



Application for Licence Amendment

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

Licence Number	L8041/1990/5
Licence Holder	Western Areas Limited
ACN	091 049 357
File Number	DER2015/000458
Premises	Forrestania Nickel Operations Forrestania-Southern Cross Road FORRESTANIA WA 6359 Legal description – Mining tenements M74/57, M74/58, M74/90, M74/91, M77/335, M77/399, M77545, M77/568, M77/574, M77/582, M77/583, M77/584, M77/586, M77/587, M77/588, M77/589, M77/912, L70/111, L74/44, L77/104, L77/141, G70/226 and G70/231 As defined by the Premise maps in Schedule 1 of the Revised Licence
Date of Report	13 May 2022
Decision	Revised licence granted

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REGULATORY SERVICES

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

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1. Decision summary

Licence L8041/1990/5 is held by Western Areas Limited (Licence Holder) for the Forrestania Nickel Operations (the Premises), located on mining tenements M74/57, M74/58, M74/90, M74/91, M77/335, M77/399, M77545, M77/568, M77/574, M77/582, M77/583, M77/584, M77/586, M77/587, M77/588, M77/589, M77/912, L70/111, L74/44, L77/104, L77/141 and general purpose leases G70/226 and G70/231.

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 L8041/1990/5 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 18 January 2022, the Licence Holder submitted an application to the department to amend Licence 8041/1990/5 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The amendment was sought to authorise the operation of the trial Bacterial Heap Leach (BioHeap Leach) facility (Bacterial Heap Leach facility), which is considered a Category 7 prescribed activity (Vat or *in situ* leaching of metals).

This amendment is limited only to the inclusion of Category 7 activity to the existing licence. No changes to the aspects of the existing licence relating to Category 5, 6, 12, 54 or 89 have been requested by the Licence Holder.

2.3 BioHeap Leach facility

The trial BioHeap Leach facility was constructed at mining tenement M77/399, within the footprint of a decommissioned tailings storage facility (TSF) previously operated by Outokumpu Western Australia Pty Ltd. The construction works were undertaken in accordance with works approval W6345/2020/1.

The trial BioHeap Leach facility extracts nickel from mill scats (i.e. the fraction of ore resilient to the crushing process) from the Cosmic Boy Operations. The scat material processed in the heap leach process are inert, contain no fibrous material and are not dispersive or contain significant acid-generating potential.

The facility is currently designed to treat up to 20,000 tonnes of stockpiled scats in a closed-circuit system, with the resulting enriched nickel solution piped to the existing nickel leaching plant adjacent to the concentrator plant. It is intended that the trial heap facility will continue to be treated with reagents until the current 20,000 tonnes of scats have been leached and are exhausted of nickel.

The relevant infrastructure for the facility is detailed in Table 1 and shown in Figure 1.

A larger full-scale BioHeap Leach capable to processing approximately 200,000 tonnes of mill scat is currently in the engineering design phase. This licence amendment does not include the assessment and authorisation of this full-scale BioHeap Leach.

Table 1: BioHeap Leach facility infrastructure

Primary infrastructure	Infrastructure description
Feed preparation area	<p>A front-end loader transports the scat from the scats stockpile to a stacking conveyor feeder, consisting of a feed bin, plate reader and conveyor belt.</p> <p>The scat material is then sprayed with an inoculum slurry (2% solids) containing nickel-leaching bacteria. The stack conveyor stacks the inoculated scats onto the heap leach pads.</p>
Heap leach pad	<p>The stacking conveyor deposits the inoculated scats directly onto the heap pad. The pad area comprises of approximately 2,400 m³, with a nominal heap height of 8 m. The heap leach pad was designed as a single-use pad with a capacity to hold 20,000 tonnes. The pad is split into three cells via two bunds, which allow the heap leach pad to operate under different conditions for testing purposes. Temperature, pH, flow and pressure are monitored in each cell.</p> <p>The pad foundation was constructed using in-situ surficial soils that have been scarified, moisture-conditioned and compacted. The foundation was then overlain with Bidim A64 geotextile and a high-density polyethylene (HDPE) liner with a leak detection and collection system. The drainage layer comprises a “Megaflow” slotted drainage pipe laid directly onto the HDPE liner. Inverted, partially slotted PVC pipes deliver air into the heap.</p> <p>The inoculated scat heap is irrigated with water dosed with small amounts of 98% sulfuric acid to produce a nickel-rich pregnant liquor solution (PLS). The heap area is graded at 1% to the south to redirect PLS into the drainage pipes</p>
PLS tank and pond	<p>Three 20 m³ tanks are installed within a pond lined with Bidim A64 geotextile and 1.5 mm HDPE liner, located west of the heap leach pad (Figure 1). PLS flows through the drainage at the heap leach pad to the PLS tanks for sampling and process control. The PLS is then re-acidified and re-irrigated to the top of the heap to accumulate nickel concentration in the PLS.</p> <p>The tanks have an overflow pipe that discharges into the PLS pond, which is approximately 5 m deep, with a storage capacity of approximately 2,820 m³. The PLS pond, in turn, will overflow into the adjacent surface water management pond via a connecting pipeline at approximately 75% capacity. A solution recovery sump pump has been installed within the PLS pond to remove any PLS spillage.</p>
Surface water management pond (overflow catchment pond)	<p>A pond with a compacted clay base to capture excess stormwater, PLS spills and overflows from the PLS pond. The pond is approximately 5 m deep, with a storage capacity of approximately 2,940 m³. The perimeter of the pond is bunded.</p>
Heap irrigation	<p>Each cell has its own irrigation feed pump, which draws PLS from the PLS tank for recirculation to the heap. The irrigation rate at the heap is typically 2 L/hour, using emitter-type dippers arranged in a square grid pattern spaced in 0.3 m intervals. The drippers can be operated to vary the irrigation rate, up to a design capacity of 24 L/m²/hour.</p>
Heap aeration	<p>A low-pressure blower distributes air to each cell for aeration. Aeration pipes are spaced at 3 m intervals. Each pipe can be isolated, flushed and drained, if precipitate accumulates within the pipes.</p>
PLS bleed pipeline	<p>Once adequate nickel concentration in the PLS is achieved, a PLS bleed pump transfers the PLS from PLS tank to the Mill Recovery Enhancement Project</p>

Primary infrastructure	Infrastructure description
	<p>(MREP) facility for nickel recovery.</p> <p>The PLS bleed pipeline has a peak transfer rate of 1.7 m³/hour, which is considered manageable within the existing MREP circuit without requiring modification to accommodate. The pipeline utilises existing tailings and decant water return pipeline corridors.</p>
Ancillary infrastructure	Infrastructure description
Mill Recovery Enhancement Project (MREP)	<p>The MREP (also known as BioLeach Facility at the Cosmic Boy Concentrator) was designed to receive PLS from the BioHeap Leach once nickel concentration in the PLS has achieved a concentration of approximately 15,000 ppm to 20,000 ppm through the PLS bleed pipeline.</p> <p>At the MREP, the PLS bleed solution is added to a Polishing Tank to precipitate and remove impurities, prior to nickel sulfide precipitation.</p> <p>Note that the MREP is not part of the BioHeap Leach facility and has been assessed under a separate licence amendment, granted on 8 September 2020.</p>
Acid storage	<p>A purpose-built 60 m³ tank for the storage of 98% sulfuric acid, provided by the acid supplier. Three pumps connect and supply acid to each of the three cells at the heap leach. One of the pumps also supplies acid to the inoculum day tank. The storage tank is bunded to prevent discharge to the environment.</p>
Water supply	<p>Raw water is required to make up solution inventory. Water is sourced from the Cosmic Boy tailings storage facility (TSF) and nearby bore FP/OBS4A and transferred to the facility via a pipeline (Figure 1). The pipeline utilises existing disturbed infrastructure corridors.</p> <p>Water from both sources is considered hypersaline, with Cosmic Boy TSF return water containing total dissolved solids (TDS) concentrations ranging from 80,000 mg/L to 120,000 mg/L, and bore water from FP/OBS4A ranging between 37,000 mg/L and 50,000 mg/L.</p> <p>One of the heap leach pad cells uses desalinated fresh water, which is stored in a separate tank, adjacent to the PLS pond.</p>
Electrical power generation	<p>Electrical power is provided by a dedicated local diesel genset. The feed preparation area, heap leach area and heating circuit require a 20 kVA, 80 kVA and 150 kVA genset unit, respectively. All fuel storage is bunded to prevent discharge to the environment.</p>
Controls and communication	<p>The heap leach circuit uses local start-stop controls, with a limited number of local control loops and instrumentation for critical process monitoring. Drive status and instrument signals are directed back to the MREP Citect control system for remote monitoring. The communication equipment utilises existing disturbed infrastructure corridors.</p>

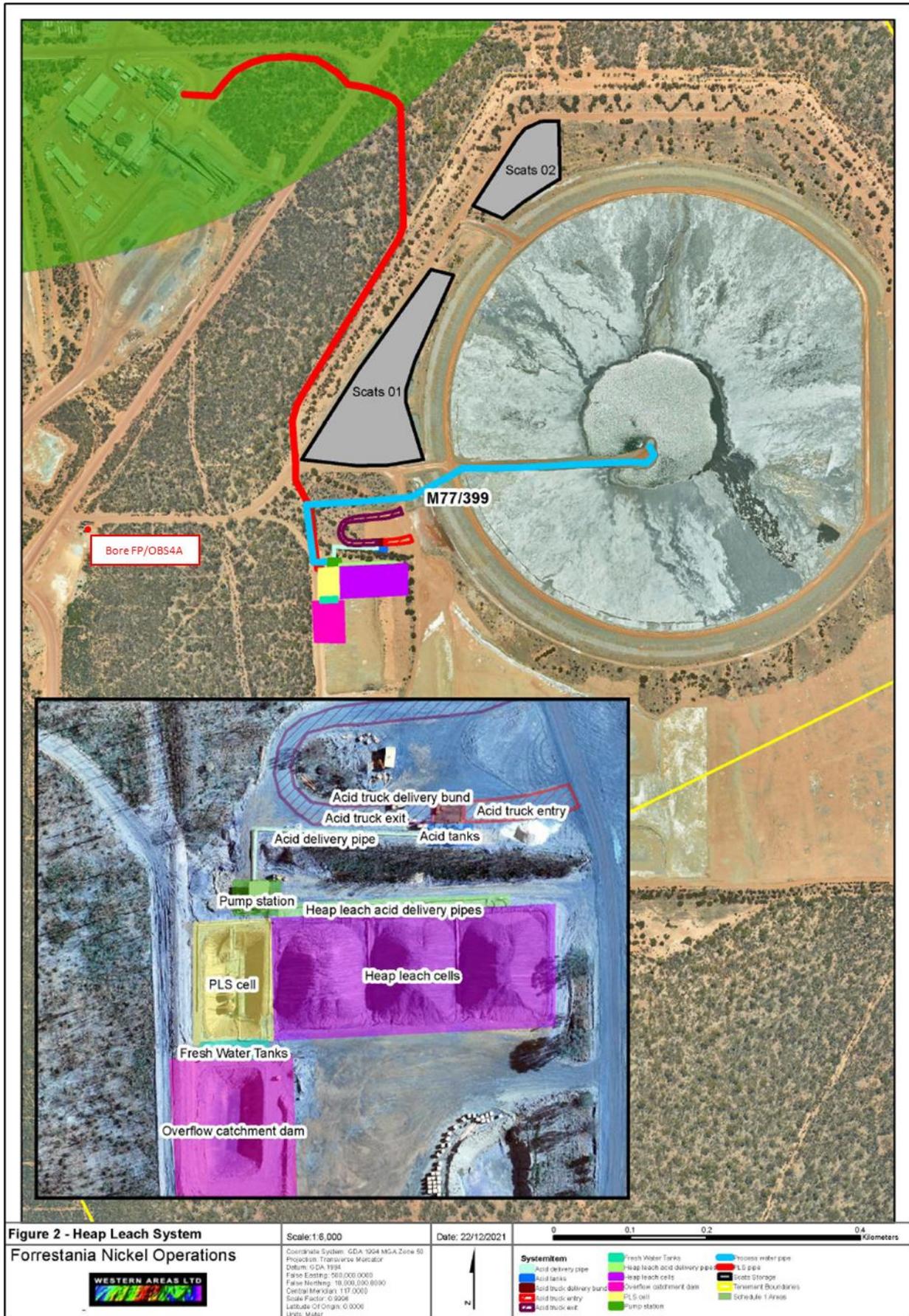


Figure 1: BioHeap Leach facility premises map

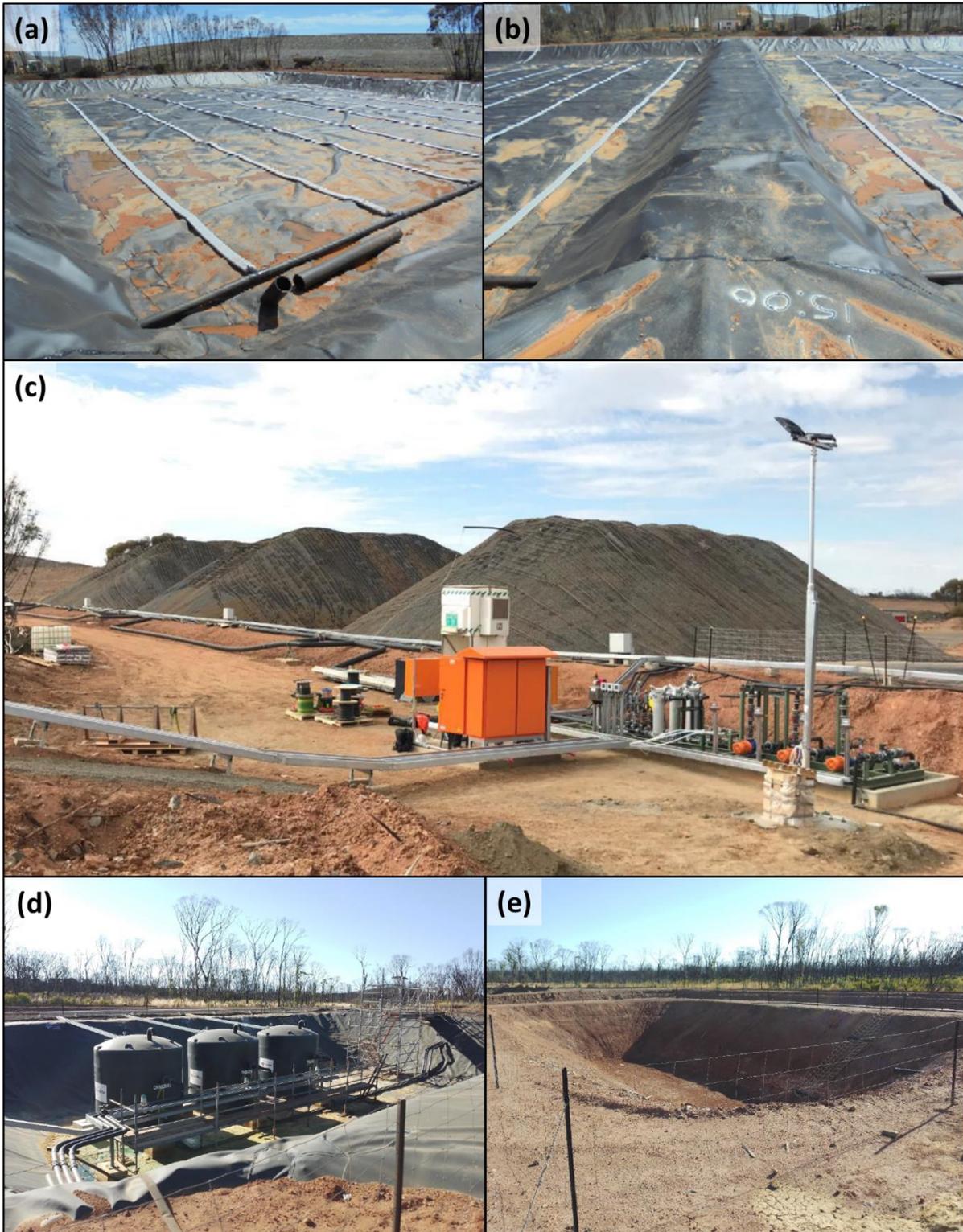


Figure 2: Photographs of relevant infrastructure: (a) heap leach pad Cell 1 with HDPE liner and drainage layer, (b) dividing embankment bund separating Cell 1 and Cell 2, (c) heap leach pad cells in operation, (d) PLS tank within HDPE-liner PLS pond, and (e) surface water management pond

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 operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Dust	Transport and loading of scat material Preparation of heap leach feed	Air/windborne pathway	<ul style="list-style-type: none"> Use of water cart as required.
Pregnant Liquor Solution (PLS)	Operation of heap leach pad Operation of PLS tank and PLS pond	Overflow or loss of containment	<ul style="list-style-type: none"> Daily inspection of heap leach pad and PLS pond to ensure adequate freeboard maintained (i.e., minimum of one inspection per shift). Minimum freeboard of 300 mm will be maintained for PLS pond; PLS tanks will be connected to Citect SCADA system to measure tank levels every three second; Solution recovery sump pump installed to remove any spillage; Perimeter bund constructed around PLS pond to prevent stormwater ingress; PLS pond is connected to compacted clay-lined surface water management pond to capture overflow. Surface water management pond was designed to contain a 1-in-100 year 72-hour rainfall event.
		Seepage	<ul style="list-style-type: none"> Heap leach pad and PLS pond lined with Bidim A64 geotextile and 1.5 mm HDPE; Leak detection sumps underlain the HDPE draining via pipework for each heap leach pad cell and PLS pond;

Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> • Daily inspection of water level in sumps to detect potential breach in liner; and • Where increases in water levels are identified, potential loss through liner will be investigated.
	Recirculation of PLS from PLS tank to heap leach	Pipeline failure	<ul style="list-style-type: none"> • Recirculation pumps will be connected to Citect SCADA system to monitor flow; and • Pipelines to be located within bunded areas or within bunded heap leach area to capture any potential leakage.
	Transfer of PLS bleed solution via pipeline to MREP		<ul style="list-style-type: none"> • Equipped with telemetry systems and flow sensors along pipelines to allow for detection of leaks and failures; • Equipped with automatic cut-outs in the event of a pipe failure; and • Daily inspection of pipeline and maintenance of records.
Contaminated stormwater	Operation of PLS pond	Overtopping	<ul style="list-style-type: none"> • Perimeter bund constructed around PLS pond to prevent stormwater ingress; • PLS pond is connected to compacted clay-lined surface water management pond to capture overflow. Surface water management pond was designed to contain a 1-in-100 year 72 hour rainfall event.
Hypersaline water	Raw water pipeline from Cosmic Boy TSF return water system and bore FP/OBS4A	Pipeline failure	<ul style="list-style-type: none"> • Equipped with telemetry systems and flow sensors along pipelines to allow for detection of leaks and failures; • Equipped with automatic cut-outs in the event of a pipe failure; and • Daily inspection of pipeline and maintenance of records.
Acidic process solution	Transfer from acid storage tank to heap leach	Pipeline failure	<ul style="list-style-type: none"> • Equipped with telemetry systems and flow sensors along pipelines to allow for detection of leaks and failures; • Equipped with automatic cut-outs in the event of a pipe failure; • Pipeline is double-walled polytetrafluoroethylene (PTFE) tubing; and • Daily inspection of pipeline and maintenance of records.
	Storage at acid tank	Spills and	<ul style="list-style-type: none"> • Daily inspection of all chemical storage

Emission	Sources	Potential pathways	Proposed controls
		leaks	areas;
Hydrocarbon	Storage at fuel storage tank	Spills and leaks	<ul style="list-style-type: none"> All hydrocarbons and dangerous goods stored and handled according to <i>Dangerous Goods Safety Act 2004</i>, <i>Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007</i> and <i>Dangerous Goods Safety (Explosives) Regulations 2007</i>; Chemical storage areas bunded with a containment capacity equivalent to 110% of the capacity of any tank, or 25% of the total capacity of an interlinked system; Maintain a register of all hazardous and dangerous goods onsite and relevant Safety Data Sheets (SDS); and Potential spillage cleaned up and disposed of as per appropriate SDS, relevant environmental and safety guidelines and the site environmental procedure.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020b), 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 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental siting* (DWER 2020a)).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
None	N/A
Environmental receptors	Distance from prescribed activity
Native vegetation	Native vegetation is present around the prescribed activity within the premises. Vegetation communities include: <ul style="list-style-type: none"> Mallee shrubland comprising <i>Eucalyptus eremophila</i>, <i>E. redunca</i> and spp; and Open woodland comprising <i>E. calophylla</i>, <i>E. wandoo</i> and <i>E. camaldulensis</i>.
Priority ecological communities (PEC)	A patch of Priority 3 PEC (Iron cap Hills vegetation assemblages) occurs across the premises, with the prescribed activity being about 200 m away east of it. No clearing was proposed as part of this amendment, as the

	prescribed activity was constructed entirely on previously disturbed areas.
Threatened flora	<p>A number of threatened and priority flora have been recorded within the premises, within two kilometres to the prescribed activity, including:</p> <ul style="list-style-type: none"> • <i>Lepidosperma ferriculmen</i> (Priority 1); • <i>Pityrodia scabra</i> subsp. <i>dendrotricha</i> (Priority 3); • <i>Stenanthemum liberum</i> (Priority 1); • <i>Grevillea insignis</i> subsp. <i>elliottii</i> (Priority 3); • <i>Calamphoreus inflatus</i> (formerly known as <i>Eremophila inflata</i>) (Priority 4); • <i>Boronia revoluta</i> (Threatened); • <i>Stylidium sejunctum</i> (Priority 3); • <i>Banksia viscida</i> (Priority 3); and • <i>Microcorys</i> sp Forresteria (Priority 4). <p>The PEC area, which included vegetation surrounding the prescribed activity, was surveyed in 2015. No threatened taxa were identified, though five priority flora were: <i>Acacia singula</i> (Priority 3), <i>L. ferriculmen</i>, <i>M. sp. Forresteria</i>, <i>S. liberum</i> and <i>S. sejunctum</i>.</p>
Groundwater	<p>The premises is located within the Kondinin-Ravensthorpe Groundwater Area. Regional groundwater occurs in weathered and fractured bedrock aquifers.</p> <p>The depth of groundwater at the premises is approximately 20 to 60 m below ground level (mbgl). Groundwater quality is acidic, ranging from saline to hypersaline (i.e. total dissolved solids concentrations typically at 70,000 mg/L).</p> <p>Localised groundwater mounding was observed due to seepage from the adjacent Cosmic Boy tailings storage facility, where standing water level ranged between 17 mbgl to 19 mbgl in 2020.</p> <p>Groundwater flows from higher areas of the landscape (i.e. greenstone belts), discharging at salt lakes. No surface water bodies are present near the prescribed activity.</p>

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020b) 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 4.

The Revised Licence L8041/1990/5 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. Category 7: Vat or *in situ* leaching of metal.

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

Table 4. 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 (Category 7: Vat or in situ leaching of metal)								
Transport and loading of scat material Preparation of heap leach feed Vehicle movements on unsealed access roads	Dust	Pathway: Air/windborne pathway Impacts: Impacts to ecological health	Native vegetation, including PEC and Threatened Flora	Refer to Section 3.1	C = Minor L = Unlikely Medium risk	Yes	Condition 9	The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to manage dust emissions and its impacts to nearby environmental receptors. Current condition in the licence is considered sufficient to control dust emissions as these source/ activities are intended to be undertaken periodically. Additional regulatory controls are not required.
Operation of heap leach pad Operation of PLS tank and PLS pond	Pregnant liquor solution (PLS)	Pathway: Overflow/overtopping or loss of containment, resulting in discharge to land Impacts: Impacts to ecological health	Native vegetation, including PEC and Threatened Flora	Refer to Section 3.1	C = Major L = Rare Medium risk	Yes	Condition 3 Condition 4	The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to manage potential PLS discharge to land, as a result of overflow or loss of containment. The proposed controls have been conditioned in conditions 3 and 4 of the amended licence. Additional regulatory controls are not required.
		Pathway: Lateral seepage/infiltration, resulting in discharge to land and potentially groundwater Impacts: Impacts to ecological health	Groundwater aquifer	Refer to Section 3.1	C = Minor L = Unlikely Medium risk	Yes	Condition 3 Condition 19 Addition of monitoring bore MB12 and MB13.	The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to manage potential PLS discharge to land and groundwater and its impacts to nearby environmental receptors. The proposed controls have been conditioned in condition 3. Groundwater monitoring is typically undertaken to monitor for potential seepage for PLS. For this premises, the Delegated Officer considers the existing groundwater monitoring bore network, currently used for monitoring seepage at the Cosmic Boy tailings storage facility, to be adequate, without requiring the construction of additional bores. Further considering production capacity of the bioheap leach pad and depth to groundwater, the volume of potential seepage

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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				
								and its likelihood of interacting with the local water table is considered low. It was noted that some monitoring bores in the area (i.e. MB12 and MB13) have been constructed north-west and south-west of the bioheap leach facility and are currently being monitored. As such, the Delegated Officer has decided to add these bores to condition 19. The monitoring parameters and frequency in condition 19 are considered adequate for the monitoring of potential nickel-enriched PLS seepage, given the current risk rating.
Recirculation of PLS from PLS tank to heap leach pad		Pathway: Pipeline leak or rupture, resulting in discharge to land Impacts: Impacts to ecological health	Native vegetation, including PEC and Threatened Flora	Refer to Section 3.1	C = Major L = Rare Medium risk	Yes	Condition 3	The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to manage potential PLS discharge to land and its impacts to nearby environmental receptors. The proposed controls have been conditioned in condition 3. Additional regulatory controls are not required.
Transfer of PLS bleed solution from PLS tank to MREP				Refer to Section 3.1	C = Major L = Unlikely Medium risk	Yes	Condition 1 Condition 4	The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to manage potential PLS discharge to land and its impacts to nearby environmental receptors. The proposed controls have been conditioned in conditions 1 and 4. Additional regulatory controls are not required.
Storage of acidic process solution	Sulfuric acid	Pathway: Leaks or failure of containment, resulting in discharge to land Impacts: Impacts to ecological health	Native vegetation, including PEC and Threatened Flora	Refer to Section 3.1	C = Minor L = Unlikely Medium risk	Yes	Condition 3	The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to manage potential sulfuric acid and hydrocarbon discharge to land and its impacts to nearby environmental receptors.
Storage of hydrocarbon product (i.e. fuel)	Hydrocarbon			Refer to Section 3.1	C = Minor L = Unlikely Medium risk	Yes	Condition 3	The proposed controls have been conditioned in condition 3. Additional regulatory controls are not required.

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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				
Transfer of raw water from Cosmic Boy TSF decant water pipeline	Hypersaline water	<p>Pathway: Pipeline leak or rupture, resulting in discharge to land</p> <p>Impacts: Impacts to ecological health</p>	Native vegetation, including PEC and Threatened Flora	Refer to Section 3.1	C = Minor L = Unlikely Medium risk	Yes	Condition 1 Condition 4	<p>The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to manage potential hypersaline water discharge to land and its impacts to nearby environmental receptors.</p> <p>The proposed controls have been conditioned in conditions 1 and 4.</p> <p>Additional regulatory controls are not required.</p>
Transfer of acidic process solution from acidic storage tank to heap leach	Sulfuric acid			Refer to Section 3.1	C = Moderate L = Unlikely Medium risk	Yes	Condition 1 Condition 4	<p>The Delegated Officer considers the controls proposed by the Licence Holder to be sufficient to manage potential sulfuric acid discharge to land and its impacts to nearby environmental receptors.</p> <p>The proposed controls have been conditioned in conditions 1 and 4.</p> <p>Additional regulatory controls are not required.</p>

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. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal on 5 April 2022	DMIRS has confirmed that the heap leach activities proposed in this licence amendment appear consistent with approvals previously granted to Mining Proposal Reg ID 83371 under the <i>Mining Act 1978</i> . DMIRS has no concerns regarding this amendment.	N/A
Shire of Kondinin advised of proposal on 5 April 2022	No comment.	N/A
Works Approval/Licence Holder was provided with draft amendment on 11 May 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 6 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 6: Summary of licence amendments

Condition no.	Proposed amendments
Cover page	Updated to reflect the most recent/this amendment and inclusion of Category 7 in table.
Licence history	Updated table to include works approval W6345/2020/1 and this current licence amendment.
Condition 3	Updated Table 1 to include infrastructure and relevant requirements for: <ul style="list-style-type: none"> Bioheap leach facility (including heap leach pad, PLS pond and surface water management pond); and Bioheap leach facility storage tanks.
Condition 4	Updated Table 2 to include the scope, type, and frequency of inspection for: <ul style="list-style-type: none"> Bioheap leach pipelines (for sulfuric acid, raw water and PLS); and Bioheap leach ponds (including PLS pond and surface water management pond).

Condition no.	Proposed amendments
Condition 18	Updated Table 10 to include monitoring for the amount of ore processed for heap leach ore on an annual basis.
Condition 19	Updated Table 11 to include monitoring bores MB12 and MB13 as GQ63 and GQ64, respectively.
Definitions	Inclusion of definition for PLS.
Schedule 1	Inclusion of figure for Bioheap leach infrastructure location.
Schedule 2	Inclusion of MB12 and MB13 groundwater monitoring point references.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020b, *Guideline: Risk Assessments*, 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
Condition 19	The Licence Holder accepts the addition of groundwater monitoring bores MB12 and MB13 to Table 11.	No further action taken by the department.
Schedule 2: Groundwater monitoring point references	<p>The Licence Holder has decided to refer to groundwater monitoring bores MB12 and MB13 as monitoring point references GQ63 and GQ64, respectively.</p> <p>The Licence Holder has also provided the easting and northing information for both of these bores to be added to Schedule 2.</p>	The department has added MB12 and MB13 to Schedule 2 as GQ63 and GQ64, respectively, along with their corresponding easting and northing data.

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)					
Application type					
Amendment to licence	<input checked="" type="checkbox"/>	Current licence number:	L8041/1990/5		
		Relevant works approval number:	W6345/2020/1	N/A	<input type="checkbox"/>
Date application received		18 January 2022			
Applicant and Premises details					
Applicant name/s (full legal name/s)		Western Areas Limited			
Premises name		Forrestania Nickel Operations			
Premises location		<p>Forrestania-Southern Cross Road, FORRESTANIA WA 6359</p> <p>Mining tenements: M74/57, M74/58, M74/90, M74/91, M77/335, M77/399, M77545, M77/568, M77/574, M77/582, M77/583, M77/584, M77/586, M77/587, M77/588, M77/589, M77/912, L70/111, L74/44, L77/104, L77/141, G70/226 and G70/231</p> <p>This licence amendment only involves prescribed activity within mining tenement M77/399 (expiring 07/11/2031).</p>			
Local Government Authority		Shire of Kondinin			
Application documents					
HPCM file reference number:		FA262371			
Key application documents (additional to application form):		1. Forrestania Nickel Operations – Cosmic Boy Concentrator Scats Trial Bioheap Leach – Licence Amendment (L8041/1990/5) Supporting Document			
Scope of application/assessment					
Summary of proposed activities or changes to existing operations.		<p>Licence amendment</p> <ul style="list-style-type: none"> • Inclusion of Category 7 prescribed activity to licence L8041/1990/5; and • Operation of trial bioheap leach of nickel scats from Cosmic Boy Operations. 			

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 (amendments only)
Category 5: Processing or beneficiation of metallic or non-metallic ore	680,000 tonnes per annual period (tpa)	No change
Category 6: Mine dewatering	6,400,000 tpa	No change
Category 7: Vat or <i>in situ</i> leaching of metal	N/A (Not in licence)	Maximum production capacity – No more than 50,000 tpa Estimated production capacity – 20,000 tpa
Category 12: Screening, etc. of material	150,000 tpa	No change
Category 54: Sewage facility	110 m ³ /day	No change
Category 89: Putrescible landfill site	1,500 tpa	No change

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"/>	N/A
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	The prescribed premises is located on a mining tenement and is regulated under the <i>Mining Act 1978</i> .
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"/>	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"/>	No clearing is proposed.

Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Licence / permit not required.
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A Type: N/A Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Regional office: N/A
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises subject to any other Acts or subsidiary regulations?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<i>Mining Act 1978, Dangerous Goods Safety Act 2004, Environmental Regulation (Unauthorised Discharges) Regulations 2004</i>
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Classification: Possibly contaminated – investigation required (PC–IR) Date of classification: 25 August 2008