



Application for Licence Amendment

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

Licence Number	L5107/1988/13
Licence Holder	Northern Star (HBJ) Pty Ltd
ACN	30 127 026 519
File Number	DER2015/002027-6
Premises	South Kalgoorlie Operations – Jubilee Gold Mine Legal description – Lot 15 on Plan 58833, Lot 50 on Plan 226299 and Lot 51 on Plan 226303, Feysville, Lot 103 on Plan 40395 Lot 105 on Plan 40396, Karamindie, and mining tenements M26/118, M26/143, M26/204 and M15/456
Date of Report	28 November 2022
Decision	Revised licence granted

A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES

Officer delegated under section 20 of the Environmental Protection Act 1986

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1. Decision summary

Licence L5107/1988/13 is held by Northern Star (HBJ) Pty Ltd (Licence Holder) for the Jubilee Gold Mine (the Premises), located at Lot 15 on Plan 58833, Lot 50 on Plan 226299, and Lot 51 on Plan 226303, Feysville, Lot 103 on Plan 40395 Lot 105 on Plan 40396, Karamindie, and mining tenements M26/118, M26/143, M26/204 and M15/456.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the operation of the Premises. As a result of this assessment, Revised Licence L5107/1988/13 has been granted.

2. Scope of assessment

2.1 Regulatory framework

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

2.2 Application summary

On 1 April 2022, the Licence Holder applied to the department to amend Licence L5107/1988/13 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- The operation of the Jubilee Tailings Storage Facility No. 3 (TSF3) at South Kalgoorlie Operations (SKO) in Western Australia following Stage 4 embankment raise construction, authorised by works approval W6502/2021/1.

The Jubilee TSF 3 at the South Kalgoorlie Gold Operations (SKO) is a paddock-type facility, formerly comprising two cells (Cells A and B) separated by an internal common embankment. Both cells were merged in the Stage 4 upstream raise.

TSF 3 was a rectangle with a nominal crest level of RL355.0 meters (m). The works, authorised by W6502/2021/1 involved merging TSF 3A cell and 3B cell and raising the perimeter embankments by 3.0 m to RL358.0 m. An upstream construction method was used, with compacted dried tailings sourced from within TSF 3A and 3B. The decant accessway and decant structure were also raised by 3.0 m along the internal common embankment to the design crest level.

Category 5 activities are already authorised under the existing licence, and there will be no change in the assessed design capacity under Schedule 1 of the Environmental Protection Regulations 1987 (EP Regulations) which is defined in the licence L5107/1988/13.

2.2.1 Construction

The TSF3 embankment raise was constructed partly on the existing embankment crest and partly on dried deposited tailings beach. Foundation preparation involved the removal of any abrupt grade changes to provide a regular surface for fill placement, followed by scarifying, moisture conditioning and compacting prior to placement of the first fill layer.

Embankment construction (compacted material zone)

The Licence Holder provided evidence that the construction of the embankment raise ('dried tailings' zone material) was typically as follows, as seen in Figure 1:

- Excavate 'dried tailings' along the upstream side of the perimeter embankment using excavators and loading into dump trucks as required. Scrapers were also used to win

tailings, with the borrow areas excavated to a maximum depth of 1.5 m and an offset of minimum 5 m from the raised embankment upstream toe.

- The material was then placed on the prepared foundation for spreading and mixing with a grader, moisture conditioning with a water cart, and compaction via a 16-tonne vibratory padfoot roller.
- Tailings were placed in homogeneous horizontal layers of 300 mm 'loose' lift / layer thickness. Each layer was compacted using 16-tonne vibratory padfoot rollers.
- Each layer was tested for compaction and moisture content.
- Test results were assessed, with reworking as required.
- Crests were graded and batters were shaped to design profile.

Decant accessway and tower

The decant accessway was constructed to crest level RL 358.0 m. The material used to construct the decant accessway was 'dried tailings' borrowed within the TSF3 impoundment area. Tailings were hauled and placed onto the decant accessway in layers of nominal 500 mm thickness and uniformly spread across the embankment with traffic compaction over the full embankment width.

Competent waste rock sourced from the two existing decant accessways (Cells 3A and 3B) was placed along the batters of the accessway for protection against decant pond wave action.

Seven (7) decant concrete well liners were used to construct the decant tower. Decant filter rock material sourced from a mine waste stockpile north-east of the processing plant was hauled and placed around the tower.

The tailings storage capacity of TSF3 Stage 4 was calculated at 1.04 Mm³ or 1.56 Mt, based on a dry density of 1.5t/m³ and an allowance of 300 mm freeboard around the perimeter embankment. Refer to Figure 1 for stage 4 general arrangement.

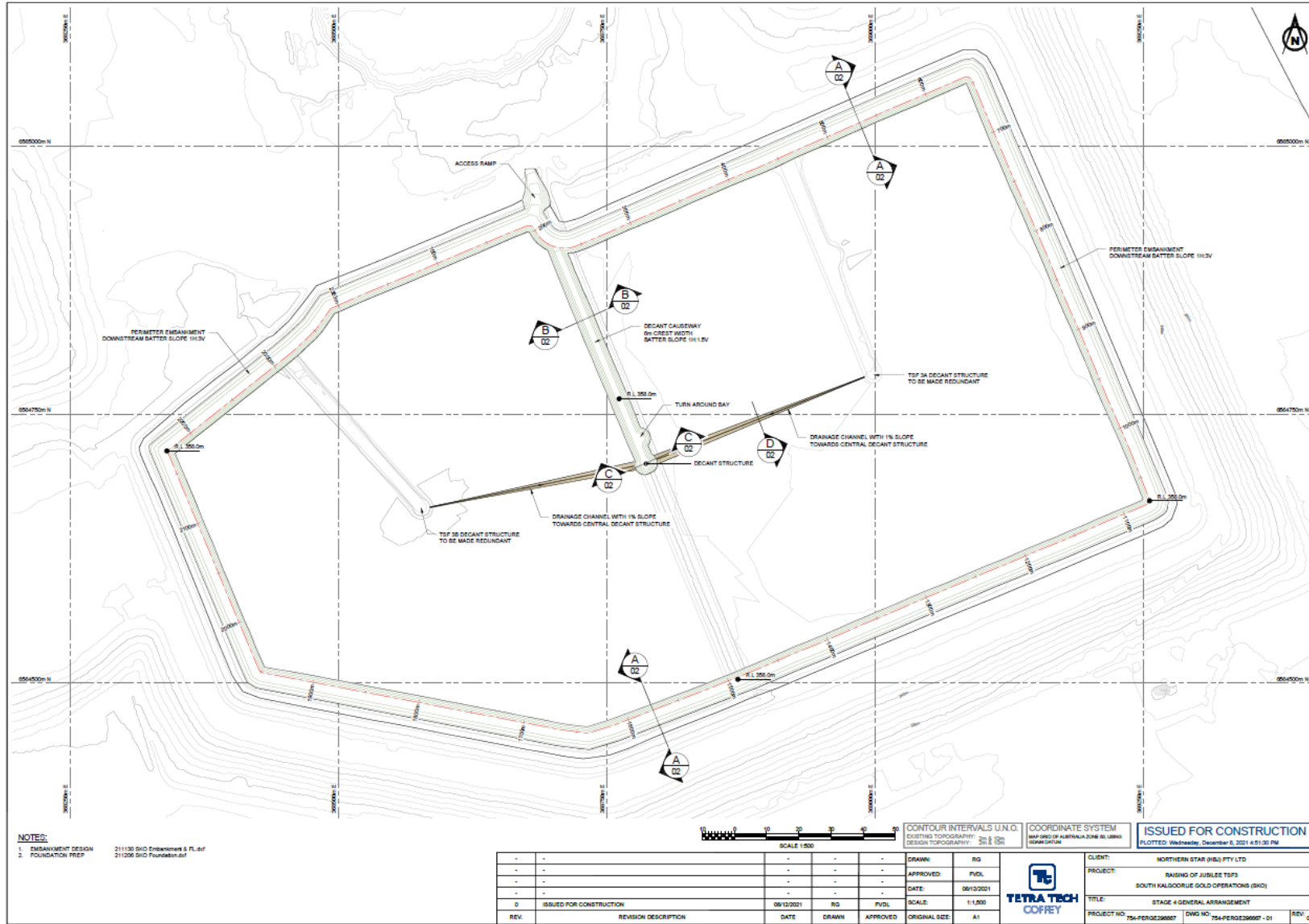


Figure 1: Raising of TSF3 stage 4 general arrangement

Licence: L5107/1988/13 (28 November 2022)

IR-T15 Amendment report template v3.0 (May 2021)

Vibrating wire piezometer installation

The piezometric monitoring system for TSF 3 was designed by Tetra Tech, in liaison with the Licence Holder and was assessed and approved under works approval W6502/2021/1.

Under W6502/2021/1 ten vibrating wire piezometers (VWP01 to VWP10) were installed and are currently operational and the Licence Holder provided evidence of installation and calibration as part of the amendment application.

The VWPs were installed in probe holes, encapsulated in cement-bentonite grout using the fully grouted method. Each VWP is connected to a field station. Each field station comprises a vibrating wire wireless node data logger, powered by long-life lithium batteries, mounted inside an environmental weatherproof enclosure mounted on a steel post on the downstream side of the crest road.

The location of installed VWPs is show below in Figure 2.

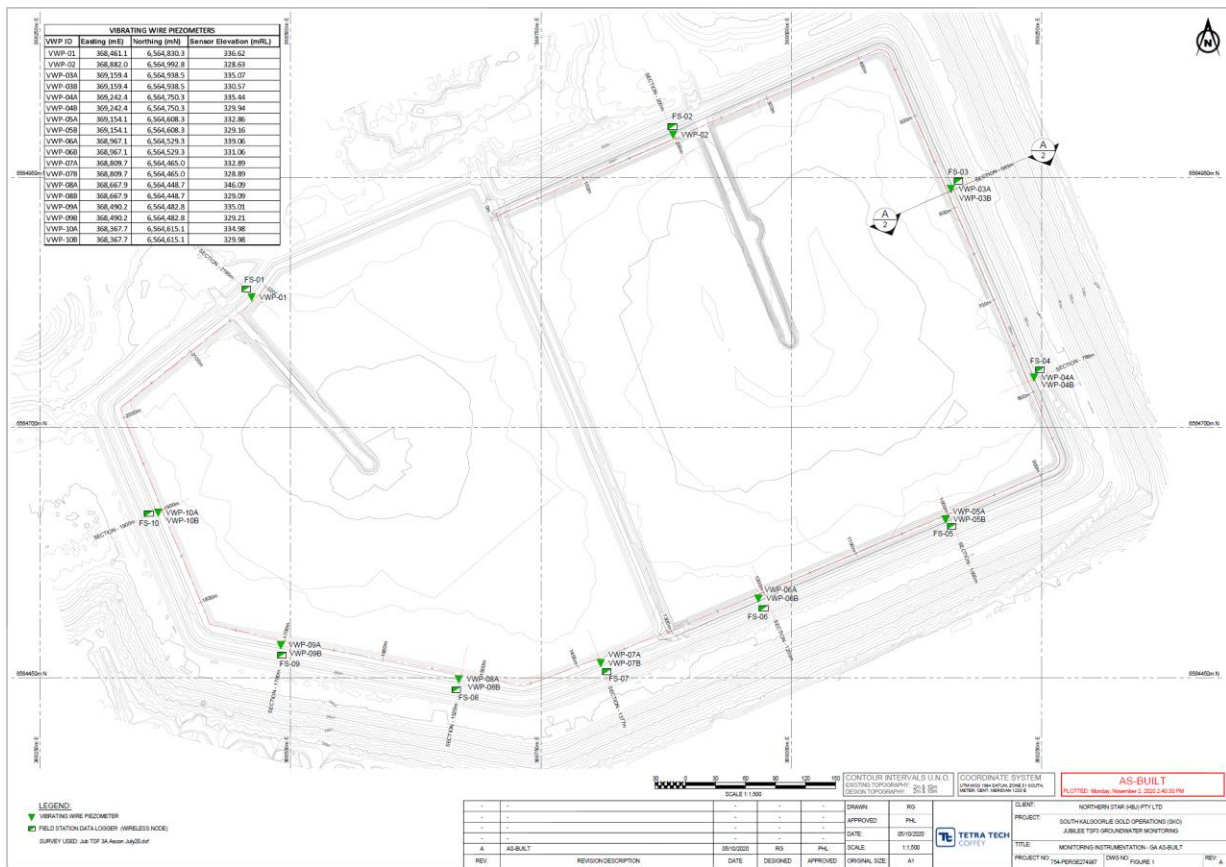


Figure 2: VWP installation location

Groundwater monitoring bores

As conditioned in W6502/2021/1, three additional groundwater monitoring bores (JMB21 - JMB23) close to the TSF were constructed in April 2022 to allow the Licence Holder to investigate the bedrock aquifer and better understand high flowrates that have been previously recorded. The monitoring bores were also proposed to allow the Licence Holder to study how the tailings storage facility operation may affect the aquifer over time.

The tailings monitoring bores were drilled up to 60 m depth and intercepted water between 11 and 24 m depth. Drilling at each of the monitoring bore locations intersected fresh ultramafic bedrock overlain by highly weathered regolith. Fresh bedrock was intersected between 18 and 20 m depth in each of the bores, with JMB21 and JMB23 showing significant broken ground. Monitoring bore JMB22 showed some minor broken ground, which did not yield significant volumes of water; generally, less than 0.5 L/s. The location of the three additional monitoring

bores (JMB21 – JMB23) are shown in Figure 3.

Groundwater levels in the three monitoring bores are presented in Figure 4. Ground water levels are highest in the north-west, JMB23, closer to the TSF (317.09 m AHD). The monitoring bore, JMB21, is 2 m lower than JMB23, which is typical of surficial aquifer regional flow in the area towards Lake Lefroy, located 16 km south/south-east of Jubilee and could indicate seepage from the TSF.

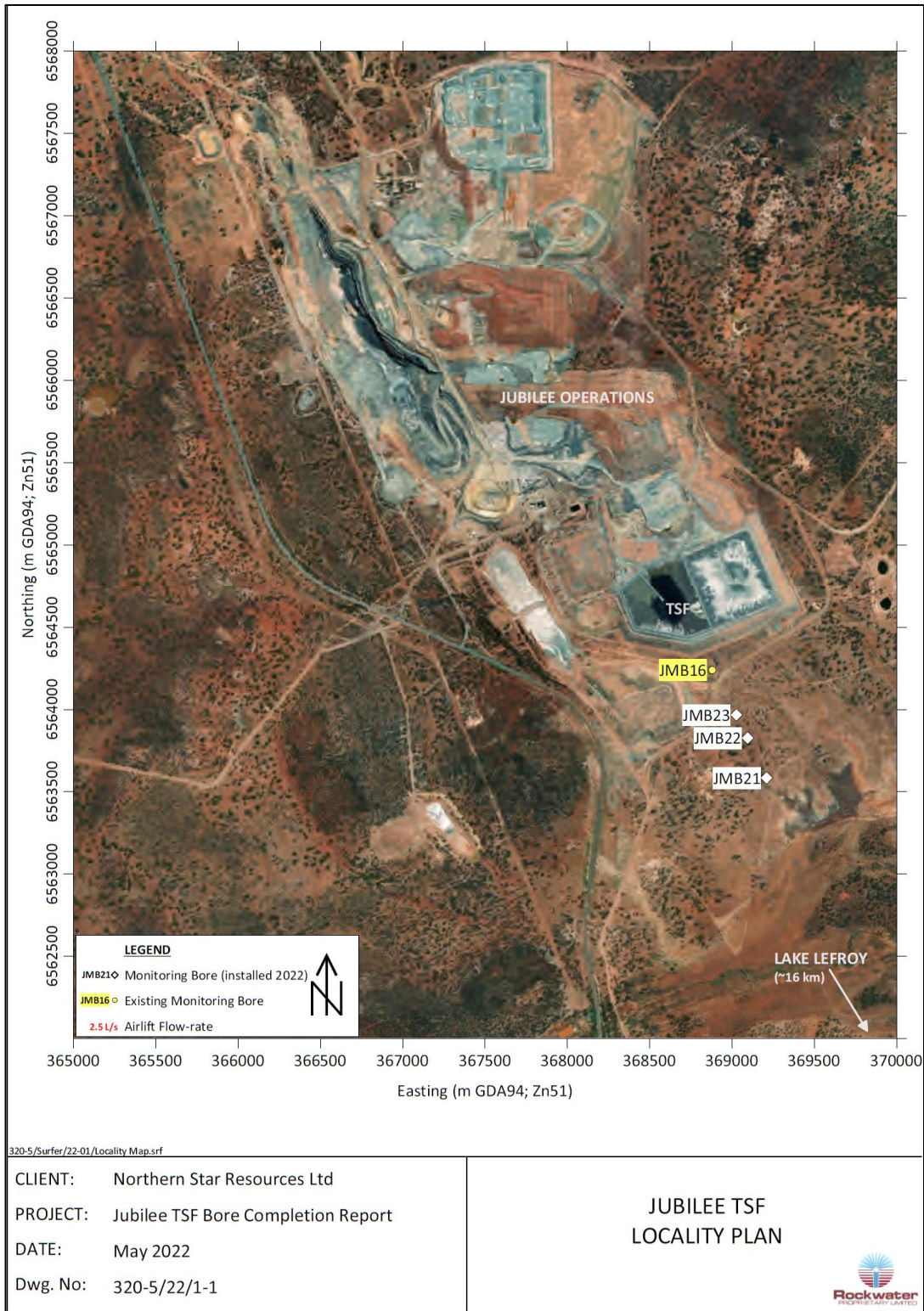
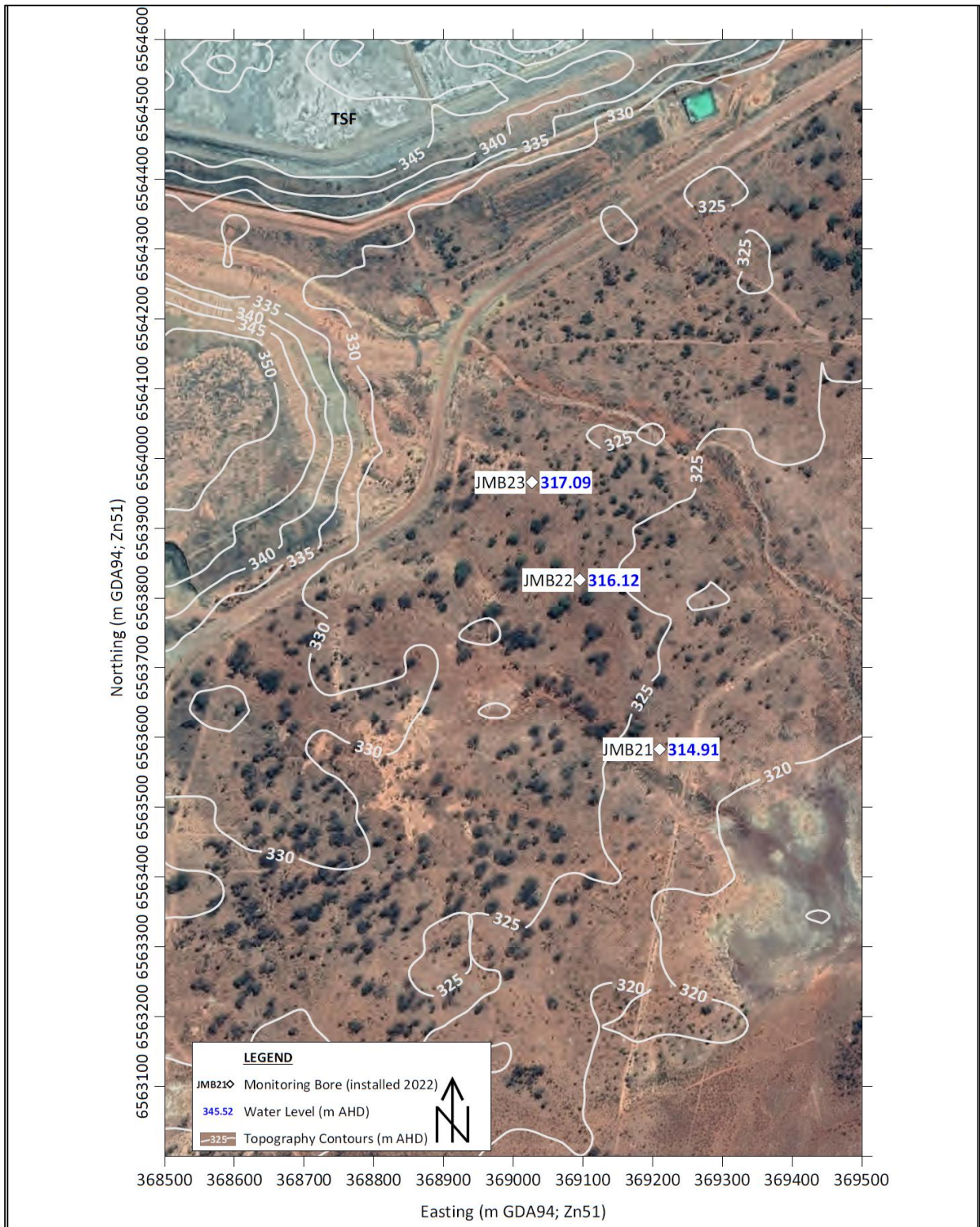


Figure 3: Jubilee TSF monitoring bore location



320-5/Surfer/22-01/Monitoring Bore Location.srf

CLIENT: Northern Star Resources Ltd
 PROJECT: Jubilee TSF Bore Completion Report
 DATE: May 2022
 Dwg. No: 320-5/22/1-2

**JUBILEE TSF
 MONITORING BORE LOCATIONS
 & WATER LEVELS**




Figure 4: Jubilee TSF3 monitoring bore location and water level (m AHD)

2.2.2 Ambient groundwater quality

Water samples were collected from the three new monitoring bores (JMB21 – JMB23) at the end of construction and submitted to ALS Laboratories for comprehensive water analyses. The laboratory results and certificates were provided in supporting documentation included with this application.

The pH values of all three bores indicate circum-neutral values, being between 7.49 and 7.78 pH units; field measurements were in a similar range from 7.08 to 7.71.

All bores contain hypersaline water, with salinity concentrations ranging from 67,500 to 73,200 mg/L TDS (Total Dissolved Solids by evaporation); field EC ranged from 92,200 to 97,700 µS/cm, which was slightly higher than the laboratory EC.

Total cyanide in the three bores ranged from 0.221 to 0.696 mg/L. For both total cyanide and salinity, concentrations are higher in JMB23, which is the closest monitoring bore to the TSF, while the lowest concentrations are recorded in JMB21. It may be evidence of seepage from the TSF.

2.3 Operations at SKO Jubilee Gold Mine (care and maintenance)

Due to suspected and ongoing seepage from the Jubilee TSF, works approval W6502/2021/1 originally conditioned the construction of seepage recovery bores in proximity to the TSF.

The approximate number and location of bores was to be assessed and identified by a suitably qualified hydrogeologist and the bores were to be constructed within 90 days from the commencement of time limited operations for items 1, 2 and 3 as set out in Condition 8 of W6502/2021/1.

On 28 June 2022 the Licence Holder applied to amend the 90-day timeframe in W6502/2021/1 (requesting an extension to 365-days or 12-months), as the Licence Holder did not believe construction and commissioning of additional seepage recovery bores could be done in time (due by 17 August 2022).

The Licence Holder stated that a delay in seepage bore construction was not likely to increase environmental risk as evidence was provided that higher abstraction rates from the existing TSF3 seepage recovery bores (JMB16, 17 & 19) could result in decreasing standing water levels. The Licence Holder has also stated that the frequency of preventative maintenance of the recovery bore submersible pumps has been increased, improving pump output and availability, and the additional time would be used to collect more data and review the groundwater seepage in more detail.

This licence amendment and the amendment to works approval W6502/2021/1 (as detailed above) were undergoing concurrent assessment.

In July 2022 DWER was contacted by the Licence Holder and notified that the feed mill at SKO Jubilee Gold Mine would be put into care and maintenance, and that tailings deposition into TSF3 would cease by the end of August 2022.

The licence holder notified the department that with the premises in care and maintenance the proposed seepage recovery bores could not be constructed within the proposed 365-days (12 months) timeframe, and the Licence Holder withdrew the application to amend works approval W6502/2021/1 on 17 August 2022.

To date, the Licence Holder has not yet determined the appropriate locations for the seepage recovery bores, as they were still waiting for hydrogeological advice and access to construction crew. Refer to section 3.3 for detailed assessment.

3. Risk assessment

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

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

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

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

Table 1: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Tailings	Tailing seepage	Direct infiltration into subsurface and groundwater	<ul style="list-style-type: none"> Existing seepage network, groundwater monitoring and pipeline infrastructure requirements are set out in licence L5107/1988/13 Three additional groundwater monitoring bores constructed to the south of TSF3 (within rock aquifer) Additional monitoring of total cyanide (as suggested in supporting document provided with the application for W6502/2021/1) Inclusion of Production Bore B and C in the ambient groundwater monitoring network to record SWL. Additional seepage recovery bores to be installed if capacity of existing wells is exceeded (as suggested in supporting document provided with the application for W6502/2021/1)
	Overtopping of TSF		<ul style="list-style-type: none"> Sufficient storage for 1 in 100-year AEP, 72-hour storm event Minimum freeboard is set out in the licence L5107/1988/13

3.1.2 Receptors

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

Table 2 below provides a summary of potential human and environmental receptors that may

be impacted because of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental siting* (DWER 2020)).

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

Human receptors	Distance from prescribed activity
Woolibar pastoral homestead	5 km south-east of TSF3 Screened out as a sensitive receptor due to distance
Environmental receptors	Distance from prescribed activity
Underlying groundwater (hypersaline)	Underlying the premises Approximately 5 – 30 meters below ground level (mbgl); generally flowing south / south-east There are no nearby groundwater users.
Surrounding native vegetation	Within premises boundary, no priority species
<i>Leipoa ocellate</i> (Malleefowl)	Reported in the area, including within premises boundary (Note that works only occurred within the already disturbed mining area)

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 considers potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete 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 3.

The Revised Licence L5107/1988/13 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. tailing deposition after embankment raises.

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

Table 3. Risk assessment of potential emissions and discharges from the Premises operation

Risk Event					Risk rating ¹ C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls				
Operation								
Tailings deposition into raised cells	Tailings seepage	Seepage through base of TSF, causing mounding of hypersaline and potentially contaminated groundwater	Groundwater (hypersaline)	Refer to Section 3.1.1	C = Moderate L = Likely High Risk	Y	Condition 16. Seepage recovery bore construction Condition 23 Cyanide monitoring and SWL Condition 30, 33 and 34 Reporting on active TSF and decommissioning status to DMIRS	See section 3.3 – detailed assessment No additional controls were proposed, but the Licence Holder directed the Delegated Officer to the controls listed in W6502/2021/1 and supporting documentation. Seepage recovery bores were not constructed as per W6502/2021/1. The inclusion of this condition into L5107/1988/13, with due consideration of 'care and maintenance', will ensure risk of seepage is managed while allowing some flexibility to the Licence Holder. Ongoing monitoring of total cyanide may provide trends of seepage from TSF3 and was included as a recommended control in W6502/2021/1. Geotechnical review by DMIRS also produced several recommended conditions for inclusion into the licence (see section 3.4). These have been added to the licence to ensure reporting on active TSF and decommissioning status be provided to the department (will be referred to DMIRS for review).
	Tailings or decant water	Overtopping tailings cell	Native vegetation	Refer to Section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 4 and Condition 6	Existing condition 4 sets out freeboard requirements and freeboard inspection are covered by existing condition 6 in licence L5107/1988/13.

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

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

3.3 Detailed risk assessment for tailing seepage

The deposition into TSF3 is already regulated under licence L51071988/13, and existing conditions set out quarterly groundwater quality monitoring, and monthly monitoring of the standing water level within bores in the proximity of TSF3. A limit for standing water level in all groundwater bores has also been conditioned within the licence (4 mbgl).

A review of the standing water levels from 2019 to July 2021 was conducted during the assessment of W6502/2021/1 and a steady increase of water levels was noted. As part of this assessment several exceedances of the standing water level limit (SWL) have been reported to the department in 2021 and more recently in October 2022 with a SWL in JMB15 recorded at 3.61 mbgl.

Three existing monitoring bores (JMB16, JMB17 and JMB19) are equipped with pumps and act as seepage recovery bores. The Licence Holder has stated that the frequency of preventative maintenance of the existing recovery bore submersible pump network has increased, and that this would improve pump output and availability.

The deposition of additional tailings after the proposed embankment raise is likely to increase the already occurring seepage and rising groundwater level.

The Licence Holder submitted a groundwater study with the original works approval application. In this report, the migration of cyanide through seepage to existing monitoring bores had been identified and was used to suggest that seepage from the TSF was occurring.

As part of the supporting documentation for this licence amendment baseline bore logs were provided for the new monitoring bores (JMB21 to JMB23) that were constructed as per W6502/2021/1. For both total cyanide and salinity, concentrations are higher in JMB23, which is the closest monitoring bore to the TSF3, while the lowest concentrations are recorded in JMB21. See section 2.2.1.

3.3.1 Licence Holder controls

No additional controls were proposed by the Licence Holder for this licence amendment. In the application documents the Licence Holder refer to the works approval supporting documentation for environmental risk assessment and management measures, along with other submitted reports related to W6502/2021/1. Controls outlined in these documents have been stipulated within Table 1 of this Amendment Report.

The recommendation from Coffey, 2020 included the construction of three additional monitoring bores to the south of the TSF3 (completed), adding Production Bore B and Bore C in the current monitoring network in L5107/1988/13 (for SWL monitoring only), adding cyanide monitoring to Monitoring of Ambient Groundwater Quality in the licence, and adding additional seepage recovery bores if the Licence Holder determines that the capacity of the current bores is exceeded. The Delegated Officer has included these controls as conditions in the revised licence.

3.3.2 Rating of this risk event

Taking into consideration the ongoing seepage that is occurring, and historical exceedances of the SWL limit of 4 mbgl within groundwater monitoring bores surrounding the TSF, the Delegated Officer has considered the consequence of tailing seepage to be **Moderate**.

While TSF3 is currently in care and maintenance, this amendment is to authorise additional tailings into the TSF which will further increase already occurring seepage. The Delegated Officer considers the likelihood of this risk event to be **Likely**.

3.3.3 Regulatory controls

The Delegated Officer acknowledges that deposition into TSF3 has ceased while the feed mill is in care and maintenance, and that upgrades to the existing seepage recovery bores has been undertaken by the Licence Holder, however additional tailing deposition because of this embankment lift is likely to result in increased seepage which requires management.

As detailed above in section 2.3, the seepage recovery bores were not constructed as per W6502/2021/1. The additional seepage recovery bores are a key control in managing the impacts of increase seepage from the TSF. Therefore, a condition has been added to L5107/1988/13, with due consideration of 'care and maintenance', to ensure the seepage recovery bores are constructed. The licence condition specifies that construction of the additional seepage recovery bores is to occur within 90 calendar days of the recommencement of tailing deposition into TSF3.

An additional regulatory control, the quarterly monitoring of total cyanide within groundwater bores surrounding TSF3, has also been added to the licence. Ongoing monitoring of cyanide may provide trends of seepage from TSF3 and was included as a recommended licence condition in the decision report for W6502/2021/1.

Geotechnical review by DMIRS also produced several recommended conditions for inclusion into the licence. These have been included to ensure reporting on active TSF and decommissioning status be provided to the department. These documents will be forwarded to DMIRS for review and comment. Refer to section 3.4.

3.4 Geotechnical Review

Jubilee TSF3 is located on freehold land, and therefore the provisions of the *Mining Act 1978* and subsidiary legislation does not apply. (DMIRS regulates safety and stability aspects of tailing storage facilities when located on mining tenements and land as set out in the *Mining Act 1978*.)

The department referred the original works approval proposal to DMIRS to undertake a geotechnical review and included relevant conditions in the works approval.

Several sections of advice were relevant for the licence amendment and are summarised below.

1. An annual audit and review of TSF3 by engineering or geotechnical specialist is required. This includes past performance, validate the design, examine tailings management, and review results of monitoring. The audit and review report, including recent survey pick-up of the facility and an updated tailings storage data sheet should be referred to DMIRS for review
2. At the time of decommissioning of TSF3 and prior to rehabilitation, a further review report by a geotechnical or engineering specialist shall be submitted to DMIRS. The report should review the status of structure and contained tailings, examine, and address the implications of the physical and chemical characteristics of the materials, and present and review the results of all monitoring. The rehabilitation stabilisation works proposed, and any ongoing remedial requirements are also to be addressed.

Conditions based on these recommendations have been included in the revised licence as regulatory controls.

Once the construction of the embankment raises was complete the Licence Holder submitted compliance reports relevant to the stability and safety of the embankment raise to DWER and these were referred to DMIRS for review. On 31 October 2022 the department received a geotechnical review summary from Mines Safety Directorate – DMIRS.

The following aspects were noted and understood by DMIRS:

- The construction report present details of earthworks associated with the Stage 4 embankment wall raise.

- The construction works were undertaken based on the design concept presented in Tetra Tech Coffey's design report dated 11 December 2020.
- QA/QC soil testing was undertaken onsite on a full-time basis.
- Compliance testing was in compliance with latest revised AS1289.
- There were no variations to the design reported.
- Blanked out areas in the documents were made by DWER and DMIRS thus assumed it be signed by the appropriate entities.

Based on the interpretations made from the information submitted by Tetra Tech Coffey including the Certificate of Compliance, it was the opinion of WorkSafe Mines Safety that the Licence Holder had now demonstrated compliance with the construction requirements of this facility.

4. Consultation

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

Table 4: Consultation

Consultation method	Comments received	Department response
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal 3 June 2022	DMIRS replied on 31 October 2022 and comments are summarised in section 3.4	Comments noted.
Licence Holder was provided with draft amendment on 2 November 2022	Comments were received from the Licence Holder on 22 November 2022, 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 will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

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

Table 5: Summary of licence amendments

Condition no.	Proposed amendments
Cover page	Updated to match current template, included assessed production / design capacities
Table 1: Definitions	Add in definition(s) for 'suitably qualified professional engineer' and 'TSF'
Interpretation	Updated to match current template / language
Table 2: Containment infrastructure	Updated Jubilee TSF cell name / number and include additional infrastructure requirements from W6502/2021/1 related to embankment raises
Table 3: Inspection of infrastructure	Added additional scope and type of inspection related to TSF operation
	Added in frequency of inspection that reduces regulatory burden while the premises is

	in care and maintenance
Table 8: Infrastructure to be constructed	Include seepage recovery bores to 'infrastructure to be constructed' table, with condition that construction must be completed following recommencement of tailings deposition into TSF3.
Table 12: Monitoring of ambient groundwater quality	Included JMB 21 – 23 and Bore B and Bore C as monitoring points, included 'total cyanide' as a monitoring parameter.
Condition 29	Added Condition 29 which triggers License Holder to audit and review active TSF and report performance and monitoring to DWER
Table 14: Notification requirements	Added a parameter related to notifying the department once operation of the feed mill and tailing deposition recommence at the premises
Condition 33	When TSF3 is to be decommissioned, a condition has been included to trigger the Licence Holder to generate a report to be submitted to DWER
Condition 34	Lists parameters that should be included in the report that is specified by condition 33.
Schedule 1: Maps	Inclusion of new updated maps, labeling of all 'figures' to allow for cross-referencing.
L5107/1988/13	Updated cross referencing throughout, replaced the term 'Licensee' with the current 'Licence Holder'.

References

1. Northern Star (HBJ) Pty Ltd 2022, *Application form; amendment to licence L5107/1988/13*, Subiaco, Western Australia
2. Tetra Tech Coffey Pty Ltd 2022, *South Kalgoorlie Operations Jubilee Tailings Storage Facility 3 Stage 4 Embankment Raise, report 754-PERGE296667*, Perth, Western Australia
3. Tetra Tech Coffey Pty Ltd 2022, *Jubilee Gold Mine – Tailing Storage Facility TSF 3 Vibrating Wire Piezometers – Installation Report, report 754-PERGE274987-02*, Perth, Western Australia
4. Rockwater Pty Ltd 2022, *Jubilee TSF Tailing Monitoring Bore Completion Report JMB21 to JMB23, report no. 320.5/22/01*, Jolimont, Western Australia
5. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
6. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Joondalup, Western Australia.
7. DWER 2020, *Guideline: Risk Assessments*, Joondalup, 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
L5107/1988/13 Table 3: Inspection of infrastructure	The Licence Holder request that frequency of inspection for infrastructure be amended to monthly , while in care and maintenance.	Notification regarding the premises entering care and maintenance came as the application was under assessment. 'Weekly' was set by the Delegated Officer but the Licence Holder was invited to suggest an alternative regime that suited the operations and resources of the premises. The intent of infrastructure inspections is to ensure appropriate level of environmental protection is maintained, and the Delegated Officer believes that monthly inspections while the site is not operational will still provide that environmental protection. The suggested change has been made in the revised Licence.
L5107/1988/13 Table 8: Infrastructure to be constructed	The Licence Holder requests that this be amended to 120 calendar days to allow more time to arrange the installation and commissioning of the seepage recovery bores, considering the current labour shortages, supply chain delays and limited contractor availability to undertake the work.	Considering the site is now in care and maintenance, the Delegated Officer does not believe that additional time (30 calendar days) will significantly increase environmental risk. The suggested change has been made in the revised Licence.
L5107/1988/13 Table 12: Monitoring of ambient groundwater quality	The Licence Holder request GHMB 3 and 12 be removed from the Licence. Amend to GHMB 1, 2, 4-9 <u>Justification:</u> GHMB 3 is deemed to be unsafe to access due to its proximity to the edge of Golden Hope pit. GHMB 12 was destroyed during a haul road re-alignment in April 2015.	The suggested change has been made in the revised Licence.
	The Licence Holder request JMB 11 be removed from the Licence. Amend to JMB 10, 12-15 <u>Justification:</u>	With the inclusion of JMB 21-23 into the monitoring network, the Delegated Officer does not believe the exclusion of JMB 11 results will increase environmental risk.

Licence: L5107/1988/13 (28 November 2022)

Condition	Summary of Licence Holder's comment	Department's response
	JMB 11 is deemed to be unsafe to access and has been bunded off due to severe erosion gullies and other safety concerns.	The suggested change has been made in the revised Licence.
	<p>The Licence Holder request SMB 2, 4 10 and 14 be removed from the Licence. Amend to SMB 1, 3, 5-9, 11, 13, 15</p> <p><u>Justification:</u> SMB 2 and SMB 4 are deemed to be unsafe to access due to their proximity to the edge of Samphire pit. SMB 10 is no longer able to be sampled due to operational changes and equipment placed down the bore. SMB 14 was destroyed by sediment following a heavy rainfall event in March 2020.</p>	The monitoring network around Samphire pit still consists of 10 monitoring bore locations and deposition into Samphire has ceased while the site is in care and maintenance. The Delegated Officer does not believe that this proposed change will increase environmental risk and has amended the revised Licence.
	<p>The Licence Holder request MGTSF 3 be removed from the Licence. Amend to MGTSF 1, 2 and 4</p> <p><u>Justification:</u> MGTSF 3 has been blocked and unable to be sampled since June 2017.</p>	The Delegated Officer has made the suggested change in the revised Licence.
	<p>The Licence Holder requests Bore B and C be removed from sampling requirement.</p> <p><u>Justification:</u> Bores B and Bore C are unable to be purged or sampled as they are production bores with equipment/pumps placed down the borehole.</p>	Bore B and Bore C were incorrectly included as monitoring points for groundwater quality. They are to be used to monitor standing water level only. The Delegated Officer has made this change in the revised Licence.
	Please amend conductivity unit to $\mu\text{S}/\text{cm}$	$\mu\text{S}/\text{cm}$ is the correct unit of measurement for conductivity and the suggested change has been made in the revised Licence.
	<p>The Licence Holder requests that frequency of ambient groundwater quality monitoring be amended to:</p> <p>Quarterly (1)</p> <p>(1) Quarterly monitoring during operations or when facility is active.</p>	<p>Based on the lack of tailing deposition into Bellevue, Golden Hope and Mt Goddard in-pit TSF's, and the site being in care and maintenance, the Delegated Officer agrees the environmental risk is low.</p> <p>The suggested change to ambient groundwater monitoring frequency has been made in the revised Licence.</p>

Condition	Summary of Licence Holder's comment	Department's response
	<p>Biannually (2)</p> <p>(2) Biannual monitoring during care and maintenance or when facility is inactive.</p> <p><u>Justification:</u></p> <p>Tailings deposition into Bellevue In-pit TSF ceased in 2008, with the facility inactive for the past 14 years.</p> <p>Tailings deposition into Golden Hope In-pit TSF ceased in 2015, with the facility inactive for the past 7 years.</p> <p>Tailings deposition into Mt Goddard's In-pit TSF ceased in 2015, with the facility inactive for the past 7 years. Mt Goddard's has been used on occasion as an emergency TSF (with minimal deposition) and for flushing excess water from pipelines.</p> <p>Standing water levels have continued to decline within historic trends, and water quality parameters have remained stable and within historical ranges across all the inactive TSF monitoring bores. Refer to 2021 AER.</p> <p>Furthermore, the SKO Jubilee Processing Plant has entered care and maintenance so there is no tailings deposition into the previously active Samphire TSF (SMB bores) or Jubilee TSF3 (JMB bores).</p>	
	<p>The Licence Holder request SMB 14 be removed from the Licence.</p> <p>Amend to SMB 9, 11, 13, 15</p> <p><u>Justification:</u></p> <p>SMB 14 was destroyed by sediment following a heavy rainfall event in March 2020.</p>	<p>The monitoring network around Samphire pit still consists of 10 monitoring bore locations and deposition into Samphire has ceased while the site is in care and maintenance. The Delegated Officer does not believe that this proposed change will increase environmental risk and has amended the revised Licence.</p>
	<p>the Licence Holder request JMB 11 be removed from the Licence.</p> <p>Amend to JMB 10, 12-15</p> <p><u>Justification:</u></p> <p>JMB11 is deemed to be unsafe to access and has been bunded off due to severe erosion gullies and other safety concerns.</p>	<p>With the inclusion of JMB 21-23 into the monitoring network, the Delegated Officer does not believe the exclusion of JMB 11 results will increase environmental risk.</p> <p>The suggested change has been made in the revised Licence.</p>
	<p>The Licence Holder request GHMB 12 be removed from the Licence.</p> <p>Amend to GHMB 1, 8 and 9.</p>	<p>The Delegated Officer has made the suggested change in the revised Licence.</p>

Condition	Summary of Licence Holder's comment	Department's response
	<p><u>Justification:</u> GHMB 12 was destroyed during a haul road re-alignment in April 2015.</p> <p>The Licence Holder requests that frequency of ambient groundwater quality monitoring be amended to:</p> <p>Monthly (1) (1) Monthly monitoring during operations or when facility is active.</p> <p>Quarterly (2) (2) Quarterly monitoring during care and maintenance or when facility is inactive.</p>	<p>Based on the lack of tailing deposition into Bellevue, Golden Hope and Mt Goddard in-pit TSF's, and the site being in care and maintenance, the Delegated Officer agrees the environmental risk is low.</p> <p>The suggested change to ambient groundwater monitoring frequency has been made in the revised Licence.</p>
Schedule 1	<p>The Licence Holder request all maps in Schedule 1 be replaced with updated figures attached.</p> <p>Figures 1-5 to be replaced by new maps provided.</p> <p>Figure 1: Premises Boundary Map.</p> <p>Figure 2: Locations of TSF's and Groundwater Monitoring Bores.</p> <p>Figure 3: Landfill & Dewatering Pipeline / Discharge Point Locations.</p>	<p>The Delegated Officer notes that the new maps are higher definitions, with better labelling of relevant infrastructure.</p> <p>The updated maps have been included in the revised Licence and cross referencing in Licence has been updated to match.</p>
N1 Form	<p>The Licence Holder request a better copy / template of the Form N1 be attached to Schedule 2.</p>	<p>A better copy of Form N1 has been added to the revised Licence.</p>

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY			
Application type			
Amendment to licence	<input checked="" type="checkbox"/>	Current licence number:	L5107/1988/13
		Relevant works approval number:	N/A <input checked="" type="checkbox"/>
Date application received	1 April 2022		
Applicant and Premises details			
Applicant name/s (full legal name/s)	Northern Star (HBJ) Pty Ltd		
Premises name	South Kalgoorlie Operations – Jubilee Gold Mine		
Premises location	Lot 15 on Plan 58833, Lot 50 on Plan 226299 and Lot 51 on Plan 226303, Feysville, Lot 103 on Plan 40395 Lot 105 on Plan 40396, Karamindie, and mining tenements M26/118, M26/143, M26/204 and M15/456		
Local Government Authority	City of Kalgoorlie-Boulder		
Application documents			
HPCM file reference number:	DER2021/000013		
Key application documents (additional to application form):	Construction compliance report, including photographs and geotechnical test results.		
Scope of application/assessment			
Summary of proposed activities or changes to existing operations.	Licence amendment of L5107 required for the transition from Works Approval W6502/2021/1 for the operation of Jubilee TSF3 (Stage 4 merge embankment raise).		
Category number/s (activities that cause the premises to become prescribed premises)			
Table 1: Prescribed premises categories			
Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity	
Category 5: Processing or beneficiation of metallic or non-metallic ore	1,650,000 tonnes per year	N/A	
Legislative context and other approvals			
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>	
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: EPA Report No:	

Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Certificate of title <input checked="" type="checkbox"/> Northern Star Resources Limited Lot 15 on Plan 58833 Freehold title land, Hamptons Plain Estate – East Location 48
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	If N/A explain why? Mining tenure
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	CPS No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Licence/permit No: GWL 106836
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004</i> , <i>Environmental Protection (Controlled Waste) Regulations 2004</i> , <i>State Agreement Act xxxx</i>)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Classification: awaiting classification (HPECM reference DEC2388)