

Amendment Report

Application for Licence Amendment

Part V Division 3 of the Environmental Protection Act 1986

Licence Number L7404/1999/9

Licence Holder IGO Cosmos Pty Ltd

ACN 111 599 323

File Number DER2015/002781-1~11

Premises Cosmos Nickel Operations

Goldfields Highway

SIR SAMUEL WA 6437

Legal description -

Mining tenements L36/118, L36/159, L36/171, L36/172, M36/127, M36/212, M36/365, M36/371, M36/375, M36/376,

M36/377, M36/441, M36/659 and part of M36/180 and

M36/349.

Date of Report 9 January 2024

Decision Revised licence granted

A/MANAGER, RESOURCE INDUSTRIES INDUSTRY REGULATION (STATEWIDE DELIVERY)

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

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1. Decision summary

Licence L7404/1999/9 is held by IGO Cosmos Pty Ltd (Licence Holder) for the Cosmos Nickel Operation (the Premises), located on the Goldfields Highway, Sir Samuel in 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 operation of the Premises. As a result of this assessment, revised Licence L7404/1999/9 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 Site overview and licence history

The Cosmos Nickel Operation is a nickel mining and processing site near Leinster, about 370 kilometers (kms) northwest of Kalgoorlie-Boulder. It was established in 1998 but entered into a period in care and maintenance around 2012. The licence was subsequently amended to remove and reduce a number of categories, including category 5 and 6, to better reflect the activities that were occurring at the operation.

In 2017, the licence was amended to reinstate category 6 (mine dewatering) activities at the premises to allow for dewatering so that mining activities could recommence. Between 2021 and 2022, the licence was amended several more times, to include category 12 (crushing and screening activities), category 52 (power generation), category 85 (sewage facilities) and category 89 (landfilling facilities). In 2023, the licence was amended to authorise the construction of two embankment lifts to an existing tailings storage facility (TSF) on the premises. Category 5 (processing or beneficiation of ore), however, was not added at this time.

In 2021, works approval W6605/2021/1 was issued to the premises to authorise the construction and refurbishment of the processing plant, and subsequent time-limited operations. It allowed for up to 1,100,000 tonnes per year of ore to be processed, under category 5. In 2022, works approval W6635/2021/1 was also issued to the premises for category 5 activities, relating to the construction and time-limited operations of a tailings paste plant. This licence was amended in 2023 to also authorise the construction of a pipeline from the processing plant to Water Management Pond (WMP) 2, to allow for the discharge of excess process water. This stream accounts for a low volume of discharge (about 37,000m³ per year) compared to the 3,000,000 tonnes of dewatering effluent that is authorised to be discharge to the WMPs each year.

In 2024, the licence holder applied for another works approval (W6912/2024/1) for the construction and time-limited operation of a second TSF, adjoining the existing TSF1. The assessment for this works approval assessed the cumulative risk of groundwater mounding from seepage from the operation of the TSFs and the WMPs at the premises.

2.3 Application summary

On 7 June 2024, the Licence Holder submitted an application to the department to amend Licence L7404/1999/9 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

 A change of the company name from Australian Nickel Investment Pty Ltd to IGO Cosmos Pty Ltd (the relevant documents were provided);

- The transfer of infrastructure relating to the processing plant, assessed under works approval W6605/2021/1 on to the licence; and
- The transfer of infrastructure relating to the paste backfill plant, assessed under works approval W6635/2021/1 on to the licence.

The construction work and associated reporting requirements of works approvals W6605/2021/1 and W6635/2021/1 have both now been completed and the department has found the construction of the infrastructure to be in accordance with the associated construction requirements. This application is seeking to amend the licence to add the infrastructure from these two works approvals on to the licence, to allow for the ongoing operation of the processing plant and paste plant facilities. By extension, this will also require the assessment of the use of the existing TSF, which will receive the tailings produced by the processing plant and supply the tailings to the paste plant. The discharge of process water to WMP 2 is also within the scope of this assessment.

Currently, licence L7404/1999/9 for the premises does not include category 5 activities. This amendment will therefore include assessing the risks of the ongoing operation of the processing plant and paste plant infrastructure, as well as involving a general review of the sufficiency of the licence to appropriately regulate category 5 activities at the premises.

The Delegated Officer notes that recently assessed works approval W6912/2024/1, for the construction and operation of a new TSF is under assessment. Construction and compliance work relating to the additional TSF is required to be undertaken prior to its operation being approved and authorised under this licence and is therefore not within the scope of this amendment.

However, the Delegated Officer notes that one of the key findings during the assessment of works approval W6912/2024/1 was that the use of WMP 8 needs to be discontinued during the operation of the additional TSF. This is required to protect the surrounding priority vegetation from the cumulative impacts of groundwater mounding from all of the facilities that emit seepage at the premises. This requirement was included as a condition on W6912/2024/1, with a recommendation that the authorisation to use WMP 8 for mine dewatering effluent discharge be removed from the licence during the next amendment, to bring these instruments into alignment.

The Delegated Officer has amended this one limited aspect of the licence, as it has created conflicting requirements between the licence and works approval W6912/2024/1. This issue has been assessed and is detailed in the decision report for works approval W6912/2024/1, and will not be reassessed as a part of this assessment.

This amendment is limited only to changes to category 5 activities. No changes to the aspects of the existing licence relating to category 6, 12, 52, 85 or 89 have been requested by the licence holder.

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

Table 1: Proposed throughput capacity changes

Prescribed premises category	Current production capacity	Proposed change to production capacity	
Category 5: Processing or beneficiation of metallic or non-metallic ore	N/A	1,100,000 tonnes per annual period	
Category 6: Mine dewatering	3,000,000 tonnes per annual period	No change	
Category 12: Screening, etc. of	100,000 tonnes per annual	No change	

material	period	
Category 52: Electric power generation	12.5 MW per annual period	No change
Category 85: Sewage facility	90 cubic metres per day	No change
Category 89: Putrescible landfill	2,200 tonnes per annual period	No change

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					
Operation								
Noise	Operation of processing plant, paste plant, mobile equipment.	Air/windborne pathway	Separation distance between the premises and sensitive receptors means there is no potential source-pathway-receptor linkage. Noise emissions and associated impacts will not be considered further in this risk assessment.					
Dust	Operation of processing plant – crushing and movement of ore.	Air/windborne pathway	Fibrous particles within the tailings will be managed in accordance with the Fibrous Minerals Management Plan (CNO-WHSPLN-3420).					
	Dust lift off from stockpiles		A baghouse will be installed adjacent to the fine ore bin to collect dust from the processing plant.					
	Reclamation of tailings from TSF1 for paste production		Water sprays will be installed at each conveyor transfer point.					
	Storage and handling of dry		Water carts will be used to spray hardstand areas and roads to manage dust					

Emission	Sources	Potential pathways	Proposed controls
	tailings at the paste		emissions.
	plant tailings storage facility Handling and storage of binder at the paste plant		Daily inspection of plant area will include observation of dust assessment and walking of site perimeter to ensure dust emissions are not crossing the premises boundary.
			Sprayers and sprinklers will be used during handling and storage of dry tailings.
			Limiting bucket height and load size in windy conditions during dry tailings loading into hopper.
			Concrete binder will be delivered and stored within a silo with an enclosed, pressurised discharge system.
			Flocculant will be stored and weighed within a container shed.
Chemicals and hydrocarbons	Spills and leaks from storage areas, processing plant equipment and pipelines Storage and handling of paste plant reagents	Direct discharge to land Overland runoff	Liquid reagents and fuels will be stored in bunded areas with the capacity to hold 110 % of the largest vessel according to Australian Standards AS1940-2004 Storage and handling of flammable and combustible liquids and AS1692-2006 Steel tanks for flammable and combustible liquids.
	plant reagents		Fuel and reagent tanks will have high level alarms to prevent overflow.
			All components of the reagents mixing and handling facility will be housed within bunded concrete containment slabs which will be serviced by permanently installed sump pumps.
			The bunds will be continuously cleared by the sump pumps and spillage will be pumped back into the process vessels or to the tailing's thickener for disposal to the existing TSF.
			Regular visual inspection of hydrocarbon and chemical containment structures and pipelines.
			Drip trays will be utilised whilst refuelling.
			Spill kits placed at reagent and hydrocarbon storages.
			Utilisation of spill pallets and other containment facilities during maintenance works
Contaminated stormwater	Runoff from ROM pad Runoff from the	Overland runoff	ROM pad has been constructed with a bund to retain potentially contaminated rainfall runoff.

Emission	Sources	Potential pathways	Proposed controls
	processing plant area Runoff from the		The dry tailings storage area has been enclosed with a perimeter bund to prevent run-off from leaving the area.
	paste plant and dry tailings storage area		Surface water infrastructure has been constructed to control and direct surface water flows away from work areas and directed to designated collection areas. This includes bunding, culverts, drainage lines and collection sumps.
			Surface water management infrastructure at the processing plant and paste plant has been designed to manage a 1 in 100-year event.
			Surface runoff in the operational areas will be collected and directed to collection soak wells (sized for peak of the 10% AEP) with pump system and will be reused in the process.
Tailings, process or decant water	Tailings and return water pipelines Overtopping of TSF	Direct discharge to land	Supernatant will be collected from the decant pond and pumped back to the plant process water tank for re-use.
	Transport of wet		Freeboard of 300mm to be maintained
	tailings to the paste plant from the processing plant via pipelines Discharge of process water to WMP 2		Pipelines incorporate leak detection technology
			Pipelines will be placed within a containment trench or suitably bunded easement capable of containing any spill with appropriately designed catch pits or sumps
			Pipelines inspected daily for integrity during operations
			Where pipelines cross creeks or drains, reinforcement (steel casing) will be used and the pipeline raised above predicated flood levels for a 1 in 100-year event.
Leachate	Seepage from TSF Seepage from WMP 2	Seepage through base and	A network of groundwater monitoring bores exists around the TSF, these bores are listed as compliance bores on the licence
		embankments of TSF and WMP 2	Monthly sanding water level (SWL) monitoring and quarterly water quality monitoring is required by existing conditions on the licence.
			A target of 6 meters below ground level (mbgl) and a limit of 4 mbgl applies to groundwater levels in the monitoring bores around the TSF.
			Downstream toe drain is in place.
			Supernatant collected from the decant

Emission	Sources	Potential pathways	Proposed controls
			pond and pumped back to the plant process water tank for re-use.

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			
The Yakabindie pastoral station	4 km north-west of the premises. The premises is occupied intermittently, during pastoral activities (i.e., mustering).			
Mining / industrial premises	Bellevue Gold Project immediately southwest, with the prescribed premises boundaries adjacent to each other.			
Environmental receptors	Distance from prescribed activity			
Native vegetation	The premises and is primarily characterised by mulga low woodland dominated by <i>Acacia aneura</i> on plains, transitioning to scrub on hills. While most of the premises has been cleared or disturbed, remnant native vegetation is present outside of operational areas.			
Priority ecological communities (PEC)	Inside the prescribed premises boundary, immediately east of the TSFs - Priority 1 PEC Violet Range (Perseverance Greenstone) vegetation complexes (banded ironstone formation).			
	3.7 km southeast of the processing plant – Priority 1 PEC Lake Miranda east calcrete groundwater assemblage types on Carey paleodrainage on Yakabindie Station.			
	4.8 km west of the processing plant – Priority 1 PEC Yakabindie calcrete groundwater assemblage type on Carey paleodrainage on Yakabindie Station which overlaps Lake Miranda			
Fauna	Dasycercus blythi (brush-tailed mulgara) (P4) has been recorded (2004) 8.6km northeast of proposed TSF3.			
	Kwonkan moriartii (Moriarty's trapdoor spider) (P2) has been recorded (1962) 11.2 km north of TSF3.			
Subterranean fauna	Limited sampling found at least 10 species of stygofauna in the immediate vicinity of the premises, primarily at the nearby PECs surrounding Lake Miranda.			
Surface water bodies	Overall, surface drainage channels have been disrupted by mining operations. Several creek lines are located across the premises, running from north to south. Regional drainage lines flow towards			

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	Lake Miranda to the south of the premises.
	Lake Miranda is a terminal salt lake, located approximately 5.5 km south of the processing plant. The salt lake is part of the Carey paleoriver system, with a surface area of approximately 200 km², containing a number of low islands and intersecting playas. Three Priority 1 PECs surround the salt lake, due to the likely presence of unique subterranean fauna assemblages within the calcrete geological units.
Groundwater aquifer	Overlies the proclaimed Goldfields Groundwater Area.
	Regional groundwater flow likely follows surface topography, flowing from north to south and terminating at Lake Miranda.
	Groundwater is characterised as brackish to hypersaline, with total dissolved solids (TDS) levels ranging from 1,000 mg/L to 100,000 mg/L.
	There are a number of groundwater users nearby, with groundwater abstraction licences primarily held by commercial entities requiring water to support mining activities (e.g., Bellevue Gold Project). No non-industrial users of groundwater are registered within a 3km radius of the mine.

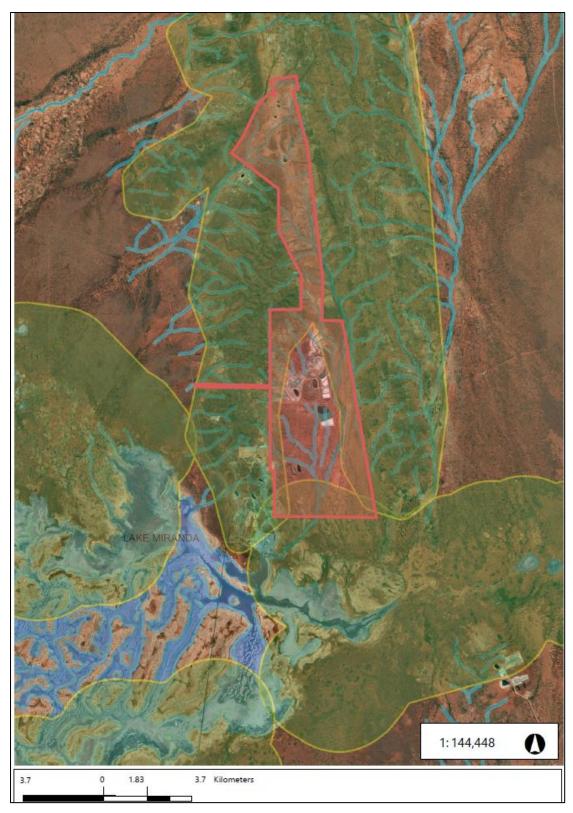


Figure 1: Cosmos Nickel Operations prescribed premises boundary (red) and distance to sensitive receptors – Priority Ecological Communities (yellow) with regional surface water drainage lines (blue)

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 L7404/1999/9 that accompanies this amendment report authorises emissions associated with the operation of the Premises i.e. category 5 activities.

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 during operation

Risk Event					Risk rating ¹	Licence			
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls	C = consequence L = likelihood	controls	Conditions ² of licence	Justification for additional regulatory controls	
Operation	peration								
	Dust	Air / windborne pathway causing impacts to health and amenity Impacts to vegetation	Pastoral station homestead 4.5km northwest of processing plant Native vegetation within a PEC.	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Condition 1	Works approval conditions for management of dust emissions from the processing plant transferred to the licence.	
Operation of the processing plant	Chemicals and hydrocarbons	Direct discharge from spills and leaks Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Seasonal creek 700m east of processing plant Native vegetation / soils west and east of processing plant area	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Condition 1 and 2	Works approval conditions for management of spills and leaks transferred to the licence.	
processing plant	Contaminated stormwater	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Seasonal creek 700m east of processing plant Native vegetation / soils west and east of processing plant area	Refer to Section 3.1	C = Minor L = Unlikely Medium Risk	Y	Condition 1	Works approval conditions for management of stormwater transferred to the licence.	
	Process water	Direct discharge to WMP 2 potentially increasing mounding or deteriorating groundwater quality	Surrounding native vegetation Groundwater	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1, 3, 15, 16, 17 and 18.	Existing conditions on the licence for monitoring and management of groundwater impacts are sufficient to manage the risk of impacts associated with this emission.	
Operation of the	Tailings dust	Air / windborne	Pastoral station	Refer to	C = Minor	Υ	Condition 1	Works approval conditions for	

Risk Event	Risk Event					Licence		
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls	C = consequence L = likelihood	Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
paste plant	from reclamation and handling of dry tailings	pathway causing impacts to health and amenity	homestead 4.5km northwest of processing plant Native vegetation within a PEC.	Section 3.1	L = Unlikely Medium Risk			management of dust emissions from the processing plant transferred to the licence.
	Tailings, reagents or hypersaline water	Direct discharge from spills and leaks Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Seasonal creek 700m east of processing plant draining to Lake Miranda PEC Native vegetation / soils west and east of processing plant area	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Υ	Condition 1 and 2	Works approval conditions for management of spills and leaks transferred to the licence. Existing pipeline requirements on the licence are sufficient to manage the risk of impacts associated with this emission.
	Contaminated stormwater	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Seasonal creek 700m east of processing plant draining to Lake Miranda PEC Native vegetation / soils west and east of processing plant area	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1	Works approval conditions for management of stormwater transferred to the licence.
Operation of the tailings dam	Tailings / decant water	Overtopping of TSF Direct discharge from spills	Seasonal creek 200m east of the TSF draining to Lake Miranda PEC Native vegetation Priority 1 PEC adjacent to the eastern side of the TSF	Refer to Section 3.1	C = Major L = Unlikely Medium Risk	Y	Condition 1 and 2	Existing TSF and pipeline requirements on the licence are sufficient to manage the risk of impacts associated with this emission.
	Seepage	Seepage through base and embankments of	Seasonal creek 200m east of the TSF draining to	Refer to Section 3.1	C = Major	N	Condition 1 Condition 1, 3, 15,	Works approval W6912/2024/1 for the expansion of the TSF has assessed the risk of seepage from

Risk Event	Risk Event					Licence		
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Licence Holder's controls	C = consequence L = likelihood	Holder's controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
		TSF causing mounding of the water table and impacts to groundwater quality	Lake Miranda PEC Native vegetation Priority 1 PEC adjacent to the eastern side of the TSF Groundwater		L = Unlikely Medium Risk		16, 17 and 18.	the operation of the TSF and WMPs. In the licence holder's application, they proposed to manage groundwater mounding impacts by ceasing to use WMP 8. This control has been incorporated into this licence amendment. Existing monitoring requirements and limits on the licence are considered sufficient to manage groundwater impacts.
Operation of process water, tailings and decant return pipelines	Pipeline leaks	Direct discharge from pipeline rupture	Seasonal creek 200m east of the TSF draining to Lake Miranda PEC Native vegetation Priority 1 PEC adjacent to the eastern side of the TSF Groundwater	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1 and 2	Existing pipeline requirements on the licence are sufficient to manage the risk of impacts associated with this emission.

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
Licence Holder was provided with draft amendment on 17 December 2024.	Licence Holder responded on 20 December 2024 with no comments.	N/A

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 licence holder name to IGO Cosmos Pty Ltd
	Updated prescribed premises category description to include Category 5 with assessed production capacity of 1,100,000 tonnes per annual period
	Updated licence history table
Condition 1, Table 1	Operation of WMP 8 no longer authorised
	Cosmos processing plant added with conditions
	Cosmos paste plant and reclaimed tailings storage area added with conditions
	Operational conditions added to TSF1
	Process water pipelines added to standard pipeline conditions
	Reformatted to remove sectioning
Condition 2	Wording changed to apply to leaks and discharges from all infrastructure
Condition 4, Table 2	Stage 1 embankment raise condition removed (compliance demonstrated 12 April 2024)
Condition 8 (new condition)	Condition added to clarify which emissions are authorised at each discharge point
Condition 12 (new condition)	Standard condition added to monitor volumes of category 5 and category 6 inputs and outputs
Condition 26	Updated to meet current licensing format.
Condition 27	Updated to meet current licensing format.

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Condition no.	Proposed amendments
Definitions	Reworded WMP definition
Figure 6	Added Figure 6, indicating the locations of new infrastructure.

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.