Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

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

Licence Number	L6420/1988/14
Licence Holder	Kalgoorlie Consolidated Gold Mines Pty Ltd
ACN	009 377 619
File Number	APP-0029372
Premises	Fimiston Processing Plant KALGOORLIE WA 6430 Legal description – Mining tenements M26/39, M26/46, M26/78, M26/81, M26/83, M26/86, M26/86, M26/95, M26/266, M26/267, M26/268, M26/294, M26/308, M26/326, M26/359, M26/373, M26/377, M26/379, M26/383, M26/405, M26/448, M26/451, M26/454, M26/503, M26/518, M26/715, M26/748, M26/778, M26/800. General purpose lease G26/15, G26/44, G26/45, G26/46, G26/47, G26/48, G26/49, G26/50, G26/51, G26/52, G26/53, G26/54, G26/55, G26/56, G26/57, G26/58, G26/59, G26/60, G26/61, G26/62, G26/63, G26/64, G26/65, G26/66, G26/67, G26/68, G26/70, G26/71, G26/73, G26/74, G26/75, G26/76, G26/77, G26/78, G26/82, G26/83, G26/84, G26/85, G26/86, G26/99, G26/100, G26/101, G26/102, G26/103, G26/104, G26/105, G26/106, G26/107, G26/138, G26/139, G26/140, G26/141, G26/142, G26/143, G26/144, G26/145, G26/149, G26/159, G26/160, G26/165, G26/166 Miscellaneous licence L26/267 As defined by the Premises maps attached to the Revised Licence
Date of Report	15 August 2025
Decision	Revised licence granted

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1. Decision summary

Licence L6420/1988/14 is held by Kalgoorlie Consolidated Gold Mines Pty Ltd (Licence Holder) for the Fimiston Processing Plant (the premises), located in Kalgoorlie, Western Australia.

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 construction and operation of the premises. As a result of this assessment, Revised Licence L6420/1988/14 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 Overview of premises

The Licence Holder currently undertakes gold ore processing at the premises at a production capacity of 14,500,000 tonnes per annual period. Tailings produced is subsequently deposited into tailings storage facilities (TSF) at the premises, including (i) Fimiston I (FIM I) TSF, (ii) Fimiston II (FIM II) TSF, and (iii) Kaltails TSF. General characteristics of the TSFs are detailed in Table 1.

Table 1: General characteristics of TSFs at the premises

TSF	Description	Current authorised elevation of embankment crest	Final design elevation of embankment crest
FIM I TSF	Aboveground single-cell TSF	410.9 mRL (Stage 4)	418.9 mRL (Stage 7)
FIM II TSF	Aboveground paddock TSF, comprising three initial cells: AB, C, and D.	Between 400.2 mRL and 409.4 mRL (Stage 4), varying by cell.	Between 406.2 mRL and 415.4 mRL (Stage 6), varying by cell.
	Aboveground paddock TSF, comprising two extension cells: E and F[1].	Between 362.5 mRL and 370 mRL (starter embankment), varying by cell[2].	Between 381.5 mRL and 389.5 mRL (Stage 8), varying by cell.
	Aboveground paddock TSF, comprising an extension Cell G[3].	359.5 mRL (starter embankment).	382 mRL (Stage 8).
Kaltails TSF	Aboveground paddock TSF, comprising two cells: East and West.	Between 392.5 mRL and 395.0 mRL (Stage 6), varying by cell.	Between 392.5 mRL and 395.0 mRL (Stage 6), varying by cell.

Note 1: FIM II TSF Cells E and F were constructed at a later stage compared to the initial cells AB, C, and D. Construction of Cells E and E starter embankment has been authorised under works approval W6496/2021/1, granted on 7 July 2021.

Note 2: Tailings deposition to the FIM II TSF Cells E and F is currently authorised under time limited operation of works approval W6496/2021/1.

Note 3: Construction of the FIM II TSF Cell G will be undertaken at a later stage compared to the other cells AB, C, D, E and F. Construction of the Cell G starter embankment has been authorised under works approval W2940/2025/1, granted on 11 June 2025.

Note 4: Tailings deposition to the FIM II TSF Cells G will be authorised under time limited operation of works approval W2940/2025/1, upon construction of the infrastructure and submission of the relevant critical containment infrastructure report to the department.

2.3 Application summary

On 6 June 2025, the Licence Holder submitted an application to the department to amend licence L6420/1988/14 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought[1]:

- To operate FIM II TSF Cells E and F starter embankments to maximum heights of 359.5 mRL and 367.0 mRL, respectively;
- To construct and operate FIM II TSF Cells E and F Stage 1 embankment raise, to maximum heights of 362.5 mRL and 370.0 mRL, respectively;
- To construct and operate FIM II TSF Stage 5 embankment raise, to maximum height of 413.9 mRL;
- To modify the prescribed premises boundary to include the FIM II TSF Cells E and F, comprising additional mining tenements M26/503, and M26/778; and
- To modify Schedule 1 Table 1 and 2 to remove decommissioned monitoring bores and include new monitoring bores.

This amendment is limited only to changes to Category 5 activities from the existing licence. No changes to the aspects of the existing licence relating to Category 12, 54, 63, or 64 have been requested by the Licence Holder.

Table 2 below outlines the proposed changes to the existing licence.

Table 2: Proposed throughput capacity changes

Category	Current throughput capacity	Proposed throughput capacity	Description of proposed amendment
Category 5: Processing or beneficiation of metallic or non-metallic ore	14,500,000 tonnes per annual period	N/A	• Operate FIM II TSF Cells E and F starter embankment. • Construct and operate FIM II TSF Cells E and F Stage 1 embankment raise and FIM I TSF Stage 5 embankment raise. • Update licensed groundwater monitoring bore network.
Category 12: Screening	2,000,000 tonnes	N/A	No amendment proposed.

[1] Further amendments relating to FIM I TSF, FIM II TSF, and modifications to the existing groundwater monitoring program were initially sought. However, the Licence Holder revised the scope of the amendment to its current state on 30 July 2025 to streamline the assessment.

Category	Current throughput capacity	Proposed throughput capacity	Description of proposed amendment
etc. of material	per annual period		
Category 54: Sewage facility	110 m^3 per day	N/A	No amendment proposed.
Category 63: Class I inert landfill site	15,000 tonnes per annual period	N/A	No amendment proposed.
Category 64: Class II putrescible landfill site	10,000 tonnes per annual period	N/A	No amendment proposed.

2.3.1 FIM II TSF Cells E and F

Background

The FIM II TSF was initially constructed as a single-cell TSF in 1991. Over time, additional cells were constructed, resulting in a multi-cell paddock TSF. The FIM II TSF Cells E and F were designed to be extension cells to the existing FIM II TSF, which had previously consisted of only three cells: Cell AB, Cell C, and Cell D. Works approval W6496/2021/1 was granted on 7 July 2021 to authorise construction of the Cells E and F starter embankments to the south-east and east of the existing facility, respectively.

Critical containment infrastructure reports for Cells E and F were submitted to the department on 27 March 2024 and 20 June 2024, respectively. The specifications of the constructed FIM II TSF Cells E and F are summarised in Table 3.

Table 3: Design specifications of FIM II TSF Cells E and F

Parameter	Cell E	Cell F
Commencement of construction	February 2023	February 2023
Practical completion	January 2024	May 2024
Compliance report submission	27 February 2024	20 June 2024
Department assessment	26 November 2024	26 November 2024
Area	145 hectares	145 hectares
Preparatory works	Prior to construction, the cell footprint area was cleared and grubbed all the way to the outside of the stormwater channel. All trees, bush and other vegetation matter were mulched *in situ* and moved to designated topsoil stripping areas. Unsuitable topsoil was stripped to the design level.	
Foundation preparation	The cell footprint area was ripped, moisture conditioned and compacted to depth of 300 mm. This was achieved for most of the starter embankment footprint.	

Parameter	Cell E	Cell F
	However, alternate foundation preparation measures were required at discrete locations along the embankment due to encountered foundation material, including cemented clay, caprock, uncontrolled rock fill, and creek bed foundation (at Cell F).	
Embankment construction	Starter embankments were constructed by loosely placing clay material in 300 mm lifts, which was then moisture conditioned, levelled and compacted to meet a standard maximum dry density of at least 95% and optimal moisture content (±2% variance). Compaction testing was undertaken, with locations that were non-compliant having been re-worked and re-tested to determine whether they met the intended design strength and permeability. Integration of Cell E into the existing Cell C was done by excavating 300 mm benches in 300 mm lifts, exposing the competent surface of the existing embankment. The competency of the exposed surface was tested through standard compaction testing.	
Embankment height	Constructed to a maximum height of RL 359.5 mRL, approximately 8 m above ground. On average, surveyed embankment crest was approximately 0.2 m above design elevation. A freeboard marker was installed approximately 300 mm below the starter embankment crest.	Constructed to a maximum height of RL 367.0 mRL, approximately 7.5 m above ground. On average, surveyed embankment crest was approximately 0.3 m above design elevation. A freeboard marker was installed approximately 300 mm below the starter embankment crest.
Decant system	A floating turret system fitted with a skid-mounted surface pump was installed for decant water recovery. Return water is pumped to and stored at existing Decant Pond 3, located adjacent to Cell C. Decant Pond 3 is lined with high-density polyethylene (HDPE). Pipelines between the decant accessway and Decant Pond 3 are equipped with automatic cut-outs in the event of potential pipe failure.	
Underdrainage system	An underdrainage system was installed by placing perforated underdrainage pipes in trenches and covered in coarse and fine filter material. Where ground condition did not meet design specifications, additional treatment was undertaken (e.g., geofabric lining, capping material, etc.). The underdrainage system was installed to run along the upstream embankment toe, as well as the final designed location of the decant pond around the centre of the cell. A primary outflow pipe was installed at the Cell E south-west embankment, where seepage will flow into two underdrainage collection sumps. A secondary outflow pipe was installed at the western end of the Cell E and Cell F dividing embankment to allow seepage from the Cell F underdrainage system to drain into the Cell E underdrainage system (and eventually through the primary outflow pipe).	
Toe drain	External toe drains were constructed approximately 20 m from the downstream embankment toe, grading towards the toe drain sump. Toe drains were excavated to a minimum depth of 1 m, with side better slopes	

Parameter	Cell E	Cell F
	of 1V:3H.	
Stormwater drain	Stormwater drains were constructed approximately 70 m from the downstream embankment toe, grading towards the toe drain sump. Toe drains were excavated to a minimum depth of 1.4 m, with side better slopes of 1V:3H. The drains contain sufficient capacity to contain a 1:100 annual exceedance probability (AEP) storm event.	
Stormwater attenuation pond	The stormwater attenuation pond, designed to collect and store stormwater diverted by the stormwater drains away from the Cell E and F embankments, has not been constructed to date. The construction of the infrastructure was not undertaken to minimise the total development area. The Licence Holder has proposed to undertake the works at a later stage, if it is determined to be necessary. A temporary overflow into the toe drains has been constructed to allow the stormwater drain to overflow into the toe drain sump.	
Seepage recovery bores	Four seepage recovery bores have been installed along the south-west embankment (Figure 1). The seepage recovery bores are typically equipped with flowmeters, pressure transmitters and pump set at specified depths.	Two seepage recovery bores have been installed along the north-west embankment (Figure 1). The seepage recovery bores are typically equipped with flowmeters, pressure transmitters and pump set at specified depths.
Groundwater monitoring bores	A total of 10 groundwater monitoring bores were installed in 2023 (Figure 1). Six monitoring bores were installed at the perimeter of Cells E and F to provide early warning of seepage influences from the FIM II TSF. Four monitoring bores were installed further away from the FIM II TSF to act as regional bores for monitoring the receiving groundwater environment. These bores were planned to be used as compliance monitoring locations.	

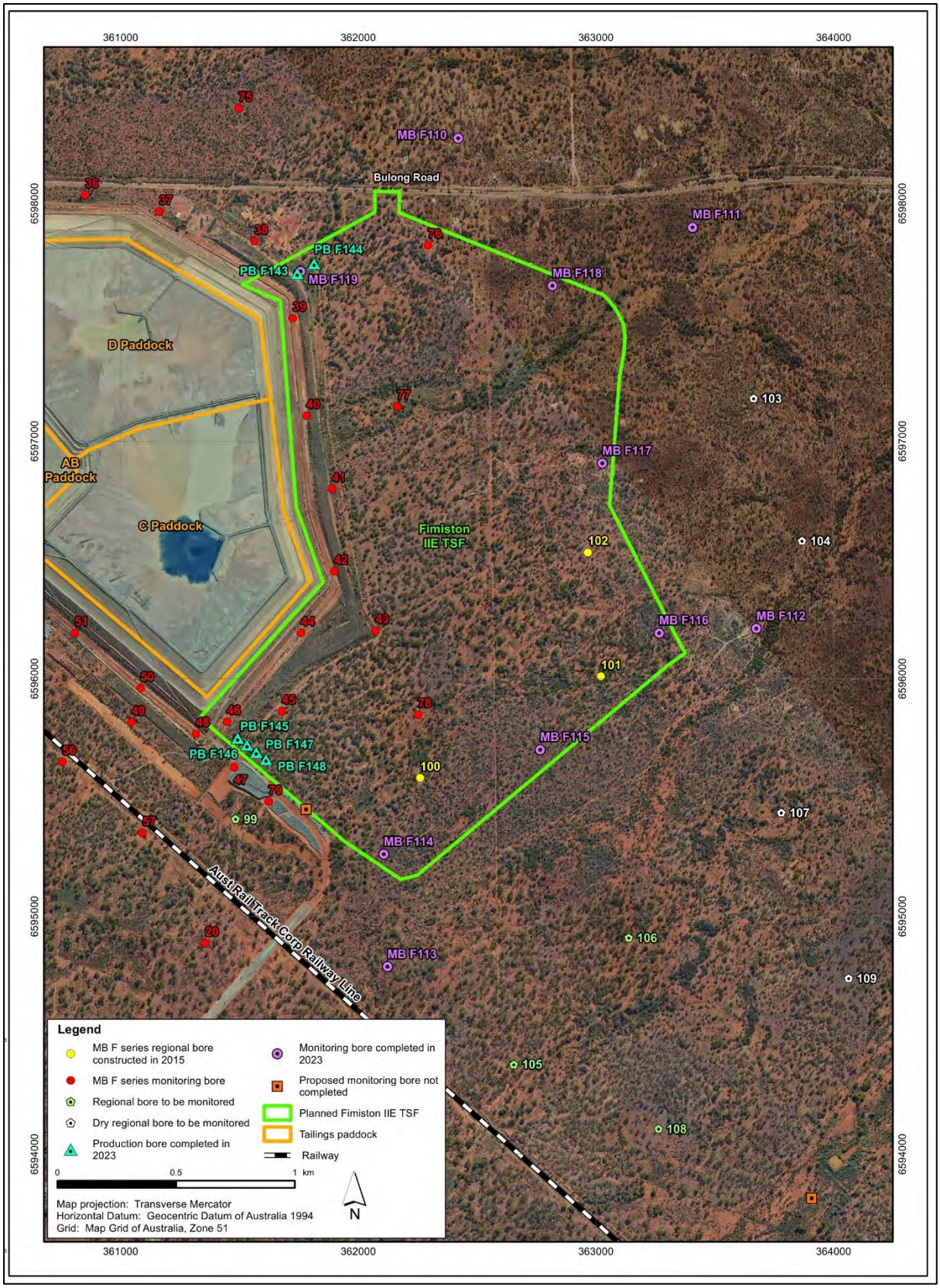

Figure 1: Monitoring bores and seepage recovery bores installed for FIM II TSF Cells E and F

Construction of the Stage 1 embankment raise

The Licence Holder has proposed to construct the Stage 1 embankment raise to the FIM II TSF Cells E and F. The upstream embankment raise will consist of two phased 1.5 m raises, which will increase the maximum embankment elevation to 362.5 mRL and 370.0 mRL at Cells E and F, respectively. To achieve this, tailings will be excavated from existing tailings beaches at the premises and placed onto the existing Cells E and F starter embankments in layers not exceeding 500 mm in compacted thickness, moisture conditioned and compacted to meet the following design specifications:

- Upstream and downstream embankment slope of 1V:1.5H and 1V:4H, respectively;
- Downstream embankment will be constructed such that it is a continuous slope to the embankment toe, with no benches during each embankment raise;
- Compacted with standard maximum dry density of 95% or higher;
- Moisture conditioned to optimal moisture content, with allowable variance of +2% to -4%; and
- Compaction testing undertaken in accordance with *Methods of testing soils for engineering purposes, Method 5.4.1: Soil compaction and density tests – Compaction control test – Dry density ratio, moisture variation and moisture ratio*.

The embankment crest will have a 2% inward crossfall to direct surface water into the tailings beach within each cell. A safety bund will be constructed on the downstream side of the embankment crest, while the tailings delivery pipeline will be reinstated on the upstream side, forming a safety bund. The downstream embankment slope will also be covered with appropriate rock capping to minimise erosion of the embankment.

The Stage 1 embankment raise will also see the decant accessway raised by placing low permeability borrow material in layers not exceeding 500 mm in compacted thickness. The accessway will be raised using centreline construction method, with nominal side slopes of 1V:2H.

The relevant tailings delivery and return water pipelines will be reinstated following completion of embankment construction.

Operation of the FIM II TSF Cells E and F starter embankments and Stage 1 embankment raises

During operation of the FIM II TSF Cells E and F, tailings slurry, at around 45% to 55% solids by mass, will be pumped to the facility and discharged through multiple spigots around the perimeter embankment crest. Tailings deposition will be rotated to form and maintain a tailings beach that grades towards the decant inlet located near the centre of the cell. The rotation of tailings deposition will also allow tailings to dry and consolidate sufficiently prior to future embankment raises.

Water from the decant pond that forms at the centre of each cell will be recovered via skid-mounted surface pump that is able to abstract water from a pond to a minimum depth of 250 mm (Figure 2a; Figure 2d). The pump type allows the pond depth and extent to be minimised as much as practicable. The recovered decant water will be sent to the existing Decant Pond 3 for temporary storage and chemical cyanide destruction, before ultimately being sent to the Fimiston Processing Plant for reuse in the processing circuit. The Licence Holder estimated around 20% to 30% of process water contained within the tailings slurry to become available for recovery and reuse under normal operating conditions. Tailings deposition and decant water recovery strategy will remain the same throughout the operational life of the facility.

Seepage management infrastructure will be operated at the FIM II TFS Cells E and F, including

an underdrainage system that spans the upstream toe of the starter embankments and the central decant pond (Figure 2e; Figure 2f), an external toe drain (Figure 2b; Figure 2c), and several seepage recovery bores (Figure 2e; Figure 2g). These infrastructure are expected to continue operating throughout the proposed and future embankment raises to Cells E and F.

Figure 2: Photographs of FIM II TSF Cells E and F – (a) return water pipelines along decant accessway, (b) water management infrastructure, (c) water management infrastructure, (d) decant pump and return water pipeline layout, (e) underdrainage system, toe drainage and seepage recovery bore layout, (f) underdrainage sump, (g) pumps for seepage recovery bores, (h) freeboard marker on upstream embankment

2.3.2 FIM I TSF

Background

The FIM I TSF is located north of the Fimiston open pit and is approximately 125.5 hectares in size. Initially comprising four cells when tailings deposition began in 1989, the cells had since been amalgamated into two cells, and now a single cell. The current footprint of FIM I TSF also incorporated adjacent north and south cells of the Croesus TSF. Tailings deposition to FIM I TSF ceased in mid-2013 when the then-maximum authorised embankment height was reached.

Between 2013 and 2017, the FIM I TSF was utilised to store and evaporate excess wastewater from the Gidji Processing Plant (outside of the prescribed premises).

Licence L6420/1988/14 was amended on 15 December 2017 to authorise construction of further embankment raises for FIM I TSF, up to 418.9 mRL (Stage 7). At the time, operation of only the Stage 1 and Stage 2 embankment raises were authorised, with the remaining embankment raises subject to further risk assessment. Currently, licence L6420/1988/14 authorises the operation of the Stage 4 embankment raise at 410.9 mRL.

Operation of the FIM I TSF Stage 5 embankment raise

The FIM I TSF Stage 5 embankment raise comprises of two lifts of 1.5 mm, with a maximum embankment height of 413.9 mRL. Operation of the Stage 5 embankment raises is expected to be consistent with current operation at the facility. In terms of tailings deposition and decant water recovery strategy, the FIM I TSF operates similarly to the FIM II TSF Cells E and F, described in Section 2.3.1.

Unlike FIM II TSF Cells E and F, FIM I TSF is not equipped with an underdrainage system. A seepage interception trench extends along the northern and north-eastern perimeter of the FIM I TSF (Figure 3). Additionally, seepage recovery bores have been installed along the northern and north-eastern perimeter (Figure 4). Recovered seepage is then pumped back to the Fimiston Processing Plant.

2.3.3 Modification to groundwater monitoring bore network

As part of the construction of the FIM II TSF Cells E and F, works approval W6496/2022/1 required the installation of groundwater monitoring bores, as well as seepage recovery bores, to manage potential seepage emitted from the newly constructed cells.

Monitoring bores MB F110 to MB F113 (n=4) were installed as compliance monitoring bores, while monitoring bores MB F113 to MB F119 (n=6) were installed as operational monitoring bores (Figure 1).

Furthermore, seepage recovery bores PB F145 to PB F148 (n=4) were installed along the south-western embankment of FIM II TSF Cell E, near the dividing wall between Cell C and E (Figure 1).

Conversely, monitoring bores MB F39 to MB F46 and MB F77 (n=9) will be removed from the amended licence (Figure 1). These monitoring bores were decommissioned in March 2023 as they were present along the eastern perimeter of FIM II TSF Cells C and D, which became the footprint of the newly constructed Cells E and F.

As a result of the construction of the FIM II TSF Cells E and F, existing monitoring bores MB F47 and MB F79 have been reclassified from operational to compliance monitoring bores, as they now abut the south-western embankment of the newly constructed Cell E (Figure 3).

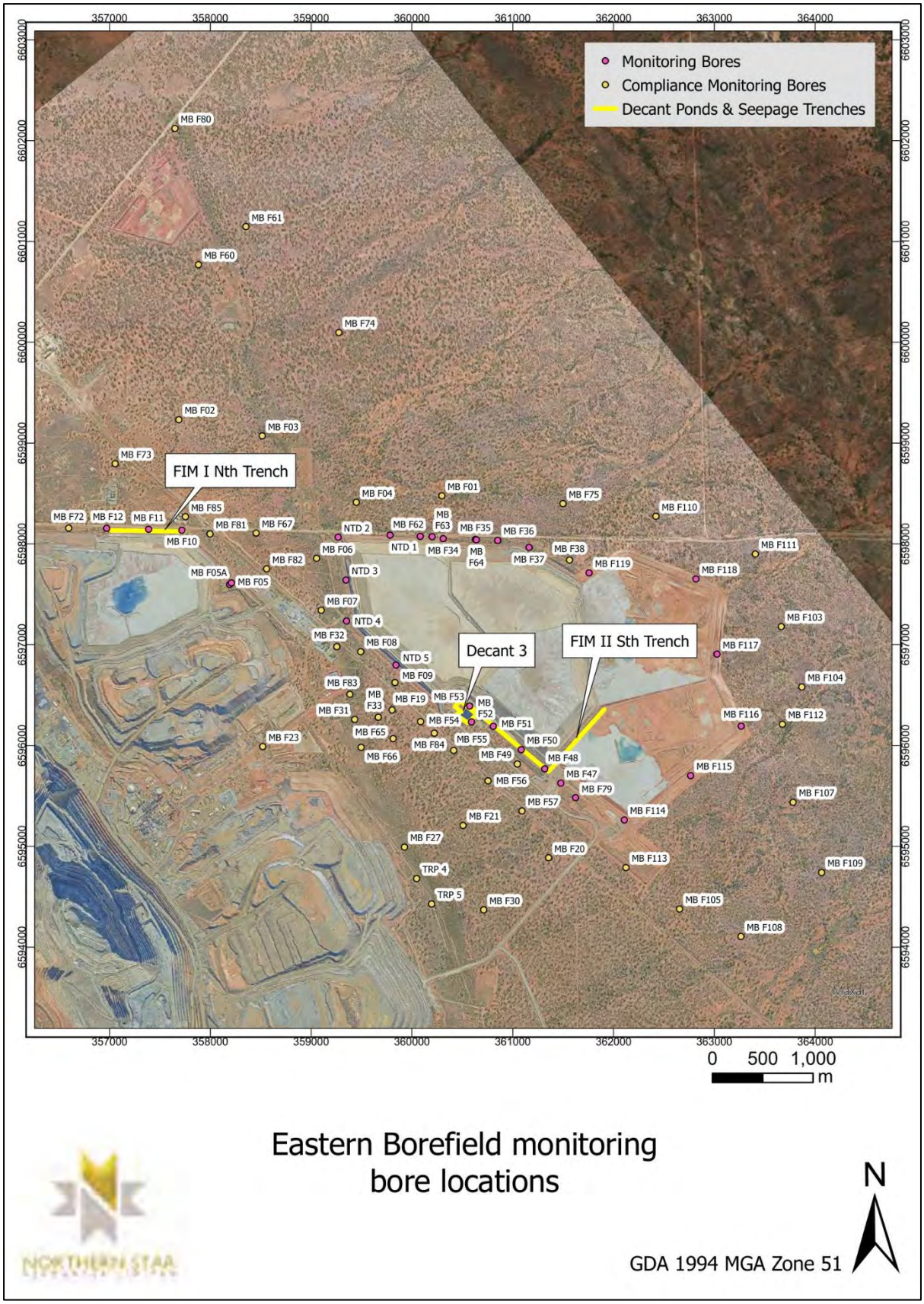

Figure 3: Current groundwater monitoring bore network and seepage interception trenches for FIM I and FIM II TSF

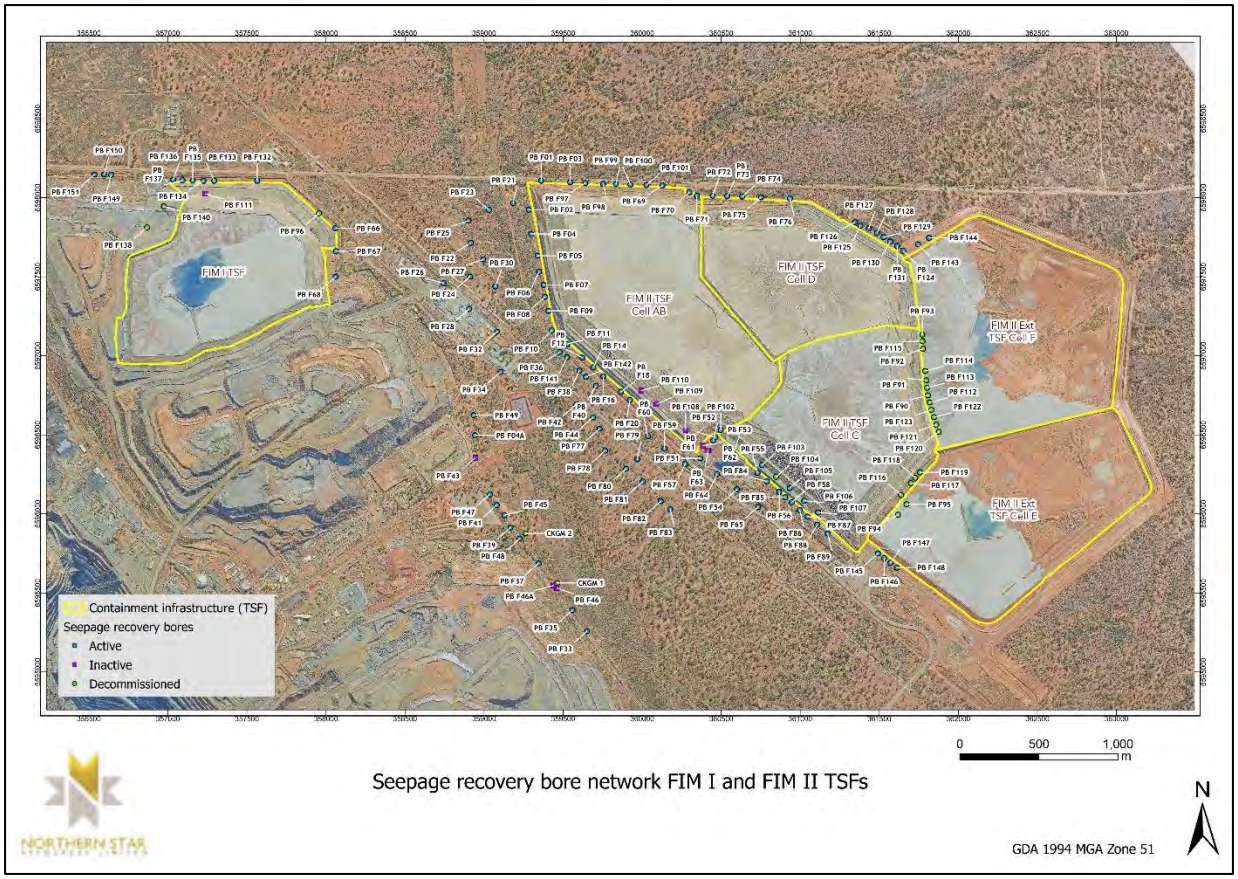

Figure 4: Current seepage recovery bore network for FIM I and FIM II TSF

2.3.4 Administrative changes to the licence

In addition, the Licence Holder has requested a number of administrative changes to the existing licence to reflect the current operational status of the premises, as summarised in Table 4.

Table 4: Administrative amendments

Condition in existing licence L6420/1988/14	Description	Amendment
Condition 7	Well construction requirements to replace decommissioned bores.	Condition is redundant, as the relevant monitoring bores were constructed on 9 February 2025. Condition is removed from the amended licence. Monitoring of these bores have already been specified in Table 2 of Schedule 1 in the existing licence.
Condition 8	Well construction reporting requirements (related to condition 7).	Condition is redundant, as the relevant well construction report was submitted to the department on 28 May 2024 and 13 June 2025. The reports were assessed by the department on 16 September 2024. Condition is removed from the

Condition in existing licence L6420/1988/14	Description	Amendment
		amended licence.
Condition 10	Authorised air emission points.	Temporary emission stack (TS) does not reflect current site layout, as the stack was removed following completion of upgrade works to the gold room furnace. The emission point is removed from Table 11 in the amended licence. The figure showing authorised emission points in Schedule 1: Maps has also been updated.
----	Prescribed premises boundary.	The premises details on the cover page of the amended licence, as well as Figure 1, has been amended to include additional mining tenements M26/503 and M26/778 in the amended licence.
----	Schedule 1: Maps	Updated figures were provided for the following figures: • Maps of waste disposal zones within the Paringa Facility; • Map of monitoring locations 1; • Map of monitoring locations 2; • Map of monitoring locations 3. These figures have been included in the amended licence as Figure 6, Figure 7, and Figure 8.
		The Licence Holder has also requested the removal of figure on the existing licence indicating the location of the pipeline route associated with tailings delivery and return water, along with associated scour pits. The department has not removed the figure as requested as it is considered relevant to specifying infrastructure location for relevant conditions (e.g., condition 4 in the amended licence). The figure has been retained as Figure 3 in the amended licence.
		Table 1 and Table 2 of Schedule 1: Maps were requested to be updated, to remove decommissioned

Condition in existing licence L6420/1988/14	Description	Amendment
		monitoring bores and include newly installed monitoring bores. This has been completed, as detailed in Section 2.3.3.
----	Schedule 2: Construction of replacement monitoring bores	Requested to be removed as the associated works have been completed. The associated conditions were also removed. As such, the existing Schedule 2 has been removed from the amended licence.

2.4 CEO-initiated amendment

2.4.1 Authorised TSF embankment heights

The CEO has decided to initiate an amendment to update construction and operating heights for the FIM II, FIM I, and Kaltails TSF specified under conditions 1, 3, and 5 of the existing licence L6420/1988/14, respectively. Authorised embankment heights are currently specified in metres above ground level.

The department has found recent assessment of environmental compliance reports associated with embankment raises to be challenging, as as-built drawings typically refer to embankment elevations (i.e., in Australian Height Datum or relative level), not height.

Consequently, the department has modified Table 1, Table 5, and Table 7 in the amended licence to specify authorised construction and operating height in metres relative level. This amendment does not modify or change the design of the assessed embankment raises. As such, no updated risk assessment has been undertaken in relation to this amendment.

2.4.2 Extension of licence duration

In July 2020, the Government announced a package of regulatory reforms to streamline approval processes and to aid economic recovery post COVID-19. With these reforms, the CEO implemented an administrative renewal process to fast-track the renewal for licences determined to be lower risk.

This work has reduced timeframes of assessments. However, the CEO proposed to streamline the process further. Where identified as being appropriate to action, the department is extending the duration of licences that are due to expire up to 30 June 2026 through an amendment (i.e., amend to extend). Licence L6420/1988/14 has been identified as a licence suitable to process as an administrative extension to the licence duration.

On 25 February 2025, the Licence Holder was notified of the department's intention to undertake this amendment. The amendment is limited to extending the licence duration by five years. No updated risk assessment has been undertaken at this time, in relation to the extension of the licence duration.

2.4.3 Other changes to licence conditions

Under this amendment, the department has also updated conditions in the existing licence to ensure they are clear and are consistent with current licensing standard conditions.

Specifically, the following conditions in existing licence L6420/1988/14 were amended:

- **Condition 10** – Amended to specify option for the use of telemetry and pressure sensor systems for managing potential pipeline failure. Existing requirements for either automatic cut-outs or secondary containment has been retained as well.
- **Condition 38 and 39** – Amended requirements for environmental compliance reports (associated with construction of TSF embankment raises) to be consistent with current licensing requirements.

2.5 Key considerations

2.5.1 Tailings characterisation

Tailings deposited into the FIM I TSF and FIM II TSF are expected to be from the same tailings waste stream, produced from the processing of ore sourced from the Super Pit (and a small quantity from the Mount Charlotte underground mine) and processed at the Fimiston Processing Plant. The processing circuit includes crushing, SAG and ball milling, followed by flotation, thickening and gold extraction via carbon-in-leach.

Currently, only flotation tailings produced from the Fimiston Processing Plant is deposited at the TSFs at the premises. Concentrate produced at the Fimiston Processing Plant would be trucked to the Gidji Processing Plant (regulated under licence L5946/1988/13) for processing via ultrafine grinding (UFG) to produce a leached flotation concentrate, which is then blended with the Gidji tailings stream and deposited at TSFs at the Gidji Processing Plant.

Under the Licence Holder's Stage 2 Growth Project for the premises, it was proposed that the concentrate would undergo UFG processing at the premises, be blended with the existing flotation tailings stream and deposited to the TSFs at the premises. Given the operational life of the proposed embankment raises, TSFs at the premises are expected to receive both the existing flotation tailings stream, as well as the blended flotation and leached concentrate tailings stream.

An investigation undertaken by WSP (2024) characterised the current tailings streams from both the Fimiston and Gidji Processing Plants, as well as tailings blended from both premises. While the leached flotation concentration from the UFG process was not characterised directly, tailings samples collected from the Gidji Processing Plant does include this tailings stream and is assessed as a proxy. Based on expected tailings feed rate of approximately 60 tonnes per hour to 100 tonnes per hour from the UFG process, against a total tailings feed rate of approximately 3,300 tonnes per hour at the Fimiston Processing Plant (i.e., 1.8% to 3.0%), blend ratios of 1%, 2%, and 3% were used to inform the investigation.

Noting that the Fimiston tailings stream has been assessed by the department previously, this risk assessment will focus on characterisation of the proposed tailings blend that will occur as a result of the Stage 2 Growth Project.

Mineral signatures of the blended tailings were found to be similar to the Fimiston tailings, comprising quartz, dolomite, albite, and mica. Marginal differences in the mineralogical compositions between the two tailings streams were driven by higher pyrite content associated with the Gidji tailings stream.

In terms of acid forming classification, blended tailings contained pH within the alkaline range (8.8 pH unit), with brackish salinity (5,460 µS/cm to 6,850 µS/cm). Total sulfur content was low (0.64% to 1.14%), predominantly present as sulfide (0.59% to 1.14%). The acid neutralising capacity was high, ranging from 205 kg H2SO4/tonne to 209 kg H2SO4/tonne, mainly provided by reactive carbonate minerals such as dolomite. As such, the blended tailings were classified as NAF, based on alkaline net acid generation (NAG) pH and negative net acid production potential (NAPP) (Figure 5; Table 5). When compared to Fimiston tailings, notable

difference was a slight reduction in NAG pH values.

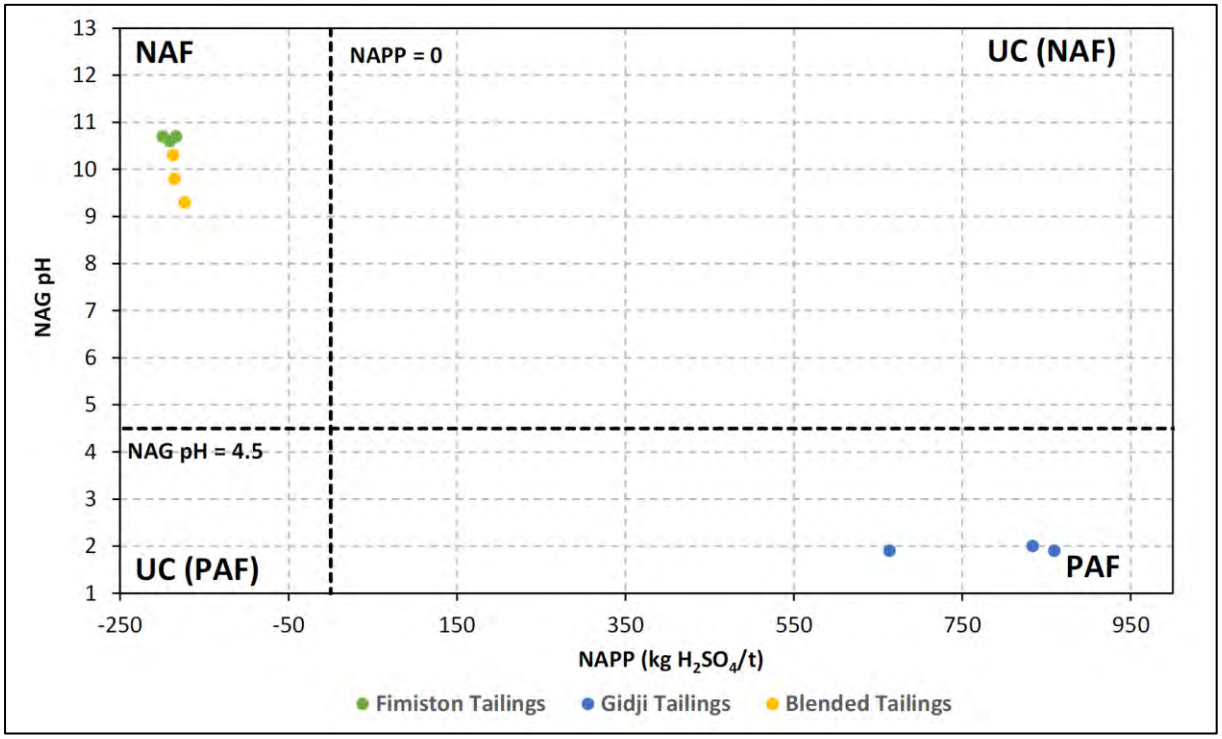

Figure 5: Acid forming classification between tailings streams

Elemental composition of blended tailings was similar to Fimiston tailings, primarily consisting of iron, aluminium, magnesium, calcium, sodium, and potassium, which reflect their mineralogical composition. Based on global abundance indices (GAI), both tailings streams were significantly enriched with arsenic, selenium, antimony, sulfur, tellurium, and tungsten (Table 5). While not significant, the inclusion of the Gidji tailings stream also resulted in some level of enrichment in siler, lead, rhenium, as well as potentially cobalt and molybdenum.

Leachate concentrations between Fimiston tailings and blended tailings stream were similar, though salinity and concentrations of major ions and certain metals and metalloids were higher in the blended tailings leachate (e.g., antimony, arsenic, molybdenum, silver, tungsten) (Table 5), likely due to addition to Gidji tailings. While the analysis of NAG liquor from the Gidji tailings stream significantly increased leachable concentrations of arsenic, cobalt, copper, lead, manganese, and nickel, a similar trend was not observed in the Fimiston tailings (except for aluminium) and blended tailings streams (data not shown).

Although no supernatant was sampled from the blended tailings stream, predictive modelling has indicated that the supernatant water quality was similar to the Fimiston tailings supernatant, except for cobalt, copper, nickel and iron, which was predicted to be of higher concentrations in the blended tailings supernatant (Table 5). The modelling indicated that dissolved metals may be lower than predicted due to processes such as mineral precipitation and surface adsorption, though these were not accounted for in the model predictions.

Overall, the geochemistry of the proposed blended tailings stream appears to be similar to the current Fimiston tailings stream, in terms of geochemical characteristics, mineralogical composition, geochemical enrichments, acid forming classification, leaching potential, and supernatant quality (except for cobalt, copper, nickel, and iron).

Table 5: Key geochemical characterisation of Fimiston and blended tailings

Parameter	Concentration range[1]	
	Fimiston tailings	**Blended tailings (Fimiston tailings and Gidji tailings, including leached flotation concentrate from ultrafine grind)**
Acid forming classification		
pH (paste)	8.9 pH unit	8.8 pH unit
Electrical conductivity (EC)	4,800 µS/cm	**6,850 µS/cm**
Total sulfur	0.28 wt.%	**0.78 wt.%**
Sulfide (as sulfur)	0.26 wt.%	**0.77 wt.%**
Acid neutralising capacity	198 kg H_2SO_4/tonnes	**209 kg H_2SO_4/tonnes**
pH (net acid generation)	10.7 pH unit	**9.8 pH unit**
Maximum potential acidity	9 kg H_2SO_4/tonnes	**24 kg H_2SO_4/tonnes**
Net acid production potential	-191 kg H_2SO_4/tonnes	-186 kg H_2SO_4/tonnes
Acid forming classification	Non acid forming	Non acid forming
Global abundance indices (GAI)		
Silver	0 to 2	**1 to 2**
Arsenic	4	4
Cobalt	0	0
Molybdenum	0	0
Lead	0	**0 to 2**
Rhenium	1	**1 to 2**
Sulfur	2 to 3	**3 to 4**
Antimony	4	**4 to 5**
Selenium	4	4
Tellurium	6	6
Tungsten	3	3
Leachate assessment (1:5 solid to liquid ratio using deionised water)		
pH	7.5 pH unit to 7.9 pH unit	7.7 pH unit to 7.9 pH unit
Electrical conductivity	2,400 µS/cm to 3,600 µS/cm	**2,970 µS/cm to 4,280 µS/cm**
Chloride	766 mg/L to 947 mg/L	**841 mg/L to 1,060 mg/L**
Sodium	399 mg/L to 496 mg/L	**460 mg/L to 586 mg/L**
Sulfate	95 mg/L to 140 mg/L	**147 mg/L to 265 mg/L**
Alkalinity	34 mg/L to 39 mg/L	**69 mg/L to 98 mg/L**
Total cyanide	0.002 mg/L to 0.05 mg/L	**0.024 mg/L to 0.102 mg/L**
Weak acid dissociable cyanide	0.003 mg/L to 0.046 mg/L	0.004 mg/L to 0.015 mg/L
Antimony	0.002 mg/L to 0.004 mg/L	**0.010 mg/L to 0.016 mg/L**

Parameter	Concentration range[1]	
	Fimiston tailings	**Blended tailings (Fimiston tailings and Gidji tailings, including leached flotation concentrate from ultrafine grind)**
Arsenic	0.001 mg/L to 0.002 mg/L	**0.002 mg/L to 0.003 mg/L**
Cobalt	0.011 mg/L to 0.024 mg/L	0.019 mg/L to 0.037 mg/L
Lead	<0.001 mg/L	<0.001 mg/L
Molybdenum	0.003 mg/L to 0.005 mg/L	**0.008 mg/L to 0.014 mg/L**
Selenium	<0.01 mg/L	<0.01 mg/L
Silver	<0.001 mg/L	**<0.001 mg/L to 0.002 mg/L**
Tellurium	<0.005 mg/L	<0.005 mg/L
Tungsten	<0.001 mg/L	**0.002 mg/L to 0.004 mg/L**
Mercury	<0.0001 mg/L to <0.001 mg/L	<0.0001 mg/L
Tailings supernatant assessment [2]		
pH	7.5 pH unit to 7.9 pH unit	8.18 pH unit to 8.48 pH unit
Electrical conductivity	116,000 µS/cm to 122,000 µS/cm	**158,194 µS/cm to 159,866 µS/cm**
Chloride	53,300 mg/L to 56,400 mg/L	**59,602 mg/L to 60,333 mg/L**
Sodium	30,200 mg/L to 34,100 mg/L	**35,519 mg/L to 35,915 mg/L**
Sulfate	4,530 mg/L to 4,590 mg/L	---
Alkalinity	71 mg/L to 98 mg/L	---
Total cyanide	67.6 mg/L to 99.7 mg/L	---
Weak acid dissociable cyanide	24.8 mg/L to 35.8 mg/L	---
Antimony	0.068 mg/L to 0.078 mg/L	**0.08 mg/L**
Arsenic	<0.02 mg/L to 0.053 mg/L	0.027 mg/L to 0.028 mg/L
Cobalt	1.00 mg/L to 1.09 mg/L	**1.25 mg/L to 1.46 mg/L**
Lead	<0.02 mg/L	0.011 mg/L to 0.012 mg/L
Molybdenum	0.089 mg/L to 0.09 mg/L	**0.109 mg/L to 0.129 mg/L**
Selenium	<0.2 mg/L	0.11 mg/L to 0.12 mg/L
Silver	0.129 mg/L to 0.150 mg/L	**0.201 mg/L to 0.287 mg/L**
Tellurium	<0.1 mg/L	---
Tungsten	<0.02 mg/L	---
Mercury	<0.001 mg/L	---
Cadmium	<0.002 mg/L to 0.0029 mg/L	0.002 mg/L
Chromium	<0.02 mg/L	**0.012 mg/L to 0.013 mg/L**
Copper	10.6 mg/L to 17.6 mg/L	**28 mg/L to 51 mg/L**
Nickel	0.621 mg/L to 0.764 mg/L	**1.06 mg/L to 1.61 mg/L**

Parameter	Concentration range[1]	
	Fimiston tailings	Blended tailings (Fimiston tailings and Gidji tailings, including leached flotation concentrate from ultrafine grind)
Iron	15.7 mg/L to 22.9 mg/L	**35 mg/L to 59 mg/L**

Note 1: Bolded value indicates parameter where concentration range is higher in blended tailings compared to Fimiston tailings.

Note 2: No supernatant from blended tailings were obtained. PHREEQC modelling was used to predict supernatant quality from blended tailings.

2.5.2 Seepage analysis and water balance modelling

FIM II TSF Cell E and F

Seepage analysis undertaken for the FIM II TSF Cells E and F at their maximum proposed embankment heights of 381.5 mRL and 389.5 mRL (respectively) predicted a maximum seepage rate of 15 L/s occurring after five years of operation. Upon cessation of tailings deposition, seepage rates were predicted to reduce to around 7 L/s and 2 L/s. The installation of the underdrainage system would have allowed for recovery of up to 50% of the seepage flow. Regionally, operation of these two extension cells would reduce the rate of rise of existing TSFs at the premises and consequently, reduce the rate of phreatic surface increase. The Licence Holder expects groundwater and seepage recovery infrastructure to continue operating for approximately 10 years after the closure of the TSF.

At a distance of 200 m from the FIM II TSF Cells E and F, groundwater was predicted to experience a maximum increase of approximately 2.5 m, when accounting for the installation of underdrainage underneath the decant pond and upstream embankment toe. The operation of seepage recovery bores at a rate of 15 m^3/hour was also predicted to be able to control groundwater levels within a range of +1 m to -2 m. The use of blanket drains and seepage interception drains were also modelled but were found to have minimal impact on controlling groundwater mounding. The Licence Holder noted that, even without any seepage management infrastructure in place, groundwater mounding was predicted to be approximately 6.5 m but still remain below 6 metres below ground level (mbgl).

FIM I TSF

Seepage analysis undertaken for the FIM I TSF at its maximum proposed embankment height of 418.9 mRL has indicated no significant increase in groundwater levels through the base of the facility. Existing groundwater and seepage management infrastructure would have sufficient capacity to manage any additional seepage from the TSF. Groundwater elevation around FIM I TSF was predicted to remain stabilised at approximately 350 mRL throughout tailings deposition. The Licence Holder expects groundwater and seepage recovery infrastructure to continue operating for approximately 10 years after the closure of the TSF.

Water balance

Water balance modelling for both the FIM I TSF and FIM II TSF Cell E and F have indicated varying levels of seepage emitted from the facility (Table 6). In the Eastern Borefield region, seepage management infrastructure has recovered up to 2.28 Mm^3 and 1.96 Mm^3 of groundwater in the 2023 and 2024 annual period.

Table 6: Water balance outflow projection

Type	Parameter	FIM I TSF	FIM II TSF Cell E	Total

			and F	
Volume	Return water	1.04 Mm^3	2.7 Mm^3	3.74 Mm^3
	Interstitial water	0.78 Mm^3	2.9 Mm^3	3.18 Mm^3
	Seepage	0.39 Mm^3	0.5 Mm^3	0.89 Mm^3
Proportion of total outflow	Return water	40%	33%	---
	Interstitial water	30%	34%	---
	Seepage	14%	6%	---

2.5.3 Local hydrogeology

There are three well-defined major groundwater systems documented at the premises:

1. **Paleochannel systems** – A localised but extensive network of alluvial Tertiary sands occurring up to 60 mbgl. This groundwater is well-defined and utilised by the Licence Holder for groundwater abstraction in the Southern Borefield and Kaltails Supply Borefield. The closest paleodrainage to the TSF area is the Yindarlgooda South Paleochannel, approximately 6 km to the south. The presence of a paleochannel west of the FIM II TSF has not been confirmed through hydrogeological investigations nor has been it been intersected by existing monitoring bores. As such, the paleochannel system is unlikely to play a significant role in migration of seepage from the TSFs at the premises.
2. **Ferricrete and alluvial sediment groundwater system** – Groundwater system consisting of sand, gravel, and fractured ferricrete within clay deposits overlying bedrock, typically occurring between 5 mbgl and 40 mbgl. This system is only present in portions of the lower topographic areas around the premises and has the highest hydraulic conductivity where significant thickness of ferricrete is developed. The groundwater system is thought to be recharged through the Central Drainage floodway. The bores located around the FIM I and FIM II TSF (collectively referred to as the Eastern Borefield) predominantly abstracts groundwater from this system. It is also the aquifer through which tailings seepage migrates.
3. **Bedrock groundwater system** – Groundwater system where groundwater flow occurs in fractured and weathered zones within the basement rocks at depth. Around the Eastern Borefield, bedrock predominantly comprises the Black Flag Beds. Regional investigations suggest these formations typically have low primary permeability and are not expected to store or transmit large volumes of groundwater, except through major secondary structures. Some portions of the Eastern Borefield may extract relatively small amounts of groundwater from the upper weathered portion of the bedrock.

Hydrogeological investigations completed to date indicate that groundwater levels at the Eastern Borefield responds to a combination of factors, including tailings seepage emitted from the nearby TSFs, natural recharge associated with rainfall events, and groundwater production in the local area. Localised variations to groundwater levels were present, controlled by the hydraulic conductivity of the groundwater system, degree of hydraulic connectivity to recharge zones (i.e., floodplains).

By comparing groundwater monitoring information during pre-deposition and during operation of TSFs, groundwater responses to tailings seepage could be observed. In areas where hydraulic conductivity was relatively high (e.g., north and west of FIM II TSF Cell AB), groundwater gradually shallowed up to approximately 10 m over the span of three to four years. However, in areas where the hydraulic conductivity was inferred to be low, steep increases to groundwater levels of up to 20 m within two years were observed (e.g., at MB F39, north-east of the FIM II TSF Cell D). Due to low hydraulic conductivity in these areas, the influence of the

groundwater mound does not extend far from the TSF, but local conditions could change quickly.

It was also observed that groundwater level trends corresponded more smoothly with long-term average precipitation conditions at monitoring bores further away from the TSFs, indicating a reduction in tailings seepage influence with increasing distance from these facilities. Seepage influences were not only controlled by the duration and frequency of deposition cycles, but also by the decant pond extent during tailings deposition. Temporary cessation of tailings deposition has also been observed to deepen local groundwater levels.

Groundwater mounding associated with tailings seepage has been observed, most evidently at the north-east of the FIM I TSF and around FIM II TSF. The north and north-east of FIM II TSF has groundwater mounding spread across a greater distance due to the higher hydraulic conductivity, while in the east and south of the facility, groundwater mounding is evident but only in limited spatial extent due to the lower hydraulic conductivity. Groundwater mounding is greatest at the north-east of Cell D.

Groundwater at the Central Drainage floodway have reported low pH, elevated total dissolved solid (TDS) concentrations (i.e., between 20,000 mg/L and 70,000 mg/L), as well as negligible concentrations of total, free, and weak acid dissociable (WAD) cyanide (CN). In contrast, decant water monitoring has found that tailings seepage was likely to have a neutral to alkaline pH (around 8 pH unit), TDS concentration greater than 100,000 mg/LK, significant concentrations of cyanide (refer to Section 2.5.1).

BDH (2022) suggested that:

- Groundwater hydrochemical types may not be directly diagnostic of seepage influences, as tailings seepage and background groundwater at the Central Drainage are of similar ionic composition, being strongly dominated by sodium and chloride ions.
- While monitoring of TDS concentrations may provide an indication of the extent of seepage influence, it is also not fully diagnostic due to natural variability of TDS in background groundwater (e.g., Central Drainage).
- Monitoring of the concentrations of various CN species in groundwater is not fully diagnostic of seepage influences, as cyanide is strongly attenuated in groundwater flow within the low pH environments. Concentrations of CN were below the limit of reporting, even in areas where seepage influence is expected to be present.
- Groundwater pH is not useful for characterising the extent of seepage influences, as the groundwater system is naturally strongly buffered with low pH.

Ultimately, it was determined that monitoring of groundwater levels is most diagnostic of seepage influence, as it responds relatively rapidly to tailings seepage and usually prior to changes in groundwater chemistry are observed.

2.5.4 Seepage and groundwater management plan

The Fimiston Seepage and Groundwater Management Plan (FSGMP) was developed in 2005 to manage potential impacts to native vegetation as a result of ongoing tailings deposition and seepage emitted from the FIM I and FIM II TSFs. The management plan incorporated existing tailings and seepage management practices employed by the Licence Holder, as well as technical advice from subject matter experts, to establish performance targets for the long-term management of seepage from TSFs at the premises.

To active manage tailings seepage and groundwater, the Licence Holder employs a number of strategies, including seepage recovery, decant pond management, and groundwater monitoring. The management actions outlined in the FSGMP are summarised in Table 7.

Table 7: Management actions from Fimiston Seepage and Groundwater Management Plan

Strategy	Description
Decant pond management	To minimise tailings seepage rates, the size of the decant pond must be kept to a minimum. As a target, the FSGMP requires the decant pond size to be below a maximum 15% of the total surface area of the paddock in which tailings deposition is occurring under normal operating scenario. The total paddock surface area is determined via survey upon completion of an embankment raise. The decant pond size is monitored through a combination of daily visual inspection and fortnightly area surveys. To manage the decant pond size and meet the specified performance target, the rate of decant recovery can be adjusted, as required. In the event the decant pond area target is exceeded (e.g., due to high rainfall, etc.), decant water recovery will be maximised, with the intent that this water stream be used for ore processing over the water stream from the surrounding seepage recovery bores.
Seepage recovery	The Eastern Borefield was progressively established in 1994 with a comprehensive network of seepage recovery bores and seepage interception trenches around the perimeter of the FIM I and FIMII TSFs. The majority of seepage recovery bores were installed within 100 m of the TSF perimeters. Abstracted groundwater is sent to the Fimiston Processing Plant, which has capacity to receive this volume of water for use in the processing circuit. Under groundwater licence GWL66252, the Licence Holder is allowed to abstract up to 4,000,000 kL of groundwater from the 'Fractured Rock West – Paleochannel Resource', which is the aquifer resource intercepted by the Eastern Borefield. Annual abstraction volumes have ranged from 17,625 kL in 1993 to 3,484,348 kL in 2012, reflecting the progressive expansion and optimisation of the Eastern Borefield. Long-term monitoring has indicated sufficient cumulative pumping capacity in the Eastern Borefield to remove tailings seepage (as well as rainfall recharge). The Licence Holder expects seepage recovery to continue beyond the cessation of tailings deposition, until groundwater levels reach and stabilises at acceptable levels. As such, the duration and rate of pumping will be a function of the residual seepage rate from the TSFs.
Groundwater management	In the 1990s, the Licence Holder specified a target of 4 metres below ground level (mbgl) for the depth to groundwater. The aim of the target was to ensure groundwater did not impact on soils from which plants sourced their water (i.e., the root zone). While there was no scientific data to support this target value and its effectiveness in the long-term protection of surrounding vegetation, a tree root investigation undertaken in 2009 found the majority of roots occurred within the top 1 m of the soil profile. Furthermore, vegetation monitoring undertaken up to 2016 has indicated no presence of impacts to the condition of surrounding vegetation. The target was not applied to groundwater monitoring bores located within the operational area of the FIM I and FIM II TSFs (i.e., approximately 100 m from the facilities), as groundwater at the immediate proximity of the TSFs were likely to be impacted and be most affected by operational changes in the facility. Furthermore, the operational areas were typically already highly disturbed by historical operational activities. The target was instead applied to monitoring bores located outside of the operational areas. These monitoring bores were referred to as Compliance

Strategy	Description
	Monitoring Bores. Groundwater levels of the Compliance Monitoring Bores are reviewed during the preparation of a quarterly groundwater monitoring report (as required by existing licence L6420/1988/14). Depending on the monitoring data, the Licence Holder may decide to increase pumping capacity to manage areas where groundwater mounding may be emerging or is apparent, as a result of tailings seepage. An increase in pumping capacity may be achieved by either (i) maximising use of nearby seepage recovery bores, (ii) upgrading existing pumping infrastructure, and/or (iii) installing additional seepage recovery bores.
Reporting	In accordance with existing licence L6420/1988/14, the Licence Holder must: • prepare and submit a quarterly groundwater monitoring report on the groundwater monitoring programme and complete an assessment against the targets of the FSGMP; • prepare and submit an annual audit on the progress towards meeting existing targets and milestones of the FSGMP, and whether the objectives of the FSGMP remain appropriate. The audit is conducted by a suitably qualified professional; and • prepare and submit an annual environmental report, including an assessment of groundwater monitoring data.

Based on the recent audits from 2021 to 2024 (Table 8), the following trends were identified:

- Decant pond size target of 15% is occasionally exceeded, due to numerous factors, including heavy rainfall events, issues with decant recovery system, or the need to prioritise water use from other decant ponds.
- Groundwater monitoring programme is undertaken in accordance with existing licence requirements, with no exceedance of standing water level limit of 4 mbgl at the Eastern Borefield Compliance Monitoring Bores detected.

In a hydrogeological review, BDH (2022) indicated that operation of seepage interception trenches and seepage recovery bores around the existing FIM I and FIM II TSFs for the past ten years were successful in managing groundwater depths to ensure they remained below the specified limit. Under existing licence conditions and the FSGMP, additional seepage recovery bores may be installed to improve seepage recovery in areas where tailings seepage influence becomes apparent and cannot be adequately managed by the existing bore network.

Table 8: Summary of audit against Fimiston Seepage and Groundwater Management Plan for the 2022, 2023, and 2024 period

Performance target	2022 annual audit	2023 annual audit	2024 annual audit
Audit period	1 October 2021 to 30 September 2022	1 October 2022 to 30 September 2023	1 October 2023 to 31 December 2024
Decant pond size <15% of total surface area under normal operating conditions	Of the 36 fortnightly surveys, the target was exceeded on two occasions (5.5%). One exceedance (at FIM I TSF) was caused by the need to prioritise	Of the 46 fortnightly surveys, the target was exceeded on 11 occasions (24%). All eleven exceedances (at FIM I TSF, FIM II TSF Cells C and D) related to	Of the 85 fortnightly surveys, the target was exceeded on 11 occasions (13%). Eight exceedances (at FIM I TSF and FIM II TSF Cell C) were caused by

Performance target	2022 annual audit	2023 annual audit	2024 annual audit
	pumping and decant water recovery at FIM II TSF Cell D. Decant Pond area returned below target size following a week of pumping. One exceedance (at FIM II TSF Cell D) was caused by a new decant location being formed while a major shutdown was occurring.	pumping management, construction works, and electrical issues.	capacity constraints relating to the decant recovery system. Two exceedances (at FIM II TSF Cell E) were caused by commissioning and establishing of decant pond, where time is required to form a tailings beach and decant pond. One exceedance (at FIM II TSF Cell D) was caused by temporary pooling following major rainfall event.
Groundwater monitoring parameters and frequency	Fully compliant.	Fully compliant, except for dry and/or decommissioned monitoring bores.	Fully compliant, except for dry and/or decommissioned monitoring bores.
Standing water level target of 4 mbgl	Fully compliant. Shallowest bore was MB F72 at 5.49 mbgl (September 2022).	Fully complaint. Shallowest bore was MB F72 at 4.75 mbgl (September 2023).	Fully complaint. Shallowest bore was MB F72 at 4.05 mbgl (December 2024).
Management action when standing water level is between 4 mbgl and 6 mbgl	This was identified in monitoring bore MB F72 from March 2022 onwards. The likely cause was determined to be tailings seepage influence. As such, the Licence Holder commenced works to install additional seepage recovery bores.	Management actions associated with rising groundwater levels at monitoring bore MB F72 (identified in the previous annual audit) have not been undertaken due to logistical challenges with drilling works.	Seepage recovery bores PB F149, PB F150, and PB F151 were installed to address rising groundwater levels previously identified at MB F72. However, the bores were not operational by December 2024 due to power supply issue. The Licence Holder has advised that the bores will commence operation shortly. Groundwater levels at newly installed monitoring bores TRP4 and TRP5 were also fluctuating between 4 mbgl and 6 mbgl in 2024. However, no management actions have been taken as it is difficult to establish the cause of shallow groundwater levels at

Performance target	2022 annual audit	2023 annual audit	2024 annual audit
			new monitoring bores without long-term monitoring data.
Reporting requirements	Fully compliant.	Fully compliant.	Fully compliant, except for late submission of well construction report required under existing licence L6420/1988/14.

2.5.5 Water monitoring assessment

Recent monitoring results from nearby groundwater monitoring bores were assessed to better understand current extent of tailings seepage influence on the ambient groundwater environment. The most recent monitoring results from the 2024 and 2025 annual period were considered in this assessment.

Groundwater level

Standing water levels at operational monitoring bores surrounding the north and east of FIM I TSF were relatively shallow (Figure 6a). Monitoring bores located along the northern seepage interception trench were the shallowest, with monitoring bore MB F12 reaching 1.93 mbgl in December 2024. Shallow groundwater levels to the north may also be associated with the operation of the seepage interception trench, which intercepts and collects subsurface seepage. Monitoring bore MB F12 is also the west-most operational monitoring bore, suggesting that groundwater mounding may also be significant to the north-west.

Standing water levels at the compliance monitoring bores surrounding the north and east of FIM I TSF were comparatively deeper than the operational monitoring bores, as they are a greater distance away from the TSF. In the assessed period, none of the monitoring bores contained standing water level shallower than the specified limit of 4 mbgl (Figure 6b). However, it is noteworthy that monitoring bore MB F72, located to the north-west of FIM I TSF and further west of operational bore MB F12, had been gradually shallowing over the past few years. The monitoring bore reached its shallowest depth at 4.05 mbgl in December 2024, almost exceeding the specified limit. Investigations undertaken in accordance with the FSGMP have indicated that the groundwater mounding is likely a result of tailings seepage. Up to three seepage recovery bores were installed, with at least one currently operational. Consequently, standing water level at the monitoring bore had fallen to 5.37 mbgl during the March 2025 monitoring event (Figure 6b). Standing water level at the nearby operational monitoring bore MB F12 had also reduced slightly to 2.1 mbgl. Operation of the remaining seepage recovery bores will commence once permanent power supply is established.

Standing water level at operational monitoring bores along the south-western embankment toe of FIM II TSF Cell E were relatively deep (Figure 6c) and of similar depths to nearby downgradient compliance monitoring bores (Figure 6d). The shallowest monitoring bore was MB F48, where groundwater was 9.3 mbgl in the most recent March 2025 monitoring event. It should be noted that, while no standing water level limit applies to operational monitoring bores, three of the four monitoring bores assessed have exhibited a shallowing trend over the assessed period. This is likely a response to commencement of tailings deposition into Cell E, as part of time limited operation of the starter embankment under works approval W6496/2021/1.

Standing water level at compliance monitoring bores further south-west of FIM II TSF Cell E were relatively deep (Figure 6d). The shallowest compliance monitoring bores were the newly installed TRP4 and TRP5, as well as existing monitoring bore MB F27, which reported standing

water levels of 4.88 mbgl, 4.35 mbgl, and 5.89 mbgl in March 2025, respectively. These monitoring bores are furthest away from the FIM II TSF, with groundwater levels deepening as monitoring bores are closer to the facility. Due to this, the Licence Holder suggested that elevated groundwater levels observed at these monitoring bores were not caused by tailings seepage, but rather, regional recharge associated with the Eastern Floodway that runs through the premises.

Additional operational and compliance monitoring bores were installed to monitor potential seepage impacts associated with the FIM II TSF Cells E and F. However, monitoring data from these locations is still not available, as tailings deposition into these TSF cells had only recently commenced. Based on pre-deposition monitoring, groundwater level and quality appear to be characteristic of regional un-impacted monitoring bores (i.e., groundwater level deeper than 4 mbgl, neutral to low pH, hypersaline, and no detectable WAD CN).

Total dissolved solids

Groundwater TDS concentrations around both FIM I and FIM II TSF are high and considered hypersaline. At the FIM I TSF, the operational and compliance monitoring bore with the shallowest groundwater (i.e., MB F12 and MB F72, respectively) exhibited the lowest salinity, compared to nearby monitoring bores (Figure 7a; Figure 7b). This suggests that groundwater salinity to the werst of FIM I TSF are lower, relative to the groundwater to the eastern side. Maximum TDS concentration around FIM I TSF was 136,000 mg/L during the assessed period.

In contrast, groundwater TDS concentrations around the FIM II TSF Cells E and F were slightly lower, with a maximum concentration of 108,000 mg/L. Unlike monitoring bores around FIM I TSF, the operational monitoring bores for FIM II TSF (Figure 7c) contained higher TDS concentrations compared to the compliance monitoring bores (Figure 7d), indicative of greater tailings seepage influence. Further, the TDS concentrations in some operational monitoring bores have been increasing over the assessed period, consistent with shallowing of groundwater observed. Groundwater TDS concentrations were relatively low, ranging between 24,000 mg/L and 48,900 mg/L at monitoring bores TRP4, TRP5, and MB F27. This supports the hypothesis that the shallow groundwater levels at these monitoring bores were associated with recharge, rather than tailings seepage.

Weak acid dissociable cyanide

At both FIM I and FIM II TSF (Cells E and F), WAD CN concentrations in operational monitoring bores have remained below the limit of reporting throughout the assessed period. However, WAD CN has been measured at detectable concentrations in isolated cases at several compliance monitoring bores, including MB F67 (0.07 mg/L in January 2025), MB F27 (0.004 mg/L in March 2024; 0.012 mg/L in December 2024), MB F75 (0.045 mg/L in August 2024; 0.043 mg/L in November 2024; 0.044 mg/L in February 2025), and TRP4 (0.091 mg/L in July 2024; 0.01 mg/L in January 2025) (data not shown). Based on existing monitoring data, there is no significant indication that WAD CN persists in the groundwater environment for prolonged periods.

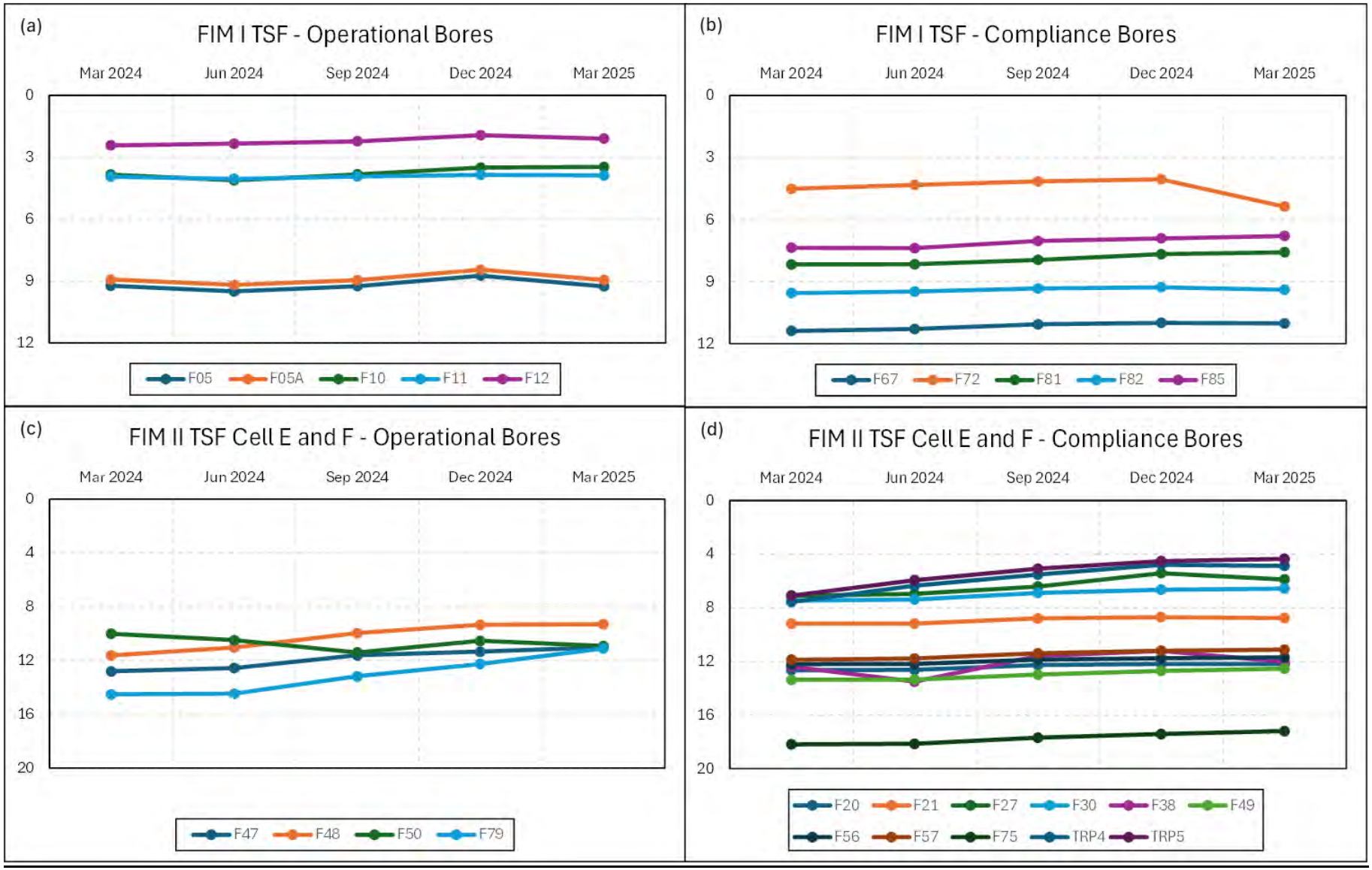

Figure 6: Standing water level (mbgl) at operational and compliance monitoring bores around FIM I TSF and FIM II TSF Cell E and F

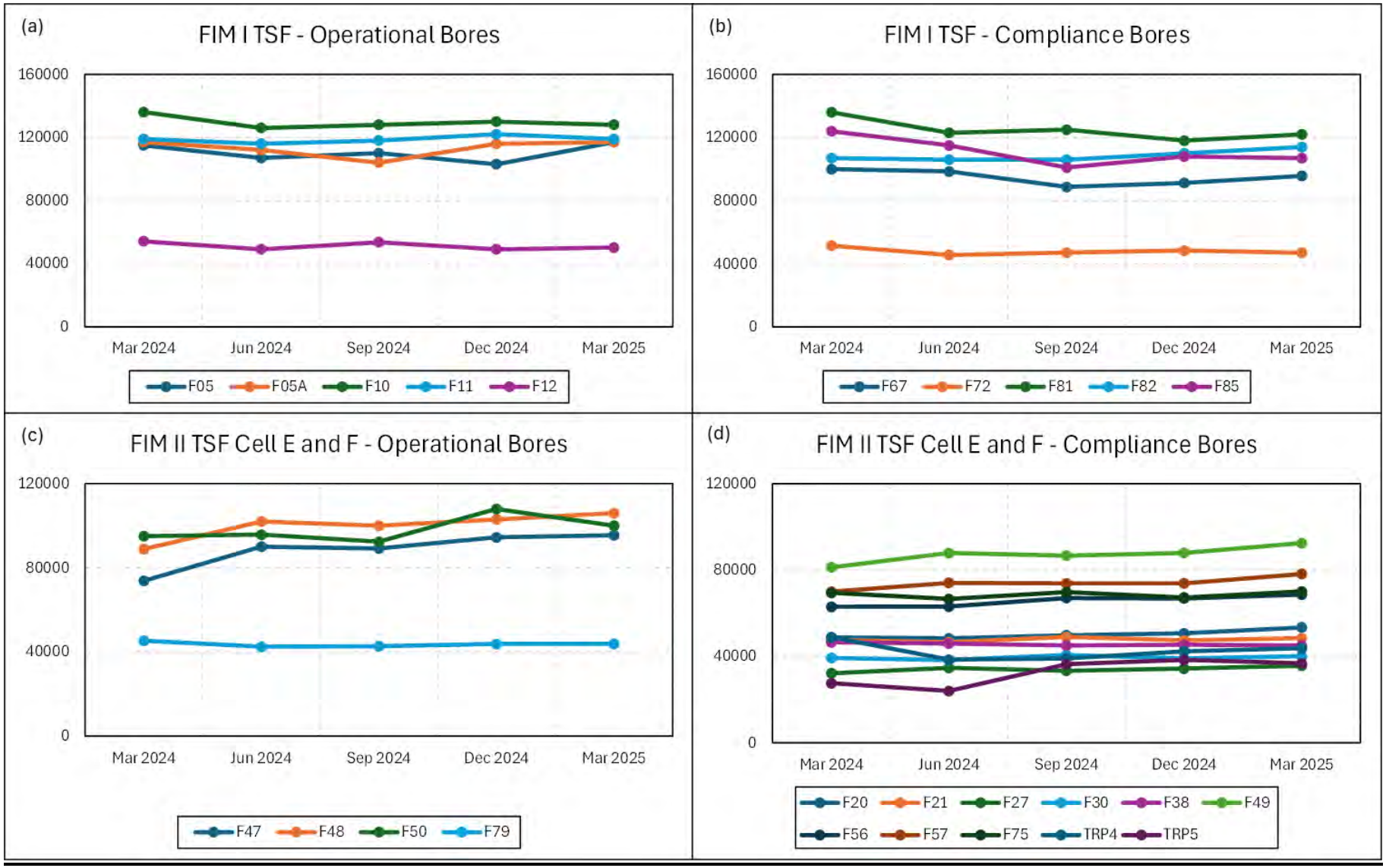

Figure 7: Total dissolved solids (mg/L) at operational and compliance monitoring bores around FIM I TSF and FIM II TSF Cell E and F

2.6 Part IV of the EP Act

In 1991, the Western Australia Environmental Protection Authority (EPA) assessed a proposal by the Licence Holder to consolidate open-cut mining activities at the premises into a single operation, now known as the Super Pit. Mining activities were regulated under Ministerial Statement (MS) 188.

In July 2005, the Licence Holder referred a proposal for the Fimiston Gold Mine Extension (Stage 3) and Mine Closure Planning to the EPA for assessment. The proposal related to an expansion of the existing Fimiston Open Pit for further mining and processing. As a result of the expansion, the proposal also related to construction of new waste rock dumps and expansion of existing tailings storage facilities FIM I, FIM II, and Kaltails TSF (including extension cells E and F at FIM II TSF). In their assessment detailed in EPA Report 1270, the following key environmental factors were identified: (i) noise and vibration, (ii) dust and air quality, (iii) tailings and groundwater management, and (iv) mine rehabilitation and closure.

When considering the scope of this amendment, tailings and groundwater management is the most relevant key environmental factor in EPA Report 1270. In their report, the EPA detailed the impacts to groundwater associated with further expansion of the FIM I, FIM II, and Kaltails TSF, historical seepage incidents associated with these facilities, primary beneficial use of groundwater for mining and mineral processing purposes, as well as existing implementation of the KSGMP and regulation under Part V of the EP Act. In considering these, the EPA was of the opinion that tailings and groundwater impacts can be adequately managed under Part V of the EP Act and the FSGMP.

Consistent with the EPA's recommendation, MS 782 was approved on 29 January 2009, with the conditions specified for management of tailings and groundwater as a result of the proposed TSF expansion. The MS 782 superseded MS 188 and commenced implementation in March 2010.

In October 2022, the Licence Holder referred a revised proposal to the EPA under section 38 of the EP Act. The revised proposal related to further expansion of mining activities at the premises, including expansion of waste rock and tailings storage facilities. However, the scope of this revised proposal relates to the construction and operation of new facilities and does not relate to the scope of this amendment, which relates to modifications to existing TSFs. At the time of this assessment, the proposal has been assessed under Part IV of the EP Act and awaiting ministerial decision pending appeals.

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 2020b).

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

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation, which have been considered in this Amendment Report are detailed in Table 9. Table 9 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 9: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Dust	Construction of the FIM II TSF (Cells E and F) Stage 1 embankment raise	Air/windborne pathway	• Dust suppression at the TSF area will be undertaken using water carts, as required. Under the Fimiston Air Quality Management Plan, the following relevant controls were proposed: • Ambient real-time dust monitoring will continue to be undertaken at seven monitoring locations throughout residential and light industrial areas in Kalgoorlie-Boulder using beta attenuation monitors (BAM). • Ambient real-time dust monitoring data will be used to compare against performance targets, including 24-hour average PM10 concentration no greater than 50 µg/m^3 and having no more than five exceedance events (where premises operations are a major contributor) annually at each monitoring location. Existing licence L6420/1988/14 includes the following requirements: • **Condition 4** – Requirement to control dust emissions using water carts during construction of FIM I TSF embankment raises.
Dust	Operation of the FIM I TSF Stage 5 embankment raise, FIM II TSF Cells E and F starter embankment and Stage 1 embankment raise	Air/windborne pathway	• Dust suppression at the TSF area will be undertaken using water carts, as required. • Dust abatement additives will be applied to minimise fugitive dust liftoff, where necessary. Under the KCGM Fimiston Processing Plant TSF Operating Manual, the following relevant controls were proposed: • Tailings deposition spigots will be rotated more frequently during hot and windy weather conditions to maintain wetted beach cover • TSFs will be visually inspected for dust generation every three hours. Under the Fimiston Air Quality Management Plan, the following relevant controls were proposed: • Ambient real-time dust monitoring will continue to be undertaken at seven monitoring locations throughout residential and light industrial areas in Kalgoorlie-Boulder using beta attenuation monitors (BAM). • Ambient real-time dust monitoring data will be used to compare against performance targets, including 24-hour average PM10 concentration no greater than 50 µg/m^3 and

Emission	Sources	Potential pathways	Proposed controls
			having no more than five exceedance events (where premises operations are a major contributor) annually at each monitoring location.
Tailings supernatant		Vertical infiltration and lateral migration of seepage through base and walls of TSF	Under the KCGM Fimiston Processing Plant TSF Operating Manual, the following relevant controls were proposed: • Tailings are deposited sub-aerially in thin discrete layers and rotated throughout the facility to promote formation of tailings beach and decant pond to maximise decant water recovery. • Tailings deposition rotation schedule will be reviewed to provide more even beach development sloping to maintain decant pond location around decant recovery infrastructure. • Each TSF cell is equipped with pumping infrastructure for decant water recovery to remove excess tailings supernatant from the TSF and keep decant pond size as small as practicable. • Fortnightly surveys will be conducted to ensure decant pond size does not exceed 15% of the total surface area of each cell. Where an exceedance is observed, the relevant trigger action response plan will be implemented, including prioritisation of decant water recovery, increasing pore pressure monitoring, and in severe cases, cessation of tailings deposition. • Decant pond size and location, as well as signs of seepage around the TSF embankments will be visually inspected every three hours. • FIM I TSF is equipped with a nominally two-metre-deep seepage interception trench that extends along the northern and north-eastern boundary of the TSF to intercept shallow subsurface seepage. Recovered seepage is pumped out and returned to the Fimiston Processing Plant via the Southern Surge tank. • FIM II TSF Cells E and F is equipped with a comprehensive underdrainage system, consisting of three strip drain systems running parallel along the upstream embankment toe, as well as a herringbone system directly beneath the decant pond location. The drains comprise slotted drain coil pipe encapsulated in filter material, intercepting tailings seepage and directing it to an engineered trench before discharging into a common sump, which is then pumped back to Decant Pond 3. • Seepage recovery bores have been installed along the northern and north-eastern

Emission	Sources	Potential pathways	Proposed controls
			embankment toe of FIM I TSF, as well as along the northern and southern embankment toe of the FIM II TSF Cells E and F, where recovered seepage will be pumped out and returned to the Fimiston Processing Plant. • Monitoring of groundwater levels and quality will be undertaken monthly and quarterly, respectively. Decant water quality will be monitored daily. • Water balance monitoring will be undertaken to estimate amount of seepage from the TSFs. • Implement Fimiston Seepage and Groundwater Management Plan (FSGMP), further detailed in Section 2.5.4. Existing licence L6420/1988/14 includes the following requirements: • **Condition 1** – Maximum operating height specified for FIM II TSF Cells and E. • **Condition 2** – Embankment raise construction requirements specified for FIM II TSF Cells E and F. • **Condition 3** – Maximum operating height specified for FIM I TSF. • **Condition 4** – Embankment raise construction requirements specified for FIM I TSF. • **Condition 12** – Inspection requirements for decant pond size and location and integrity of embankments. • **Condition 26** – Ambient groundwater monitoring requirements. • **Condition 27** – Requirement to implement Fimiston Seepage and Groundwater Management Plan. • **Condition 28** – Requirement to take measures to reduce groundwater levels for the protection of native vegetation, when directed by the CEO.
		Ingestion of tailings supernatant at decant ponds	Under the KCGM Fimiston Processing Plant TSF Operating Manual, the following relevant controls were proposed: • Each TSF cell is equipped with pumping infrastructure for decant water recovery to remove excess tailings supernatant from the TSF and keep decant pond size as small as practicable.

Emission	Sources	Potential pathways	Proposed controls
			• Fortnightly surveys will be conducted to ensure decant pond size does not exceed 15% of the total surface area of each cell. Where an exceedance is observed, the relevant trigger action response plan will be implemented, including prioritisation of decant water recovery, increasing pore pressure monitoring, and in severe cases, cessation of tailings deposition. • Decant pond size and location, as well as signs of seepage around the TSF embankments will be visually inspected every three hours. • Terrestrial wildlife access to the TSF area is limited through physical barriers, including perimeter fencing. • Decant water quality (including total dissolved solids, as well as total, free, and weak acid dissociable cyanide) will be monitored daily. Under the Hypersaline Tailings Management Plan, the following relevant controls were proposed: • Cyanide concentrations along the processing circuit at the Fimiston Processing Plant. Copper concentrations are also monitored due to relatively strong correlation with cyanide concentrations. • Total dissolved solid (TDS) and copper concentrations in the decant water will be monitored daily, where a TDS of <52,000 mg/L and/or copper concentration of >30 mg/L will result in further actions taken, due to reduced palatability associated with salinity and strong associated between copper and cyanide concentrations, respectively. • During decant water monitoring, wildlife monitoring will also be undertaken for a period of twenty minutes within three hours of sunrise. Existing licence L6420/1988/14 includes the following requirements: • **Condition 12** – Inspection requirements for decant pond size. • **Condition 26** – Surface water monitoring requirements, including WAD CN and total dissolved solids.
Tailings slurry		Overtopping of TSF, resulting in discharge to	Under the KCGM Fimiston Processing Plant TSF Operating Manual, the following relevant controls were proposed:

Emission	Sources	Potential pathways	Proposed controls
		land	• Minimum operational (wall) freeboard of 300 mm will be maintained at all times. • Total (stormwater) freeboard of 500 mm, after accounting for a 1-in-100 year rainfall event for 72 hours, will be maintained at all times. • Freeboard marker will be inspected every three hours (Figure 2h), with freeboard survey undertaken fortnightly. • If beach freeboard of 300 mm has been breached, tailings deposition will cease as soon as practicable. Existing licence L6420/1988/14 includes the following requirements: • **Condition 1** – Maximum operating height specified for FIM II TSF Cells and E. • **Condition 3** – Maximum operating height specified for FIM I TSF. • **Condition 11** – TSF freeboard requirements. • **Condition 12** – Freeboard inspection requirements.
Hypersaline decant water		Pipeline spill or leaks, resulting in discharge to land	Under the KCGM Fimiston Processing Plant TSF Operating Manual, the following relevant controls were proposed: • Tailings delivery pipelines are double-sleeved or contained within a bunded corridor between the Fimiston Processing Plant and TSF area. • Pipeline has been fitted with differential flow leak detection monitors, where leak detection will initiate shutdown procedures, including cessation of pumping and activation of alarm in the control room. Pipelines will be inspected immediately, with necessary repairs and cleanup undertaken. • Any spills or leaks within the bunded corridor will be contained and collected within catchment pits. • Tailings distribution pipeline will be inspected during fallow periods after being decoupled prior to embankment raise construction, where any accumulated sediments will be removed from valves, spigots, and around fittings. Existing licence L6420/1988/14 includes the following requirements: • **Condition 4** – Pipeline installation requirements during embankment raise construction

Emission	Sources	Potential pathways	Proposed controls
			for FIM I TSF. • **Condition 10** – Pipeline management requirements. • **Condition 15** – Requirement for spill management.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 202b0), 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 10 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 2020a)).

Table 10: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Kalgoorlie township	The Kalgoorlie township is located approximately 1.5 km and 5.8 km west of the FIM I TSF and FIM II TSF Cell E and F, respectively (Figure 8). Of note is the East Kalgoorlie Primary School, also located 1.5 km west of the FIM I TSF, at the fringe of the town area. In 2021, the population of the township was approximately 29,000. The FIM II TSF is separated from the township by the Fimiston Processing Plant and the Super Pit.
Ninga Mia Aboriginal Community	The Ninga Mia Aboriginal Community is located approximately 1.7 km and 6.8 km north-west of the FIM I TSF and the FIM II TSF Cell E and F, respectively (Figure 8).
Environmental receptors	**Distance from prescribed activity**
Remnant native vegetation	The area within and surrounding the prescribed premises have been subject to prolonged periods of disturbance as a result of historical mining activities. Nevertheless, native vegetation is still present throughout the premises in conditions varying between Good and Excellent, including surrounding the FIM I and FIM II TSFs, as shown in aerial imagery (Figure 8). Vegetation communities around FIM I and FIM II TSFs have been described as low *Eucalyptus* woodland over lower shrubs of *Eremophia* sp., which are common and widespread in the region. Open *Acacia* shrubland also exist in association with the Eastern Floodway between the FIM I and FIM II TSF. There are no threatened or priority ecological communities within the premises.
Conservation significant flora	Populations of *Eremophila praecox*, a Priority 2 flora species have been sighted near the premises. Targeted surveys identified several individuals south-east of the FIM II TSF Cell E and F (Figure 9).
Transient avifauna	Avifauna have been known to occur throughout the region, with some potentially utilised decant ponds for drinking water and/or as a place to rest.
Surface waterbodies	The FIM I and FIM II TSFs are located within the Eastern Floodway Catchment, where several drainage lines are present to the north-east of FIM I TSF, as well as south and south-west of the FIM II TSF (Figure 10).

	The Eastern Floodway Catchment has a defined main channel that is ephemeral and cuts through the premises, between FIM I and FIM II TSF (Figure 10). Based on aerial imagery, the main channel is approximately 500 m wide, with individual flow tributaries being approximately 100 m wide. Aside from this channel, most surface runoff occurs as sheetflow due to relatively flat topography. Drainage channels within the catchment generally flow from north to south, towards Hannan Lake, located approximately 5 km south of the FIM II TSF Cell E (Figure 10). Separation distance between Hannah Lake and FIM I TSF is greater at approximately 8.2 km, with the Fimiston Processing Plant and waste rock dumps existing in between the two.
Groundwater aquifer	Local hydrogeology has been summarised in Section 2.5.3, consisting of three major groundwater systems: the paleochannel system located south of the Eastern Borefield, the ferricrete and alluvial sediment groundwater system that is the most relevant for the Eastern Borefield, and the deep bedrock groundwater system which contains limited and heterogeneous groundwater transmissivity. Regional groundwater flow direction is from north to south, parallel to surface drainage flow paths, towards Hannan Lake. Groundwater is abstracted by the Licence Holder and other nearby mining operations for ore processing. Groundwater is not used for potable purposes. Tap water in the Kalgoorlie and Boulder township is supplied by the Goldfields Water Supply Scheme.

Figure 8: Siting of human health receptors relative to FIM I and FIM II TSF

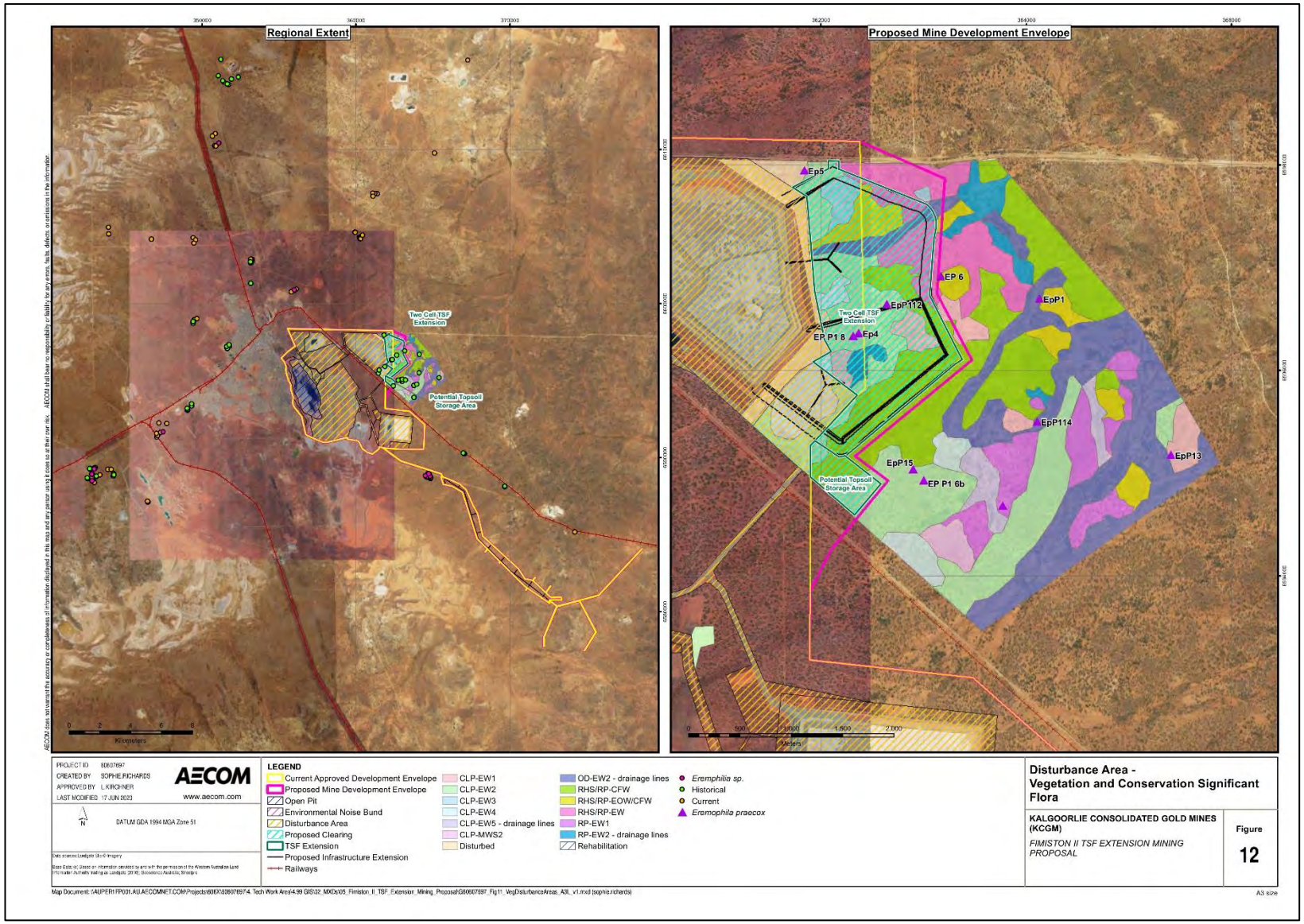

Figure 9: Vegetation communities and conservation significant flora around FIM II TSF Cell E and F

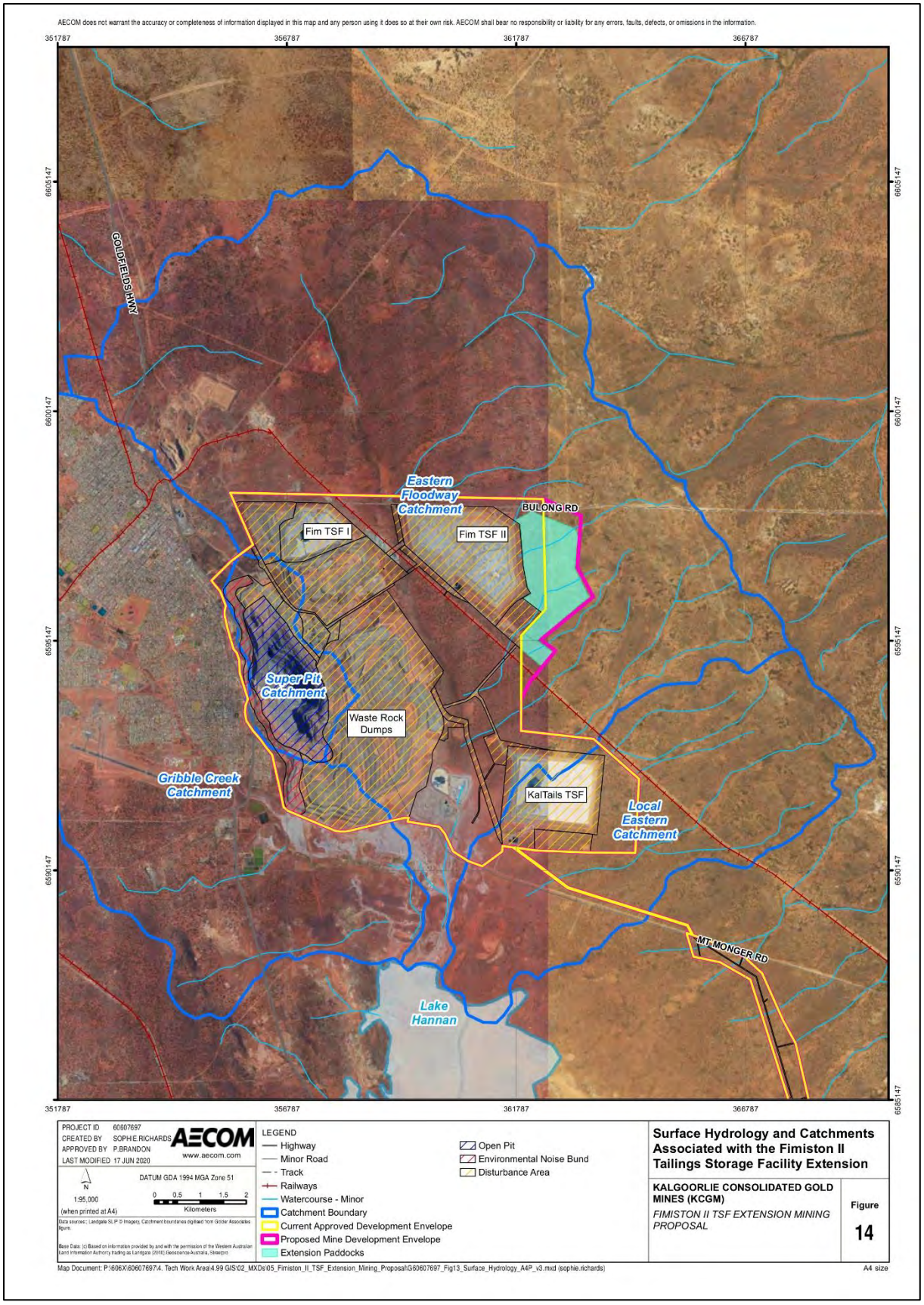

Figure 10: Surface hydrology at the premises

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 11.

The Revised Licence L6420/1988/14 that accompanies this Amendment Report authorises emissions associated with the operation of the premises i.e. tailings deposition into TSF.

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

Table 11. Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Comments
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Construction								
Construction of the FIM II TSF (Cells E and F) Stage 1 embankment raise	Dust	***Pathway:*** Air / windborne pathway ***Impact:*** Impact to ecological health	Remnant native vegetation	Refer to Section 3.1	C = Slight L = Unlikely **Low risk**	Y	Condition 2 – FIM II TSF embankment raise construction requirements	The department considers the proposed controls for managing dust emissions from the proposed construction activities to be adequate. No additional regulatory controls are required.
Operation								
Operation of the FIM I TSF Stage 5 embankment raise, FIM II TSF Cells E and F starter embankment and Stage 1 embankment raise.	Dust	***Pathway:*** Air / windborne pathway ***Impact:*** Impact to human health and amenity, as well as ecological health	Kalgoorlie township Ninga Mia Aboriginal Community Remnant native vegetation Conservation significant flora	Refer to Section 3.1	C = Minor L = Possible **Medium risk**	Y	None	The department considers the proposed controls for managing dust emissions from the proposed activities to be adequate. Ambient dust monitoring and general dust management across the premises is undertaken and regulated via MS 782 under Part IV of the EP Act.
	Tailings supernatant	***Pathway:*** Vertical infiltration and lateral migration of seepage through base and walls of TSF ***Impact:*** Groundwater mounding and deterioration of groundwater quality, potentially resulting in impact to ecological health	Remnant native vegetation Surface waterbodies Groundwater aquifer	Refer to Section 3.1	C = Moderate L = Unlikely **Medium risk**	N	Condition 1 – FIM II TSF construction and operating elevation limit Condition 2 – FIM II TSF embankment raise construction requirements Condition 3 – FIM I TSF construction and operating elevation limit Condition 4 – FIM I TSF embankment raise construction requirements Condition 7 – Containment infrastructure requirements, including authorised material accepted Condition 10 – TSF inspection requirements, including decant pond Condition 24 – Ambient groundwater and process water monitoring requirements, including **additional compliance monitoring locations** Condition 25 – Water balance monitoring requirements Condition 26 – Seepage and groundwater management plan (SGMP) implementation requirements Condition 27 – SGMP annual audit requirements Condition 28 – Groundwater mounding management action	The department has considered the existing and proposed controls for managing the risk of potential seepage into the environment. Conditions specified in existing licence L6420/1988/14 were considered relevant. In specifying conditions associated the construction of the FIM II TSF Cell E and F Stage 1 embankment raise, infrastructure construction requirements have been explicitly specified in the licence. This is consistent with current licensing practice and provides clarity to the Licence Holder on the requirements for demonstrating compliance with the licence condition. Where possible, the department will minimise the referencing of external documents in setting conditions. The department also understands that the Stage 1 embankment raise will be constructed and operated in 1.5 m lifts. Consequently, the department has specified construction (and compliance reporting) for two 1.5 m lifts, rather than a single 3.0 m lift. Consistent with the current licensing format, submission of the relevant environmental compliance reports are required prior to commencing operation of the infrastructure. Furthermore, the department has included additional conditions based on the Licence Holder's proposed controls to better manage potential emissions and the associated impacts, including: • Containment infrastructure requirements for the TSFs have been updated to authorise the discharge of tailings that include leached flotation concentrate from the ultrafine grind process at the premises. A maximum of 3% leached flotation concentrate is authorised, as existing studies did not investigate blended tailings geochemistry using higher proportions of concentrate. Further assessment may be required if higher proportions of concentrate are proposed to be deposited, due to the potentially acid-forming characteristics of this tailings stream (based on analysis of Gidji tailings and blended tailings). • Water balance monitoring, to better estimate and understand seepage entering the environment, which can validate the accuracy of water balance models and contextualise volume of recovered water via seepage interception trenches and seepage recovery bores. Based on the TSF operating manual, the department understands that water balance monitoring is already being undertaken.

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Comments
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
							requirements Condition 29 – Requirements to protect native vegetation from groundwater mounding **<u>Condition 30 – Specified action for tailings leachate and supernatant characterisation</u>**	Furthermore, the department considers additional regulatory requirements to be necessary to adequately manage potential emissions and associated impacts, including: • Inclusion of monitoring bores MB F103, MB F104, MB F105, MB F107, and MB F109 in the ambient groundwater monitoring program specified in condition 24. Based on BDH (2022), the department understands that these monitoring bores are present and can be monitored as compliance monitoring bores. Furthermore, these monitoring bores should be minimally impacted by the proposed FIM II TSF Cell G. • Reclassification of MB F110, MB F111, MB F 112, and MB F113 from operational monitoring bores to compliance monitoring bores, as these monitoring bores are not immediately abutting the FIM II TSF Cell E and F. Furthermore, their installation was specified as compliance monitoring bores in works approval W6496/2021/1. • Requirement to undertake specified actions to characterise blended tailings leachate and supernatant quality once deposition of blended tailings stream has commenced. This requirement is consistent with recommendation by WSP (2024). Furthermore, water quality of blended tailings supernatant could not be empirically assessed during the WSP (2024) investigation, relying on predictive modelling. Consequently, this specified action has been included to validate previous findings. The department considers this requirement to be justified, given the characteristics of the Gidji tailings stream (which was used as a proxy for the leached flotation concentrate stream).
		Pathway: Ingestion of tailings supernatant at decant ponds ***Impact:*** Impact to ecological health, including potential wildlife death	Transient avifauna	Refer to Section 3.1	C = Moderate L = Unlikely **Medium risk**	Y	Condition 10 – TSF inspection requirements, including decant pond Condition 24 – Surface water monitoring requirements Condition 26 – SGMP implementation requirements Condition 27 – SGMP annual audit requirements	The department considers the proposed controls for managing the risk of tailings supernatant ingestion by transient avifauna to be adequate. No additional regulatory controls are required.
	Tailings slurry	***Pathway:*** Overtopping of TSF, resulting in discharge to land ***Impact:*** Impact to ecological health	Remnant native vegetation Surface waterbodies	Refer to Section 3.1	C = Moderate L = Unlikely **Medium risk**	Y	Condition 9 – TSF freeboard requirements Condition 10 – TSF inspection requirements	The department considers the proposed controls for managing the risk of tailings overtopping to be adequate. No additional regulatory controls are required.
		Pathway: Pipeline spill or leaks, resulting in discharge to land ***Impact:*** Impact to ecological health		Refer to Section 3.1	C = Minor L = Unlikely **Medium risk**	Y	Condition 8 – Pipeline infrastructure requirements Condition 10 – Pipeline inspection requirements	The department considers the proposed controls for managing the risk of pipeline failure to be adequate. No additional regulatory controls are required.
	Hypersaline decant water			Refer to Section 3.1	C = Minor L = Unlikely **Medium risk**	Y		

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020b).
Note 2: Proposed Licence Holder's controls are depicted by standard text. **<u>Bold and underline text</u>** depicts additional regulatory controls imposed by department.

4. Consultation

Table 12 provides a summary of the consultation undertaken by the department.

Table 12: Consultation

Consultation method	Comments received	Department response
City of Kalgoorlie-Boulder advised of application on 22 July 2025.	None received.	N/A
Department of Mines, Petroleum and Exploration (DMPE) advised of application on 22 July 2025.	DMPE provided comment on 5 August 2025, stating that the proposed activities were consistent with approvals under the *Mining Act 1978*.	None. The department highlights that it is the responsibility of the Licence Holder to ensure relevant approvals have been obtained prior to implementing the proposed activities.
Licence Holder was provided with draft amendment on 8 August 2025.	The Licence Holder provided comments on 13 August 2025 and waived the remainder of the comment period. Refer to Appendix 1.	Refer to Appendix 1.

5. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence L6420/1988/14 will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 13 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 13: Summary of licence amendments

Existing condition no.	Amended condition no.	Proposed amendments
----	----	General updates to format and wording of licence conditions to be consistent with current licensing format. Cover page updated to: • Update DWER file number from DER2015/002506-1 to INS-0001317; • Include mining tenements M26/503 and M26/778; • Update licence history log.
Condition 1	Condition 1	Updated Table 1 to specify embankment elevation, instead of embankment heights for each stage of FIM II TSF embankment raise. Added Table 2 to specify embankment elevation for the starter embankment and Stage 1 embankment raise of FIM II TSF Cell E and F.

Existing condition no.	Amended condition no.	Proposed amendments
Condition 2	Condition 2	Updated Table 3 to specify construction requirements up to FIM II TSF Cells AB, C, and D Stage 6 embankment raise. Added Table 4 to specify construction requirements for FIM II TSF Cells E and F Stage 1 embankment raise.
Condition 3	Condition 3	Updated Table 5 to specify embankment elevation, instead of embankment heights for each stage of FIM I TSF embankment raise.
Condition 4	Condition 4	Updated Table 6 to reference Figure 3, in line with existing approvals.
Condition 5	Condition 5	Updated Table 7 to specify embankment elevation, instead of embankment heights for each stage of Kaltails TSF embankment raise.
Condition 7	----	Removed condition 7 for well construction requirements, as the monitoring bores have been constructed.
Condition 8	----	Removed condition 8 for well construction reporting requirements, as the relevant reports have been submitted to the department.
Condition 9	Condition 7	Updated Table 9 to: • Specify individual cells at each TSF; • Update materials accepted at the TSFs to include blended tailings, including the leached flotation concentrate (produced through ultrafine grind process) at no more than 3% of total tailings throughput; and • Specify containment infrastructure location.
Condition 10	Condition 8	Updated pipeline requirements to be consistent with current licensing format and other licences.
Condition 14	Condition 12	Updated Table 11 to: • Remove temporary emission stack TS as an authorised air emission point, as it no longer exists at the premises; and • Specify emission point location.
Condition 16	Condition 14	Updated Table 12 to refer to Figure 4.
Condition 25	Condition 23	Updated Table 14 to refer to Figure 6.
Condition 26	Condition 24	Updated Table 15 to refer to Figure 7, Figure 8, Table 21 and Table 22.
----	Condition 25	New condition to require monthly water balance monitoring for each active TSF at the premises, for the purpose of estimating seepage volumes emitted to the environment.
Condition 29	Condition 28	Updated Table 16 to refer to Table 21.
----	Condition 30	New condition to require collection of blended tailings leachate and tailings supernatant to investigate chemical properties during operational tailings deposition.
Condition 36	Condition 36	Updated Table 18 to specify reporting requirements for new condition 25 and condition 30.
Condition 38	Condition 38	Updated condition wording to be consistent with current licensing format.

Existing condition no.	Amended condition no.	Proposed amendments
Condition 39	Condition 39	Updated condition wording to be consistent with current licensing format.
----	----	Updated Table 20 to include definitions for: AS3780, US EPA LEAF Method 1313.
----	----	Updated Schedule 1: Maps to include figure numbering and improved referencing between figures and relevant conditions. The following figures were updated: • Prescribed premises boundary has been updated to include additional mining tenements for FIM II TSF Cells E and F. The figure is now referred to as Figure 1. • A new figure has been added to indicate location of containment infrastructures specified in condition 7. The figure is referred to as Figure 2. • The existing figure indicating the pipeline route associated with FIM I TSF has been updated to show tailings delivery and return water pipeline route and is now referred to as Figure 3. • The figure indicating the Paringa landfill facility, as well as the Zone A and Zone B, has been updated to display recent aerial imagery. The figure is now referred to as Figure 4. • The figure indicating authorised air emission points has been updated to remove temporary emission stack TS. The figure is now referred to as Figure 5. • The figure indicating the Paringa landfill facility, wastewater treatment plant, and the Fimiston processing plant has been updated to display recent aerial imagery. The figure is now referred to as Figure 6. • The figure indicating groundwater monitoring bores, seepage interception trenches and decant dams at the Eastern Borefield (FIM I TSF and FIM II TSF) has been updated to reflect the current monitoring bore network, including newly installed monitoring bores and reclassification of bore types as a result of the FIM II TSF Cells E and F. The figure is now referred to as Figure 7. • The figure indicting groundwater monitoring bores, seepage interception trenches and decant dams at the Kaltails Borefield (Kaltails TSF) has been updated reflect the current monitoring bore network and recent aerial imagery. The figure is now referred to as Figure 8. • Figure 1 from the existing licence was included in the amended licence as Figure 9. The purpose of the figure is to indicate the authorised extent of the landfill area, which was removed from the updated Figure 1. Removed Schedule 2: Construction of replacement monitoring bores, as the associated conditions 7 and 8 have been removed. Added Schedule 2: Construction drawings, including: • Kaltails TSF embankment raise design drawing, as referenced in condition 6. This figure is referred to as Figure 10. • FIM II TSF Cell E and F embankment raise design drawing, as reference in condition 2. This figure is referred to as Figure 11 and Figure 12. Added Schedule 3: TSF groundwater monitoring bores to specify compliance monitoring bores and all monitoring bores in Table 22 and Table 23 (previously Table 1 and Table 2 of Schedule 1), with the following amendments: • Compliance monitoring bores TRE3 and TRP4 have been renamed to TRP4 and TRP5, respectively, in Table 22 and Table 23.

Existing condition no.	Amended condition no.	Proposed amendments
		• Monitoring bores MB F47 and MB F79 have been removed from Table 22, as they have been reclassified from compliance to operational monitoring bores. • Monitoring bores MB F39 to MB F46 and MB F77 have been removed from Table 22 and Table 23, as they have been decommissioned for the construction and operation of the FIM II TSF Cells E and F. • Monitoring bores MB F103, MB F104, MB F105, MB F107, MB F108, MB F109, MB F110, MB F111, MB F112, and MB F113 have been included in Table 22 as compliance monitoring bores, and in Table 23. • MB F114, MB F115, MB F116, MB F117, MB F118, MB F119 have been included in Table 23 as operational monitoring bores.

References

1. Big Dog Hydrogeology (BDH) 2022, *KCGM Hydrogeological Review of the Fimiston I, Fimiston II, Fimiston IIE and Fimiston III TSFs*, Albany, Western Australia.
2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
3. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Environmental Siting*, Perth, Western Australia.
4. DWER 2020b, *Guideline: Risk Assessments*, Perth, Western Australia.
5. WSP 2024, *Fimiston and Gidji Tailings Geochemical Characterisation – Fimiston Operation Stage 2 Growth Project*, Perth, Western Australia.

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

Condition	Summary of Licence Holder's comment	Department's response
General	The Licence Holder requested that the FIM II TSF Cells E and F be referred to as 'Fimiston II Extension TSF Cells E and F' in the amended licence to better indicate that these cells were constructed separately to the existing Cells AB, C, D with different design features and infrastructure.	The department has applied the requested terminology in the amended licence.
	The Licence Holder indicated typographical errors in the licence relating to the reference of other condition numbers.	The department has corrected these typographical errors in the amended licence.
	The Licence Holder provided updated figures and embankment elevation values, as requested by the department.	The department has updated the relevant figures and tables in the amended licence.
Condition 2 – Construction requirements	In Table 4, the Licence Holder highlighted that the requirement to construct embankment raises for the Fimiston II Extension TSF Cells E and F required lifts to be moisture conditioned to between +2% and -2% of the optimum moisture content. This is not in accordance with the relevant Design Report (Section 9.4.5), where this specification was only required for the construction of the starter embankment. For the construction of embankment raises, embankment material needed to be moisture conditioned to within +2% and -4% of the optimum moisture content.	The department has modified the construction requirement accordingly to reflect the specifications for embankment raises outlined in the relevant Design Report.
Condition 7 – Containment infrastructure requirements	In Table 9, the Licence Holder highlighted that the incorrect terminology was used to refer to the proposed tailings stream that is intended to be deposited into the TSFs at the premises under their Stage 2 Growth Project. No tailings generated from the Gidji Processing Plant is proposed to be deposited into the TSFs at the premises. Therefore, the term 'Gidji tailings' should not be used in Table 9. Currently, the Licence Holder sends concentrate produced at the	Noting the clarification provided by the Licence Holder, the department has applied the requested terminology when referring to the proposed tailings stream under the Stage 2 Growth Project in the amended licence. The department has also revised Section 2.5.1 of the Amendment Report to clarify this. However, the department has retained the requirement that the tailings stream from the UFG process be no greater than 3% of the total tailings throughput. The rationale for this was that the WSP (2024) investigation

Condition	Summary of Licence Holder's comment	Department's response
	Fimiston Processing Plant to the Gidji Processing Plant for processing. However, under the Stage 2 Growth Project, the Licence Holder is proposing to treat the concentrate at the premises via ultrafine grinding (UFG) at the premises, rather than sending it offsite to the Gidji Processing Plant. Consequently, the final tailings stream that will be deposited into the TSFs at the premises will consist of both the existing flotation tails, as well as leached flotation concentrate from the UFG process. While the tailings investigation completed by WSP (2024) did not directly investigate the characteristics of the UFG concentrate, it did consider both current Fimiston tailings stream as well as the current Gidji tailings stream (which included leached flotation concentrate from the UFG process). Further, the Licence Holder is concerned that, in the event where higher sulfur content is encountered in the ore processing, higher amounts of concentrate may be produced, which would result in higher UFG concentrate feed rates. Consequently, the Licence Holder requested that the material accepted at the TSFs be modified from 'from '*Fimiston processing plant; and/or Gidji processing plant, such that the Gidji tailings is blended with Fimiston tailings and comprise no more than 3% of the total tailings throughput*' to '*Tailings from Fimiston processing plant, including blended tailings slurry comprised of leached flotation tails and leached flotation concentrate (UFG process)*'.	had only tested blended tailings, where the proportion of Gidji tailings ranged between 1.8% and 3.0%. In the report, the Licence Holder advised the ratio investigated to roughly reflect the expected ratios from the Stage 2 Growth Project. Furthermore, the investigation found the Gidji tailings were of greater concern (relative to the Fimiston tailings), but had not characterised the UFG concentrate directly (rather, the final tailings stream from the Gidji processing plant, which includes the UFG concentrate, was tested). Consequently, it is difficult to determine and assess the risks associated with the proposed tailings stream being deposited at the premises. Authorisation to deposit tailings with a higher proportion of UFG concentrate may be authorised, where the relevant environmental risk can be demonstrated to be acceptable through the necessary investigations and assessed under a future licence amendment. Until that time a precautionary approach has been adopted, and the requirement has been retained.
Condition 8 – Pipeline requirements	The Licence Holder requested that 'or' be included in condition 8(a), such that the Licence Holder may utilise either telemetry systems and pressure sensors or automatic cut-outs or secondary containment.	The department has modified this condition as requested. This modification does not materially alter the requirements of the condition.
Condition 14 – Waste management requirements	In Table 12, the Licence Holder clarified that landfill disposal is not limited to the Paringa facility. An updated Figure 4 was provided to show the extent of the landfill area at the premises, which spans across waste rock dump areas, in addition to the Paringa facility, which is authorised to accept hydrocarbon contaminated waste (e.g., sediment, waste rock).	The department understands that the extent of the landfill is not limited to the Paringa facility and has amended Table 12 accordingly. The department also understands that extent of the landfill area at the premises was recently revised under a licence amendment (granted on 23 October 2023). In regard to the updated Figure 4 provided, the department notes that the extent differs significantly from the existing figure depicting the extent of the landfill area (i.e., Figure 1 of the existing licence). Understanding that a decision on this licence amendment application is time-critical for the Licence Holder, the department has not completed a

Condition	Summary of Licence Holder's comment	Department's response
		thorough review to verify the information shown on updated Figure 4. Consequently, the updated Figure 4 was not included in the amended licence. Instead, Figure 1 from the existing licence was revised to Figure 9.
Condition 30 – Tailings characterisation requirements	In Table 17, the Licence Holder requested the sample type and corresponding requirements be modified to accurately refer to the tailings stream under the Stage 2 Growth Project, as described under comments for condition 7.	Noting the clarification provided by the Licence Holder, the department has applied the requested terminology when referring to the proposed tailings stream under the Stage 2 Growth Project in the amended licence.