department acknowledges that as part of this amendment process, ambient air quality monitoring requirements have been updated to reflect ongoing improvements to the monitoring network, including the addition of Australian Standard compliant air monitors and the inclusion of trigger action response/management criteria for PM ₁₀ . The Department considers that these changes enable aspects of Table 13 to be revised during this amendment, such as replacing Osiris monitors with TEOM monitors for management action and response. At this stage however, and acknowledging further reviews are required, the department will retain the requirement for monitoring TSP until such time where its potential removal from the licence can be considered in detail.
7.	Table 13	The Licence Holder reiterated the request made in line item 13 of Appendix 1 regarding updating the methodologies and monitoring periods for the PM10 high-volume sampler requirements.	Please refer to the department's response to line item 13 of Appendix 1.
8.	Table 15, Table 19 and Table 22	As per line item 14 of Appendix 1, the Licence Holder is requesting that the removal of Osiris monitors from management actions on the licence.	The department met with the Licence Holder on 11 July 2024 to discuss their position further and understand the request to remove the Osiris monitors. On 30 July 2024, the Licence Holder provided the siting audit and report for the northern TEOM monitor. The departments review and response regarding this requested is summarised in section 5.
9.	Table 26	The Licence Holder provided coordinates for all monitoring locations associated with the annual ecological assessment.	Table 26 updated.
10.	Figure 17	The Licence Holder has provided an updated figure showing all monitoring locations associated with the annual ecological assessment.	New Figure included.
11.	AR Table 8	As in item 37 of Appendix 1, the Licence Holder has reiterated that they have confirmed that Woljenu Creek water is not used for potable purposes and therefore 'drinking water' should be removed from 'potential impacts to downstream residential groundwater and surface water users (drinking water and consumption of aquatic species) and therefore cannot be considered to be high risk as water is not known to be consumed and the pathway is therefore occasional consumption of aquatic species consistently shown to have low levels of contaminants present. This change, including reduction to medium risk, is required to contextualise the conditioned monthly water balance monitoring, in particular the excessive frequency of calculation and overly onerous evaporation measurement.	As the noted in the department's response to item 37 in Appendix 1, the department conducted its own additional external consultation with residents along Woljenu Creek and received confirmation regarding the use of water along Woljenu Creek for potable purposes. The department does not support any changes to the major risk rating for this event. At this time, the department will maintain the high risk rating for the justifications outlined in section 3.3.6, however acknowledge that this rating may be revised for future assessments, noting that environmental monitoring data required within the Licence (existing and included as part of this amendment) and recent works approval W6901/2024/1 will inform future risk assessments.
12.	AR section 3.3.4	As per item 11, the Licence Holder requests removal of text regarding drinking water users along Woljenu Creek.	As per the response to item 11, the department does not accept this change.
13.	AR section 3.3.6	As per item 11, the Licence Holder requests the risk rating be changed to moderate instead of major .	As per the response to item 11, the department does not accept this change.

Appendix 3: Application validation summary

SECTION 1: APPLICATION SUMMARY						
Application type						
Amendment to licence	<input checked="" type="checkbox"/>	<table border="1"> <tr> <td>Current licence number:</td> <td>L4247/1991/13</td> </tr> <tr> <td>Relevant works approval number:</td> <td>W6618/2021/1 (TSF4) W6835/2023/1 (Village WWTP)</td> </tr> </table>	Current licence number:	L4247/1991/13	Relevant works approval number:	W6618/2021/1 (TSF4) W6835/2023/1 (Village WWTP)
Current licence number:	L4247/1991/13					
Relevant works approval number:	W6618/2021/1 (TSF4) W6835/2023/1 (Village WWTP)					
Date application received	22/12/2023					
Applicant and Premises details						
Applicant name/s (full legal name/s)	Talisson Lithium Australia Pty Ltd					
Premises name	Talisson Lithium Mine					
Premises location	Mining tenements M01/3, M01/6, M01/7, M01/8, M01/9 and M1/16					
Local Government Authority	Shire of Bridgetown-Greenbushes					
Application documents						
HPCM file reference number:	2012/0071641~12					
Key application documents (additional to application form):	8A. TSF4 Detailed design report (GHD, 2021a) 8B. TSF4 BGM liner cell 1 design report (GHD, 2023a) 8C. TSF4 Supporting information for Staged commissioning (2023b) 8D. Environmental Review of replacing clay liner with BGM in TSF4 Cell 1(GHD, 2023c) 8E. WWTP Installation, Operation and Maintenance Manual 8F. Recycled Water Quality Management Plan Framework (GHD, 2023e) 8G. Emergency Dump Pond Design Report (GHD, 2022a) 8H. Air Quality Impact Assessment (ETA, 2023) 8I. TSF4 Seepage Assessment - Site Specific Water quality guidelines (GHD, 2023f) 8J. TSF4 Seepage Assessment - Clay attenuation testing of saprolitic profile beneath TSF4 (GHD, 2023g) 8K. TSF4 Seepage Assessment - Short-term LEAF testing (GHD, 2023h) 8L. TSF4 Seepage Assessment - Woljenup Creek Hydrological Assessment (GHD, 2023i) 8M. TSF4 Seepage Assessment – Conceptual Hydrological Model (GHD, 2023j)					
Scope of application/assessment						
Summary of proposed activities or changes to existing operations.	As per section 2.2 of this Amendment Report.					
Category number/s (activities that cause the premises to become prescribed premises)						
Table 1: Prescribed premises categories						
Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity				
Category 5: Processing or beneficiation of metallic or non-metallic ore	7,100,000 tonnes beneficiated per annual period. 5,000,000 tonnes of tailings deposited per annual period	Increase to 5,200,000 tonnes of tailings deposited per annual period				
Category 54: Sewage facility: premises	187.5 m ³ per day	Currently on W6835/2023/1, to be transferred to licence L4247/1991/13				
Legislative context and other approvals						
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Assessed under Part IV <input checked="" type="checkbox"/>				

Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Ministerial statement No: 1111 EPA Report No: 1635
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Reference No: EPBC 2018/8206 and EPBC 2013/6904.
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Mining lease / tenement <input checked="" type="checkbox"/> Expiry: 2026-2044
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	<i>Mining Act 1978</i> applies.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	CPS No: 5056/2 No additional clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: Licence/permit No: Licence / permit not required.
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A Type: Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Regional office:
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A Priority: N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Is the Premises subject to any other Acts or subsidiary regulations.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<i>Mining Act 1978</i> <i>Contaminated Sites Act 2003</i> <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Classification: contaminated – restricted use (C–RU) Date of classification: 2015