



Environmental  
Protection  
Authority

# Mulga Downs Iron Ore Mine

Hancock Prospecting Pty Ltd

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This assessment report has been prepared by the Environmental Protection Authority (EPA) under s. 44 of the *Environmental Protection Act 1986* (WA). It describes the outcomes of the EPA's assessment of the Mulga Downs Iron Ore Mine proposal by Hancock Prospecting Pty Ltd.

This assessment report is for the Western Australian Minister for Environment and sets out:

- what the EPA considers to be the key environmental factors identified in the course of the assessment
- the EPA's recommendations as to whether or not the proposal may be implemented and, if it recommends that implementation be allowed, the conditions and procedures, if any, to which implementation should be subject
- other information, advice and recommendations as the EPA thinks fit.



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Chair  
Environmental Protection Authority

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# Summary

## Proposal

The Mulga Downs Iron Ore Mine is a proposal to develop and operate an iron ore mine. The proposal is located 180 kilometres north-west of Newman, in the Pilbara region of Western Australia.

The proponent for the proposal is Hancock Prospecting Pty Ltd.

The proposal includes the development of above and below water table mine pits, dry ore crushing and screening plant(s), groundwater abstraction, surplus water management via managed aquifer recharge and/or in pit infiltration, waste rock dumps, infrastructure to manage surface water, linear infrastructure, mine associated infrastructure and support facilities, and transport of the ore via the Great Northern Highway to Port Hedland, or to a siding along Roy Hill railway infrastructure for export.

## Context

The proposal is located within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion and overlapping the Fortescue and Chichester IBRA subregions. The development envelope is within the Mulga Downs pastoral station and located within the Banjima Native Title Determination Area (WCD2014/001).

The proposal is directly to the north of the Goodiadarrie Swamp, which forms part of the nationally significant Fortescue Marshes wetland. Two related proposals, the Murray's Hill Project and the Mulga Downs Hub and Rail Spur, overlap the development envelope for the proposal.

## Environmental values

Flora and vegetation, terrestrial fauna, inland waters, subterranean fauna, social surroundings, and greenhouse gas emissions are the key environmental factors that may be impacted by the proposal.

## Consultation

The EPA published the proponent's referral information for the proposal on its website for seven days public comment. The EPA also published the proponent's environmental review document on its website for public review for 6 weeks (from 17 April 2025 to 2 June 2025). The EPA considered the comments received during these public consultation periods in its assessment.

## Mitigation hierarchy

The mitigation hierarchy is a sequence of proposed actions to reduce adverse environmental impacts and emissions. The sequence commences with avoidance, then moves to minimisation, rehabilitation, and offsets are considered as the last step in the sequence.

The proponent considered the mitigation hierarchy in the development and assessment of its proposal, and as a result will:

- avoid direct impacts to the Freshwater claypans of the Fortescue Valley Priority 1 priority ecological community (PEC)
- avoid disturbance of significant fauna habitat, including 43 nocturnal bat roosts, through implementation of a Fauna Habitat Exclusion Zone (FHEZ) and FHEZ Corridor
- avoid formation of pit lakes by backfilling of pits
- avoid direct impacts to culturally significant site Mungurrdu
- minimise disturbance to priority flora
- minimise disturbance to the Four plant assemblages of the Wona Land System Priority 1 – Priority 3 PEC, riparian vegetation, and locally significant vegetation through limits of disturbance
- minimise spread of weed species through implementation of weed hygiene and management measures
- minimise dust emissions through implementation of speed limits, dust suppression measures, and sealing of the haul road
- minimise impacts to significant fauna species by implementing speed limits, fauna friendly underpasses, noise and vibration limits, and adaptive lighting
- minimise alteration of surface water flows by optimising mine planning and through surface water diversion and management measures
- minimise disturbance of subterranean fauna habitat through staged mine scheduling
- minimise waste rock landform size by backfilling of pits
- minimise impacts to cultural heritage values by ensuring ongoing access to Country, implementing cultural awareness training, and designing permanent landforms in consultation with the Banjima Traditional Owners
- rehabilitate landforms to be safe, stable, and non-polluting
- rehabilitate vegetation and fauna habitat with native species of local provenance, as informed by consultation with the Banjima Traditional Owners.

## Assessment of key environmental factors

The EPA has identified the key environmental factors (listed below) in the course of the assessment. For each factor, the EPA has assessed the residual impacts of the proposal on the environmental values and considered whether the environmental outcomes are likely to be consistent with the EPA environmental factor objectives.

## Flora and vegetation

Residual impact or risk to environmental value		Assessment finding
1.	Clearing of up to 4,339.16 ha of native vegetation, of which 4,296.93 ha is in a 'Good' to 'Excellent' condition.	<p>The clearing of 'Good' to 'Excellent' vegetation in the Pilbara bioregion is significant in the context of biological diversity and ecological integrity, as it provides habitat for conservation significant flora and fauna species.</p> <p>The EPA advises that subject to limits on clearing, decision-making authority (DMA) regulation, and recommended conditions on progressive rehabilitation, there is likely to be a significant residual impact. However, the residual impact can be counterbalanced through offsets (recommended condition B7) such that the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p>
2.	Clearing of up to 70.31 ha of the Wona Land System PEC (P1-P3).	<p>The EPA advises that the clearing of the Wona Land System PEC will result in a significant residual impact, and that the proposal should be subject to reasonable conditions to limit the extent of direct disturbance to the PEC (recommended condition A1), to progressively rehabilitate with species of relative diversity (recommended condition B5), and to counterbalance the clearing via contributions to the Pilbara Environmental Offsets Fund (PEOF) (recommended condition B7).</p> <p>The EPA advises that subject to the limit on clearing, DMA regulation, recommended condition to avoid and minimise indirect impacts (B1-2), and recommended conditions on rehabilitation (B5), there is likely to be a significant residual impact. However, the residual impact can be counterbalanced through offsets (recommended condition B7) such that the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p>
3.	Clearing of 17.27 ha of riparian vegetation.	<p>The clearing of riparian vegetation in the Pilbara bioregion is significant in the context of biological diversity and ecological integrity, as it provides habitat for conservation significant flora and fauna species, particularly in dry conditions, and in supporting habitat connectivity.</p> <p>The EPA advises that subject to limits on clearing, DMA regulation, and recommended conditions on progressive rehabilitation, there is likely to be a significant residual impact. However, the residual impact can be counterbalanced through offsets (recommended condition B7) such that the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p>
4.	Clearing of priority 1 flora species.	<p>The proposal will directly disturb three priority flora species, two of which are priority 1 species: <i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) and <i>Triodia veniciae</i>.</p>

		The EPA considered that a clearing limit of up to 14.7% of the known records of <i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) and 14.4% of known records of <i>Triodia veniciae</i> within the local extent (within 10 kms), and subject to rehabilitation involving native species of local provenance (recommended condition B5), the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.
5.	Indirect impacts associated with altered fire regimes, dust deposition, and the introduction and spread of weeds.	<p>The proposal has the potential to result in indirect impacts to values of flora and vegetation. The EPA advises that the implementation of the proposal should avoid and minimise indirect impacts to the Freshwater Claypan PEC, the Wona Land System PEC, riparian vegetation, and locally significant vegetation (recommended condition B1-2).</p> <p>The EPA advises that subject to limits on clearing, DMA regulation, recommended conditions on avoiding and minimising indirect impacts (condition B1), and recommended conditions on progressive rehabilitation (condition B5), any residual impacts associated with altered fire regimes, dust deposition, or the spread and introduction of weeds are not likely to be significant. The environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p>
6.	Indirect impacts associated with altered surface water regimes, including to the Freshwater Claypan PEC, riparian vegetation, and sheetflow dependent vegetation.	<p>The EPA advises that the implementation of the proposal has the potential to result in indirect impacts from altered surface water regimes.</p> <p>Subject to the recommended conditions to avoid and minimise indirect impacts to the Freshwater Claypan PEC, riparian vegetation, and surface water dependent vegetation (B1-2), and to progressively rehabilitate (B5), the residual impacts can be reasonably minimised such that the environmental outcome is likely be consistent with the EPA's objective for flora and vegetation.</p>

### Terrestrial fauna

	Residual impact or risk to environmental value	Assessment finding
1.	Clearing of up to 4,339.11 ha of critical and supporting fauna habitat, comprising:	<p>The EPA considers the loss of habitat for significant fauna species to be a significant residual impact.</p> <p>The proponent has amended its mine plan to reduce the scale of clearing required and has committed to various exclusion zones which will retain areas of high value habitat.</p>

	<ul style="list-style-type: none"> <li>• 15.72 ha of chenopod/cracking clay floodplain</li> <li>• 71.26 ha of drainage line/floodplain</li> <li>• 520.80 ha of rocky hills</li> <li>• 813.97 ha of stony spinifex plains and hillslopes.</li> </ul>	<p>The EPA advises that the significant residual impacts to terrestrial fauna habitat can be minimised through the recommended conditions on maximum clearing extents and rehabilitation of fauna habitat and can be counterbalanced by contributions to PEOF. The environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p>
2.	<p>Clearing of nocturnal refuges for the Pilbara leaf-nosed bat.</p> <p>Clearing of hollow forming trees, habitat for the northern quoll, Pilbara olive python, and peregrine falcon.</p> <p>Clearing of occupied grey falcon nests.</p>	<p>The EPA considers that the clearing of nocturnal refuges, hollow forming trees, and potential grey falcon nests could result in residual impacts to significant fauna species.</p> <p>The EPA advises that pre-clearance surveys should be undertaken prior to disturbance of any nocturnal refuges, hollow forming trees, or potential grey falcon nests to minimise disturbance to significant fauna species.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p> <p>Further understanding of Pilbara leaf-nosed bat roosting habitat will be obtained through the Pilbara leaf-nosed bat research program (recommended condition B9).</p>
3.	<p>Fauna mortality or injury from vehicle strikes, entrapment, or entanglement in barbed wire.</p> <p>Indirect impacts from the increase in abundance of feral fauna.</p>	<p>The proposal has the potential to kill or injure significant fauna through vehicle strikes, entrapment in infrastructure such as trenches, and through entanglement in barbed wire.</p> <p>The EPA considers that speed limits on haul and access roads in proximity to exclusion zones are important to reduce the likelihood of collisions with vehicles. In addition, the construction of suitable fauna crossings will further reduce the likelihood of collisions.</p> <p>The EPA advises that pre-clearance surveys should be undertaken prior to disturbance of any critical habitat types to target fauna species likely to be present.</p> <p>Feral fauna have the potential to be attracted to mining operations, resulting in increased predation on native species. The EPA considers that the proponent should implement management measures to ensure the abundance of feral fauna does not increase as a result of the proposal.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p>

4.	Indirect impacts from the loss or degradation of fauna habitat, such as altered fire regimes, altered hydrological water regimes, habitat fragmentation, and the introduction and/or spread of weeds.	<p>The EPA considers that the implementation of the proposal is likely to result in residual impacts to terrestrial fauna habitat, such as from altered fire regimes, altered hydrological regimes, habitat fragmentation, and weeds.</p> <p>The EPA advises that subject to limits on clearing of habitat, and the implementation of management measures to minimise impacts from dust emissions, weeds, fire, and altered hydrological regimes, the environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p>
5.	Disturbance or degradation of habitat from noise, light, and/or vibration.	<p>The EPA considers that implementation of the proposal is likely to result in residual impacts to terrestrial fauna species from noise, light, and vibration. These impacts may lead to temporary abandonment or permanent structural changes to suitable roost/refuge caves.</p> <p>The proponent has committed to using directional, adaptive, and/or shielded lighting to reduce impacts to nocturnal species.</p> <p>Noting that the caves within and near the development envelope are likely to be an important site for the Pilbara leaf-nosed bat, the EPA considers that the structural integrity of suitable caves within the FHEZ, FHEZ corridor, and LIAA should not be impacted.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p>

### Inland waters

	Residual impact or risk to environmental value	Assessment finding
1.	Impacts associated with groundwater drawdown.	<p>The drawdown associated with groundwater abstraction for mine pit dewatering is not expected to impact significant environmental values. The predicted extent of groundwater drawdown indicates that some pastoral bores are likely to be affected, however the potable water supply bores for nearby Aboriginal communities are not expected to be impacted. The proponent has committed to supply alternative water sources where water supply is affected, the EPA considers that this can be administered under the provisions of the <i>Rights in Water Irrigation Act 1914</i> (RiWI Act).</p> <p>Vegetation within the extent of predicted drawdown is not considered to be groundwater dependent. Significant impacts to vegetation from drawdown are not expected.</p>

		The EPA advises that subject to recommended conditions and regulation under RiWI Act, the environmental outcome is likely to be consistent with the EPA objective for inland waters.
2.	Impacts associated with groundwater mounding from MAR.	<p>Groundwater mounding associated with the injection of excess mine dewater has the potential to impact vegetation if mounding intersects the root zone. Mounding may also result in adverse ecological impacts if it reaches the near-surface.</p> <p>The predicted 1 m mounding contour extends up to 10 km to the south into the Fortescue Valley. Modelling indicates that mounding influenced groundwater levels will remain deeper than 2 metres below ground level (mbgl) in most locations. The proponent has committed to ensuring groundwater remains lower than 2.5 mbgl and will monitor vegetation health in at risk locations.</p> <p>The EPA advises that subject to recommended conditions, the environmental outcome is likely to be consistent with the EPA objective for inland waters.</p>
3.	Impacts resulting from groundwater quality changes.	<p>The proposal has the potential to impact groundwater quality primarily through the discharge of saline dewater. Given the controls on mounding, and the lack of groundwater dependent vegetation, significant impacts to vegetation are not expected.</p> <p>The predicted extent of salinity changes indicates that some pastoral bores are likely to be affected, however the potable water supply bores for nearby Aboriginal communities are not expected to be impacted. The proponent has committed to provide alternative water supply in the event pastoral bores are impacted by elevated salinity levels.</p> <p>Potential impacts to groundwater quality from acid and metalliferous drainage (AMD), contamination events (e.g. spills and leaks) and use of saline water for dust suppression can be mitigated through standard management measures administered through the <i>Mining Act 1978</i> (Mining Act) and Part V of the <i>Environmental Protection Act 1984</i> (EP Act).</p> <p>The EPA advises that subject to recommended conditions and regulation by other DMAs, the environmental outcome is likely to be consistent with the EPA objective for inland waters.</p>
4.	Impacts to groundwater quality associated with pit lake formation.	<p>Pit lake formation post closure has the potential to adversely impact groundwater quality due to saline water and AMD seepage into the surrounding aquifer.</p> <p>The proponent has committed to backfilling all pit voids to above the groundwater level to avoid the formation of pit lakes.</p>

5.	Indirect impacts to from changes in surface water hydrology.	<p>The proposal will alter existing hydrological regimes, including changes to important surface water catchments. The key values at risk of impact are related to the downstream Fortescue Valley and the associated claypans and persistent pools.</p> <p>With the implementation of management measures to maintain natural flows to the extent possible, the modelled changes in hydrology are not expected to result in significant impacts to downstream receptors.</p> <p>The EPA advises that subject to recommended conditions and regulation by other DMAs, the environmental outcome is likely to be consistent with the EPA objective for inland waters.</p>
6.	Impacts resulting from surface water quality changes.	<p>Surface water quality may be impacted through sediment loading, leaks and spills of fuels and chemicals, AMD and the use and handling of saline water. The main values at risk include the downstream Fortescue Valley, and associated claypans and persistent pools.</p> <p>Sediment loading due to increased surface flow velocities and ground disturbance are expected to be mitigated through industry standard design measures included in the Water Management Plan.</p> <p>The risks associated with leaks or spills of hazardous chemicals or fuels are able to be regulated through the Mine Development and Closure Plan (MDCP) required under the Mining Act, and the works approval and licence required under Part V of the EP Act.</p> <p>Impacts to surface water from AMD, including seepage from waste rock landforms, will be regulated through the MDCP, and complemented by the EPA's recommended rehabilitation outcome conditions.</p> <p>Potential impacts associated with the handling and use of saline water, including use as dust suppression, will be regulated through the works approval and licence required under Part V of the EP Act.</p>

### Subterranean fauna

Residual impact or risk to environmental value	Assessment finding
1. Impacts to troglofauna habitat and individuals.	The proposal will result in the loss of troglofauna individuals and habitat due to the development of mine pits and groundwater mounding into the vadose zone. The troglofauna assemblage identified

		<p>within the proposal area is abundant and diverse, with several taxa/operational taxonomic units (OTUs) exhibiting short-range endemism.</p> <p>Extensive surveys and habitat modelling indicates that the troglofauna habitat is contiguous and extends beyond the areas of impact. The distribution of troglofauna records indicates that the suitable habitat supports a diversity of taxa, and that troglofauna are unlikely to be restricted to impact areas.</p> <p>With the retention of suitable connected habitat, and limiting the extent of mounding, the EPA considers that the proposal is unlikely to have a significant impact on troglofauna diversity. Through implementation of the recommended conditions, the EPA considers that the environmental outcome is likely to be consistent with the factor objective for subterranean fauna.</p> <p>Further understanding of the potential for troglofauna to recolonise backfilled pit voids will be obtained through implementation of the subterranean fauna research program (recommended condition B8).</p>
2.	Impacts to stygofauna habitat and individuals from mine pits and groundwater drawdown	<p>The proposal will result in the loss of stygofauna individuals and habitat due to the development of mine pits below the water table and associated groundwater drawdown. The stygofauna assemblage identified within the proposal area is abundant and diverse, with several taxa/OTUs exhibiting short-range endemism.</p> <p>The EPA notes that prospective habitat for stygofauna is likely to be extensive and continuous, with taxa distribution indicating dispersal ability.</p> <p>The EPA considers that the proposal is unlikely to have significant impacts on stygofauna from the reduction in habitat through mining and groundwater drawdown. Through implementation of the recommended conditions to limit impacts to stygofauna habitat, combined with the recommended conditions for inland waters, the EPA considers that the environmental outcome is likely to be consistent with the factor objective for subterranean fauna.</p>
3.	Impacts to stygofauna habitat and individuals from water quality changes.	<p>The proposal will result in changes to groundwater quality primarily through increases in salinity in proximity to dewater injection areas. A number of potentially restricted stygofauna taxa are located within the area of predicted salinity change, however, there is evidence available to indicate stygofauna within the area are tolerant of elevated levels of salinity. The EPA also notes that prospective stygofauna is likely to be extensive and continuous, with taxa distribution indicating dispersal ability.</p> <p>The EPA considers that the proposal is unlikely to have a significant impact on stygofauna from increases in salinity associated with aquifer reinjection. Through implementation of the</p>

	<p>recommended conditions to limit impacts to stygofauna habitat, combined with the recommended conditions for inland waters, the EPA considers that the environmental outcome is likely to be consistent with the factor objective for subterranean fauna.</p> <p>Further understanding of stygofauna tolerance to changes in salinity will be obtained through implementation of the subterranean fauna research program (recommended condition B8).</p>
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### Social surroundings

Residual impact or risk to environmental value		Assessment finding
1.	Direct impacts to Aboriginal heritage features/sites.	<p>The EPA considers that there are residual impacts to sites of Aboriginal cultural heritage associated with the clearing for the proposal. This includes disturbance of ethnographic or archaeological sites. It is noted that the proponent is required to seek approval to directly disturb Aboriginal cultural heritage sites.</p> <p>The EPA advises that the proposal should be subject to recommended condition B6 to ensure there is no disturbance to heritage sites unless consent is granted under the <i>Aboriginal Heritage Act 1972</i> (AH Act) and has involved consultation with the Traditional Owners.</p> <p>Subject to the recommended conditions and DMA regulation, the environmental outcome is likely to be consistent with the EPA's objective for social surroundings.</p>
2.	Indirect impacts to Aboriginal heritage features/sites.	<p>The EPA considers that there is a risk of residual indirect impacts on Aboriginal heritage sites. This includes potential disturbance from noise, dust, and vibration on sensitive receptors, and changes to hydrological regimes impacting Mungurrdu.</p> <p>The EPA considers that the proponent should implement measures to reduce the risk of indirect impacts. It is noted that the proponent has committed to dust monitoring at the Wirrilimurra and Youngaleena communities and relocated the haulage route away from the Wirrilimurra community to minimise disturbance. The proponent will be required to monitor surface and groundwater regimes and minimise impact to surface water dependent vegetation.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for social surroundings.</p>

3.	Loss or restriction of access to land for cultural purposes.	<p>The EPA considers that there is a residual impact to Aboriginal cultural heritage through the loss or restriction of access to land used for traditional or cultural purposes.</p> <p>The EPA recommends condition B6-1(2) to ensure access to Country is maintained.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for social surroundings.</p>
4.	Visual and landscape impacts.	<p>The EPA advises that there is a residual impact to visual and landscape amenity from implementation of the proposal.</p> <p>The EPA considers that the Traditional Owners should be consulted on the end land use post-closure. This includes the design of permanent landforms, such as waste rock dumps, which are regulated under Part V of the EP Act and under the Mining Act.</p> <p>Subject to the recommended conditions and regulation under the Mining Act, the environmental outcome is likely to be consistent with the EPA's objective for social surroundings.</p>

### Greenhouse gas emissions

Emissions		Assessment finding
1.	<p>Without mitigation Scope 1 emissions, inclusive of haulage, are expected to average 256,102 t CO<sub>2</sub>-e per annum (up to a maximum of 334,641 t CO<sub>2</sub>-e in the third year of implementation).</p> <p>There are no scope 2 emissions associated with this proposal.</p> <p>Scope 3 greenhouse gas (GHG) emissions are estimated to be 14.584 million t CO<sub>2</sub>-e per annum.</p>	<p>The proponent has adopted avoidance and mitigation measures to reduce GHG emissions at commencement of the proposal. Scope 1 emissions from road haulage and mining operations are regarded as separate facilities under the National Greenhouse and Energy Reporting Scheme, as a result the proposal scope 1 emissions are not expected to be covered under the Safeguard Mechanism.</p> <p>The proponent has committed to achieving net proposal scope 1 emissions below the default threshold of 100,000 t CO<sub>2</sub>-e per annum for the life of the proposal. The EPA notes that this limit is likely to be achieved through a combination of direct emissions reductions measures and offsets. The proponent has undertaken due diligence that indicates that offsets, that meet relevant integrity principles, will be available over the course of the proposal.</p> <p>The EPA advises that emissions reductions through implementing best practice measures, and the EPA's recommended condition limiting annual net scope 1 emissions to under 100,000 t CO<sub>2</sub>-e, is likely to reduce GHG gas emissions as far as practicable for this proposal and achieve consistency with the environmental factor objective for GHG emissions.</p>

## Holistic assessment

The EPA considered the connections and interactions between relevant environmental factors and values to inform a holistic view of impacts to the whole environment. The EPA formed the view that the holistic impacts would not alter the EPA's conclusions about consistency with the EPA factor objectives.

## Conclusion and recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values which may be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- likely environmental outcomes which can be achieved with the imposition of conditions
- consistency of environmental outcomes with the EPA's objectives for the key environmental factors
- EPA's confidence in the proponent's proposed mitigation measures
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment
- principles of the *Environmental Protection Act 1986*.

The EPA has recommended that the proposal may be implemented subject to conditions recommended in Appendix A.

## Other advice

The EPA considers that rehabilitation of native vegetation impacted by large-scale mining in the Pilbara is critically important, yet there is limited evidence of success over the last 60 years. The EPA has recommended conditions for rehabilitation and expects to see tangible progress towards achieving rehabilitation at an appropriate rate and scale.

# 1 Proposal

The Mulga Downs Iron Ore Mine is a proposal to develop and operate an iron ore mine. The proposal is located 180 kilometres north-west of Newman, in the Pilbara region of Western Australia (see Figure 1).

The proposal includes the development of above and below water table mine pits, dry ore crushing and screening plant(s), groundwater abstraction, surplus water management via managed aquifer recharge and/or in pit infiltration, waste rock dumps, infrastructure to manage surface water, linear infrastructure, mine associated infrastructure and support facilities, and transport of the ore via the Great Northern Highway to Port Hedland, or to a siding along Roy Hill railway infrastructure for export.

The proponent for the proposal is Hancock Prospecting Pty Ltd. The proponent referred the proposal to the Environmental Protection Authority (EPA) on 24 December 2021. The referral information was published on the EPA website for seven days public comment. On 24 February 2022, the EPA decided to assess the proposal at the level Public Environmental Review. The EPA published the environmental review document (JBS&G 2025b) on its website for public review for 6 weeks (from 17 April 2025 to 2 June 2025). After receiving the response to public submissions document from the proponent, the EPA published the proponent's response to submissions document (HanRoy 2025b) and revised environmental review document (JBS&G 2025c) on its website.

The elements of the proposal which have been subject to the EPA's assessment are included in Table 1.

**Table 1: Proposal content document (HPPL 2025)**

Proposal element	Location	Maximum extent or range
<i>Physical elements</i>		
Mine elements, including: <ul style="list-style-type: none"> <li>- Series of open pits (above and below water table);</li> <li>- WRDs;</li> <li>- Topsoil stockpiles;</li> <li>- Dewatering.</li> </ul>	Figure 2	Clearing of up to 4,339.16 ha of native vegetation for the Indicative Footprint within the 16,848.53 ha Development Envelope.
Processing elements, including: <ul style="list-style-type: none"> <li>- Ore stockpiles;</li> <li>- Dry crushing and screening plant(s); and</li> <li>- Transfer water dams/ponds.</li> </ul>		
Infrastructure elements, including: <ul style="list-style-type: none"> <li>- Accommodation camp;</li> <li>- Energy supply infrastructure;</li> </ul>		

Proposal element	Location	Maximum extent or range
<ul style="list-style-type: none"> <li>- Road haulage of ore from the mine to Port or Rail Siding;</li> <li>- Conveyors for the transportation of ore;</li> <li>- Bore fields/water reinjection infrastructure;</li> <li>- Mine workshops &amp; infrastructure;</li> <li>- Pipelines;</li> <li>- Haul and light vehicle roads;</li> <li>- Ancillary buildings (e.g. workshops, telecommunications, offices);</li> <li>- WWTPs;</li> <li>- Landfill;</li> <li>- Hydrocarbon storage;</li> <li>- Explosive mixing and storage facility;</li> <li>- Laydown areas;</li> <li>- Evaporative ponds;</li> <li>- Water diversion channels and catchment ponds; and</li> <li>- Above ground water storage dams to manage supply or disposal of clean or mine water</li> </ul>		
<i>Operational elements</i>		
Groundwater abstraction for water supply and mine dewatering		Over the life of the mine it is anticipated the water abstraction requirements may reach up to 12 GL/a, due to mine dewatering and water supply requirements. Consideration may be given to the use of a water treatment facility (i.e. reverse osmosis desalination) should it be required to provide the necessary water quality.
Surplus water		Up to 11 GL/a to be disposed of through MAR and/or infiltration within the Development Envelope. Temporary water storage may be required to assist in the management of water quality for supply or prior to discharge.
Evaporation pond capacity		May be required to assist in the management of surplus water and discharge. These will preferentially be located in disturbed areas such as pit

Proposal element	Location	Maximum extent or range
		voids, however some ex-pit structures may be required within the WRDs
Crushing and screening plant(s)		Dry processing of ore to produce up to 12 Million tonnes per annum of iron ore product.
WRDs		Approximately 160 Mt of waste rock will be mined throughout the life of the Proposal. WRDs will be designed to integrate into the surrounding landforms where possible, with a maximum height defined by waste rock characterisation studies.
<b>Greenhouse gas emissions</b>		
<i>Construction elements – Peak annual</i>		
Scope 1	62,393 t CO <sub>2</sub> -e	
Scope 2	Zero (construction electricity demand met by on-site generation and included in Scope 1 emissions).	
<i>Operation elements – Peak annual</i>		
Scope 1	334,641 t CO <sub>2</sub> -e (unmitigated) Up to 100,000 t CO <sub>2</sub> -e (mitigated)	
Scope 2	Zero (construction electricity demand met by on-site generation and included in Scope 1 emissions).	
<i>Operation elements – Annual average life of mine</i>		
Scope 1	256,102 t CO <sub>2</sub> -e (unmitigated) Up to 100,000 t CO <sub>2</sub> -e (mitigated)	
Scope 2	Zero (construction electricity demand met by on-site generation and included in Scope 1 emissions).	
<i>Commissioning</i>		
Commissioning of the processing facilities will be undertaken subject to the operational limits above.		
<i>Rehabilitation</i>		
Where practicable, progressive rehabilitation will be undertaken over the life of the mine. Areas disturbed through the implementation of the Proposal will be designed to be safe and non-polluting and will be constructed so the final shape, size, stability, are comparable with the natural landforms in the area.		
<i>Other elements which affect extent of effects on the environment</i>		
Proposal time	Maximum project life	18 years

**Units and abbreviations**

GL/a – gigalitres per annum

ha – hectare

Mt – million tonnes

t CO<sub>2</sub>-e – tonnes carbon dioxide equivalents

## Proposal amendments

The original proposal is set out in section 1.3 of the proponent's referral supporting document (Strategen JBS&G 2021), which is available on the EPA website. During the assessment process the EPA encouraged the proponent to identify avoidance and mitigation measures for the proposal in addition to those included in the original proposal.

The proponent requested changes to the original proposal during the assessment under section 43A of the *Environmental Protection Act 1986* (EP Act). The changes were assessed to be unlikely to significantly increase any impacts of the proposal and some reduced potential impacts on the environment. The EPA Chair's notices, of 26 May 2023, 23 February 2024, 4 October 2024 and 30 September 2025, consenting to the changes are available on the EPA website.

The EPA notes the proponent has reduced the proposal since referral, resulting in:

- an overall reduction in the disturbance footprint by 5,288.84 ha to 4,339.16 ha (54.9% reduction)
- an overall reduction in the development envelope size by 23,804.47 ha to 16,848.53 ha (58.6% reduction)
- a reduction in the number of mine pits, reductions in the depths of mine pits, and removal of pit lakes post-closure
- removal of surface water discharge as a disposal option, an overall reduction in groundwater abstraction from 24.5 GL/a to 12 GL/a, and an overall reduction in surplus water discharge (via managed aquifer reinjection and/or pit infiltration) from 25.5 GL/a down to 11 GL/a
- removal of the wet processing facility (now dry processing) and tailings storage facility
- addition of a solar farm and two exclusion areas, the Fauna Habitat Exclusion Zone (FHEZ) and FHEZ corridor
- addition of a haul road connecting to the Great Northern Highway.

The consolidated and updated elements of the proposal which has been subject to the EPA's assessment is included in Table 1.

## Proposal alternatives

The proponent considered several alternatives in designing the proposal, as detailed in section 2.3 of the environmental review document (JBS&G 2025c). The proponent initially considered mining the Anticline South and Horseshoe South pits, both of which have since been removed.

The proposed placement of non-fixed infrastructure changed over the assessment to avoid and minimise impacting areas of social, cultural, or environmental significance. For example, the change in location of the power supply and telecommunications infrastructure to develop the FHEZ corridor.

In designing the proposal, the proponent considered several water management options which were ultimately not progressed, such as the Mulga West abstraction borefield and pipeline route to the west and the Malay Well reinjection bores to the south. The proposal also initially included the haulage of ore along Fenceline Road to the west, however this was altered to a north-west alignment to minimise impacts to the Wirrilimurra community and to follow the indicative disturbance footprint of the Mulga Downs Hub and Rail Spur (see 'Proposal Context' below) to minimise cumulative disturbance, should that proposal be approved.

### Proposal context

The proposal is located within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) region. The majority of the development envelope is within the Fortescue IBRA subregion, with the northern portion of the haul road and northern infrastructure corridor located in the Chichester IBRA subregion. The proposal is an iron ore mine located on mining lease M47/1621, miscellaneous licences L45/380, L45/384 and L45/463, and exploration licences E47/2044-I, E45/3593-I, E45/4231-I, and E45/4417-I.

The closest conservation reserves to the proposal are the Mungaroona Range Nature Reserve, approximately 13 km to the north of the development envelope, and Karijini National Park, approximately 16 km to the south, across the Fortescue Valley.

The development envelope is within the Mulga Downs pastoral station and located within the Banjima Native Title Determination Area (WCD2014/001). The Banjima Traditional Owners are represented by the Banjima Native Title Aboriginal Corporation (BNTAC).

### Consultation and engagement

During the assessment process, the EPA received commentary from BNTAC regarding impacts on various environmental factors, and impacts across Banjima Country more broadly. The EPA met with representatives from BNTAC to discuss these impacts and how they could be addressed through the assessment process. Following these consultations, the EPA encouraged the proponent to strengthen its consultation efforts with BNTAC regarding potential impacts from the implementation of the proposal, and how these impacts could be mitigated. Subsequent to these interactions, the EPA understands that the proponent undertook additional consultation with Traditional Owners, including community meetings at the Wirrilimurra and Youngaleena Aboriginal communities. Outcomes of the proponent's engagement with Traditional Owners are reflected in the proponent's commitments in relation to additional mitigation and management measures, such as avoidance of key cultural heritage sites (see Section 2.5 below).

Consideration of impacts raised by BNTAC, during and outside of the public review periods, have been incorporated into the assessment of environmental factors, as discussed in the chapters below.

### Goodiadarrie Swamp

The middle reaches of the Fortescue River are split into the Fortescue Marsh and Goodiadarrie Swamp as a result of the low permeability of the Goodiadarrie Hills

(EPA 2013a). The proposal is located to the west of the Goodiadarrie Hills, within the Goodiadarrie Swamp catchment. Together, the Fortescue Marsh and Goodiadarrie Swamp form part of the nationally significant Fortescue Marshes wetland, as listed on the Directory of Important Wetlands in Australia (Environment Australia 2001).

The portions of the Goodiadarrie Swamp and Fortescue Marsh that are located within the Banjima Native Title Determination Area (WCD2014/001), and the surrounding banks of these wetlands, is known to the Banjima Traditional Owners as Mungurrdu and is a registered cultural heritage site (ACH-00040484).

### Murray's Hill Project

The proponent referred a related proposal, the Mulga Downs Project (now referred to as the Murray's Hill Project) to the EPA on 1 July 2013 (EPA 2013b). This proposal was for a 5 Mtpa iron ore mine and involved the mining, crushing, and screening of ore above the water table in the Murray's Hill pit. The EPA determined the level of assessment for this proposal to be 'Not Assessed – managed under Part V Division 2 of the EP Act (Clearing)' on 6 August 2013. The proponent has now referred some expanded aspects of the Murray's Hill Project, such as mining below the water table, for consideration in the Mulga Downs Iron Ore Mine proposal.

The EPA notes that any disturbance beyond the scope of that considered by the former EPA Chair's determination of 6 August 2013, such as any dewatering, mining below the water table, and disturbance beyond 890 ha, has been assessed as part of the Mulga Downs Iron Ore Mine proposal. At the time of this report, the proponent has not yet implemented the Murray's Hill Project.

It is noted that the proponent is still required to obtain secondary approvals, such as under the *Mining Act 1978* (Mining Act) and Part V of the EP Act, prior to implementing the Murray's Hill Project.

### Mulga Downs Hub and Rail Spur

The Mulga Downs Hub and Rail Spur was referred to the EPA by Roy Hill Infrastructure Pty Ltd, is for the development of a hub and rail spur to connect into the existing Roy Hill Railway (Ministerial Statement 847). The Mulga Downs Hub and Rail Spur overlaps with the Mulga Downs Iron Ore Mine development envelope and, if approved and implemented, would facilitate the transport of ore to Port Hedland for export.

### Environment Protection and Biodiversity Conservation Act 1999

The proposal was referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) in June 2022 for consideration of impacts to matters of national environmental significance (MNES) under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The proposed action, as referred to DCCEEW, includes both the Mulga Downs Iron Ore Mine proposal and the Murray's Hill Project.

In August 2022 the proposed action was determined to be a controlled action (EPBC 2022/09255) to be assessed by DCCEEW by public environment report. The action is not the subject of an accredited assessment, noting the differences between the action referred to DCCEEW and the proposal referred to the EPA. At the time of the EPA's assessment the EPBC Act assessment was ongoing.

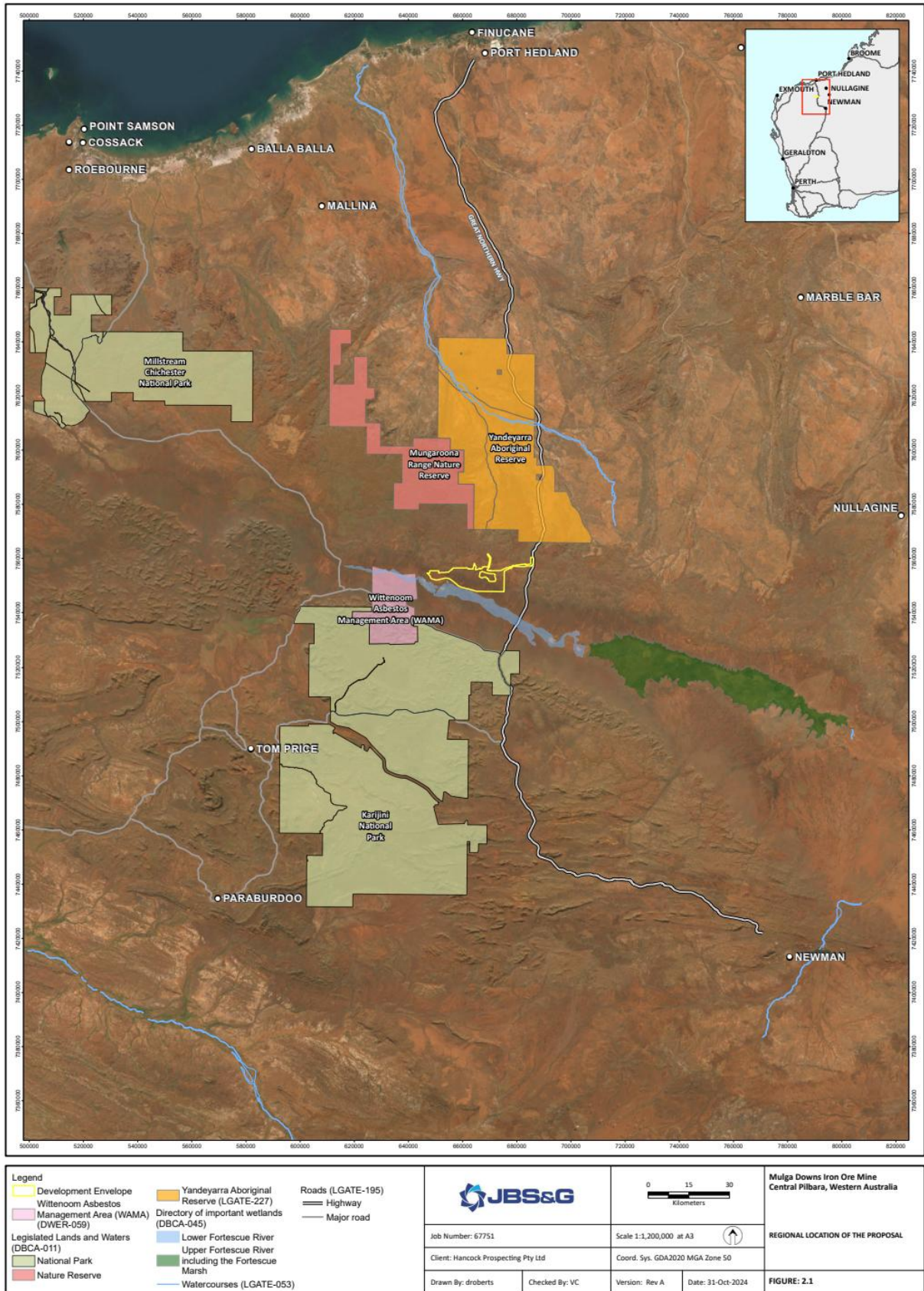


Figure 1: Project location (Figure 2.2 of JBS&G 2025c)

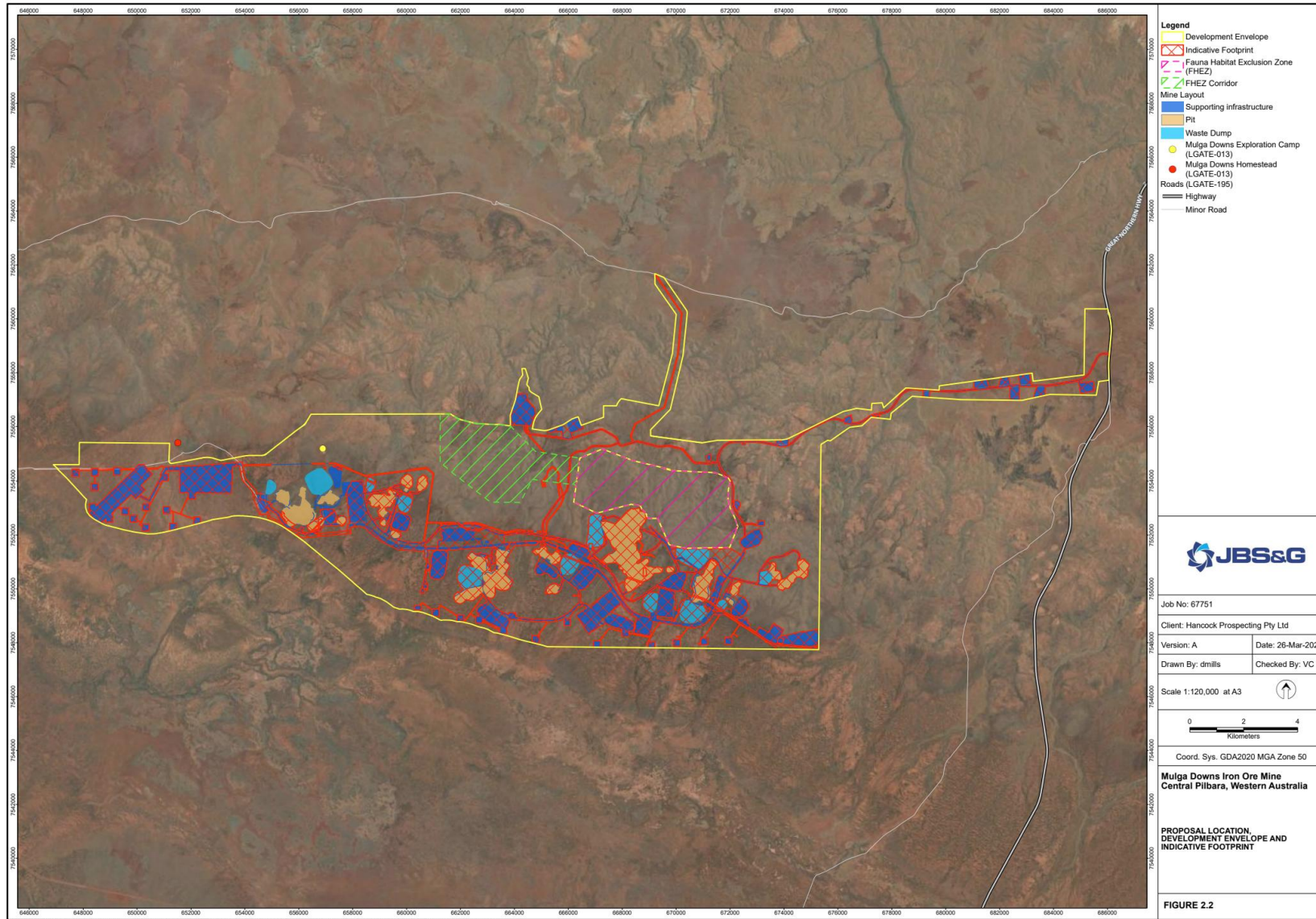


Figure 2: Development envelope and disturbance footprint (Figure 2.2 of JBS&G 2025c)

## 2 Assessment of key environmental factors

This section includes the EPA's assessment of the key environmental factors. The EPA also evaluated the impacts of the proposal on other environmental factors and concluded these were not key factors for the assessment. This evaluation is included in Appendix D.

### 2.1 Flora and Vegetation

#### 2.1.1 Environmental objective

The EPA environmental objective for flora and vegetation is *to protect flora and vegetation so that biological diversity and ecological integrity are maintained* (EPA 2016a).

#### 2.1.2 Investigations and surveys

The EPA advises the following investigations, surveys and peer reviews were used to inform the assessment of the potential impacts to flora and vegetation:

- Mulga Downs Iron Ore Project, mine and borefield study area – Detailed flora and vegetation assessment 2019 – 2022 (appendix 10a.1 of the environmental review document) (Maia 2022)
- Data reconciliation memo (appendix 10a.2 of the environmental review document) (Spectrum 2024a)
- Mulga Downs Iron Ore Mine, additional survey areas – Flora and vegetation assessment (appendix 10b of the environmental review document) (Maia 2023)
- Mulga Downs Rail and Hub – Flora and vegetation surveys – Supplementary memorandum to Attexo (2022a, b) (appendix 10c of the environmental review document) (JBS&G 2023b)
- Targeted flora and vegetation survey (appendix 10d of the environmental review document) (Spectrum 2024b)
- Mulga Downs *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) targeted flora survey (appendix 10e of the environmental review document) (Spectrum 2025).

The surveys were largely consistent with the *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016e). The EPA sought advice from the Department of Water and Environmental Regulation (DWER) and the Department of Biodiversity, Conservation and Attractions (DBCA) in relation to the flora and vegetation surveys that were considered as part of this assessment. The EPA considered that the relevant studies were appropriate to inform the assessment of the potential impacts to flora and vegetation.

#### 2.1.3 Assessment context – existing environment

The proposal is located within the Pilbara IBRA region, and within the Chichester (PIL01) and Fortescue (PIL02) IBRA subregions. The Chichester subregion contains

Archaean granite and basalt plains supporting shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, and basaltic ranges supporting *Eucalyptus leucophloia* tree steppes (Kendrick & McKenzie 2001). The Fortescue subregion contains extensive salt marsh, mulga-bunch grass, and short grass communities on alluvial plains to the east and deep gorge systems to the west. The subregion also contains a northern limit of Mulga (*Acacia aneura*) and drainage lines fringed by river gum woodlands (Kendrick 2001).

## Vegetation

The development envelope contains four broad pre-European vegetation associations, namely low woodland 29, shrub-steppe 173, grasslands 175, and low tree-steppe 562 (Maia 2022). All four associations have at least 99.5% of the pre-European extents remaining.

Fifteen vegetation types have been recorded across the development envelope, as described in section 3.3 of the environmental review document (JBS&G 2025c). Of these, six were considered by Maia (2022) to be locally significant (AdEvWL, ASL (2), AWL (1), AWL (2), AWL (3), and TvHG).

No threatened ecological communities (TEC) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or *Biodiversity Conservation Act 2016* (BC Act) were recorded within 20 kms of the development envelope. Two priority ecological communities (PECs) were recorded in surveys; the Freshwater claypans of the Fortescue Valley Priority 1 PEC (Freshwater Claypans PEC) and the Four plant assemblages of the Wona Land System Priority 1 – Priority 3 PEC (Wona Land System PEC).

The indicative disturbance footprint overlaps 70.31 ha of the Wona Land System PEC (Figure 4).

Seven (7) vegetation types within the development envelope (AaAxSL, ASL (1), ASL (2), AWL (1), AWL (2), AWL (3) and AxAsSL) were identified as potentially sheetflow dependent (Figure 3). Vegetation type ASL (2) is associated with drainage lines that run through the development envelope. The proponent did not identify any groundwater-dependent ecosystems (GDE) but noted that the facultative phreatophyte *Eucalyptus victrix* was recorded and is an indicator species for GDEs. The surveys identified two riparian vegetation types, AdEvWL and MSW, within the development envelope .

The vegetation mapped within the development envelope was predominately in 'Good' (11.76%), 'Very Good' (49.64%), and 'Excellent' (37.61%) condition. Less than 1% of vegetation was in a 'Degraded' (0.94%) or 'Completely Degraded' (0.04%) condition (Figure 9-3 of JBS&G 2025c). Within the development envelope, 164.63 ha of degraded or completely degraded areas have been recorded, primarily due to historic pastoral use and exploration activities. Of this, 42.23 ha occurs within the indicative disturbance footprint. Not all of the remaining 122.2 hectares of degraded or completely degraded vegetation is likely to be rehabilitated, as some areas are designated for the Murray's Hill Project or the proposed Mulga Downs Hub and Rail Spur. For instance, a portion of the existing 'Fenceline Road' pastoral track is proposed to be upgraded to accommodate haul trucks. Additionally, uncertainty in vegetation condition is likely as exploration activities conducted since 2012 were not digitised at the time (Maia 2022).

## Flora

No threatened flora species under the EPBC Act or the BC Act were recorded within the development envelope. Ten priority flora species were recorded within the development envelope (Figure 4). No declared pest species under the *Biosecurity and Agriculture Management Act 2007* or Weeds of National Significance on the Western Australian Organism List were recorded (JBS&G 2025c).

The coinciding Murray's Hill Project and Mulga Downs Hub and Rail Spur have the potential to contribute to cumulative impacts to flora and vegetation if these proposals are implemented. The EPA has considered the potential cumulative impacts from these proposals in its assessment of the Mulga Downs Iron Ore Mine.

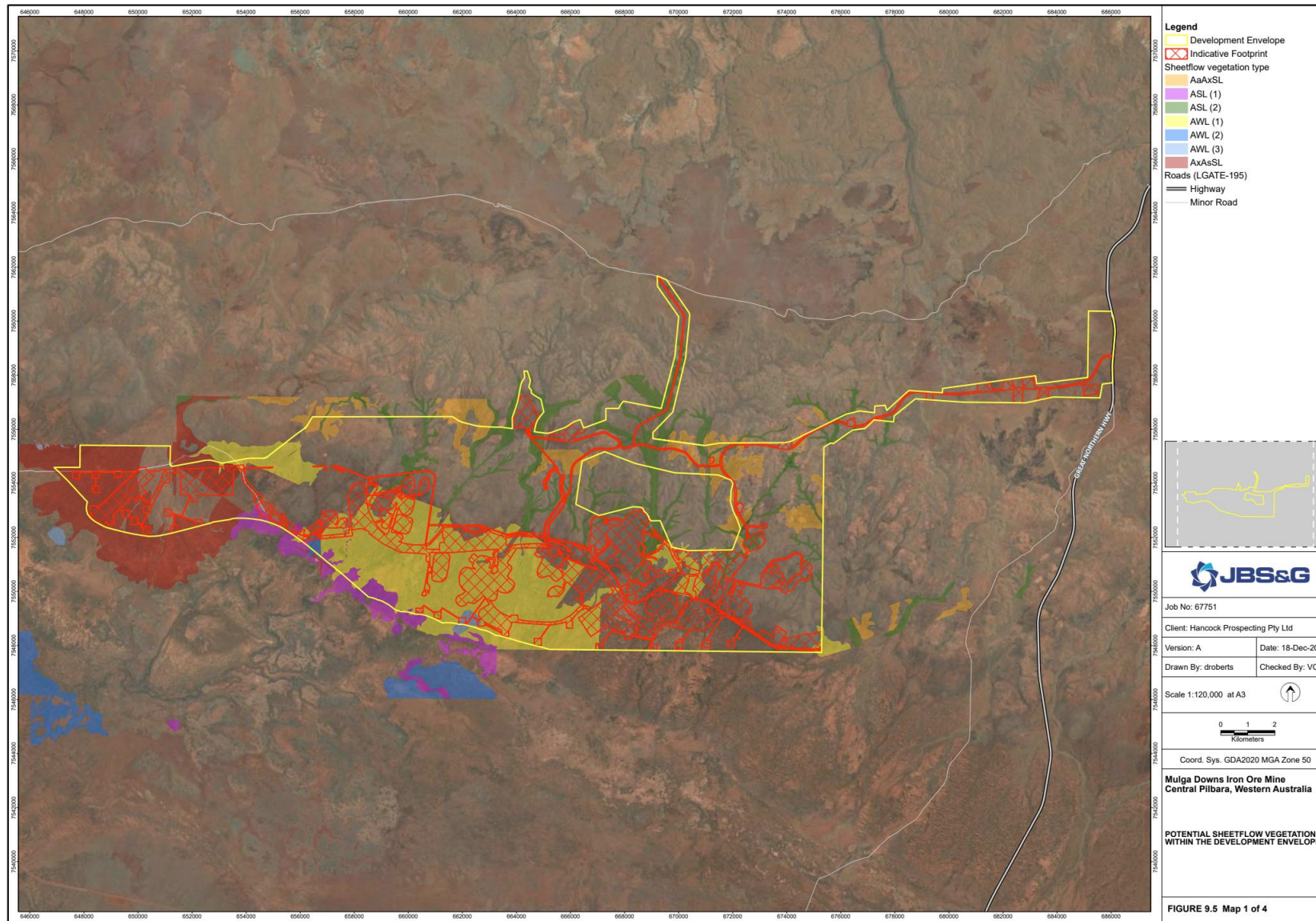


Figure 3: Potential sheetflow vegetation types (Figure 9.5 of JBS&G 2025c)

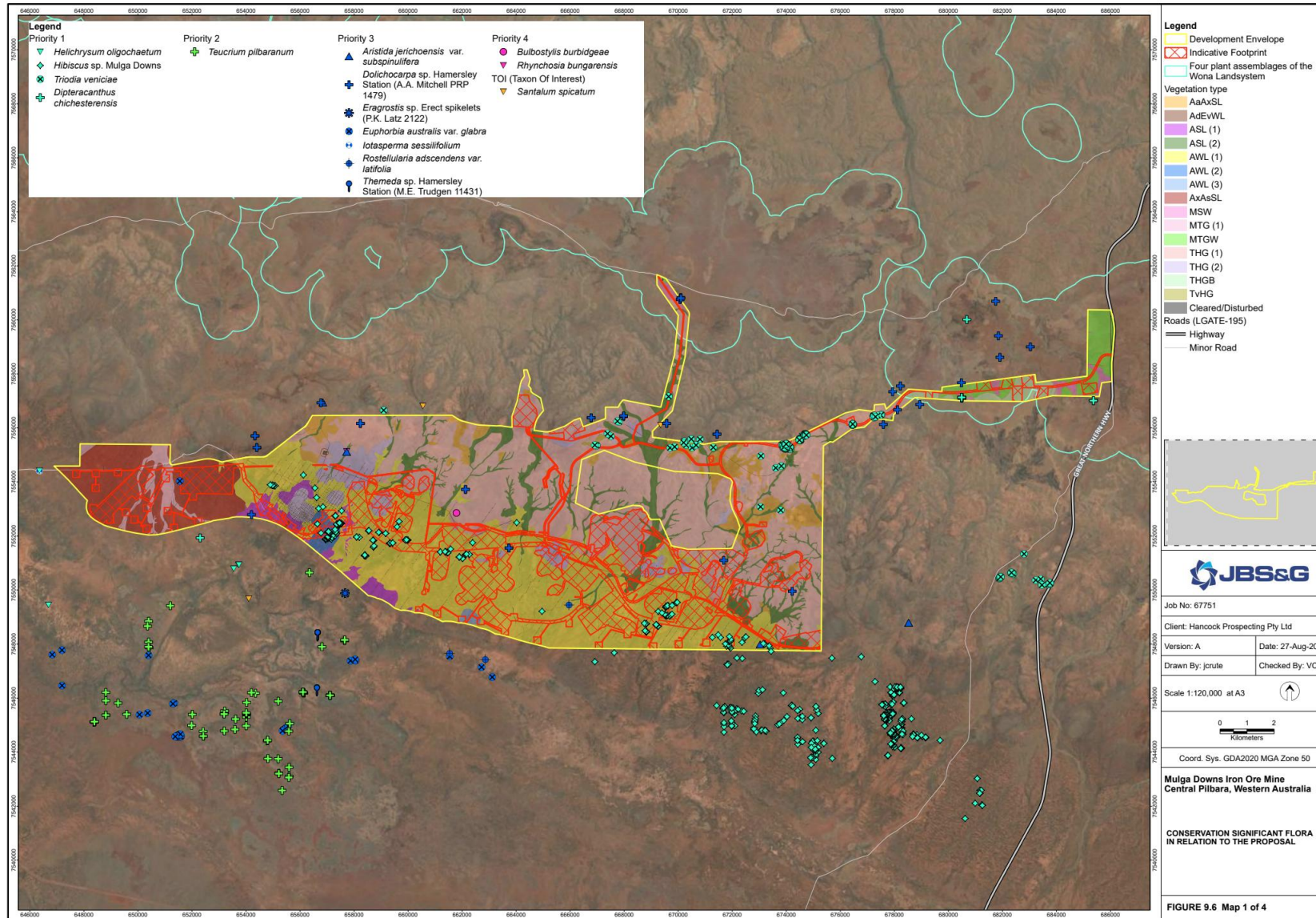


Figure 4: Records of priority flora within and near the development envelope (Figure 9.6 of JBS&G 2025c)

### 2.1.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (HanRoy 2025b). Public consultation on the proposal raised concerns about excessive clearing of vegetation, loss of priority species, and management of dust emissions.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in the following sections.

### 2.1.5 Potential impacts from the proposal

#### Direct impacts

Potential direct impacts to flora and vegetation from:

- clearing of 4,339.16 ha of native vegetation, including 4,296.93 ha in 'Good' to 'Excellent' condition
- clearing of 70.31 ha of the Wona Land System PEC
- clearing of 17.27 ha of riparian vegetation and 2,973.51 ha of sheet-flow dependent vegetation
- clearing of P1 species *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) (622 individuals) and *Triodia veniciae* (574 individuals)
- clearing of P3 species *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (2 individuals).

#### Indirect impacts

Potential indirect impacts to flora and vegetation from:

- loss, degradation, or alteration of surface water-dependent species from changes to surface water regimes
- loss, degradation, or alteration of groundwater-dependent species from groundwater drawdown, reinjection, or in-pit infiltration
- introduction and/or spread of weeds
- altered fire regimes
- degradation of vegetation through dust deposition

### 2.1.6 Avoidance measures

The proponent has committed to the following flora and vegetation impact avoidance measures (JBS&G 2025c):

- excluding the Freshwater Claypans PEC from the development envelope

### 2.1.7 Minimisation measures (including regulation by other DMAs)

The proponent has proposed measures to minimise impacts to flora and vegetation (JBS&G 2025c):

- revising the mine plan to reduce the overall extent of clearing by 5,288.84 ha

- designing the disturbance footprint to utilise areas of existing disturbance, where possible
- designing the disturbance footprint to avoid all known records of seven priority flora species and to minimise clearing of the remaining three priority species
- designing the disturbance footprint to minimise disturbance to watercourses and riparian vegetation
- implementing speed limits and dust suppression measures to minimise dust emissions
- installing and maintaining fire breaks and ensuring fire-control equipment is available in risk areas
- implementing standard weed control methods to prevent the spread or introduction of weed species.

The issues raised during the public consultation about excessive clearing and impacts to priority flora have been partially addressed through the proposed minimisation measures.

### Mining Act 1978

In accordance with section 103O(1) of the Mining Act the proponent will be required to prepare a Mining Development and Closure Proposal (MDCP) consistent with the Department of Mining, Petroleum and Exploration (DMPE) guidelines (DMPE 2025b). These guidelines specify requirements for rehabilitation and mine closure, including revegetation performance and landform stability.

#### 2.1.8 Rehabilitation measures

The proponent has proposed the following rehabilitation measures (JBS&G 2025c):

- construction and operational areas that are no longer required will be progressively rehabilitated throughout the life of the mine
- topsoil will be stored and stockpiled to a maximum of 2 m
- rehabilitation will include native species of local provenance and will be informed by consultation with the Banjima Traditional Owners.

The issues raised during the public consultation about excessive clearing and impacts to priority flora have been partially addressed through the proposed minimisation measures, including progressive rehabilitation.

#### 2.1.9 Assessment of impacts to environmental values

The EPA considers that the key environmental values for flora and vegetation likely to be impacted by the proposal are 'Good' to 'Excellent' condition native vegetation, locally significant vegetation, surface and groundwater dependent vegetation, PECs, and priority flora species. The EPA notes that the proposal is likely to directly and indirectly disturb flora species of cultural significance (see section 2.6).

In assessing this proposal, the EPA has had regard to the combined and cumulative effect that surrounding approved and proposed projects may have on flora and vegetation, particularly the Murray's Hill Project and proposed Mulga Downs Hub and Rail Spur.

### Priority flora

The EPA has assessed direct impacts to priority flora species in the context of the relative abundance of the species within the local area (the area within 10 km of the development envelope) and on a cumulative basis (refer to 'Cumulative impact assessment' below).

Ten priority flora species were recorded within the development envelope (Figure 4). Of these, three species were recorded within the indicative disturbance footprint:

- *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) (P1)
- *Triodia veniciae* (P1)
- *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3).

The EPA notes that seven other priority flora species were recorded within the development envelope, however, the proponent has committed to avoiding known records of these species. Subject to the proponent's proposed avoidance and minimisation measures, and the EPA's recommended conditions on indirect impacts and impacts to supporting habitat (refer to 'Locally significant vegetation' and 'Indirect impacts to flora and vegetation' below), there are unlikely to be residual impacts to these seven species.

The *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) (P1) was first recorded in surveys for the Murray's Hill Project in 2012 (HPPL 2013; Maia 2022), and again between 2021 and 2025 (Maia 2022; Spectrum 2024b; Spectrum 2025). The species is not known to have been recorded outside of these surveys. Since discovery, the proponent has conducted extensive surveys within and outside the development envelope to understand and map its distribution and contextualise the impact of the proposal on this species. *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) appears to favour sheetflow dependent vegetation types (refer to 'Locally significant vegetation' below). Based on the indicative disturbance footprint, the proposal will result in the loss of up to 622 individuals of *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638), representing 14.72% of the current known extent. The EPA considers that a clearing limit of 14.7% of *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) individuals within the local area (recommended condition B1-1(1)(a)) is unlikely to be inconsistent with the EPA's factor objective for flora and vegetation. Further, the EPA considers that a loss of 14.7% of records within the local area is unlikely to change the conservation status of the species. The EPA also expects that the proponent will monitor the health of vegetation that supports the *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) through the implementation of the Water Management Plan and Conservation Significant Fauna Management Plan (CSFMP).

*Triodia veniciae* (P1) was recorded in hummock grasslands vegetation types as well as tall shrublands (Maia 2022). Within the development envelope, *Triodia veniciae* was primarily recorded to the north of the FHEZ and along the haul route (Figure 4).

The proponent has proposed a maximum clearing extent of up to 574 individuals, which represents 14.4% of the locally recorded extent. The EPA considers that a clearing limit of 14.4% of *Triodia veniciae* individuals within the local area (recommended condition B1-1(1)(b)) is unlikely to be inconsistent with the EPA's factor objective for flora and vegetation.

Twenty-nine *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3) were recorded in development envelope, out of 180,220 individuals recorded across surveys for the proposal. The EPA considers that the extent of clearing of *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) within the development envelope is unlikely to represent a significant residual impact and considers that a maximum limit on clearing was not necessary.

It is noted that the proposal will result in the clearing of supporting habitat for priority species, and there are potential indirect impacts to priority flora, such as from dust deposition. The EPA's consideration of these impact pathways is discussed below in the context of 'Locally significant vegetation' and 'Indirect impacts to flora and vegetation', respectively.

### Vegetation

The EPA has assessed the likely impacts of the proposal on vegetation. In particular, the potential impacts on native vegetation in 'Good' to 'Excellent' condition, riparian vegetation, PECs, and locally significant vegetation types.

#### *'Good' to 'Excellent' native vegetation*

The EPA considers the clearing of up to 4,339.16 ha native vegetation, of which 99% (4,296.63 ha) is in a 'Good' to 'Excellent' condition, to be a significant residual impact. The proponent has proposed to offset this residual impact through financial contributions to the Pilbara Environmental Offsets Fund (PEOF), which has been reflected in recommended condition B7. Offsets are discussed further in section 4.

#### *Riparian vegetation*

The EPA notes the significant ecological value of riparian vegetation in the Pilbara region as it provides important habitat for flora and fauna species, particularly during dry conditions, and supports and maintains biological diversity, ecological integrity, and habitat connectivity. Across the Pilbara region, riparian vegetation makes up only 4% of the landscape (Alaibakhsh et al. 2017) and yet supports a wide range of significant fauna species (see Section 2.2 below).

The proposal will result in the clearing of up to 17.27 ha of riparian vegetation (Table 2). The EPA considers the loss of riparian vegetation to be a significant residual impact, noting the proponent has proposed to offset the residual impacts to riparian vegetation through financial contributions to PEOF, which has been reflected in recommended condition B7 (refer to section 4).

The EPA considers vegetation on the fringes of surface water pools to be riparian vegetation. However, no direct impacts are expected given the proponent's commitment to not disturb the surface water pools (refer to Section 3.7) and the EPA

has included this in recommended condition A1-1. Subject to the recommended conditions, the EPA considers that the environmental outcome for riparian vegetation is likely to be consistent with the EPA's environmental objective for flora and vegetation.

#### *Priority ecological communities*

The Wona Land System PEC (P1-P3) is described as shrubless plains of stony gibber community on tablelands. There is little vegetation cover during the dry season, but a suite of ephemerals and short-lived perennials during the wet season (DBCA 2023). This PEC extends approximately 127,050 ha across the Pilbara region, of which 407.5 ha occurs within the development envelope (Figure 4). The proposal will result in the direct disturbance of 70.31 ha of this PEC, representing approximately 0.05% of the total extent of the PEC across the region. The EPA notes that the proposed clearing within the PEC is primarily for the development of the haulage route, which follows a similar alignment to the proposed Mulga Downs Hub and Rail Spur rail corridor. The EPA recognises that the overlapping corridors are likely to reduce the overall clearing extent of the Wona Land System PEC and therefore reduce the likely cumulative impact. The EPA considers that the proposed clearing represents a relatively small portion of the overall extent, and the potential impacts are not likely to change the conservation status of the PEC. Given the conservation status of the PEC, the proponent has committed to offsetting its clearing through financial contributions to PEOF. The EPA acknowledges this commitment and has reflected it in recommended condition B7. Further discussion on offsets is provided in Section 4.

The Freshwater Claypans PEC (P1) is described as a series of claypans downstream of the Goodiadarrie Hills and on the Mulga Downs pastoral station (DBCA 2023). The lateral extent of the PEC is approximately 70 kms, however, the known distribution is limited to five discrete claypans located outside of the development envelope (Figure 9.4 of JBS&G 2025c). These claypans are understood to support a diverse variety of invertebrate species and restricted flora species and are reliant on surface water flows (rainfall and sheet flow) (Pinder et al. 2017). Surface water flows are captured and stored in the claypans for extended periods due to the underlying clay layer restricting seepage of water into the ground. For this reason, the claypans provide an extended source of water for both flora and fauna species, particularly during dry conditions. Historic pastoral land use has introduced additional pressures on the Freshwater Claypan PEC, such as from stock grazing and introduction of weed species.

The Gnalka Gnoona Claypan and the Koojjeepindarranna Claypan form part of the Freshwater Claypan PEC and are located downstream from the proposal and have the potential to be indirectly impacted. The EPA recognises that the proponent has excluded the Freshwater Claypans PEC from the development envelope and has avoided direct impacts to the PEC. The EPA has reflected this in recommended condition A1-1, to require no direct disturbance of the Freshwater Claypans PEC aside from low impact activities such as monitoring. As the claypans are surface water dependent, and are located downstream of the proposal, they may be subject to indirect impacts associated with changes to surface water regimes and changes in water quality such as from increased sediment loads. In addition, altered fire regimes

and the introduction or spread of weed species may indirectly impact the PEC given its proximity to the proposal area. The EPA's consideration of indirect impacts is provided in the sections below.

### *Locally significant vegetation*

In addition to riparian vegetation and PECs as discussed above, the EPA considers sheetflow-dependent vegetation and vegetation that provides habitat for priority 1 and 2 flora species to be locally significant (Table 2).

Sheetflow dependent vegetation were considered locally significant as they support or are associated with the drainage of surface flows to the Goodiadarrie Swamp. Species such as *Acacia aneura* are often indicator species of sheetflow dependent vegetation and are sensitive to changes in surface water regimes (Maia 2022). The EPA considers that the proposed clearing represents a relatively small proportion of mapped extents (Table 2), however, the clearing of sheetflow dependent vegetation may result in increased impacts to values downstream, such as from increased erosion and changes to water quality including sediment loads. Indirect impacts from changes to surface water regimes are discussed further in 'Indirect impacts to flora and vegetation' below.

All vegetation types recorded within the development envelope, aside from MTG (1), were found to provide habitat for priority 1 and/or priority 2 flora species (Table 2). However, these vegetation types were all mapped outside the development envelope, and the EPA considers the proposed clearing to be a relatively small percentage of known extents. Clearing of priority flora habitat is unlikely to represent a significant residual impact.

Subject to the clearing limits of the Wona Land System PEC and riparian vegetation (recommended condition A1-1) and the EPA's recommended conditions regarding the mitigation of indirect impacts (see 'Indirect impacts to flora and vegetation' below) the environmental outcome is likely to be consistent with the EPA's objective for flora and vegetation.

**Table 2: Locally significant vegetation types (Maia 2022; JBS&G 2023b; JBS&G 2025c)**

Vegetation types	Reason for local significance	Priority 1 or 2 flora recorded	Mapped extent (ha)	Extent within IDF
AdEvWL	Riparian vegetation. Habitat for priority flora.	<i>Helichrysum oligochaetum</i> (P1) <sup>3</sup> and <i>Teucrium pilbaranum</i> (P2) <sup>3</sup> .	12,051.30	4.31 ha (0.04%)
AaAxSL	Likely sheetflow dependent. Presence of mulga species such as <i>Acacia aneura</i> . Habitat for priority flora.	<i>Triodia veniciae</i> (P1) <sup>1</sup> .	3,628.68	68.53 ha (1.89%)
ASL (1)	Likely sheetflow dependent. Habitat for priority flora.	<i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) (P1) <sup>3</sup> .	1,854.75	64.95 ha (3.50%)
ASL (2)	Likely sheetflow dependent. 4 ha is associated with the Wona Land System PEC. Habitat for priority flora.	<i>Triodia veniciae</i> (P1) <sup>3</sup> .	4,283.22	253.47 ha (5.92%)
AWL (1)	Likely sheetflow dependent. Groves and bands of mulga species. Habitat for priority	<i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) (P1) <sup>1</sup> and <i>Josephinia</i> sp. Woodstock (A.A. Mitchell PRP 989) (P1) <sup>3</sup> .	14,111.52	2,087.41 ha (14.79%)
AWL (2)	Likely sheetflow dependent. Groves and bands of mulga species. Habitat for priority flora.	<i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) (P1) <sup>1</sup> and <i>Teucrium pilbaranum</i> (P2) <sup>3</sup> .	7,240.06	35.98 ha (0.50%)
AWL (3)	Likely sheetflow dependent. Groves and bands of mulga species. Habitat for priority flora.	<i>Teucrium pilbaranum</i> (P2) <sup>3</sup> .	4,066.26	8.83 ha (0.22%)
AxAsSL	Likely sheetflow dependent. Habitat for priority flora.	<i>Teucrium pilbaranum</i> (P2) <sup>3</sup> .	9,779.71	454.33 ha (4.65%)
MSW	Riparian vegetation. Contains groundwater dependent species.	None recorded.	2,433.38	12.96 ha (0.53%)

Vegetation types	Reason for local significance	Priority 1 or 2 flora recorded	Mapped extent (ha)	Extent within IDF
MTG (1)	Likely sheetflow dependent. Restricted to drainage lines and floodplains draining into the Fortescue River.	None recorded.	576.38	40.61 ha (7.05%)
MTGW	Associated with the Wona Land System PEC. Habitat for priority flora.	<i>Dipteracanthus chichesterensis</i> (P1) <sup>1</sup> and <i>Euphorbia inappendiculata</i> var. <i>inappendiculata</i> (P2) <sup>2</sup> .	3,162.29	69.98 ha (2.21%)
THG (1)	Habitat for priority flora.	<i>Triodia veniciae</i> (P1) <sup>1</sup> .	21,015.77	939.23 ha (4.47%)
THG (2)	Presence of mulga species, such as <i>Acacia aneura</i> . Habitat for priority flora.	<i>Triodia veniciae</i> (P1) <sup>1</sup> .	5,732.79	184.90 ha (3.23%)
TvHG	Restricted to small patches of shale. Habitat for priority flora.	<i>Triodia veniciae</i> (P1) <sup>1</sup> .	122.15	0.31 ha (0.25%)

IDF = Indicative disturbance footprint.

<sup>1</sup> species was recorded within habitat type and within development envelope during surveys for this proposal.

<sup>2</sup> species was recorded within habitat type outside of the development envelope during surveys for this proposal.

<sup>3</sup> species was recorded within habitat type outside the development envelope during historic surveys.

## Indirect impacts to flora and vegetation

The EPA has assessed the potential residual indirect impacts to key flora and vegetation values, including the Freshwater Claypan PEC, Wona Land System PEC, surface water dependent vegetation, groundwater dependent vegetation, and locally significant vegetation. The indirect impact pathways, as discussed below, were identified as the introduction and spread of weeds, dust emissions and deposition, altered fire regimes, and altered surface and groundwater regimes.

It is noted that some indirect impacts, such as dust emissions from cleared land, the introduction and spread of weeds, and erosion of drainage pathways, are likely to be minimised through progressive rehabilitation measures. The EPA's consideration of rehabilitation is set out in the 'Rehabilitation and closure' section below.

### *Freshwater Claypan PEC*

The two claypans of the Fortescue Valley PEC downstream of the proposal, the Gnalka Gnoona Claypan and the Koodjeepindarranna Claypan, may be indirectly impacted by the proposal such as through altered surface flows, groundwater mounding, and sediment deposition. The EPA recognises that the Gnalka Gnoona and the Koodjeepindarranna claypans have substantial social and cultural values, and these are discussed in section 2.5 below.

The proponent has committed to surface water and vegetation health monitoring downstream of mine infrastructure through the Water Management Plan (recommended condition B4-2) to identify impacts from contaminated runoff, increased sediment loads, and changes to hydrological regimes. To minimise indirect impacts to the Freshwater Claypan PEC, the proponent has committed to surface water control measures, including diverting natural surface flows around disturbed areas, treating runoff from waste rock dumps, stockpiles, and pits before releasing to the environment, and burying of pipeline at drainage lines to prevent disruptions to flows (HanRoy 2025d). The EPA considers that due to the conservation status of the Freshwater Claypan PEC, associated social, cultural, and environmental values, and relative sensitivity to changes in environmental quality, rigorous protection is warranted. Condition B1-2 has been recommended to avoid and minimise indirect impacts to the PEC compared to baseline. Subject to the recommended conditions, the EPA considers that there is unlikely to be significant residual impacts to the Freshwater Claypan PEC.

### *Surface water dependent vegetation*

Surface water dependent vegetation types were categorised as either riparian vegetation or sheetflow dependent vegetation (see Table 2). The EPA considers that surface water dependent vegetation present within and near the development envelope is of substantial value in providing a variety of ecosystem functions. For example, these vegetation types are likely to reduce the speed and volume at which surface water flows move southward into the Goodiadarrie Swamp and therefore maintain water quality by reducing erosion and sediment loads.

The EPA considers that the proponent should implement reasonable measures to mitigate indirect impacts to surface water dependent vegetation from altered surface water regimes and has therefore recommended condition B1-2, as well as recommended condition B4-2 to review and update the water management plan. Subject to the recommended conditions, the EPA considers that the indirect impacts to surface water dependent vegetation from altered surface water regimes is unlikely to be a significant residual impact.

#### *Groundwater dependent vegetation*

The depth to groundwater varies across the development envelope and is relatively shallow (approximately 2.5 metres below ground level (mbgl)) to the south of the development envelope within the Goodiadarrie Swamp. Implementation of the proposal is expected to result in groundwater drawdown from mine pit dewatering as well as groundwater mounding from managed aquifer recharge and pit infiltration (refer to Section 2.3 for further discussion on inland waters).

The proponent conducted an ecohydrological assessment to evaluate the likelihood of groundwater dependent vegetation within and near the proposal (AQ2 2025). The ecohydrological assessment focused on the presence of known facultative phreatophyte species, *Eucalyptus victrix*, within the study area (Maia 2022). *E. victrix* was recorded primarily within the riparian vegetation and scattered or isolated trees found in drainage areas or claypans (Maia 2022).

The EPA considers that vegetation south of the development envelope is likely accessing shallow groundwater. However, a calcrete or dense impermeable clay layer above the water table probably limits root access to this groundwater. Supporting this, time-series leaf water potential data showed tree root zones were above the water table, time-series NDVI imagery<sup>1</sup> did not reveal areas of consistently high greenness, and water balance modelling indicated that surface water inputs alone were sufficient to sustain the observed density of *E. victrix* within the woodland communities.

Despite the provided evidence, the proponent acknowledged the inherent uncertainty with groundwater modelling and has proposed annual monitoring of vegetation health in key areas through its Water Management Plan, which the EPA has included in recommended condition B4-2. The Water Management Plan also includes additional provisions on monitoring the spatial extent of groundwater drawdown and mounding, and the quality of water disposed of via managed aquifer recharge (refer to Section 2.3). Where monitoring indicates that impacts are greater than the proposed extents, the proponent will implement contingency measures, including to redirect, reduce, or cease aquifer reinjection. Over the life of the proposal, the proponent will also implement adaptive management measures, such as comparing modelled baseline data to actual results, to ensure groundwater drawdown and mounding extents do not exceed the extents modelled.

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<sup>1</sup> Normalised Difference Vegetation Index (NDVI) imagery is a satellite or aerial-based visual tool that uses red and near-infrared (NIR) light to measure vegetation health, density, and vigour.

It is noted that the study area for the ecohydrology assessment did not cover the entire area of anticipated groundwater drawdown and mounding. In addition, the ecohydrological assessment did not target other groundwater dependent species *Eucalyptus camaldulensis* and *Melaleuca argentea*. In the Pilbara region, *E. camaldulensis* is understood to be an obligate phreatophyte and *M. argentea* to be a facultative phreatophyte. Both species, as well as *E. victrix*, were recorded to the north of the development envelope (Attexo 2022b). However, the EPA considers that it is unlikely this area of the development envelope would be impacted by changes to groundwater regimes, as the maximum drawdown and mounding extents are not expected to extend to the north-east (see Section 2.3).

The EPA considers that while groundwater dependant vegetation is present in the development envelope, there is unlikely to be a significant reduction in the health or mortality of vegetation from the groundwater drawdown or mounding arising from the proposal implementation. Given the proponent's proposed mitigation and management measures, and the limits and outcomes on groundwater abstraction, reinjection, and drawdown extent (recommended conditions A1-1 and B3-1), there is unlikely to be significant residual impacts to groundwater dependent vegetation from implementation of the proposal.

#### *Other locally significant vegetation*

The EPA considered potential indirect impacts on the Wona Land System PEC and other locally significant vegetation from dust, altered fire regimes, and the introduction and spread of weeds.

The proponent has committed to dust control measures (e.g., sealing haul routes, dust suppression, speed limits) and will monitor vegetation health, including dust deposition, through the Water Management Plan (recommended condition B4-2). Water for dust suppression will not exceed 5,000 mg/L TDS, except in firefighting emergencies. Fire risk will be managed through an emergency management plan, Hot Works Procedure, and fire-control equipment. Weed management will include machinery cleaning, segregating weed-infested material, and targeted control. The EPA considers these measures will minimise indirect impacts. While the proponent commits to preventing new weeds, the EPA notes the potential for spread of existing species due to historic pastoral use. Recommended condition B1-2 addresses avoidance and minimisation of weed spread.

Subject to recommended conditions A1 (limits and extents), B1-2 (avoid and minimise impacts to the Freshwater Claypan PEC and locally significant vegetation), B5 (progressive rehabilitation), and B7 (offset contributions), the EPA considers residual impacts to flora and vegetation values are unlikely to be significant and are likely to be consistent with its objective for flora and vegetation.

#### Cumulative impact assessment

The proponent assessed cumulative impacts within 100 km of the development envelope (JBS&G 2025c, Chapter 17). Approximately 76,900 ha of native vegetation has been or is likely to be cleared in this area. The proposal would add 4,339 ha,

representing an additional 2.42% of vegetation loss within the local assessment area.

The proposal includes clearing 70.31 ha of the Wona Land System PEC. Of its total extent (204,248 ha), about 24.66% has been or is likely to be disturbed; locally (143,562 ha), about 34.02%. Clearing from this proposal represents no more than 0.05% of either the local or total extent.

The EPA considered potential cumulative impacts on riparian and sheetflow-dependent vegetation in the Pilbara region, noting these values are subject to ongoing development pressures.

For *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) (P1), cumulative impacts were estimated at 15.45% of all known records. For *Triodia veniciae* (P1), estimates were 35.45% of records within 100 km, however it is noted further populations are known from shale slopes greater than 100 km to the east of the proposal (Barrett 2019). The total cumulative impact to *Triodia veniciae* was estimated as 0.98% of known records. The EPA acknowledges that both species are subject to data deficiencies.

The EPA considered cumulative impacts from overlapping proposals (the Murray's Hill Project and Mulga Downs Hub and Rail Spur). Combined impacts may affect native vegetation, riparian areas, sheetflow-dependent vegetation, PECs, and priority flora (Table 3). However, even if all three projects proceed, the EPA considers that the impacts are unlikely to result in large-scale irreversible effects. It is noted that overlapping disturbance footprints may reduce estimated impacts, such as the proposal's haulage route and the proposed rail alignment for the Mulga Downs Hub and Rail Spur.

The EPA considers cumulative impacts on vegetation in 'Good' to 'Excellent' condition, PECs, riparian vegetation, and priority flora are not at a level that would warrant a decision to allow no further clearing of these values. However, consistent with EPA advice on Pilbara cumulative impacts (EPA 2014), incremental loss must be managed through recommended conditions.

The EPA advises that the combined impacts from the implementation of Mulga Downs Iron Ore Mine, Murray's Hill Project, and Mulga Downs Hub and Rail Spur proposal is not likely to result in large-scale irreversible impacts.

The EPA considers that, subject to the limits of the proposal (recommended condition A1) and the recommended conditions B1 (flora and vegetation), B5 (rehabilitation), and B7 (offsets), the environmental outcome is likely to be consistent with the EPA's objective for flora and vegetation.

**Table 3: Cumulative impacts to flora and vegetation for adjacent projects (JBS&G 2023b; JBS&G 2025c)**

Environmental value	Mulga Downs Iron Ore Mine	Murray's Hill Project	Mulga Downs Hub and Rail Spur	Cumulative impact
Native vegetation in 'Good' to 'Excellent' condition	4,296.93 ha.	790 ha. <sup>1</sup>	2,744.37 ha. <sup>2</sup>	7,883.71 ha.
Wona Land System PEC	70.31 ha.	N/A.	238.87 ha. <sup>2</sup>	309.18 ha.
Riparian vegetation	4.31 ha of riparian vegetation type AdEvWL. 12.96 ha of riparian veg MSW.	N/A.	141.71 ha of riparian vegetation type MSW.	146.02 ha of riparian vegetation.
Surface water dependent vegetation	2,014.11 ha of sheetflow dependent vegetation.	378.42 ha of sheetflow dependent vegetation.	520.82 ha of sheetflow dependent vegetation. <sup>2</sup>	2913.35 ha of sheetflow dependent vegetation.
Priority flora (individuals)	622 of <i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) (P1).	31 of <i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) (P1).	N/A.	653 of <i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) (P1).
	574 of <i>Triodia veniciae</i> (P1).	N/A.	842 of <i>Triodia veniciae</i> (P1).	692 of <i>Triodia veniciae</i> (P1).

<sup>1</sup> A portion of this extent may have been in a 'Poor' condition.

<sup>2</sup> A portion overlaps with the Mulga Downs Iron Ore Mine footprint.

### Rehabilitation and closure

The EPA recognises that measures to improve environmental outcomes for rehabilitation and mine closure are required throughout the life of the proposal. The EPA's Section 16(e) advice (EPA 2014), states that the environmental impact from clearing of vegetation is exacerbated by the lack of successful rehabilitation of mines in the Pilbara. While large-scale mining has occurred in the Pilbara for over 60 years, there is limited evidence of successful rehabilitation of areas disturbed by mining. The EPA considers that further work needs to be undertaken to improve broad scale rehabilitation techniques, including establishing the standard of rehabilitation that can reasonably be expected to be achieved.

The proponent is required to implement a Mine Closure Plan under the Mining Act and has provided a preliminary plan to the EPA for consideration (HanRoy 2025c). The EPA considers that the regulatory framework under the Mining Act for mine closure is appropriate, however, recommends condition B5 for the inclusion of

environment outcomes and prescriptive requirements for progressive rehabilitation and the return of native species of local provenance to rehabilitated areas. These outcomes and prescriptive requirements are to be incorporated into the MDCP (and subsequent mine closure plans) required to be submitted to the DMPE for approval, as required under recommended condition B5-3.

#### 2.1.10 Summary of key factor assessment and recommended regulation

The EPA has considered the likely residual impacts of the proposal on flora and vegetation environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can ensure consistency with the EPA factor objective. The EPA assessment findings are presented in Table 4.

The EPA has also considered the principles of the *Environmental Protection Act 1986* (see Appendix D) in assessing whether the residual impacts will be consistent with its environmental factor objective and whether reasonable conditions can be imposed (see Appendix A).

**Table 4: Summary of assessment for flora and vegetation**

Residual impact or risk to environmental value		Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
1.	Clearing of up to 4,339.16 ha of native vegetation, of which 4,296.93 ha is in a 'Good' to 'Excellent' condition.	<p>The clearing of 'Good' to 'Excellent' vegetation in the Pilbara bioregion is significant in the context of biological diversity and ecological integrity, as it provides habitat for conservation significant flora and fauna species.</p> <p>The EPA advises that subject to limits on clearing, decision-making authority (DMA) regulation, and recommended conditions on progressive rehabilitation, there is likely to be a significant residual impact. However, the residual impact can be counterbalanced through offsets (recommended condition B7) such that the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B5 (Rehabilitation)</b> Progressive rehabilitation.</p> <p><b>Condition B7 (Pilbara Environmental Offsets Fund)</b> Contribution to PEOF for clearing of 'Good' to 'Excellent' condition vegetation within the Pilbara bioregion.</p> <p><b>DMA legislation</b> The DMPE can regulate rehabilitation, including progressive rehabilitation, through the requirements of the mining proposal and mine closure plan under the Mining Act as supported by recommended condition B5.</p>
2.	Clearing of up to 70.31 ha of the Wona Land System PEC (P1-P3).	<p>The EPA advises that the clearing of the Wona Land System PEC will result in a significant residual impact, and that the proposal should be subject to reasonable conditions to limit the extent of direct disturbance to the PEC (recommended condition A1), to progressively rehabilitate with species of relative diversity (recommended condition B5), and to counterbalance the clearing via contributions to PEOF (recommended condition B7).</p> <p>The EPA advises that subject to the limit on clearing, DMA regulation, the recommended condition to avoid and minimise indirect impacts (B1-2), and recommended conditions on rehabilitation (B5), there is likely to be a significant residual impact. However, the residual impact can be counterbalanced through offsets</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B5 (Rehabilitation)</b> Rehabilitated areas to have consistent species diversity as reference sites.</p> <p><b>Condition B7 (Pilbara Environmental Offsets Fund)</b> Contribution to PEOF for clearing of the Wona Land System PEC.</p> <p><b>DMA legislation</b> The DMPE can regulate rehabilitation, including progressive rehabilitation, through the requirements of mining proposal and</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	(recommended condition B7) such that the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.	mine closure plan under the Mining Act as supported by recommended condition B5.
3. Clearing of 17.27ha of riparian vegetation.	<p>The clearing of riparian vegetation in the Pilbara bioregion is significant in the context of biological diversity and ecological integrity, as it provides habitat for conservation significant flora and fauna species, particularly in dry conditions, and in supporting habitat connectivity.</p> <p>The EPA advises that subject to limits on clearing, DMA regulation, and recommended conditions on progressive rehabilitation, there is likely to be a significant residual impact. However, the residual impact can be counterbalanced through offsets (recommended condition B7) such that the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B5 (Rehabilitation)</b></p> <p>Rehabilitated areas to have consistent species diversity as reference sites.</p> <p><b>Condition B7 (Pilbara Environmental Offsets Fund)</b></p> <p>Contribution to PEOF for the clearing of 'Good' to 'Excellent' condition vegetation within the Pilbara bioregion.</p>
4. Clearing of priority 1 flora species.	<p>The proposal will directly disturb three priority flora species, two of which are priority 1 species: <i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) and <i>Triodia veniciae</i>.</p> <p>The EPA considered that a clearing limit of up to 14.7% of the known records of <i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) and 14.4% of known records of <i>Triodia veniciae</i> within the local extent (within 10 kms), and subject to rehabilitation involving native species of local provenance (recommended condition B5), the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p>	<p><b>Condition B1 (Flora and vegetation)</b></p> <p>Disturbance limit on priority 1 species.</p> <p><b>Condition B5 (Rehabilitation)</b></p> <p>Rehabilitated areas to include species of local provenance, including <i>Hibiscus</i> sp. Mulga Downs (S. Hitchcock SH 638) and <i>Triodia veniciae</i>.</p>
5. Indirect impacts associated with altered fire regimes, dust deposition, and the introduction and spread of weeds.	<p>The proposal has the potential to result in indirect impacts to values of flora and vegetation.</p> <p>The EPA advises that the implementation of the proposal should avoid and minimise indirect impacts to the Freshwater Claypan PEC, the Wona Land System PEC, riparian</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B1 (Flora and vegetation)</b></p> <p>Avoid and minimise indirect disturbance to the Freshwater Claypans</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>vegetation, and locally significant vegetation (recommended condition B1-2).</p> <p>The EPA advises that subject to limits on clearing, DMA regulation, recommended conditions on avoiding and minimising indirect impacts (condition B1), and recommended conditions on progressive rehabilitation (condition B5), any residual impacts associated with altered fire regimes, dust deposition, or the spread and introduction of weeds are not likely to be significant. The environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p>	<p>PEC and locally significant vegetation.</p> <p><b>Condition B5 (Rehabilitation)</b> Progressive rehabilitation and the creation of stable landforms.</p>
<p>6. Indirect impacts associated with altered surface water regimes, including to the Freshwater Claypan PEC, riparian vegetation, and sheetflow dependent vegetation.</p>	<p>The EPA advises that the implementation of the proposal has the potential to result in indirect impacts from altered surface water regimes.</p> <p>Subject to the recommended conditions to avoid and minimise indirect impacts to the Freshwater Claypan PEC, riparian vegetation, and surface water dependent vegetation (B1-2), and to progressively rehabilitate (B5), the residual impacts can be reasonably minimised such that the environmental outcome is likely be consistent with the EPA's objective for flora and vegetation.</p>	<p><b>Condition B1 (Flora and vegetation)</b> Avoid and minimise indirect impacts to the Freshwater Claypan PEC and surface water dependent vegetation.</p> <p><b>Condition B5 (Rehabilitation)</b> Progressive rehabilitation and the creation of stable landforms.</p>

## 2.2 Terrestrial fauna

### 2.2.1 Environmental objective

The EPA environmental objective for terrestrial fauna is *to protect terrestrial fauna so that biological diversity and ecological integrity are maintained* (EPA 2016d).

### 2.2.2 Investigations and surveys

The EPA advises the following investigations, surveys and peer reviews were used to inform the assessment of the potential impacts to flora and vegetation:

- Mulga east baseline terrestrial vertebrate fauna assessment (appendix 11a.1 of the environmental review document) (Ecologia 2021a)
- Mulga east Pilbara leaf-nosed bat (appendix 11a.2 of the environmental review document) (Ecologia 2021b)
- Mulga Downs Iron Ore Mine: Mulga west borefield and mulga east southern corridor terrestrial fauna survey (appendix 11b.1 of the environmental review document) (Biologic 2022a)
- Mulga Downs Iron Ore Project: Transport corridor to Great Northern Highway terrestrial fauna survey (appendix 11b.2 of the environmental review document) (Biologic 2022b)
- Mulga Downs Iron Ore Mine – Consolidated terrestrial fauna report (appendix 11c of the environmental review document) (Attexo 2023)
- Mulga east short-range endemic invertebrate fauna assessment (appendix 11d of the environmental review document) (Ecologia 2020)
- Mulga Downs Iron Ore Mine – Targeted bilby and night parrot survey (appendix 11e of the environmental review document) (Spectrum 2024d)
- Mulga Downs Iron Ore Mine – Supplementary targeted fauna survey (appendix 11f of the environmental review document) (Spectrum 2024c)
- MDIOM solar farm, haul road & pipeline – Vertebrate & short-range endemic terrestrial fauna assessment (appendix 11g of the environmental review document) (Spectrum 2023a)
- Mulga Downs Iron Ore Mine – Desktop risk assessment for the Pilbara leaf-nosed bat and ghost bat (appendix 11h.1 of the environmental review document) (Ecologia 2023a)
- Mulga Downs Iron Ore Mine Pilbara leaf-nosed bat assessment (appendix 11h.2 of the environmental review document) (Biota Environmental Sciences 2024)
- Mulga Downs Iron Ore Project – Desktop risk assessment for the grey falcon (appendix 11i.1 of the environmental review document) (Ecologia 2023b)
- Mulga Downs Iron Ore Mine – Targeted grey falcon survey (appendix 11h.2 of the environmental review document) (Spectrum 2023b)
- Mulga Downs Iron Ore Mine – Freshwater claypans desktop assessment (appendix 24 of the environmental review document) (Biologic 2023)

- Geotechnical assessment of bat caves – Mulga Downs Iron Ore Project (appendix 28 of the environmental review document) (PSM 2024).

The surveys were largely consistent with the *Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020b) and *Technical Guidance – Sampling of short range endemic invertebrate fauna* (EPA 2016f). The EPA considered that the relevant studies are appropriate to inform the assessment of the potential impacts to the above environmental factor.

The EPA sought advice from DWER and DBCA in relation to the terrestrial fauna surveys that were considered as part of this assessment. The EPA also considered relevant fauna recovery plans and conservation advice where applicable.

### 2.2.3 Assessment context – existing environment

The proposal is expected to clear up to 4,339.11 ha of terrestrial fauna habitat, ranging from 'Degraded' to 'Excellent' condition. Existing disturbance is primarily related to exploration drilling and cattle grazing.

#### Fauna habitat

Surveys identified nine fauna habitat types within the development envelope (Figure 5). These habitat types were stony spinifex plains and hillslopes (4,758.15 ha) rocky hills (2,658.23 ha), gibber cracking clay (257.69 ha), drainage line/floodplain (522.64 ha), mulga woodland (8,203.43 ha), chenopod/cracking clay floodplain (92.78 ha), cracking clay (217.84 ha), snakewood (96.55 ha), and rocky plains and footslopes (37.75 ha) (JBS&G 2025c). 3.47 ha was recorded as cleared/disturbed.

The proponent identified 51 caves within the survey area that are likely to be Pilbara leaf-nosed bat and/or ghost bat caves. No permanent water features were identified within the development envelope; however, one persistent pool was located in the northern infrastructure corridor (Figure 6).

Following rainfall events, drainage line habitat will carry surface flow to the south of the development envelope, into the Goodiadarrie Swamp. The Goodiadarrie Swamp is recognised in the Directory of Important Wetlands of Australia as part of the 'Fortescue Marshes' (WA066) (Environment Australia 2001).

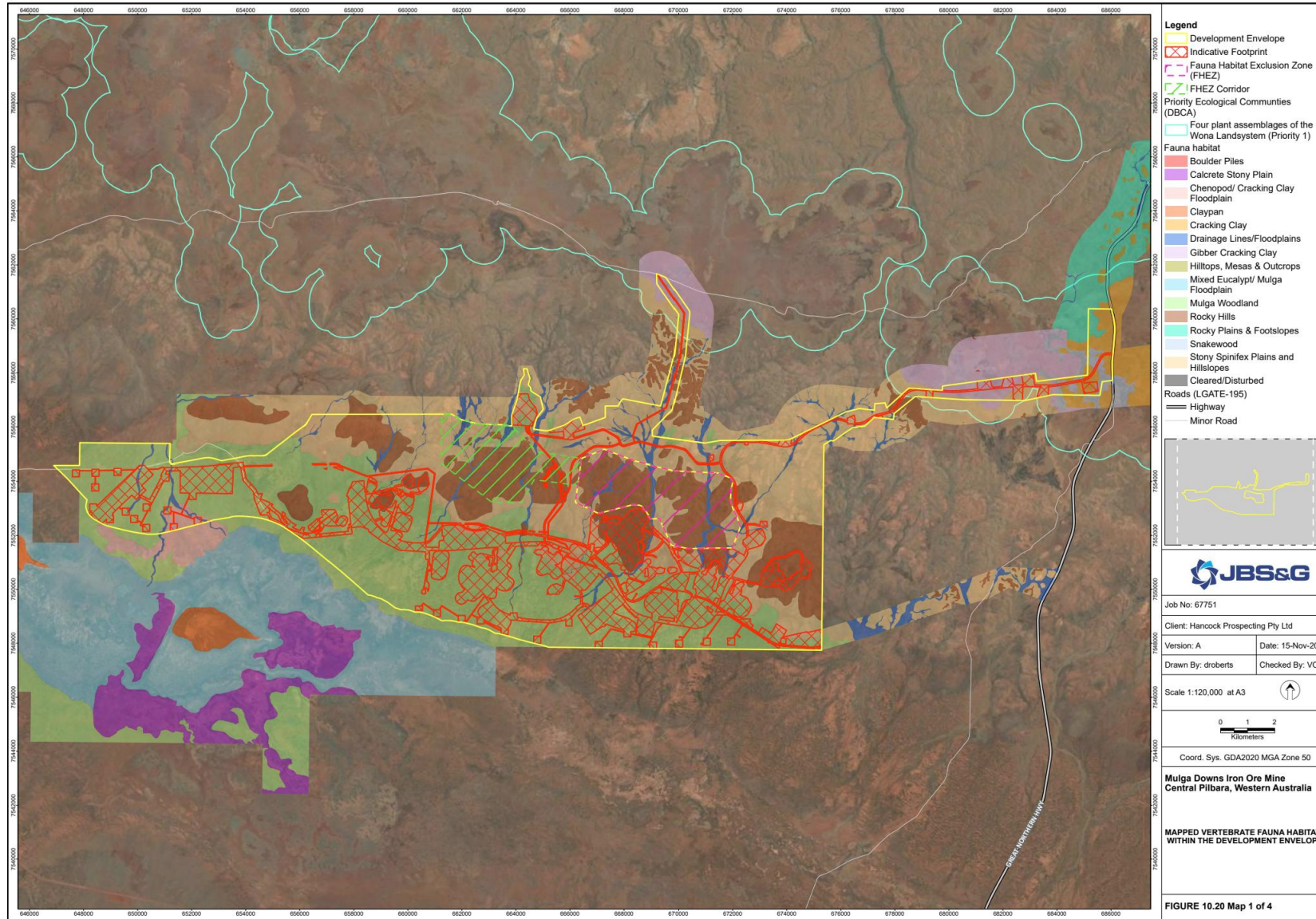


Figure 5: Terrestrial fauna habitat types (Figure 10.20 of JBS&G 2025c)

## Significant fauna

### *Vertebrate fauna*

The threatened and priority species that were recorded within the development envelope were:

- northern quoll (*Dasyurus hallucatus*) (EN)
- ghost bat (*Macroderma gigas*) (VU)
- grey falcon (*Falco hypoleucos*) (VU)
- Pilbara leaf-nosed bat (*Rhinonictoris aurantia*) (VU)
- Pilbara olive python (*Liasis olivaceus barroni*) (VU)
- peregrine falcon (*Falco peregrinus*) (OS)
- Gane's blind snake (*Anilius ganei*) (P1)
- western pebble-mound mouse (*Pseudomys chapmani*) (P4)
- red-necked stint (*Calidris (Ereunetes) ruficollis*) (Mi)
- wood sandpiper (*Tringa (Rhyacophilus) glareola*) (Mi)
- common greenshank (*Tringa (Glottis) nebularia*) (Mi).

The threatened and priority species that were considered likely to occur within the development envelope were:

- night parrot (*Pezoporus occidentalis*) (CR)
- greater bilby (*Macrotis lagotis*) (VU)
- spotted ctenotus (*Ctenotus uber johnstonei*) (P2)
- brush-tailed Mulgara (*Dasyercus blythi*) (P4)
- northern short-tailed mouse (*Leggadina lakedownensis*) (P4)
- glossy ibis (*Plegadis falcinellus*) (Mi).

### *Invertebrate fauna*

32 potential short-range endemic (SRE) species were recorded within the development envelope. Of these, a single isopod species was confirmed as an SRE species, *Buddelundia* 56, and was recorded within the drainage line/floodplain habitat and chenopod/cracking clay floodplain habitat (JBS&G 2025c).

The claypans to the south of the development envelope support a diverse and unique aquatic invertebrate assemblage (Biologic 2023). The two claypans in the desktop study area (Koodjeepindarranna Claypan and Gnalka Gnoona Claypan) yielded a total of 267 taxa, of which five were new species (Biologic 2023).

## 2.2.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (HanRoy 2025b). Public consultation on the proposal raised concerns about residual impacts to fauna species including SRE species and insufficient management measures for significant fauna species.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in the following sections.

## 2.2.5 Potential impacts from the proposal

### Direct impacts

Potential direct impacts to terrestrial fauna from:

- clearing of up to 4,339.11 ha of native vegetation comprising fauna habitat
- clearing of high value fauna habitat, including bat caves
- habitat fragmentation and barriers to fauna movement
- fauna injury or mortality from vehicle strikes
- clearing of habitat suitable for confirmed or potential SRE species.

### Indirect impacts

Potential indirect impacts to terrestrial fauna from:

- loss or degradation of fauna habitat from altered fire regimes, dust deposition, altered surface or groundwater regimes, and the introduction and/or spread of weeds
- reduction in water availability from changes to surface water regimes
- disturbance or degradation of habitat from noise, light, and vibration, including collapsing of caves
- disturbance from an increase in feral fauna presence.

The EPA considers that changes to surface and groundwater regimes may impact foraging and dispersal opportunities of terrestrial fauna habitat. Impacts to inland waters are considered in section 2.3.

## 2.2.6 Avoidance measures

The proponent has committed to the following terrestrial fauna impact avoidance measures (JBS&G 2025c):

- implementation of two exclusion zones, the Fauna Habitat Exclusion Zone (FHEZ) and FHEZ Corridor, to avoid disturbance across an area of 2,312.27 ha
- no direct disturbance to 43 nocturnal roosts (36 contained the FHEZ, 6 within the FHEZ corridor, and one within the Low Impact Activity Area (LIAA))
- no direct disturbance to the rocky plains and footslopes habitat type
- no direct disturbance to the Freshwater Claypans PEC.

### 2.2.7 Minimisation measures (including regulation by other DMAs)

The proponent has proposed measures to minimise impacts to terrestrial fauna (JBS&G 2025c):

- maximum of 5 ha of clearing within the LIAA, attributable to access roads and a communication tower
- revising the mine plan to reduce the overall extent of clearing by 5,288.84 ha
- design the disturbance footprint to utilise areas of existing disturbance, where possible
- design the disturbance footprint to minimise disturbance to watercourses and riparian vegetation
- implementing speed limits and construction of fauna friendly underpasses to minimise the risk of fauna strikes
- implement maximum noise and vibration limits
- installation of directional, low-intensity, and/or adaptive lighting
- avoid use of barbed wire fencing, and where unavoidable, install reflectors
- implementing standard weed control methods to prevent the spread or introduction of weed species
- avoid clearing of high value habitat, including rocky hills and drainage lines/floodplains
- clearing to be done in accordance with an internal ground disturbance permit.

The issues raised during the public consultation about residual impacts to, and management of, significant fauna species have been partially addressed through the proposed minimisation measures.

#### Mining Act 1978

In accordance with the Mining Act the proponent will be required to prepare a Mine Closure Plan consistent with the Guideline for preparing Mine Closure Plans (DMPE 2025a) which includes requirements for rehabilitation and revegetation of land and closure objectives and criteria.

### 2.2.8 Rehabilitation measures

The proponent has proposed the following rehabilitation measures (JBS&G 2025c):

- construction and operational areas that are no longer required will be progressively rehabilitated throughout the life of the mine
- topsoil will be stored and stockpiled to a maximum of 2 m
- establish suitable fauna habitat
- rehabilitation will include native species of local provenance and will be informed by consultation with the Banjima Traditional Owners.

The issues raised during the public consultation have been partially addressed through the proposed minimisation measures, including progressive rehabilitation.

### 2.2.9 Assessment of impacts to environmental values

The EPA considered that the key environmental values for terrestrial fauna likely to be impacted by the proposal are fauna habitat, conservation significant species, and priority species.

In assessing this proposal, the EPA has had regard to the combined and cumulative effect that surrounding approved and proposed projects may have on terrestrial fauna, particularly the Murray's Hill Project and Mulga Downs Hub and Rail Spur.

#### Significant fauna habitat

The EPA has assessed the potential impacts to fauna habitat from implementation of the proposal. The proposed indicative clearing of habitat types is presented in Table 5. The maximum extent of fauna habitat to be cleared is 4,339.11 ha.

No permanent surface water pools were located within the development envelope, although one persistent water body was found in the northern infrastructure corridor, within the drainage line/floodplain habitat type (Figure 6). Pools were also known from within the Goodiadarrie Swamp (see Section 2.3). These surface water pools are likely to act as foraging habitat for fauna species, including the northern quoll, Pilbara leaf-nosed bat, and Pilbara olive python. Subject to the recommended conditions A1 (limits and extents) and B1 (avoid and minimise impacts from changes to surface water regimes), the EPA considers there is unlikely to be any significant residual impacts to habitat associated with surface water pools.

The northern quoll, Pilbara olive python, and peregrine falcon are known to preference hollow-forming trees as nesting locations (Ecologia 2021a). The EPA considers that the proponent should minimise clearing of hollow-forming trees, as included in recommended condition B2-2(1).

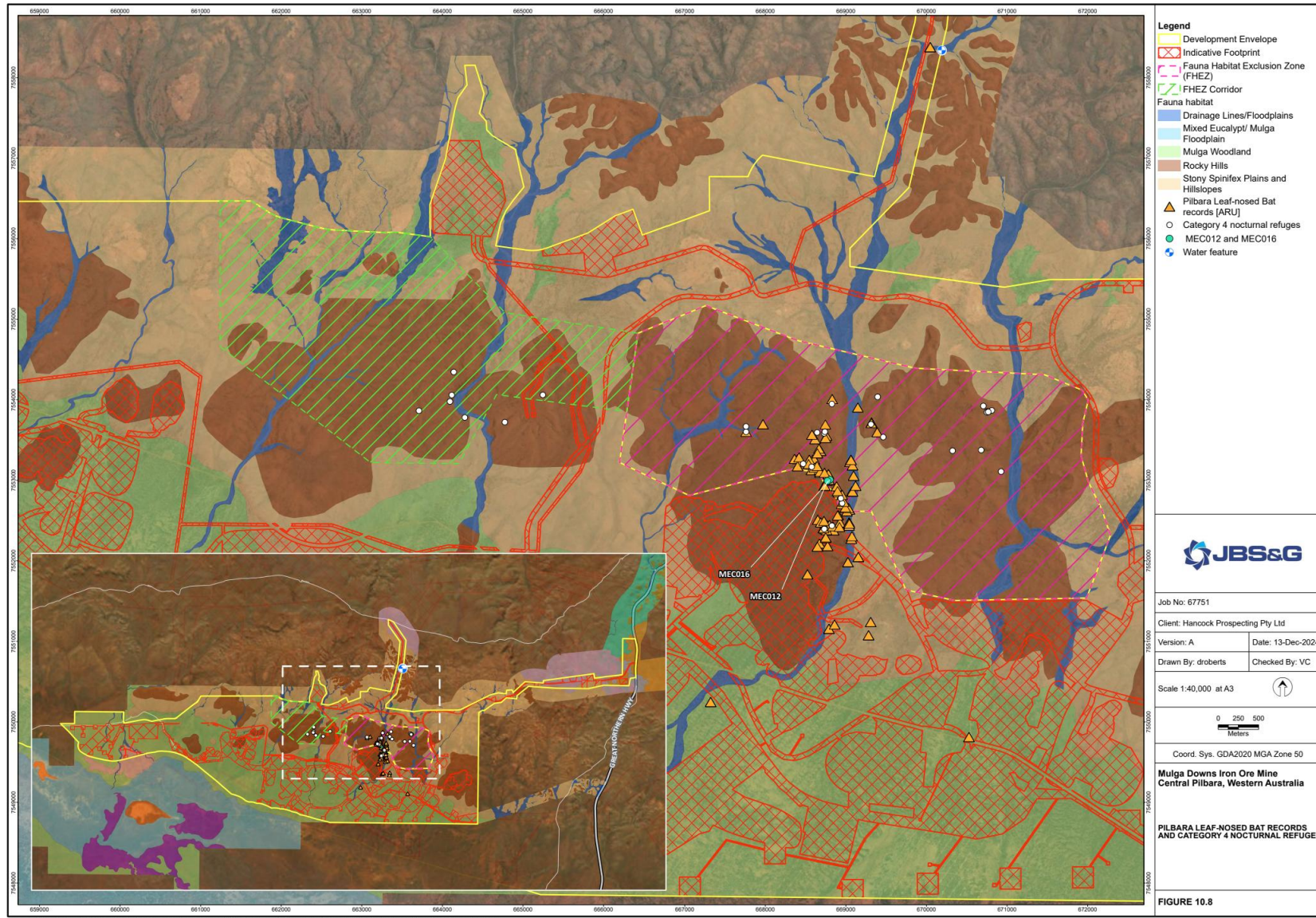


Figure 6: Pilbara leaf-nosed bat records, Category 4 caves, and surface water feature (Figure 10.8 of JBS&G 2025c)

**Table 5: Fauna habitat types within development envelope (Attexo 2022a; Attexo 2023; Spectrum 2023a; JBS&G 2025c)**

Habitat type	Likely habitat value	Potential use by significant species likely to occur within development envelope	Mapped extent (ha)	Extent within IDF
Chenopod/ Cracking Clay Floodplain	Critical habitat	Greater bilby (foraging and dispersal).	983.20	15.72 ha (1.60%)
	Supporting habitat	Pilbara leaf-nosed bat (foraging). Night parrot (foraging, if mature spinifex is present). Peregrine falcon (foraging).		
Cracking Clay	Critical habitat	N/A	5,529.69	28.10 ha (0.51%)
	Supporting habitat	Night parrot (foraging, if mature spinifex is present). Grey falcon (foraging). Greater bilby (foraging). Northern short-tailed mouse (foraging and refuge).		
Drainage Line/Floodplain	Critical habitat	Grey falcon (nesting, foraging, and refuge). Pilbara olive python (foraging and dispersal). Northern quoll (foraging and dispersal). Greater bilby (breeding, foraging, and dispersal). Peregrine falcon (nesting, foraging, and refuge). Night parrot (nesting and foraging, if mature spinifex is present).	38,141.21	71.26 ha (0.19%)
	Supporting habitat	Ghost bat (foraging and dispersal). Pilbara leaf-nosed bat (foraging and dispersal). Brush-tailed mulgara (foraging, dispersal, and refuge). Spotted ctenotus. Northern short-tailed mouse (foraging and refuge) Western pebble-mound mouse (foraging, if near suitable habitat).		
Gibber Cracking Clay	Critical habitat	Western pebble-mound mouse (breeding, foraging, dispersal, and refuge).	3,556.27	56.48 ha

Habitat type	Likely habitat value	Potential use by significant species likely to occur within development envelope	Mapped extent (ha)	Extent within IDF
	Supporting habitat	Ghost bat (foraging). Peregrine falcon (foraging). Spotted ctenotus. Northern short-tailed mouse (foraging and refuge).		(1.59%)
Mulga Woodland	Critical habitat	Greater bilby (breeding, foraging and dispersal).	43,575.10	2,824.74 ha (6.48%)
	Supporting habitat	Pilbara leaf-nosed bat (foraging). Ghost bat (foraging). Grey falcon (foraging and refuge). Peregrine falcon (foraging and refuge). Spotted ctenotus. Northern short-tailed mouse. Gane's blind snake (foraging and refuge).		
Rocky Hills	Critical habitat	Northern quoll (denning, foraging, and dispersal). Pilbara olive python (roosting, foraging, and dispersal).	11,982.01	520.80 ha (4.35%)
	Supporting habitat	Pilbara leaf-nosed bat (roosting and foraging). Ghost bat (roosting, foraging, and dispersal). Peregrine falcon (foraging). Western pebble-mound mouse (foraging and dispersal). Gane's blind snake (foraging and dispersal).		
Rocky Plains and Footslopes	Critical habitat	Northern quoll (denning, foraging, and dispersal). Greater bilby (foraging and dispersal). Night parrot (foraging, if mature spinifex is present). Western pebble-mound mouse (breeding, foraging, dispersal, and refuge). Gane's blind snake (foraging and dispersal).	32,444.58	0.00 ha (0 %)

Habitat type	Likely habitat value	Potential use by significant species likely to occur within development envelope	Mapped extent (ha)	Extent within IDF
	Supporting habitat	Ghost bat (foraging). Grey falcon (foraging). Pilbara leaf-nosed bat (foraging). Peregrine falcon (foraging). Brush-tailed mulgara.		
Snakewood	Critical habitat	N/A	731.62	8.04 ha (1.10%)
	Supporting habitat	Night parrot (foraging, if mature spinifex is present). Greater bilby (foraging and dispersal). Grey falcon (foraging). Northern short-tailed mouse (foraging and refuge).		
Stony Spinifex Plains and Hillslopes	Critical habitat	Night parrot (nesting and foraging, if mature spinifex is present). Greater bilby (foraging and dispersal). Pilbara olive python (foraging and dispersal). Northern quoll (foraging and dispersal).	62,690.54	813.97 ha (1.30%)
	Supporting habitat	Pilbara leaf-nosed bat (foraging) Ghost bat (foraging). Grey falcon (foraging). Peregrine falcon (foraging). Spotted ctenotus. Western pebble-mound mouse (foraging and dispersal).		

IDF = Indicative disturbance footprint.

## Threatened and priority fauna

### *Pilbara leaf-nosed bat*

The Pilbara leaf-nosed bat (*Rhinonictoris aurantia*, Pilbara form) is listed as Vulnerable under the BC Act. The Pilbara leaf-nosed bat was observed within the development envelope and the FHEZ, predominately in rocky hills and drainage line/floodplain habitat. Initial surveys recorded a substantial number of calls immediately following dusk civil twilight, indicating the likely presence of a permanent roost. Long-term surveys were then conducted, which recorded year-round bat calls and provided further evidence for a permanent population in the vicinity. Targeted surveys which followed did not locate any Category 1, 2 or 3 caves, as defined by TSSC (2016). It is noted, however, that most of the surveys targeted a single drainage line and the adjacent rocky hills habitat (Biota 2024). In total, 82 structures were assessed (Figure 10.5 of JBS&G 2025c) and out of these, 51 were considered Category 4 caves (Figure 6). It is likely that these Category 4 caves are used as nocturnal refuges when foraging and to support dispersal between roost sites.

The proponent has proposed numerous mitigation and management measures to minimise impacts to the Pilbara leaf-nosed bat habitat (see sections 2.2.6 and 2.2.7 above), including various exclusion zones to protect avoid impacts to cave sites. The FHEZ, FHEZ corridor, and LIAA will avoid direct disturbance to 43 of the known 51 Category 4 caves. Of the remaining eight caves, five were located within the indicative disturbance footprint. The proponent has committed management measures for noise, dust, light pollution, and vibration (see 'Indirect impacts' below).

In total, the proposal will result in the loss of up to 1,406.03 ha of suitable foraging habitat. The extent of clearing is not expected to be at a level that would result in large-scale irreversible damage; however, the EPA does consider the loss of foraging habitat to be a significant residual impact. The proponent has proposed maximum clearing extents on habitat types (Table 5), which the EPA has reflected in recommended condition B2-1 as well as recommending contributions to PEOF to counterbalance the significant residual impacts (recommended condition B7).

The EPA has also considered the potential impacts to the Pilbara leaf-nosed bat on a broader landscape scale. The nearest documented Pilbara leaf-nosed bat roost site is approximately 30 km southwest of the DE, near Wittenoom (Spectrum 2024c). Individuals are understood to be able to travel up to 40 kms overnight when moving between roost sites (Bullen 2023). As the Fortescue Valley is greater than 40 kms wide at certain points, the movement of Pilbara leaf-nosed bats between the East Hamersley and Chichester ranges may be restricted to certain corridors and dependent on certain refuges to facilitate dispersal (Biota 2025). It is possible that the caves within and near the proposal act as a critical pathway in facilitating genetic connectivity between subpopulations in the Hamersley Ranges and East Pilbara. Movement routes are not well understood and have been identified as a research priority for the species (Bradley et al. 2024). To date, only one other known location is understood to support dispersal across the Fortescue Valley, being the roost sites at the Koodaideri (Gudai-Darri) Iron Ore Mine (Ministerial Statement 999) approximately 70 kms to the south-east. This site is already subject to pressure from mining operations. The EPA considers that the group of caves identified by the

proponent are likely to hold more value than expected for Category 4 caves as defined by TSSC (2016). The EPA has recommended condition B2-1 to require the proponent to ensure no detectable decrease in Pilbara leaf-nosed bat abundance, compared to baseline.

In addition, the EPA considers that the proponent should further research caves near the proposal to build reduce uncertainty. The EPA has recommended condition B9 to require the proponent to address knowledge gaps associated with the Pilbara leaf-nosed bat within 50 km of the development envelope, including investigating the presence of diurnal roosts, defining cave habitat characteristics, characterising foraging habitat around roost sites, and characterising the dispersal of the species.

The EPA considers that that significant residual impacts to the Pilbara leaf-nosed bat habitat can be minimised through recommended conditions A1-1 (limits and extents), B2-1 (fauna habitat disturbance limits, no impacts to bat caves, and no decrease in population abundance), B5 (rehabilitation of fauna habitat), and B9 (research program), and can be counterbalanced by recommended condition B7 (contributions to PEOF).

### *Ghost bat*

The ghost bat has been recorded on various occasions near the proposal, however, no Category 1, 2, or 3 roost caves have been located within 30 km. The closest roost site/s are expected to be within the Hamersley Ranges, near Wittenoom (Ecologia 2023a).

During surveys, bat recorders were placed in suitable habitat locations, including long-term recorders at one cave location, MEC016, and at five suitable foraging habitat locations. Numerous calls were recorded at one site within suitable foraging habitat in the Goodiadarrie Swamp, and secondary evidence was recorded at two caves locations (Figure 10.9 of JBS&G 2025c). Both caves are located within the FHEZ. Caves across the development envelope and within the FHEZ were assessed for suitability as roost sites. Of the 82 caves assessed, 23 were considered as Category 4 nocturnal refuges, and none were considered Category 1, 2, or 3 roost sites. Of the Category 4 caves, nine are located within the development envelope and five within the indicative disturbance footprint. Given the low number of recordings and lack of suitable roosting sites, the EPA considers that the ghost bat is likely to be intermittent visitor for foraging or refuge.

Data is limited on the habitat preferences of ghost bats; however, they are expected to forage up to 12 km from diurnal roosts, and dispersal between roost can be up to 30 km (Bat Call WA 2021). Current understanding indicates that ephemeral and permanent water sources within 5 km of roost sites are important foraging sites as they are productive. Implementation of the proposal is expected to result in the loss of up to 1,462.72 ha of potentially suitable foraging habitat. However, as no roost were located, and ghost bat observations were limited, the EPA considers that the suitable habitat is unlikely to represent a locally or regionally significant area for the species.

Subject to the maximum clearing extents of foraging habitat, as included in recommended condition B2-1, the EPA considers that there is unlikely to be significant residual impacts to the ghost bat from clearing of habitat.

### *Northern quoll*

The northern quoll (*Dasyurus hallucatus*) is listed as Endangered under the BC Act. The proponent's initial surveys recorded three northern quolls on camera traps during surveys, and scats at six locations, all within rocky hills habitat. An additional survey following higher rainfall conditions targeted suitable habitat within the FHEZ and FHEZ corridor identified numerous northern quolls, indicating the presence of a high-density breeding/resident population (Spectrum 2024c).

Rocky hills habitat is considered critical habitat for shelter and denning, while drainage line/floodplains and stony spinifex plains and hillslopes are considered as supporting habitat. In addition, native vegetation within 1 km of rocky hills is considered critical habitat essential for the survival of the species (CoA 2016). The FHEZ contains 950.81 ha of suitable denning habitat, although the entirety of the FHEZ (1,320.82 ha) is considered critical habitat as it is within 1 km of rocky hills. The FHEZ corridor contains a further 991.45 ha of critical habitat, of which 548.14 ha is rocky hills. The LIAA contains a further 108.7 ha, of which 105 ha is rocky hills. The boulder pile habitat type is also considered critical denning habitat but lies outside the development envelope (JBS&G 2025c).

During the breeding season (August to October), male northern quolls are understood to travel long distances to seek breeding partners and food (Cowan et al. 2024). Northern quoll are also more likely to avoid areas disturbed by mining, likely related to the reduced availability of food and suitable denning habitat. This emphasises the importance of the proponent's proposed habitat exclusion zones, which will facilitate northern quoll safe passage between habitat in the FHEZ and to habitat within the Chichester Range to the north.

The EPA considers the clearing of critical and supporting habitat, including foraging and dispersal habitat, to be a significant residual impact. The proponent has proposed maximum clearing extents on habitat types, which the EPA has included in recommended condition B2-1(1). The EPA has also recommended a disturbance limit on dispersal and foraging habitat (recommended condition B2-2(1)).

Northern quoll are considered to have a high sensitivity to population change, partly due to males only lasting one breeding season and females lasting between one and three, and partly due to mortality from predation or cane toad ingestion (Oakwood 2000; CoA 2016). Based on advice received during the assessment process, and the results of fauna surveys, the EPA considers that the high-density northern quoll population is likely to be locally significant. The proponent should monitor the abundance of northern quoll in the area and compare against suitable reference sites to determine if the proposal is having an adverse impact (recommended condition B2-1(4)).

The EPA advises that significant residual impacts to northern quoll can be minimised through recommended conditions A1-1 (limits and extents), B2-1 (fauna habitat

disturbance limits and no decrease in population abundance), and B5 (rehabilitation of fauna habitat), and can be counterbalanced by recommended condition B7 (contributions to PEOF).

### *Greater bilby*

The greater bilby (*Macrotis lagotis*) is listed as Vulnerable under the BC Act. Suitable breeding habitat types were considered as drainage line/floodplain and mulga woodland, while chenopod/cracking clay floodplain and stony spinifex plains and hillslopes was considered potential dispersal and/or foraging habitat (Spectrum 2024d). It is noted that sandy substrate for burrow excavation was largely absent from the development envelope, aside from a few patches within drainage line/floodplain habitat (JBS&G 2025c). Sandy substrates are preferred as they easier for burrow excavation (DCCEEW 2023b).

No primary or secondary evidence of the greater bilby was recorded in surveys conducted by the proponent. Irrespectively, it is noted that the species often occurs in low abundance and has faced considerable population decline in the last 200 years (DCCEEW 2023b). Feral predators such as foxes and cats are known to be a key threat for the greater bilby, and their presence within the Mulga Downs Pastoral Station may have contributed to a reduced local population. Historic surveys have recorded the greater bilby approximately 10 km to the north, 24 km to the north-east, and within the Mulga Downs Pastoral Station (anecdotal record, location uncertain). More recent surveys have recorded the greater bilby approximately 22 kms south-east and 24 kms to the north (JBS&G 2025c). The confirmed range of the greater bilby overlaps the eastern portion of the development envelope (Map 3.1 of Spectrum 2024d).

The EPA considers that the greater bilby may travel within and near the proposal, however, it is unlikely to take up permanent resident due to the lack of suitable denning habitat.

The EPA considers that that residual impacts to greater bilby habitat can be minimised through recommended conditions A1-1 (limits and extents), B2-1 (fauna habitat disturbance limits) and B5 (rehabilitation of fauna habitat), and can be counterbalanced by recommended condition B7 (contributions to PEOF).

### *Night parrot*

The night parrot (*Pezoporus occidentalis*) is listed as Critically Endangered under the BC Act. Breeding and roosting habitat includes low dense vegetation on flat and open terrain, which is typically mature (>20 years old), unburnt spinifex but can also include thickets of lignum, dense shrubby samphire, and chenopods (DCCEEW 2025a). Permanent and ephemeral water sources, floodplains, claypans, rocky breakaways, and salt lake margins are also understood to be habitat critical for the survival of the species. The closest record of the night parrot to the proposal was approximately 57 km to the east, within the Fortescue Marsh, during surveys in 2019-2022 (DCCEEW 2025a).

Within the surveyed area, drainage line/floodplain, stony spinifex plains and hillslopes, claypan, and chenopod/cracking clay floodplain habitat types were considered critical (Spectrum 2024d). There is no claypan habitat within the development envelope, however the other three habitat types are expected to be cleared as a result of the proposal (Table 5). Surveys conducted targeting suitable nesting habitat found sparse records of mature unburnt spinifex, with only a small area found in the northern infrastructure corridor, within gibber cracking clay, and fragmented areas in the Goodiadarrie Swamp to the south, within calcrete stony plain (Ecologia 2021a). Historic pastoral land use and exploration activities is likely to have contributed to the degradation of habitat within the local area.

No night parrot calls were detected during the proponent's surveys; however, the effective detection range of acoustic recorders is approximately 200 m. The EPA considers that night parrots may use dispersal and foraging habitat within the development envelope, but they are unlikely to be permanent residents due to the absence of mature spinifex for nesting. Nevertheless, spinifex within the envelope could mature over the life of the mine and become suitable nesting habitat. The proponent has proposed maximum clearing limits for potentially critical habitat types: up to 15.72 ha of chenopod/cracking clay floodplains, 71.26 ha of drainage line/floodplain, and 813.97 ha of stony spinifex plains and hillslopes. These limits are reflected in recommended condition B2-1.

The EPA considers that potential significant residual impacts to night parrot habitat can be minimised through recommended conditions A1-1 (limits and extents), B2-1 (fauna habitat disturbance limits) and B5 (rehabilitation of fauna habitat), and can be counterbalanced by recommended condition B7 (contributions to PEOF).

### *Pilbara olive python*

The Pilbara olive python (*Liasis olivaceus barroni*) is listed as Vulnerable under the BC Act. While there is no definitive understanding of what constitutes critical habitat for the Pilbara olive python, rocky gorges, gullies, and permanent waterholes are accepted as a proxy (Northover et al. 2023). Critical denning habitat within the development envelope is expected to be rocky hills, and foraging habitat is expected to be drainage line/floodplain and stony spinifex plains and hillslopes though it is noted that all habitat types have the potential to be foraging (Ecologia 2021a). Water features, such as the one identified in the northern infrastructure corridor, are likely to provide temporary foraging habitat (Biologic 2022b).

Only one opportunistic record of the species was recorded during surveys, from the proponent's temporary campsite. Historic sightings have been recorded in proximity surrounding the proposal, with the closest approximately 6 kms north of the development envelope (Ecologia 2021a). It is likely that the Pilbara olive python is at least a temporarily visitor to the development envelope for foraging and dispersal but appears unlikely to permanently reside in the area due to the lack of permanent water features.

The EPA considers that clearing of suitable habitat for the Pilbara olive python is likely to represent a significant residual impact. The proponent has proposed clearing limits on habitat types (Table 5), which the EPA has included in recommended

condition B2-1. The EPA considers that that significant residual impacts to Pilbara olive python habitat can be minimised through recommended conditions A1-1 (limits and extents), B2 (fauna habitat disturbance limits) and B5 (rehabilitation of fauna habitat), and can be counterbalanced by recommended condition B7 (contributions to PEOF).

### *Grey falcon*

The grey falcon (*Falco hypoleucos*) is listed as Vulnerable under the BC Act. The grey falcon does not have specific habitat requirements but typically nests in tall trees along watercourses or in tall man-made infrastructure, such as telecommunication towers.

One grey falcon individual was recorded during a reconnaissance survey in the eastern portion of the development envelope (Ecologia 2021a). Targeted surveys for potential nesting trees and potential nests were also conducted within the mixed eucalypt/mulga floodplain and the drainage line/floodplain habitat types that are considered potential nesting habitat. 46 potential nests were located during the targeted survey (Spectrum 2023b), noting that grey falcons utilise nests constructed by other birds, however no grey falcon or secondary evidence of breeding activities was observed. Chenopod/cracking clay floodplain was identified as suitable foraging habitat.

The EPA considers that clearing of suitable breeding or foraging habitat for the grey falcon is likely to represent a significant residual impact. The proponent has proposed maximum clearing limits on habitat types (Table 5), which the EPA has included in recommended condition B2-1. The EPA considers that that significant residual impacts to grey falcon habitat can be minimised through recommended conditions A1-1 (limits and extents), B2-1 (fauna habitat disturbance limits) and B5 (rehabilitation of fauna habitat), and can be counterbalanced by recommended condition B7 (contributions to PEOF).

### *Priority fauna*

Clearing associated with the proposal is not expected to have a significant residual impact on priority fauna species, as list by DBCA. The priority species recorded during surveys were the Gane's blind snake (*Anilius ganei*, P1) and the western pebble-mound mouse (*Pseudomys chapmani*, P4). The spotted ctenotus (*Ctenotus uber johnstonei*, P2), brush-tailed mulgara (*Dasycercus blythi*, P4), and northern short-tailed mouse (*Leggadina lakedownensis*, P4) were not recorded but considered likely to occur, with historic records within 30 km of the development envelope. All species were considered to have relatively broad distributions, and at least 93% of the surveyed extent of all suitable habitat types will remain after implementation of the proposal. Subject to the recommended conditions (A1-1 and B2-1), the EPA considers that the clearing of habitat is unlikely to represent a significant residual impact for the above priority fauna species.

### *Peregrine falcon and migratory species*

The peregrine falcon is listed under the BC Act as Other Specially Protected. The species does not have specialised foraging requirements, and as such, all habitat types within the development envelope are suitable for foraging (Spectrum 2023a). Peregrine falcons are uncommon visitors but have widespread ranges, occurring across most of Australia (Spectrum 2023a). During surveys, one peregrine falcon was opportunistically recorded in 2022 immediately west of the development envelope, and there have been various historic records within 10 kms (Biologic 2022a).

Migratory birds are highly mobile species with broad foraging ranges, often visiting wetland areas after favourable rainfall events. Within the surveyed area, the claypan, drainage lines/floodplains, and mixed eucalypt/mulga woodland habitat types are considered suitable habitat for foraging. Importantly, the Gnalka Gnoona and Koodjeepindarranna claypans form part of the DIWA-listed Fortescue Marshes wetland, as discussed in section 2.1 above, but are outside the development envelope and therefore not likely to be subject to direct impacts.

The proponent recorded the following migratory bird species within the local area (Figure 10.19 of JBS&G 2025c), though it is noted other migratory species also have the potential to occur (Spectrum 2023a):

- common greenshank (*Tringa nebularia*)
- wood sandpiper (*T. glareola*)
- glossy ibis (*Plegadis falcinellus*)
- red-necked stint (*Calidris ruficollis*).

While the peregrine falcon and migratory birds are likely to utilise habitat within the development envelope for foraging, they are unlikely to be reliant on this habitat given widespread foraging ranges. As such, the EPA considers that there is unlikely to be significant residual impacts to the peregrine falcon or migratory bird species.

### *Invertebrate fauna*

Desktop assessments identified 12 potential or confirmed short-ranged endemic (SRE) invertebrate taxa previously recorded within the development envelope (JBS&G 2025c). Potential SRE taxa were recorded across most habitat types, with the most prospective areas being breakaways and gorges within the rocky hills and the drainage lines/floodplain habitat types. Mulga woodland and calcrete stony plain were also considered moderately prospective. Field surveys recorded 31 potential SRE and one confirmed SRE, *Buddelundia* 56. Of the 14 records of *Buddelundia* 56, none were recorded within the indicative disturbance footprint and only one was recorded from within the development envelope (Figure 10.21 of JBS&G 2025c). Of the 31 potential SRE taxa, 16 were only recorded from within the development envelope, and of these, three singletons (isopod *Buddelundia* indet. 1, arthropod *Dampetrus* 'OPI001', and arachnid *Missulena* sp. indet.) were recorded from only within the indicative disturbance footprint associated with the rocky hills habitat type (JBS&G 2025c). While these taxa have only been recorded from within the indicative disturbance footprint, this is likely to be due to a lack of available data on newly

discovered singletons. Suitable rocky hills habitat extends outside the development envelope and within the FHEZ and FHEZ corridor, and therefore the EPA considers that these species are likely to persist. Subject to clearing limits of suitable SRE habitat types (recommended condition B2-1), the EPA considers that the proposal is unlikely to significant impact SRE taxa.

Aquatic invertebrates form highly diverse and unique communities within the claypans of the Fortescue Valley. According to Biologic (2023), these claypans may support over 50% of all aquatic invertebrate species found in the Pilbara region. Two claypans relevant to the proposal, the Gnalka Gnoona Claypan and the Koodjeepindarranna Claypan, are part of the Freshwater Claypans PEC. As noted in Section 2.1, both claypans lie outside the development envelope but could be indirectly affected by changes to surface and groundwater regimes, altered fire patterns, and the introduction or spread of weeds. The EPA considers that, with the recommended conditions for flora and vegetation (preventing indirect disturbance to claypan vegetation) and inland waters (protecting surface water pools and limiting groundwater drawdown), significant residual impacts to aquatic invertebrates are unlikely.

Subject to the recommended conditions (A1-1, B1, and B3), the EPA considers that the environmental outcome for invertebrate fauna species is likely to be consistent with the EPA objective for terrestrial fauna.

### Direct impacts

During construction and operation, terrestrial fauna species are at risk of injury or mortality from collision with vehicles, entrapment, or entanglement with barbed wire.

The proponent has proposed a speed limit across the development envelope of 90 km/hr on sealed roads, and 60 km/hr on unsealed roads, as well as further reductions within a portion of the haulage route that runs adjacent to the FHEZ referred to as the Northern Haul Road FHEZ Restriction Zone. As discussed above, there are likely to be significant populations of northern quoll and Pilbara leaf-nosed bat present within the FHEZ. The presence of a haul road within 1 km of the FHEZ is likely to introduce additional pressures on these populations, as well as other nocturnal species such as the greater bilby or Pilbara olive python which may disperse through these areas. The fauna habitat surrounding the exclusion areas is considered to be critical foraging, dispersal, and breeding habitat for various species and highly likely to be utilised throughout the life of mine. Noting the presence of numerous fauna species within and near the exclusion areas, including nocturnal species such as the northern quoll, the EPA recommends that a speed limit restriction zone should be adopted. . The EPA considers that haul and access roads within 1 km of the FHEZ and FHEZ Corridor, as well as within 1 km to a portion of the rocky hills habitat to the east of the FHEZ, should be subject to speed limits. This area has been designated the Speed Limit Restriction Zone and is shown in Figure 2 of Attachment A. A speed limit of 40 km/hr is considered best practice for minimising the occurrences of fauna strikes, particularly for nocturnal species (Rendall et al. 2021). The recommended speed limits have been included in recommended condition B2-5.

The EPA has also considered that haul and access roads should be constructed with fauna crossings in suitable locations within the development envelope to minimise the risk of fauna strikes, provided the fauna crossing would not channel species into operational areas (such as mine pits and waste rock dumps). While there has been limited studies on the effectiveness of fauna crossings in Australia, noting the potential for feral predator species to target hunting efforts along these crossing, the EPA considers that with adequate feral fauna management (as required under condition B2-1), native fauna are likely to benefit from the installation of these crossings. The EPA also considers this conclusion to be consistent with recent research (such as Taylor & Goldingay 2010 and Goldingay et al. 2021). Recommended condition B2-3(4) has been included to require fauna crossings along haul roads and sealed access roads within the Speed Limit Restriction Zone, as well as ensuring culverts across the development envelope are designed to allow fauna movement, where appropriate.

It is noted that unsealed access roads within the development envelope are likely to have less frequent vehicle movements and would be subject to reduced speed limits under recommended condition B2-5. As such, fauna strikes are considered less likely along these roads and significant fauna species are unlikely to benefit from the installation of fauna crossings at these locations.

Conservation significant fauna present within suitable habitat types have the potential to be injured or killed during clearing activities. This includes the potential impacts to the northern quoll, Pilbara olive python, or night parrot when clearing critical habitat types. The EPA advises that pre-clearance surveys should be undertaken when clearing critical habitat (recommended condition B2-4).

To minimise the risk of entanglement, the proponent has committed to avoiding the use of barbed wire fencing, and where unavoidable, bat reflectors will be installed. The EPA also notes that other species have the potential to become trapped in barbed wire, such as the night parrot, which should also be addressed if barbed wire is to be installed. The EPA has recommended condition B2-3 to avoid the use of barbed wire, and where unavoidable, install suitable bat and bird deterrents.

The proponent has committed to installing egress points and fauna ladders within relevant infrastructure to avoid the entrapment of fauna (JBS&G 2025a).

The EPA considers that direct impacts to terrestrial fauna species can be minimised through recommended conditions A1-1 (limits and extents), B2-3 (prescriptive requirements), B2-4 (pre-clearance surveys), and B2-5 (speed limits).

## Indirect impacts

### *Habitat degradation*

Implementation of the proposal has the potential to impact habitat beyond that which is being cleared through dust deposition, introduction and spread of weeds, altered fire regimes, and altered hydrological regimes.

The EPA considers that the potential impacts from dust deposition, introduction and spread of weeds, and altered fire regimes can be minimised through the proponent's

mitigation and management measures as discussed under the flora and vegetation factor (see Section 2.1).

Changes to surface and groundwater regimes have the potential to indirectly impact significant fauna species by degrading, or destroying, suitable habitat. This includes the degradation of drainage line habitat which is used by species such as the northern quoll and Pilbara olive python for foraging and dispersal, or mature spinifex grasslands associated with the Gnalka Gnoona and Koodjeepindarranna Claypans suitable for the night parrot. The potential impacts to vegetation from changes surface and groundwater regimes is discussed further in Section 2.1.

Altered groundwater regimes has the potential to reduce the suitability of caves for the Pilbara leaf-nosed bat. The Pilbara leaf-nosed bat has very specific habitat requirements, requiring a hot (28-32°C) and humid (96-100%) microclimate. These conditions are often influenced by the presence of groundwater in cave depths.

The depth to groundwater near the identified caves is approximately 20 mbgl (AQ2 2024b). Groundwater drawdown beneath retained caves is likely to be no more than 3 m. Following mine closure, the proponent has committed to backfilling of pits to at least 2 m above the pre-mining water table, which is predicted to recover groundwater levels to within 0.1 m of baseline (see Section 2.3 below). It is noted that not all suitable habitat within the groundwater drawdown extent have been surveyed for presence of bat caves, such as the rocky hills habitat to the northwest of the development envelope (Figure 10.22 of JBS&G 2025c). The proponent considered that this area was unlikely to host caves, aside from the identified cave MEC023, based on aerial imagery.

The EPA considers that it is possible that some caves may be subject to changes in microclimate from implementation of the proposal. However, noting that no critical habitat caves have been recorded to date, these changes are unlikely to constitute significant residual impacts. It is noted that the EPA considers that the proponent should monitor the structural integrity of caves, which is discussed in 'Noise, vibration, and light pollution' below.

Subject to the EPA's recommended conditions A1-1 (limits on groundwater abstraction), B2-1 (no impacts to the structural integrity of caves), and B3-1 (maximum groundwater drawdown extent), the residual impacts to Pilbara leaf-nosed bat cave habitat are unlikely to be significant.

### *Pest species*

The introduction or increase in abundance of invasive species, such as cane toads, cats, and foxes, can result in population decline and local extinctions of significant fauna species. While the cane toads have not reached the Pilbara region, and there is lack of permanent water to support introduction of the species, the proponent has committed to reporting any sightings and conducting animal control measures as required (JBS&G 2025a). Typical of the existing pastoral land use, feral species were recorded within the development envelope during surveys. The construction and operation of mining projects can adversely impact significant terrestrial fauna species, such as through predation along a fragmented landscape. The EPA has

included recommended condition B2-1(5) to require no increase in the abundance of feral fauna.

### *Noise, vibration, and light pollution*

The proposal has the potential to disturb Pilbara leaf-nosed bat and ghost bats roosting or sheltering in caves near the proposal. In particular, blasting in pits may result in the temporary abandonment of caves or permanent structural changes reducing the suitability of caves as roosts or refuges.

As discussed in 'Habitat degradation' above, the Pilbara leaf-nosed bat requires specific microclimate conditions. Changes to the structural integrity of caves, including rockfall, have the potential to change microclimate conditions and leave roost or refuge sites unsuitable. The proponent conducted a geotechnical assessment of identified caves and attributed a level of susceptibility based on the potential impacts from vibration (PSM 2024). High susceptibility caves were assigned a maximum vibration limit of 25 mm/s, while low susceptibility caves were assigned 75 mm/s. The proponent has committed to monitoring of vibration in proximity to caves, including continuous data collection at least six months prior to, and six months following, blasting within 500 m. Noting that the location of any Category 1, 2, or 3 cave/s have not been confirmed, the EPA considers these vibration limits to be reasonable in maintaining the structural integrity of identified caves, which the EPA has reflected in condition B2-1(2).

It is noted that the proponent's proposed exclusion zones will also reduce impacts from noise and vibration.

The proponent has proposed the use of directional, adaptive, and/or shielded lighting in the CSFMP to reduce impacts to nocturnal species. The EPA considers this to be appropriate and has reflected this as a prescriptive requirement in recommended condition B2-3.

The EPA considers that indirect impacts from noise, vibration, and light pollution can be minimised through recommended conditions A1-1 (limits and extents), B2-1 (no impact to structural integrity of caves), and B2-3 (directional, shielded and/or adaptive lighting).

### *Fragmentation of habitat*

Fragmentation of fauna habitat associated with clearing for the proposal has the potential to result in additional impacts to terrestrial fauna species, such as through the removal of key dispersal corridors and edge effects. The proponent's proposed exclusion zones (FHEZ, FHEZ corridor, and LIAA) will assist in maintaining habitat connectivity across the landscape, as they provide a pathway for conservation significant fauna to move between areas of high value habitat. The proponent has also committed to installing fauna friendly culverts in areas near the FHEZ and FHEZ corridor to maintain habitat connectivity (HanRoy 2025a). The EPA's recommended condition B2-3(4) for the installation of fauna crossings is likely to minimise impacts related to fragmentation of habitat. In addition, the proponent will progressively rehabilitate fauna habitat throughout the life of the proposal (as included in

recommended condition B5), which will reduce potential barriers to fauna movement. Subject to the proposed management measures and recommended conditions (A1-1, B2, and B5), the environmental outcomes are likely to be consistent with the EPA's factor objective for terrestrial fauna.

### Cumulative impact assessment

The proponent has assessed cumulative impacts by considering the combined effect of this proposal, the Mulga Downs Hub and Rail Spur, and the Murray's Hill Project. All three proposals propose to clear similar habitat types. In the event all three proposals are implemented, more than 92% of the mapped extent of fauna habitat types will remain (JBS&G 2025c).

Similar priority and threatened fauna species were also recorded, or likely to exist, across the proposal areas. For example, the grey falcon, northern quoll, and western pebble-mound mouse was recorded in surveys for the Murray's Hill Project (Terrestrial Ecosystems 2013), and for the Mulga Downs Hub and Rail Spur (JBS&G 2023b).

The EPA notes that the indicative footprints for the Murray's Hill Project and the Mulga Downs Hub and Rail Spur both currently propose disturbance within the FHEZ corridor. The EPA considers that any disturbance within this corridor is likely to drastically reduce the effectiveness of this corridor in providing a pathway for dispersal between critical habitat within the FHEZ, and with habitat to the north of the development envelope.

The EPA considers that, subject to the EPA's recommended conditions and no disturbance within the FHEZ or FHEZ corridor, the cumulative effect of adjacent proposals is unlikely to reach a level that would warrant no further disturbance, and the environmental outcome is likely to be consistent with the EPA's factor objective for terrestrial fauna.

### Rehabilitation and closure

As discussed in Chapter 2.1.9 above, the EPA has considered that specific requirements for rehabilitation and mine closure will be incorporated into the proponent's MDCP (and subsequent Mine Closure Plans), as required under the Mining Act. This extends to the consideration of maintaining fauna corridors and rehabilitating cleared areas as suitable for use as fauna habitat.

The EPA has included outcomes and prescriptive conditions for rehabilitation and mine closure in recommended condition B5. These outcomes and prescriptive conditions are to be incorporated into the MDCP required to be submitted to the Department of Mines, Petroleum and Exploration (DMPE) for approval.

#### 2.2.10 Summary of key factor assessment and recommended regulation

The EPA has considered the likely residual impacts of the proposal on terrestrial fauna environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can ensure consistency with the EPA factor objective. The EPA assessment findings are

presented in Table 6.

The EPA has also considered the principles of the *Environmental Protection Act 1986* (see Appendix D) in assessing whether the residual impacts will be consistent with its environmental factor objective and whether reasonable conditions can be imposed (see Appendix A).

**Table 6: Summary of assessment for terrestrial fauna**

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
<p>1. Clearing of up to 4,339.11 ha of critical and supporting fauna habitat, comprising:</p> <ul style="list-style-type: none"> <li>• 15.72 ha of chenopod/cracking clay floodplain</li> <li>• 71.26 ha of drainage line/floodplain</li> <li>• 520.80 ha of rocky hills</li> <li>• 813.97 ha of stony spinifex plains and hillslopes.</li> </ul>	<p>The EPA considers the loss of habitat for significant fauna species to be a significant residual impact.</p> <p>The proponent has amended its mine plan to reduce the scale of clearing required and has committed to various exclusion zones which will retain areas of high value habitat.</p> <p>The EPA advises that the significant residual impacts to terrestrial fauna habitat can be minimised through the recommended conditions on maximum clearing extents and rehabilitation of fauna habitat and can be counterbalanced by contributions to PEOF. The environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B2 (Terrestrial fauna)</b> Disturbance limits on fauna habitat types.</p> <p><b>Condition B5 (Rehabilitation)</b> Rehabilitation of fauna habitat to include progressive rehabilitation and maintain habitat connectivity.</p> <p><b>Condition B7 (Pilbara Environmental Offsets Fund)</b> Contribution to PEOF for the clearing of critical and supporting fauna habitat.</p> <p><b>DMA legislation</b> DMPE can regulate rehabilitation, including progressive rehabilitation, through the MDCP, required under the Mining Act as supported by recommended condition B5.</p>
<p>2. Clearing of nocturnal refuges for the Pilbara leaf-nosed bat. Clearing of hollow forming trees, habitat for the northern quoll,</p>	<p>The EPA considers that the clearing of nocturnal refuges, hollow forming trees, and potential grey falcon nests could result in residual impacts to significant fauna species.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B2 (Terrestrial fauna)</b></p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
<p>Pilbara olive python, and peregrine falcon. Clearing of occupied grey falcon nests.</p>	<p>The EPA advises that pre-clearance surveys should be undertaken prior to disturbance of any nocturnal refuges, hollow forming trees, or potential grey falcon nests to minimise disturbance to significant fauna species.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p> <p>Further understanding of Pilbara leaf-nosed bat roosting habitat will be obtained through the Pilbara leaf-nosed bat research program (recommended condition B9).</p>	<p>Disturbance limits on fauna habitat types. Minimise clearing of hollow forming trees and grey falcon nests. Pre-clearance surveys for nocturnal refuges, hollow forming trees and potential grey falcon nests.</p> <p><b>Condition B5 (Rehabilitation)</b> Rehabilitation of fauna habitat, including progressive rehabilitation.</p> <p><b>DMA legislation</b> DMPE can regulate rehabilitation, including progressive rehabilitation, through the MDCP, required under the Mining Act as supported by recommended condition B5.</p>
<p>3. Fauna mortality or injury from vehicle strikes, entrapment, or entanglement in barbed wire. Indirect impacts from the increase in abundance of feral fauna.</p>	<p>The proposal has the potential to kill or injure significant fauna through vehicle strikes, entrapment in infrastructure such as trenches, and through entanglement in barbed wire.</p> <p>The EPA considers that speed limits on haul and access roads in proximity to exclusion zones are important to reduce the likelihood of collisions with vehicles. In addition, the construction of suitable fauna crossings will further reduce the likelihood of collisions.</p> <p>The EPA advises that pre-clearance surveys should be undertaken prior to disturbance of any critical habitat types to target fauna species likely to be present.</p>	<p><b>Condition B2 (Terrestrial fauna)</b> Avoid use of barbed wire, and where unavoidable, install suitable bat deflectors and bird deterrents. Speed limits on haulage roads. Pre-clearance surveys within critical habitat types. No detectable increase in feral fauna abundance.</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>Feral fauna have the potential to be attracted to mining operations, resulting in increased predation on native species. The EPA considers that the proponent should implement management measures to ensure the abundance of feral fauna does not increase as a result of the proposal.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p>	
<p>4. Indirect impacts from the loss or degradation of fauna habitat, such as altered fire regimes, altered hydrological water regimes, habitat fragmentation, and the introduction and/or spread of weeds.</p>	<p>The EPA considers that the implementation of the proposal is likely to result in residual impacts to terrestrial fauna habitat, such as from altered fire regimes, altered hydrological regimes, habitat fragmentation, and weeds.</p> <p>The EPA advises that subject to limits on clearing of habitat, and the implementation of management measures to minimise impacts from dust emissions, weeds, fire, and altered hydrological regimes, the environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B2 (Terrestrial fauna)</b></p> <p>Minimise indirect impacts to critical and supporting fauna habitat.</p> <p><b>Condition B5 (Rehabilitation)</b></p> <p>Rehabilitated areas are stable, self-sustaining, and consistent of diverse species of local provenance.</p> <p><b>DMA legislation</b></p> <p>DMPE can regulate rehabilitation, including progressive rehabilitation, through the MDCP, required under the Mining Act as supported by recommended condition B5.</p>
<p>5. Disturbance or degradation of habitat from noise, light, and/or vibration.</p>	<p>The EPA considers that implementation of the proposal is likely to result in residual impacts to terrestrial fauna species from noise, light, and vibration. These impacts may lead to temporary abandonment or permanent</p>	<p><b>Condition B2 (Terrestrial fauna)</b></p> <p>Use of direction, adaptive, and shielded lighting.</p> <p>No impacts to the structural integrity or</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>structural changes to suitable roost/refuge caves.</p> <p>The proponent has committed to using directional, adaptive, and/or shielded lighting to reduce impacts to nocturnal species.</p> <p>Noting that the caves within and near the development envelope are likely to be an important site for the Pilbara leaf-nosed bat, the EPA considers that the structural integrity of suitable caves within the FHEZ, FHEZ corridor, and LIAA should not be impacted.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for terrestrial fauna.</p>	<p>microclimate of caves within exclusion zones.</p>

## 2.3 Inland waters

### 2.3.1 Environmental objective

The EPA environmental objective for inland waters is to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected (EPA 2018).

### 2.3.2 Investigations and surveys

The EPA advises the following investigations, surveys and peer reviews were used to inform the assessment of the potential impacts to flora and vegetation:

- Mulga Downs groundwater, surface water & ecohydrological studies – Baseline assessment (appendix 4 of the environmental review document) (AQ2 2025)
- Mulga Downs groundwater, surface water & ecohydrological - Impact assessment (appendix 5 of the environmental review document) (AQ2 2024a)
- Mulga Downs water studies: Groundwater & surface water impact assessment – Peer review (appendix 7a of the environmental review document) (GHD 2023)
- Mulga Downs groundwater modelling independent peer review (appendix 7b of the environmental review document) (HydroGeoLogic 2023)
- Mulga Downs Iron Ore Mine – Freshwater claypans desktop assessment (appendix 24 of the environmental review document) (Biologic 2023).

The inland waters studies were largely consistent with the *Technical Guidance – Inland Waters* (EPA 2018). The EPA considered that the relevant studies are appropriate to inform the assessment of the potential impacts to the above environmental factor.

The EPA sought advice from DWER in relation to the surface and groundwater modelling that was considered as part of this assessment.

### 2.3.3 Assessment context – existing environment

#### Surface water

The proposal is located within the Chichester Range, immediately north of the lower Fortescue Valley and the Goodiadarrie Swamp. Surface water runoff into the valley is from the hills of the Chichester Range to the north, and the Hamersley range from the south. The hills of the Chichester Range rise approximately 100 m above the valley and are dissected by gullies that form alluvial fans feeding into the valley floor. These fans and tributaries contribute surface water to the Fortescue River wetland system, including Goodiadarrie Swamp (see Figure 7). Smaller rainfall events are retained locally, while larger events are needed for discharge into the Lower Fortescue River. Vegetation patterns suggest sheet flow across wide interfluvial zones (refer to section 2.2 for further discussion regarding surface water dependent vegetation).

To the east of the proposal area, the Goodiadarrie Hills mark the western boundary of the Upper Fortescue River Catchment and provide a separation from the Fortescue Marsh to the east. The Fortescue Marsh is the largest ephemeral wetland in the Pilbara region and supports significant environmental and cultural values. The marsh is located about 60 km upstream from the proposal and is considered to be largely hydrologically and hydrogeologically distinct from the Lower Fortescue River system adjacent to the proposal area.

The broader Fortescue Valley, including the Goodiadarrie Swamp, is recognised as a wetland of national significance in the Directory of Important Wetlands in Australia (DCCEEW 2021).

The Koodjeepindarranna and Gnalka Gnoona Claypans are considered locally significant and located immediately south-west of the development envelope, within the Goodiadarrie Swamp. The Gnalka Gnoona Claypan can form a large waterbody which can persist for several years during favourable climatic conditions. The area is considered important habitat for migratory, transient and resident bird species, as well as providing a refugia for invertebrates. The claypans become inundated in response to frequent average rainfall events and are not reliant on low frequency high rainfall events to maintain ecosystem function.

In the Fortescue Valley area small pools in surface water-fed channels downstream of the development envelope retain water temporarily after runoff events. Four of these channel pools have been identified within the Goodiadarrie Swamp and its drainage channels, these pools may hold local conservation value due to their persistence following rainfall. A further channel pool is located to the north, upstream of the proposal area within the northern infrastructure corridor (Figure 7).

The proponent has identified 16 surface water sub-catchments relevant to the proposal area, the majority of which (11) flow into the Fortescue Valley (Figure 8).

Surface water quality within the proposal area is naturally variable and influenced by rainfall patterns. Water quality within drainage lines is typically fresh and circumneutral, with high levels of suspended sediments during periods of high flow. Water quality of the claypans to the south is characterised by high levels of salinity as a result of evapo-concentration.

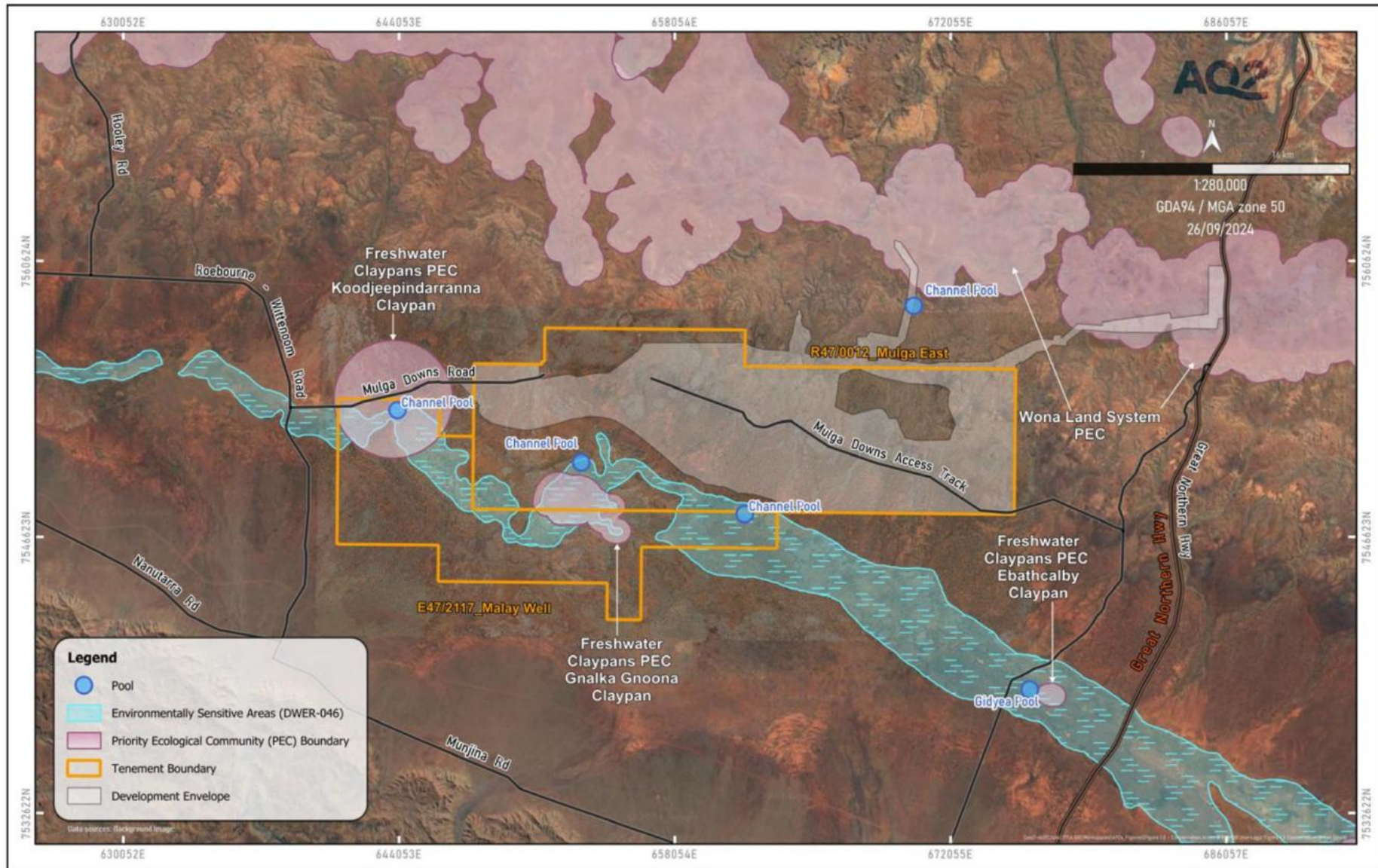


Figure 7: Key inland waters features in the proposal area (Figure 1.6 of AQ2 2025)

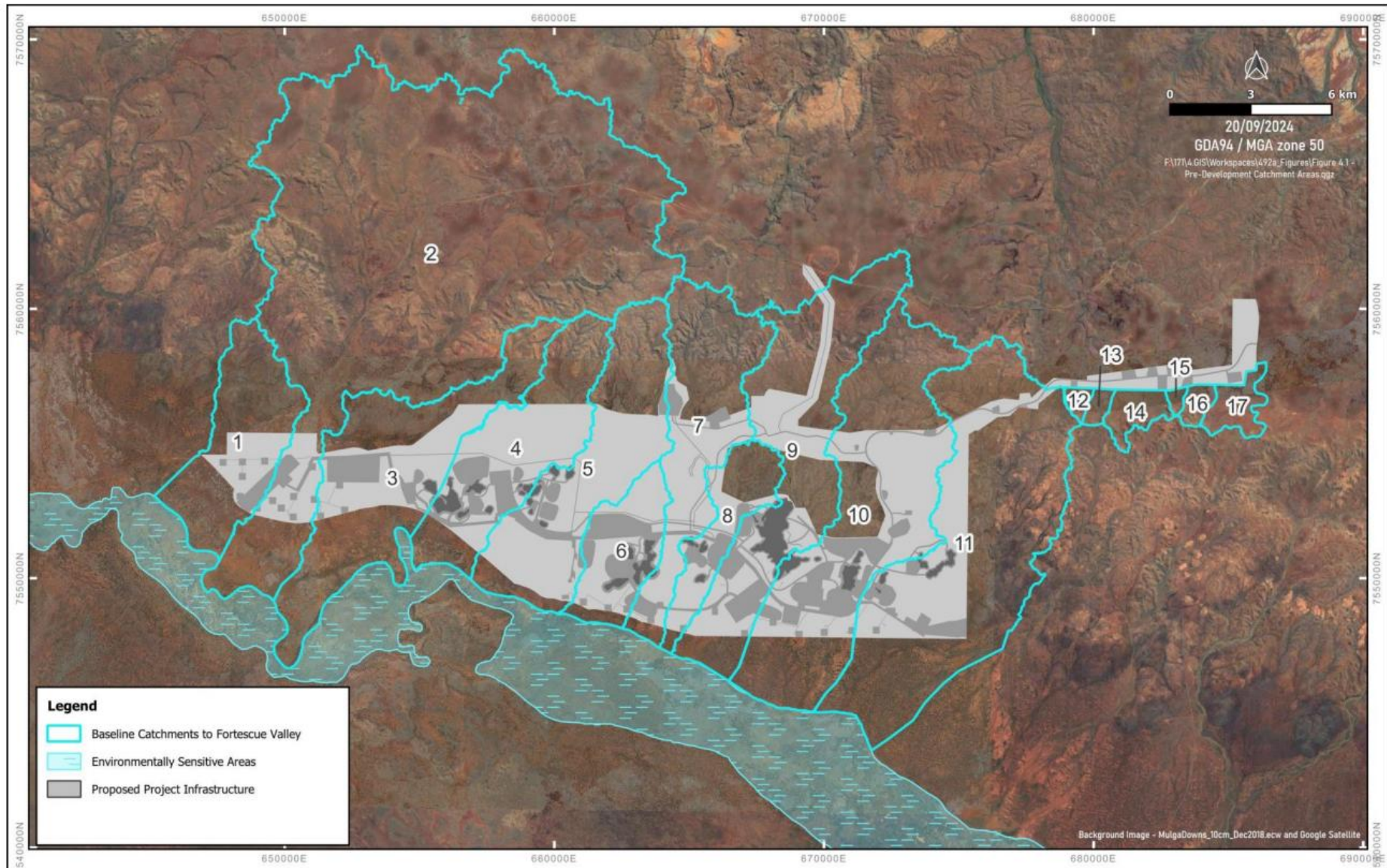


Figure 8: Baseline surface water catchments in the proposal area (Figure 7.1 of JBS&G 2025c)

## Groundwater

The hydrogeological regime is dominated by bedrock and valley units that host a groundwater system across the development envelope and the surrounding area. Groundwater investigations and modelling suggests that these units, including the target Marra Mamba Iron Formation, are hydraulically connected and form an extensive basement aquifer. The permeable aquifer units are underlain and overlain by aquitards, being the Jeerinah Formation and Wittenoom Formation respectively.

The basement units are overlain by detrital materials deposited within the Fortescue River valley originating from the erosion of the Chichester and Hamersley Ranges. These detrital materials form an unconfined sedimentary aquifer within the Fortescue Valley up to 60 m in thickness, while in the development envelope these sediments are generally unsaturated. An inferred hydrogeological cross-section is shown in Figure 9 below, across a broadly north-east to south-west section through the central portion of the mine area (i.e. through the Anticline Hill pit area).

The unconfined sedimentary aquifer and the underlying fractured rock / bedrock aquifers are considered to be hydraulically connected, with some localised areas of hydraulic disconnection associated with the presence of saprolitic clays or clay-dominated tertiary sediments (AQ2 2024a).

Groundwater recharge occurs through infiltration in response to rainfall events, particularly during the wet season. Seasonal groundwater level fluctuation in the area is typically 0.3 to 0.5 m per year and rarely exceeds 1 m. The degree of groundwater recharge across the development envelope is variable and dependent on factors such as local lithology and depth to groundwater. Monitoring locations at higher elevations and greater groundwater depths exhibited a minimal response to rainfall (AQ2 2024a).

The depth to groundwater is variable across the area, with relatively shallow depths within the Fortescue Valley (3 to 4 mbgl) and more than 40 mbgl in the upper areas of the Chichester Range. Groundwater flow directions typically follow topography, with flows from higher areas in the north and northeast towards the south.

Groundwater quality varies from fresh in the elevated areas, with total dissolved solids (TDS) values around 180 milligrams per litre (mg/L), to saline in the valley, with TDS values around 18,000 mg/L (AQ2 2024a). As noted above in respect of surface water, the elevated salinity of groundwater in the valley is a result of evaporative effects within the claypans and the subsequent migration of dissolved salts into the underlying aquifer.

## Groundwater dependent ecosystems

A description of riparian vegetation and potential groundwater dependent vegetation within the development envelope is provided in section 2.1.3 of this report. Indirect impacts to these values are inherently linked to inland waters, with impacts to riparian vegetation and groundwater dependent vegetation assessed in section 2.1.9.

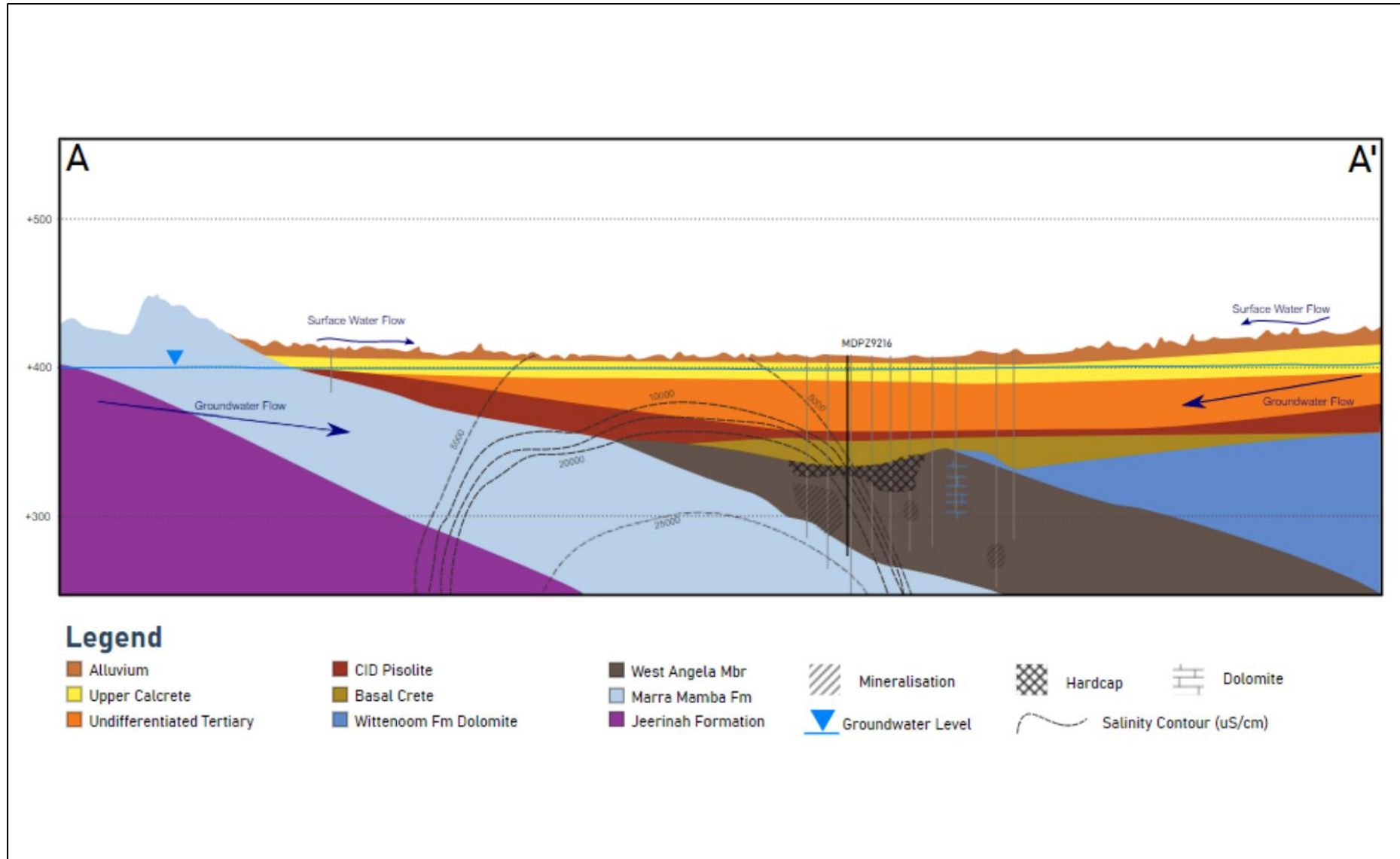


Figure 9: Inferred hydrogeological cross-section (Figure 6.1 of AQ2 2025)

## Beneficial use of water

In addition to the environmental and cultural values of water discussed above, groundwater in the region is also utilised for stock water purposes by pastoral stations, including the Mulga Downs station. Groundwater is also used to supply potable water to communities at Wirrilimarra and Youngaleena, and to support regional railway and transport operations.

### 2.3.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the proponent's Response to Submissions document (HanRoy 2025b).

Public consultation on the proposal raised concerns about the adequacy of the characterisation of the groundwater system, including the reliability of modelling used to predict impacts associated with groundwater drawdown. Public comments also highlighted the potential impact of the proposal on the water-related values of the Fortescue Marsh and Karijini National Park from groundwater abstraction and reinjection of excess mine dewater, as well as the appropriateness of management measures to mitigate impacts.

The key issues raised and how they have been considered in the assessments are described in the following sections. Concerns regarding GDEs and groundwater dependent vegetation are discussed further under section 2.1 flora and vegetation and section 2.2 terrestrial fauna of this report.

### 2.3.5 Potential impacts from the proposal

The proposal has the potential to impact inland waters values from:

- alteration of existing hydrological regimes, including changes to surface water catchments and increasing or reducing the availability of water in the downstream environment
- decreased surface water quality such as from increases in suspended sediments and increased sediment loads into the Fortescue Valley and the associated claypans and pools
- decreased surface water quality and/or groundwater quality such as from pollution events, acid mine drainage and seepage from mine landforms (e.g. waste rock dumps), and saline water runoff
- reduced groundwater levels from abstraction of groundwater for mine dewatering
- increased groundwater levels (i.e. mounding) as a result of reinjection of excess mine dewater
- changes to groundwater salinity, principally as a result of reinjection of saline excess mine dewater.

### 2.3.6 Avoidance measures

The proponent has designed the proposal to avoid impacts to inland waters by:

- divert surface water from mining areas to avoid the potential for contamination of surface water flows to downstream environments
- mine scheduling such that the abstraction of water for operational purposes is avoided (i.e. utilisation of mine dewater)
- avoid mining of geological units with higher sulfur levels, and hence reducing the risk of water quality impacts associated with acid mine drainage
- backfilling of pits at closure to avoid formation of pit lakes.

### 2.3.6 Minimisation measures (including regulation by other DMAs)

The proponent has proposed the following measures to minimise impacts to inland waters:

- design and construction of surface water management to minimise alteration of existing hydrological regimes
- optimise pit and mine planning to reduce the extent of mine dewatering and reinjection needed
- maximise utilisation of abstracted water prior to reinjection
- appropriate storage of hazardous materials, and clean up of spills and leaks
- management of potential acid forming material, including encapsulation in waste rock landforms
- design and construction of waste rock landforms to include seepage and leachate control structures
- ongoing consultation with other groundwater users
- implementation of the Water Management Plan, including monitoring and management of dewatering and reinjection activities to minimise impacts to identified values, such as other waters users and vegetation.

#### Rights in Water and Irrigation Act 1914

The proposal is located in a proclaimed groundwater area under the RiWI Act. The proponent would be required to obtain a licence to take water (section 5C) that would include conditions intended to mitigate impacts of taking water and describe how the water resource must be monitoring and managed. One of the primary objectives of this legislation is the management of water resources, including regulation of activities which are detrimental to the protection of the water resource ecosystems and the environment in which the water resource is situated.

A Groundwater Operating Strategy would be needed to supplement the conditions of the RiWI Act licence. The Groundwater Operating Strategy would contain monitoring and reporting requirements, and the proponent would need to verify the results against the hydrogeological model to ensure the results align with predictions. If the monitoring shows that the proposal is having unintended impacts on the aquifer, the environment, or other users, or that the impacts of taking the water are significantly different to those originally predicted, DWER may require the Groundwater Operating Strategy to be amended (DWER 2020b).

Consistent with Sections 11, 17 and 21A of the RiWI Act, to interfere with or obstruct a watercourse or its banks or surrounds, a permit is required to be obtained from DWER. This includes activities that interfere with existing surface water flow regimes, and construction of roads, culverts or crossings over watercourses. Assessment of permit applications considers controls to mitigate direct impacts to the riparian zone and indirect downstream impacts from construction of crossings.

#### Part V, Division 3 of the EP Act

To manage the emissions and discharges during construction and operation of the proposal, the proponent is required to obtain a works approval and licence under Part V of the EP Act. The licence would relate to the following prescribed premise categories for activities that may impact on inland waters:

- Category 5 – processing or beneficiation of metallic or non-metallic ore
- Category 6 – mine dewatering
- Category 12 – screening of material
- Category 52 – electrical power generation
- Category 54 – sewage facility
- Category 64 – class II or III putrescible landfill site
- Category 73 – bulk storage of chemicals.

All works approvals and licences are issued with conditions that are related to the purposes of the EP Act: to prevent, control, abate or mitigate pollution or environmental harm (DER 2015).

A works approval would authorise the construction, commissioning and time limited operations for the proposal. A works approval and subsequent licence may include risk-based conditions requiring the mitigation and monitoring of impacts associated with emissions and discharges where the impacts are not already addressed through conditions of a Ministerial Statement.

#### Mining Act 1978

The proposed activities are located on tenure granted under the Mining Act and therefore the activities will be required to be included in a MDCP that must be approved under section 103AO of the Mining Act and recorded on an Approvals Statement. The geotechnical design and stability as well as rehabilitation of waste rock landforms and pits would be reviewed by DMPE as part of the MDCP process. DMPE will verify the proposed design and appropriateness of the management methodology to achieve consistency with DMPE's guidelines as part of the assessment process (DMPE 2025b).

### 2.3.6 Rehabilitation measures

The proponent has proposed the following rehabilitation measures associated with inland waters:

- ensure pits are backfilled to above the original water table to avoid the formation of pit lakes
- removal of infrastructure at closure and reestablish natural flow paths and water catchments
- stabilise and re-vegetate landforms to be stable and non-polluting.

### 2.3.7 Assessment of impacts to environmental values

The EPA advises that the assessment of residual risks to groundwater and surface water have been based on the proponent's investigations and DWER's advice.

The EPA recognises the application of the mitigation hierarchy by the proponent in modifying the proposal to avoid direct disturbance impacts within the Goodiadarrie Swamp and associated claypans and floodplains.

The EPA has determined that the key environmental values for inland waters are likely to be impacted by:

- groundwater drawdown and mounding
- decline in groundwater quality
- modification of surface water regimes
- decline in surface water quality.

#### Groundwater drawdown and mounding

The proposal involves dewatering to access ore below the water table, with the lowest pit elevation expected to be approximately 12 to 16 mbgl (AQ2 2024a). Mine planning and groundwater modelling has predicted peak dewatering rates up to 11.4 GL/a with an upper limit of 12 GL/a identified by the proponent (JBS&G 2025c).

The proponent has indicated that average operational water demand will be approximately 0.75 GL/a during construction and throughout the life of mine. Water demand will be met through dewatering effluent where possible, such as during the mining period. Water demand during construction will be met via groundwater abstraction in the mining operational area, which, depending on the location, will serve as advanced dewatering ahead of mining activities. The EPA notes that the proponent has advised that early abstraction for construction water supply is not likely to significantly affect modelled groundwater drawdown or mounding (JBS&G 2025c).

Excess mine dewater is proposed to be disposed of via managed aquifer recharge (MAR) using a combination of reinjection bores, repurposed dewatering bores and in-pit infiltration. Mine dewatering can impact the environment through the lowering of the watertable, conversely, MAR can impact the environment through groundwater mounding, as well as groundwater quality changes depending on the chemical characteristics of the mine dewater.

The proponent has undertaken detailed groundwater numerical modelling to predict the likely changes to groundwater level and quality resulting from the combined

effects of mine dewatering and MAR (AQ2 2024a). The EPA notes that the adequacy of the modelling to inform the impact assessment was verified through an independent peer review (HydroGeoLogic 2023) and advice from DWER.

As noted in section 2.3.3 four channel pools have been identified within the Goodiadarrie Swamp and its drainage channels, with a further pool located to the north, upstream of the proposal area. These persistent pools are considered to be surface water dependent and unrelated to groundwater, and therefore not at risk of impact due to groundwater level or quality changes (AQ2 2025).

### *Groundwater drawdown*

The modelling predicted maximum drawdown of up to 25 metres within the mining area and extending away from mining areas to the south across the Fortescue Valley. The model found that drawdown along the strike, to the east and west, will be limited by MAR operations during periods of the life of mine. The 2 m groundwater drawdown contour is predicted to extend approximately 8 km south-southwest of the Fridge West pit but will not reach the Hamersley Ranges or Karijini National Park. The EPA notes that the 2 m drawdown contour extends approximately 7.5 km south-southwest of the Murray's Hill mine area and across the Gnalka Gnoona Claypan area. The maximum extent of the 2 m drawdown contour to the east (3.5 km) and west (6 km) typically occur early in the life of mine (2032 to 2035) prior to being curtailed by MAR. The predicted groundwater drawdown extents are shown in Figure 11.

As discussed in section 2.1, comprehensive ecohydrological studies indicate that vegetation throughout the development envelope is unlikely to be groundwater dependent, except for vegetation type MSW which was mapped in the northern portions of the development envelope and outside the predicted area of groundwater drawdown. The EPA therefore considers that groundwater drawdown is not expected to significantly impact vegetation. These studies also indicated that the Gnalka Gnoona and Koodjeepindarranna Claypans are surface water reliant and not groundwater dependent. Potential indirect impacts to the claypans are discussed in section 2.1 in the context of impacts to the Freshwater Claypan PEC vegetation, and further below in the context of impacts to surface water regimes and surface water quality.

Groundwater drawdown may impact other groundwater users including pastoral stations and the Wirrilimarra and Youngaleena Communities (Figure 10). The modelling indicates that the water supply bores for both communities are located outside of the predicted maximum extent of the 2 m drawdown contours and water levels in these bores are unlikely to be significantly impacted (JBS&G 2025c). The EPA notes that water levels within some pastoral bores are expected to be adversely impacted, particularly those located closer to the proposal area. The proponent intends to undertake further consultation with pastoral station stakeholders whose bores may be impacted and enter into agreements to supply alternative water sources as required (HanRoy 2025d).

The EPA advises that there is unlikely to be a significant residual impact to other groundwater users and concludes that potential impacts can be adequately regulated through recommended conditions and through the provisions of the RiWI

Act through the 5C licensing process and the required Groundwater Operating Strategy. The EPA notes that the proponent's commitment to provide alternative water supplies to affected bore users can be administered through the required Groundwater Operating Strategy under the RiWI Act.

The EPA considers that, subject to the limits of the proposal (recommended condition A1, including limits on groundwater abstraction) and the recommended conditions B3 (inland waters), B4-2 (Water Management Plan) the environmental outcome is likely to be consistent with the EPA's objective for inland waters in the context of proposal-induced groundwater drawdown.

The EPA recognises that groundwater drawdown has the potential to impact stygofauna through loss of habitat, impacts to subterranean fauna are addressed in section 2.4 below.

### *Groundwater mounding*

The modelling predicted maximum mounding of 11 to 12 metres in the Fridge / Horseshoe South MAR area between 2032 to 2038. The corresponding 1 m mounding contour is predicted to extend approximately 10 km south across the valley. The 1m mounding contour associated with the Murray's West MAR area is predicted to extend 7 km to the northwest and up to 5.5 km to the south and southwest towards the Koojjeepindarranna Claypan. The EPA notes that modelling indicates that groundwater level in the vicinity of the claypans is not expected to significantly change in response to the modelled dewatering and MAR schedule.

As discussed in section 2.1, based on ecohydrological studies and baseline conditions, vegetation may interact with groundwater when groundwater levels are shallower than 2.0 mbgl. As such, groundwater mounding above this threshold, especially over prolonged periods, may adversely impact vegetation through inundation of the root zone. The EPA notes that near surface groundwater mounding may also affect drainage patterns resulting in more extensive and longer duration flooding and changes in salinity levels, that could result in adverse impacts to surface water dependent ecosystems.

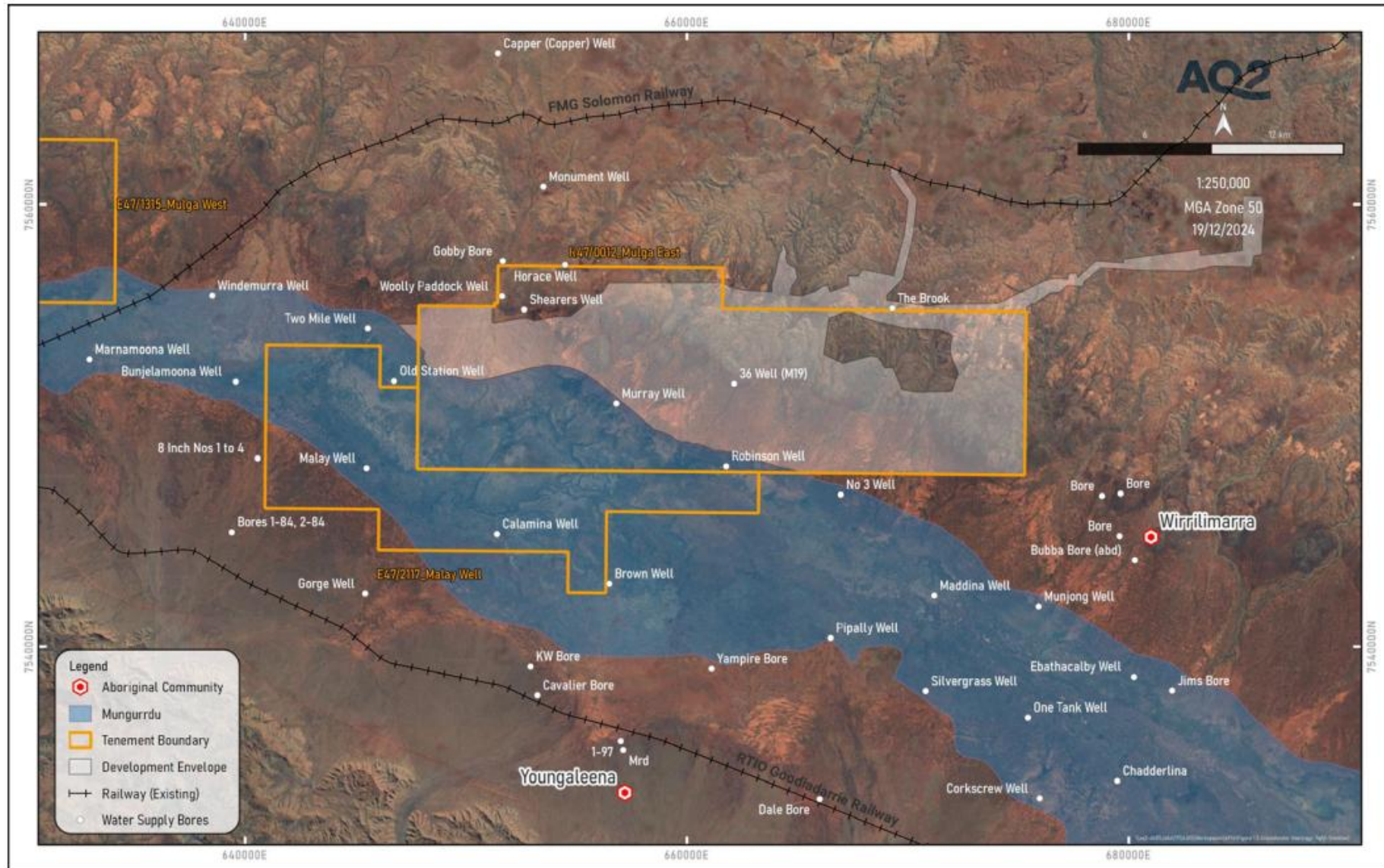


Figure 10: Existing pastoral and community water supply bores in the vicinity of the proposal (Figure 1.5 of AQ2 2025)

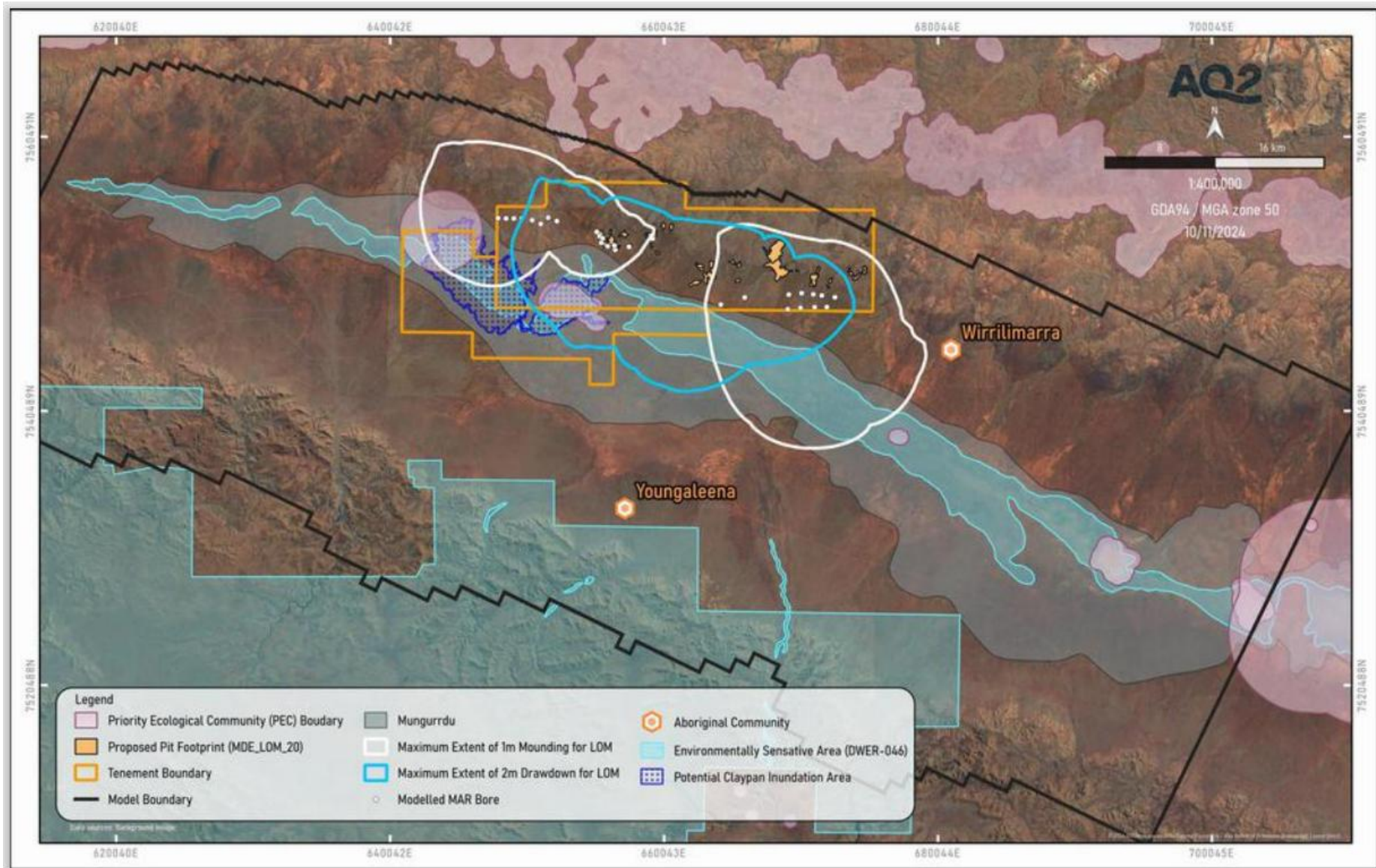


Figure 11: Predicted maximum extents of groundwater drawdown and mounding (Figure 5.16 of AQ2 2024a)

Two areas are predicted to experience shallow groundwater as a result of MAR in the Murray's Hill / Anticline Hill and Fridge / Horseshoe South areas (AQ2 2024a). Mounding to the south of the Murray's Hill / Anticline Hill may exceed 2.0 mbgl but the spatial extent is small, and the duration is predicted to be short, with levels receding within months (AQ2 2024a). The EPA considers that 2.0 mbgl is an appropriate threshold for groundwater depth above which interaction with vegetation may occur. Longer duration and higher risk mounding is predicted to occur in the area to the south of the Fridge / Horseshoe South MAR borefield, correlating with a change in slope in that location (Figure 12). The EPA notes that the indicative area where mounding may exceed 2.0 mbgl coincides with the ecohydrological unit 'Loamy Flats' associated with *E. victrix* which may be adversely impacted by prolonged mounding of groundwater (refer to section 2.1.9).

The proponent has committed to ongoing monitoring of groundwater levels and vegetation health and managing aquifer injection such that groundwater mounding is maintained beneath the root zones of vegetation (JBS&G 2025c). The proponent has committed, through its Water Management Plan, to ensuring that groundwater levels influenced by mounding remain at least 2.5 mbgl (Hanroy 2025d). The EPA notes that this outcome is expected to be achievable through optimisation and redistribution of the MAR program as required through an adaptive management framework.

The proponent's modelling predicts that surplus water disposed of via MAR will not report to the claypan. The EPA considers that the groundwater response to MAR will need to be closely monitored to identify any potential impacts prior to any adverse impacts to the claypans occurring.

The EPA considers that, subject to the limits of the proposal (recommended condition A1, including limits on excess water disposal) and the recommended conditions B3 (inland waters), B4-2 (Water Management Plan) the environmental outcome is likely to be consistent with the EPA's objective for inland waters in the context of proposal-induced groundwater mounding.

The EPA recognises that groundwater mounding has the potential to impact troglofauna through loss of habitat, impacts to subterranean fauna are addressed in section 2.4 below.

#### Decline in groundwater quality

The EPA considers that the primary risk of impact to groundwater quality is through changes to salinity levels due to dewatering and MAR activities. As described previously, groundwater quality varies from fresh in the mining areas to saline (approximately 18,000 mg/L TDS) within the valley area where evaporation of surface water in the claypans contributes to elevated salinity in groundwater. The proponent used the numerical groundwater model to predict changes in groundwater salinity associated with dewatering and MAR. Based on available pre-disturbance groundwater monitoring data, the TDS of mine dewater requiring discharge is predicted to vary between 1,700 and 4,200 mg/L over the life of mine.

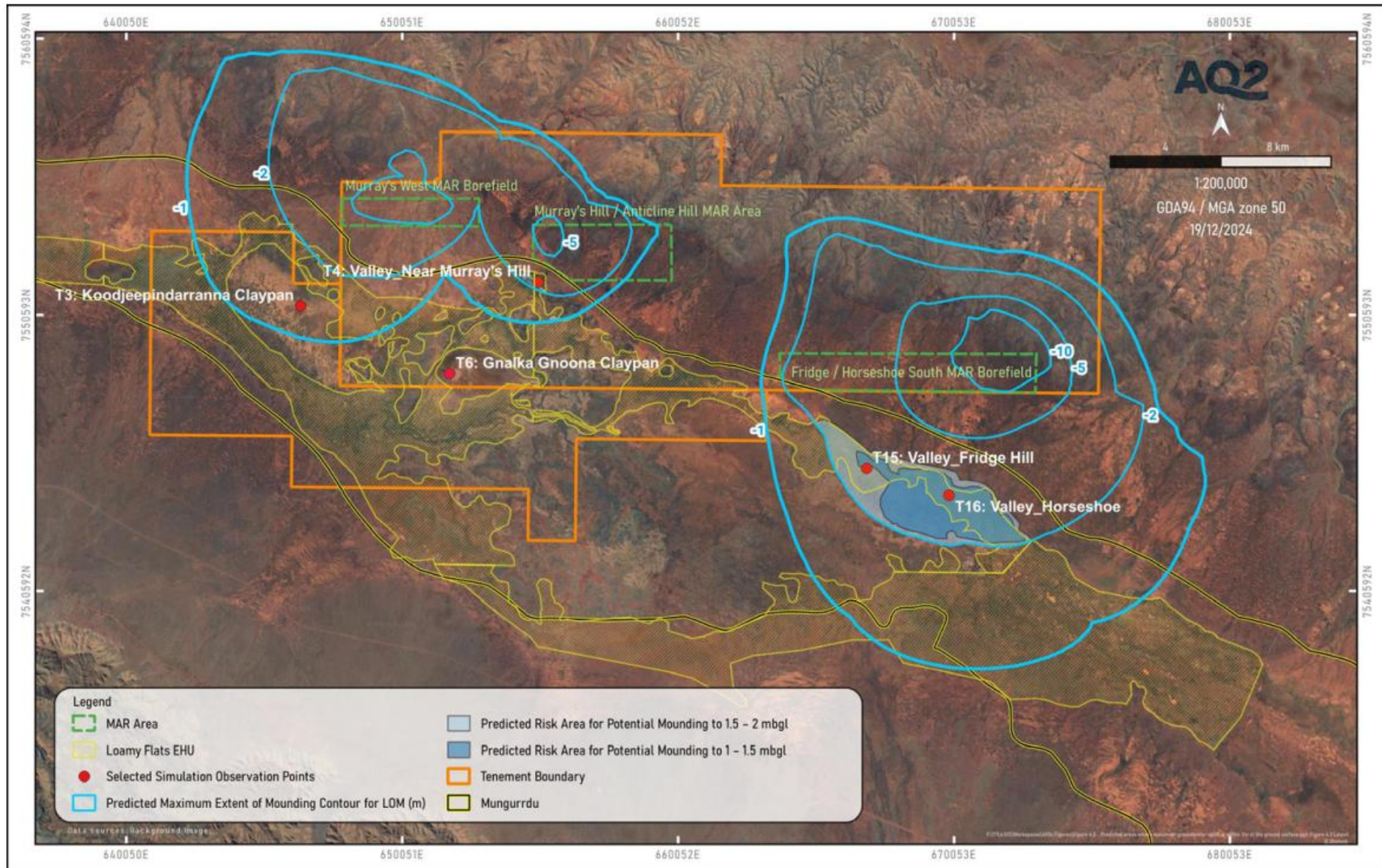


Figure 12: Predicted groundwater mounding within 2 m of natural ground surface (Figure 6.2 of AQ2 2024a)

The discharge of excess mine dewater is predicted to cause changes in groundwater quality within approximately 2 km of the discharge areas (JBS&G 2025c). The main driver for TDS changes is predicted to be the discharge of mine dewater from the Murray's Hill mine area which is predicted to draw in more saline groundwater from the valley area. The main areas of predicted groundwater quality change include:

- Murray's West MAR area, with increase in TDS from 1,200 mg/L to up to 4,700 mg/L
- South of Murray's Hill mining / MAR area, with increase in TDS from 3,600 mg/L to up to 5,600 mg/L
- South of Fridge / Horseshoe South MAR area, with increase in TDS from 2,300 mg/L up to 3,900 mg/L.

As discussed above, ecohydrological studies have indicated that there are no significant GDEs in the proposal area, apart from subterranean fauna (AQ2 2024a). Naturally occurring groundwater discharge (such as into creeks or via springs) has not been identified in proximity to the proposal area. The EPA notes that modelling predicts modest changes in groundwater salinity in the area of the claypans (<500 mg/L TDS) and therefore significant impact to the ecological functions of the claypans is considered unlikely.

The increase in salinity, in conjunction with the groundwater mounding discussed above, has the potential to adversely impact deep-rooted phreatophytic plant species in the event that mounding of saline groundwater approaches shallower depths. The EPA notes that the proponent has committed to managing dewatering and MAR activities to ensure that there is no adverse indirect impact to vegetation. The EPA considers that the risk of impact to vegetation from the combined effects of salinity increases and groundwater mounding can be mitigated through recommended condition A1 (including limits on excess water disposal), B3 (inland waters) and B4-2 (Water Management Plan).

Increasing salinity of groundwater may also impact other water users, including potable water supply at Aboriginal communities, and stock water supply bores. Modelling indicates that water quality at the Wirrilimurra and Youngaleena community bores is unlikely to be affected by the proposal (AQ2 2024a). However, the EPA supports the proponent's commitment to monitor and manage water level and quality to ensure this outcome is achieved for these water users. The EPA has reflected this outcome in its recommended condition B3 and complemented through implementation of the Water Management Plan (recommended condition B4-2). The EPA understands that there are pastoral bores within the area predicted to be impacted by dewatering and MAR that are actively used to supply livestock (cattle) drinking water. The proponent has committed to monitoring groundwater in the vicinity of these pastoral bores and managing dewatering and MAR to minimise the impacts to water quality, as set out in the Water Management Plan (HanRoy 2025d). The WMP includes provisions to maintain salinity below 5,000 mg/L TDS in pastoral groundwater bores within the predicted area of impact. However, the EPA notes that between 4,000 and 5,000 mg/L TDS, beef cattle are expected to be adversely impacted, albeit without any expected loss of health or productivity (ANZECC & ARMCANZ 2000). The EPA therefore considers that it is appropriate to maintain water quality at pastoral bores such that TDS does not exceed 4,000 mg/L or provide

alternative supplies of suitable water in consultation with relevant stakeholders. This is reflected in recommended condition B3-1.

The EPA recognises that groundwater salinity changes have the potential to impact stygofauna, impacts to subterranean fauna are addressed in section 2.4 below.

The EPA recognises the proponent's commitment to backfill all mine pits to above the groundwater level to ensure that pit lakes are not formed after closure. The EPA commends the proponent for this commitment, which is understood to have been, in part, a response to concerns raised by interested parties, including Traditional Owners. The backfilling of mine pits will mitigate the potential for ongoing post-mining adverse impacts to groundwater quality that can arise from pit lake formation. The EPA has reflected this commitment in recommendation condition B5-1 (rehabilitation outcomes).

Potential impacts to groundwater arising from seepage of impacted surface water, or other spills releases of contaminants is addressed in relation to surface water below.

#### Modification of surface water regimes

Implementation of the proposal will result in the alteration of existing hydrological regimes, including changes to surface water catchments and increasing or reducing the availability of water in the downstream environment. The key values at risk of being impacted include local vegetation and watercourses, particularly in the downstream Fortescue Valley, including the claypans and persistent pools. The potential impact on surface water vegetation, including vegetation associated with the claypans as part of the Freshwater Claypans PEC, is addressed in section 2.1.9.

The proposal will cause a reduction in downstream surface water flow due to a reduction in the catchment area, such as from mine pits. Diversion of surface water flows also have the potential to increase flow rates in localised areas, with a resultant risk of erosion and water ponding. The impacts of increased erosion and sediment loading is discussed below in the context of surface water quality.

Flood modelling and water balance modelling for the claypans suggests that, with the application of mitigation measures, residual impacts associated with hydrological regime changes are likely to be low. The proponent has designed surface water diversions with the objective of ensuring that natural surface water flows are maintained. However, the EPA notes that there will be a residual change to flows into the Fortescue Valley, particularly in the central mine area to the south of Fridge, Murray's Hill and Horseshoe West pits and impacting the area downstream area in the vicinity of the claypans (JBS&G 2025c). The proposal is expected to result in a loss of approximately 10% of the catchment of the Gnalka Gnoona claypan, and 2% of the combined catchment of the Gnalka Gnoona and Koodjeepindarranna claypan catchment area (AQ2 2024a). However, the EPA notes that water balance model predictions indicate that the claypans will experience a negligible change in terms of the duration of flooding and water levels (AQ2 2024a).

As noted previously, surveys identified four persistent channel pools to the south of the development envelope within the Fortescue Valley and a further pool within the

northern infrastructure corridor portion of the development envelope. The pool within the infrastructure corridor was the only persistent surface water feature identified within the development envelope and the proponent has committed to avoiding direct disturbance of this pool given its ecological value and habitat for conservation significant fauna (refer to section 2.2) (JBS&G 2025c). The EPA's recommended condition A1 reflect this commitment. Indirect impacts to this pool are not expected given its location upstream of the mining area, and the proposal infrastructure in proximity to the pool being limited to an access road. Three of the channel pools within the Fortescue Valley are likely to be affected by changes in surface water flow regimes resulting from the proposal. Gidyea Pool, co-located with the Ebathcalby claypan/well, is located further to the east and is not expected to be significantly impacted by the proposal.

Surface water modelling indicates that the changes in surface water inundation in the Fortescue Valley are unlikely to materially interrupt the flow of surface water into the channel pools (AQ2 2024a). The EPA therefore advises that with appropriate mitigation measures in place, the impact to channel pools is unlikely to be significant.

The EPA notes that some changes to surface water hydrology are unavoidable. However, the EPA considers that the proponent should implement reasonable measures to mitigate indirect impacts from altered surface water regimes, particularly to the claypans and channel pools of the Fortescue Valley and has therefore recommended condition B3-2. The EPA recognises that the proponent has identified a suite of mitigation measures in the Water Management Plan, required through recommended condition B4-2. The EPA also considers that rehabilitation and closure should be undertaken such that pre-mining surface water regimes are reestablished as far as practicable and has recommended condition B5-1. The EPA considers that with the implementation of the proponent's minimisation measures, and adherence to the EPA's recommended conditions, the downstream impacts of the proposal from altered surface water regimes is likely to be consistent with the EPA objective for inland waters.

#### Decline in surface water quality.

The proposal may impact surface water quality through sediment loading, leaks and spills of fuels and chemicals, acid and metalliferous drainage and the use and handling of saline water. The key values at risk of being impacted include local vegetation and watercourses, particularly in the downstream Fortescue Valley, including the claypans and persistent pools.

#### *Sediment loading*

As noted above, the proposal will result in changes in surface flow regimes that are likely to increase flow velocities and erosion which, along with ground disturbance, have the potential to impact water quality through increased sediment loading. The proponent has committed, through the Water Management Plan, to implementing a suite of mitigation measures, including stormwater management design to divert natural flows around disturbed areas, and the use of silt traps and sedimentation basins were applicable. The EPA advises that with the implementation of the proponent's mitigation measures as set out in the Water Management Plan, there is

unlikely to be a significant risk of impact to downstream receptors from excessive sediment loading.

#### *Leaks and spills of fuels and chemicals*

The EPA recognises that mining operations will involve the handling and storage of a variety of chemicals, fuels and lubricants that have the potential to impact surface water quality in the event of a significant spill or chronic leak event. However, the EPA advises that with appropriate management, supported through regulatory processes under Part V of the EP Act (works approval and licence) and the Mining Act (the MDCP) the risk of impact is sufficiently low that there is unlikely to be a significant impact on surface water quality. The EPA also advises that the provisions of the *Contaminated Sites Act 2003* will ensure that any leak or spill at risk of contamination soil, surface water or groundwater is reported and then appropriately investigated, remediated and managed.

#### *Acid and metalliferous drainage*

The EPA notes that groundwater quality considerations also arise from acid and metalliferous drainage (AMD). The EPA recognises that the proponent has designed the pits to avoid disturbance of geological formations identified to have elevated sulfur levels and pose a greater risk of AMD. Geochemical studies indicate the overall acid-generating potential for the proposal is low, with 95% of the waste rock material classified as non-acid forming (SRK Consulting 2024). The management of potential acid-forming material will be addressed through the MDCP required under the Mining Act, including the encapsulation of any potential acid forming wastes within waste landforms. The EPA notes that the management of AMD will be supported through the proponent's commitment to undertake ongoing waste characterisation during mining operations. The EPA considers that potential impacts associated with AMD can be adequately assessed and regulated by DMPE under the Mining Act, complemented by the EPA's recommended conditions for rehabilitation (condition B5) that require rehabilitated landforms, such as waste rock landforms, to be stable and not result in pollution or environmental harm.

#### *Saline water management*

As discussed above, mine dewater will have elevated levels of salinity due to the extraction of naturally saline groundwater in the mining area. The EPA notes that the handling of saline mine dewater, including pipelines and the use of saline water for dust suppression, will be regulated through the works approval and licence under Part V of the EP Act (Category 6). The risk to the environment from spills/discharges of saline mine dewater will be assessed and where applicable, regulatory controls will be imposed through conditions to mitigate risks to acceptable levels.

The EPA advises that potential impacts to surface water quality can be appropriately mitigated through the EPA's recommended conditions, including implementation of a revised Water Management Plan, and through regulation under other statutory decision-making processes such that the environmental outcome for inland waters is likely to be consistent with the EPA's objective.

## Water Management Plan

The EPA notes that the proponent has prepared a Water Management Plan that sets out monitoring and management provisions to ensure that environmental outcomes for inland waters can be achieved. The Water Management Plan has been substantially revised throughout the EPA's assessment, with the most recent being Revision 7 (HanRoy 2025d) submitted with the proponent's response to submissions document (HanRoy 2025b). Whilst the EPA considers that the Water Management Plan provides a framework for the monitoring and management of potential impacts to inland waters values, the EPA's recommended conditions require:

- the Water Management Plan to be revised and submitted to DWER for review and approval, with groundwater abstraction not to commence until the plan is approved for implementation (recommended condition C1-1)
- the proponent to consult with the Banima People in the revision of the plan (recommended condition B6-4(1))
- the plan to incorporate the subterranean fauna research program required under recommended condition B8 (recommended condition C2-4)
- the plan to demonstrate how achievement of the inland waters environmental outcomes and objectives will be monitoring and substantiated (recommended condition B4-2)
- a review of the plan after a period of 5 years to ensure that adaptive management is applied in the implementation of the proposal (recommended condition C2-3).

## Cumulative impacts

The EPA notes that cumulative impacts to inland waters associated with this proposal primarily relate to cumulative changes to surface hydrology and groundwater levels. The related Murray's Hill Project and Mulga Downs Hub and Rail Spur are the primary proposals that are located within the same groundwater and surface water catchments as the proposal that may contribute to cumulative impacts.

The EPA acknowledges that the impacts of groundwater abstraction within the Pilbara region, particularly relating to mining operations, is an evolving environmental issue (EPA 2014). More recently, in October 2025, the Minister requested that the EPA provide advice on the potential impacts of current and future water demand in the West Pilbara, particularly in relation to environmental and cultural values associated with the Millstream aquifer. This advice is intended to inform future decision making, including the regulation and mitigation of potential impacts, in the context of increasing pressure on groundwater resources and the environment (GoWA 2025). The EPA notes that the proposal is located approximately 150 kilometres from the Millstream borefield and not expected to contribute to cumulative impacts to the Millstream Aquifer. However, the EPA acknowledges that the proposal is located within the broader central Pilbara region that is subject to cumulative pressures from mine dewatering and water supply.

### *Surface hydrology*

As discussed above, the proposal will result in changes to natural surface water flow regimes that may affect the downstream environment of the Fortescue Valley and associated claypans. The EPA recognises that there are multiple pressures contributing to cumulative impacts on the hydrological regime of the broader Fortescue Valley, including extensive mining operations in the region and the effects of climate change. The proposal will result in changes to 16 distinct water catchment areas that influence the movement of surface water into the Fortescue Valley. To the east of the proposal the Goodiadarrie Hills acts as a hydrological barrier, separating the Fortescue Valley to the south of the proposal from the Fortescue Marsh to the east. A further surface water divide exists immediately to the west of Koodjeepindarranna Claypan, effectively separating the Goodiadarrie Swamp downstream of the proposal area from the Lower Fortescue River (AQ2 2025). Accordingly, cumulative impacts to the Goodiadarrie Swamp are expected to be limited to altered surface water regimes associated with the proposal and related projects, being the Murray's Hill Project, and the potential future Mulga Downs Hub and Rail Spur.

The EPA notes that the assessment of impacts from the proposal has included, through surface water modelling, impacts associated with the Murray's Hill Project. The EPA recognises that implementation of the Mulga Downs Hub and Rail Spur will contribute to cumulative impacts associated with hydrological changes. However, consistent with this proposal, the EPA expects that with the implementation of best practice management measures to minimise disturbance of natural surface water flows, that potential cumulative impacts can be appropriately managed to meet the EPA objective. The EPA advises that cumulative impacts will be a key consideration in its assessment of the Mulga Downs Hub and Rail Spur and in determining appropriate implementation conditions should the proposal be recommended for implementation.

### *Groundwater*

As discussed above, the proposal involves large scale dewatering and excess water injection (via MAR) resulting in areas of groundwater drawdown and areas of groundwater mounding. The Murray's Hill Project is limited to above water table mining and does not involve mine dewatering. The water demand for this project is relatively minor (1.1 GL/yr over approximately 5 years) and will be sourced from abstraction bores within the mining and injection areas of the Mulga Downs Iron Ore Mine proposal, acting as advanced dewatering, or providing increased aquifer capacity for future discharge of excess water (JBS&G 2025c). The Murray's Hill Project is not expected to result in a significant cumulative impact on groundwater level change.

The Mulga Downs Hub and Rail Spur requires up to 2 GL/year during construction (2.5 years) and up to 0.25 GL/year during operations. The proponent has advised that water needs for the southern extent of the project will be sourced from excess mine dewater from the Mulga Downs Iron Ore Mine (JBS&G 2025c).

Based on the groundwater modelling completed for the proposal, the extent of mounding and drawdown is not expected to interact cumulatively with other mining operations in the region. The closest mining operation with large scale dewatering is the Solomon Iron Ore Expansion Project, located approximately 20 km to the west (Ministerial Statement 1062). Based on available information, the maximum extent of the 2 m drawdown contour for the proposal remains approximately 16.5 km from the inferred 2 m drawdown contour resulting from the Solomon Iron Lower Fortescue Borefield (JBS&G 2025c).

The EPA considers that the impacts of the proposal, in the context of the significance of the environmental values at risk, can be approximately managed to provide for environmental outcomes that is consistent with the EPA’s objectives for inland waters.

### 3.8 Summary of key factor assessment and recommended regulation

The EPA has considered the likely residual impacts of the proposal on inland waters environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can mitigate potential inconsistency with the EPA factor objective. The EPA’s assessment findings are presented in Table 7.

The EPA has also considered the principles of the EP Act (see Appendix D) in assessing whether the residual impacts will be consistent with its environmental factor objective and whether reasonable conditions can be imposed (see Appendix A).

**Table 7: Summary of assessment for inland waters**

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
<p>1. Impacts associated with groundwater drawdown.</p>	<p>The drawdown associated with groundwater abstraction for mine pit dewatering is not expected to impact significant environmental values. The predicted extent of groundwater drawdown indicates that some pastoral bores are likely to be affected, however the potable water supply bores for nearby Aboriginal communities are not expected to be impacted. The proponent has committed to supply alternative water sources where water supply is affected, the EPA considers that this can be administered under the provisions of the RiWI Act. Vegetation within the extent of predicted drawdown is not considered to be groundwater dependent. Significant impacts to</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b> Limit on groundwater abstraction volume.</p> <p><b>Condition B3 (inland waters and subterranean fauna)</b> Groundwater drawdown does not exceed the predicted drawdown extent. No interruption to supply of water for pastoral groundwater users. No impact to the Aboriginal community water supply bores.</p> <p><b>Condition B4 (water management plan)</b></p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>vegetation from drawdown are not expected.</p> <p>The EPA advises that subject to recommended conditions and regulation under RiWI Act, the environmental outcome is likely to be consistent with the EPA objective for inland waters.</p>	<p>Measures to monitor and mitigate impacts associated with groundwater drawdown, including 5-year review of the plan (condition C2).</p> <p><b>DMA regulation</b></p> <p>Licensing of water abstraction under the RIWI Act, including provision of alternative water supply as required.</p>
2. Impacts associated with groundwater mounding from MAR.	<p>Groundwater mounding associated with the injection of excess mine dewater has the potential to impact vegetation if mounding intersects the root zone. Mounding may also result in adverse ecological impacts if it reaches the near-surface.</p> <p>The predicted 1 m mounding contour extends up to 10 km to the south into the Fortescue Valley. Modelling indicates that mounding influenced groundwater levels will remain deeper than 2 mbgl in most locations. The proponent has committed to ensuring groundwater remains lower than 2.5 mbgl and will monitor vegetation health in at risk locations.</p> <p>The EPA advises that subject to recommended conditions, the environmental outcome is likely to be consistent with the EPA objective for inland waters.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p>Limit on volume of wastewater discharged via MAR and/or pit infiltration.</p> <p><b>Condition B3 (inland waters and subterranean fauna)</b></p> <p>Groundwater mounding does not exceed the predicted drawdown extent.</p> <p>Proposal induced mounding remains lower than 2.5 metres below ground level.</p> <p><b>Condition B4 (water management plan)</b></p> <p>Measures to monitor and mitigate impacts associated with groundwater drawdown, including 5-year review of the plan (condition C2).</p>
3. Impacts resulting from groundwater quality changes	<p>The proposal has the potential to impact groundwater quality primarily through the discharge of saline dewater. Given the controls on mounding, and the lack of groundwater dependent vegetation, significant impacts to vegetation are not expected.</p> <p>The predicted extent of salinity changes indicates that some pastoral bores are likely to be affected, however the potable water supply bores for nearby Aboriginal</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p>Limit on volume of wastewater discharged via MAR and/or pit infiltration.</p> <p><b>Condition B3 (inland waters and subterranean fauna)</b></p> <p>No interruption to supply of water for pastoral groundwater users.</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>communities are not expected to be impacted. The proponent has committed to provide alternative water supply in the event pastoral bores are impacted by elevated salinity levels.</p> <p>Potential impacts to groundwater quality from AMD, contamination events (e.g. spills and leaks) and use of saline water for dust suppression can be mitigated through standard management measures administered through the Mining Act and Part V of the EP Act.</p> <p>The EPA advises that subject to recommended conditions and regulation by other DMAs, the environmental outcome is likely to be consistent with the EPA objective for inland waters.</p>	<p>Maintain groundwater quality to support stygofauna habitat.</p> <p>No impact to the Aboriginal community water supply bores.</p> <p><b>Condition B4 (water management plan)</b></p> <p>Measures to monitor and mitigate impacts associated with groundwater drawdown, including 5-year review of the plan (condition C2).</p> <p><b>Condition B5 (Rehabilitation)</b></p> <p>Rehabilitation outcome requiring rehabilitated landforms to be stable and not cause pollution or environmental harm.</p> <p><b>DMA regulation</b></p> <p>MDCP required under the Mining Act.</p> <p>Works approval and licence required under Part V of the EP Act.</p>
4.	<p>Impacts to groundwater quality associated with pit lake formation.</p> <p>Pit lake formation post closure has the potential to adversely impact groundwater quality due to saline water and aAMD seepage into the surrounding aquifer.</p> <p>The proponent has committed to backfilling all pit voids to above the groundwater level to avoid the formation of pit lakes.</p>	<p><b>Condition B5 (Rehabilitation)</b></p> <p>Rehabilitation outcome requiring backfilling of pits.</p> <p><b>DMA regulation</b></p> <p>MDCP required under the Mining Act.</p>
5.	<p>Indirect impacts to from changes in surface water hydrology.</p> <p>The proposal will alter existing hydrological regimes, including changes to important surface water catchments. The key values at risk of impact are related to the downstream Fortescue Valley and the associated claypans and persistent pools.</p> <p>With the implementation of management measures to maintain natural flows to the extent possible, the modelled changes in hydrology</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p>Limit on area of disturbance footprint that may interrupt surface water flows.</p> <p>No direct disturbance of channel pools, including the pool within the northern infrastructure corridor.</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>are not expected to result in significant impacts to downstream receptors.</p> <p>The EPA advises that subject to recommended conditions and regulation by other DMAs, the environmental outcome is likely to be consistent with the EPA objective for inland waters.</p>	<p><b>Condition B1 (flora and vegetation)</b> Avoid or minimise impacts to vegetation from changes to hydrological regimes.</p> <p><b>Condition B3 (inland waters and subterranean fauna)</b> Minimise impacts to claypans and channel pools within the Fortescue Valley from changes to surface water hydrology.</p> <p><b>Condition B4 (environmental management plans)</b> Implementation of a revised Water Management Plan.</p> <p><b>Condition B5 (rehabilitation)</b> Reestablishment of pre-mining surface water flow regimes during closure and rehabilitation.</p>
6.	<p>Impacts resulting from surface water quality changes.</p> <p>Surface water quality may be impacted through sediment loading, leaks and spills of fuels and chemicals, AMD and the use and handling of saline water. The main values at risk include the downstream Fortescue Valley, and associated claypans and persistent pools.</p> <p>Sediment loading due to increased surface flow velocities and ground disturbance are expected to be mitigated through industry standard design measures included in the Water Management Plan.</p> <p>The risks associated with leaks or spills of hazardous chemicals or fuels can be regulated through the MDCP required under the Mining Act, and the works approval and licence required under Part V of the EP Act.</p> <p>Impacts to surface water from AMD, including seepage from waste rock</p>	<p><b>Condition B5 (Rehabilitation)</b> Rehabilitation outcome requiring rehabilitated landforms to be stable and not cause pollution or environmental harm.</p> <p><b>DMA regulation</b> MDCP required under the Mining Act. Works approval and licence required under Part V of the EP Act.</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>landforms, will be regulated through the MDCP, and complemented by the EPA's recommended rehabilitation outcome conditions.</p> <p>Potential impacts associated with the handling and use of saline water, including use as dust suppression, will be regulated through the works approval and licence required under Part V of the EP Act.</p>	

## 2.4 Subterranean fauna

### 2.4.1 Environmental objective

The EPA environmental objective for subterranean fauna is to protect subterranean fauna so that biological diversity and ecological integrity are maintained (EPA 2016c).

### 2.4.2 Investigations and surveys

The EPA advises the following investigations, surveys and peer reviews were used to inform the assessment of the potential impacts to flora and vegetation:

- Mulga east subterranean fauna desktop (appendix 8a of the environmental review document) (Bennelongia 2019)
- Mulga east subterranean fauna baseline survey (appendix 8b of the environmental review document) (Bennelongia 2021)
- Mulga Downs Iron Ore Mine – Revised troglofauna habitat assessment (appendix 9 of the environmental review document) (AQ2 2024b)
- Salinity tolerance of stygofauna at Mulga Downs Iron Ore Mine (appendix 22 of the environmental review document) (Bennelongia 2024b)
- *Ophisternon candidum* (Vulnerable) – Blind Cave Eel (appendix 26 of the environmental review document) (JBS&G 2024b)
- Mulga Downs iron ore mine: subterranean fauna survey (Attachment A of JBS&G 2024b) (Bennelongia 2024a)
- MDIOM stygofauna salinity tolerance peer review (appendix 31 of the environmental review document) (Biologic n.d.-b)
- MDIOM stygofauna baseline peer review (appendix 32 of the environmental review document) (Biologic n.d.-a)
- Analysis of stygofaunal associations with groundwater salinity and potential salinity tolerances based on observations for the Mulga Downs Iron Ore Mine (appendix 33 of the environmental review document) (JBS&G 2025a)
- Mulga Downs Iron Ore Mine: Revised Risk Assessment on Troglofauna and Environmental Outcomes (appendix 34 of the environmental review document) (JBS&G 2025d)
- Mulga Downs Iron Ore Mine: Targeted troglofauna survey (Attachment A of JBS&G 2025d) (Biologic 2025a)
- Mulga Downs targeted troglofauna survey: Molecular systematics analysis (Attachment B of JBS&G 2025d) (Biologic 2025b).

The surveys were largely consistent with the *Technical Guidance – Subterranean fauna survey* (EPA 2021d). The EPA considered that the relevant studies are appropriate to inform the assessment of the potential impacts to the above environmental factor.

The EPA sought advice from the DWER in relation to the subterranean fauna surveys that were considered as part of this assessment.

### 2.4.3 Assessment context – existing environment

The Pilbara region is recognised as having a high diversity of subterranean fauna. The proposal is situated between the Chichester and Hamersley ranges in the lower Fortescue Valley. The area is known to contain substantial areas of prospective habitat for stygofauna and troglofauna, including depositional units (colluvium and alluvium), channel iron, Marra Mamba Formation and calcrete (Bennelongia 2021). Whilst several calcrete aquifers in the Yilgarn and Pilbara regions are listed as PECs, the calcrete aquifer near the proposal area is not listed as a PEC. The nearest subterranean fauna PEC to the proposal is located approximately 160 km to the north-west (Priority 4 - Stygofaunal community of the Western Fortescue Plains freshwater aquifer).

The EPA notes that prior to the completion of proposal-related surveys, the subterranean fauna of the Middle Fortescue Valley area was undocumented. Accordingly, the assessment of impacts to subterranean fauna was hindered by taxonomic uncertainty, which made it difficult to accurately identify species and evaluate their ecological significance. The EPA acknowledges the proponent for adopting an iterative approach by commissioning additional studies to address uncertainties throughout the assessment process.

#### Troglofauna

Troglofauna habitat assessment modelling (AQ2 2024b; JBS&G 2025d) found that prospective habitat for troglofauna in the area includes:

- the mineralised Marra Mamba and Channel Iron Deposits (CID) / Pisolite
- the unsaturated upper calcrete which extends over the Fortescue Valley
- undifferentiated tertiary sediments extending across the development envelope on the slopes of the Chichester Ranges
- the upper undifferentiated shaley / unmineralized portion of the Marra Mamba Formation.

A typical geological cross-section of modelled troglofauna habitat is shown in Figure 13 below, across a broadly north-east to south-west section through the central portion of the mine area.

Surveys over a 15-year period have recorded a high diversity of troglofauna within and proximal to the development envelope, with 2,307 specimens collected belonging to 154 troglofauna operational taxonomic units (OTU). The EPA notes that surveys have been completed over an extensive spatial area approximately 50 km along the Fortescue Valley. The groups represented in the troglofauna surveys include diplurans, isopods, beetles, pauropods, pseudoscorpions, silverfish, true bugs, schizomids, centipedes, palpigrids, cockroaches, spiders, symphylans, millipedes and flies (JBS&G 2025c).

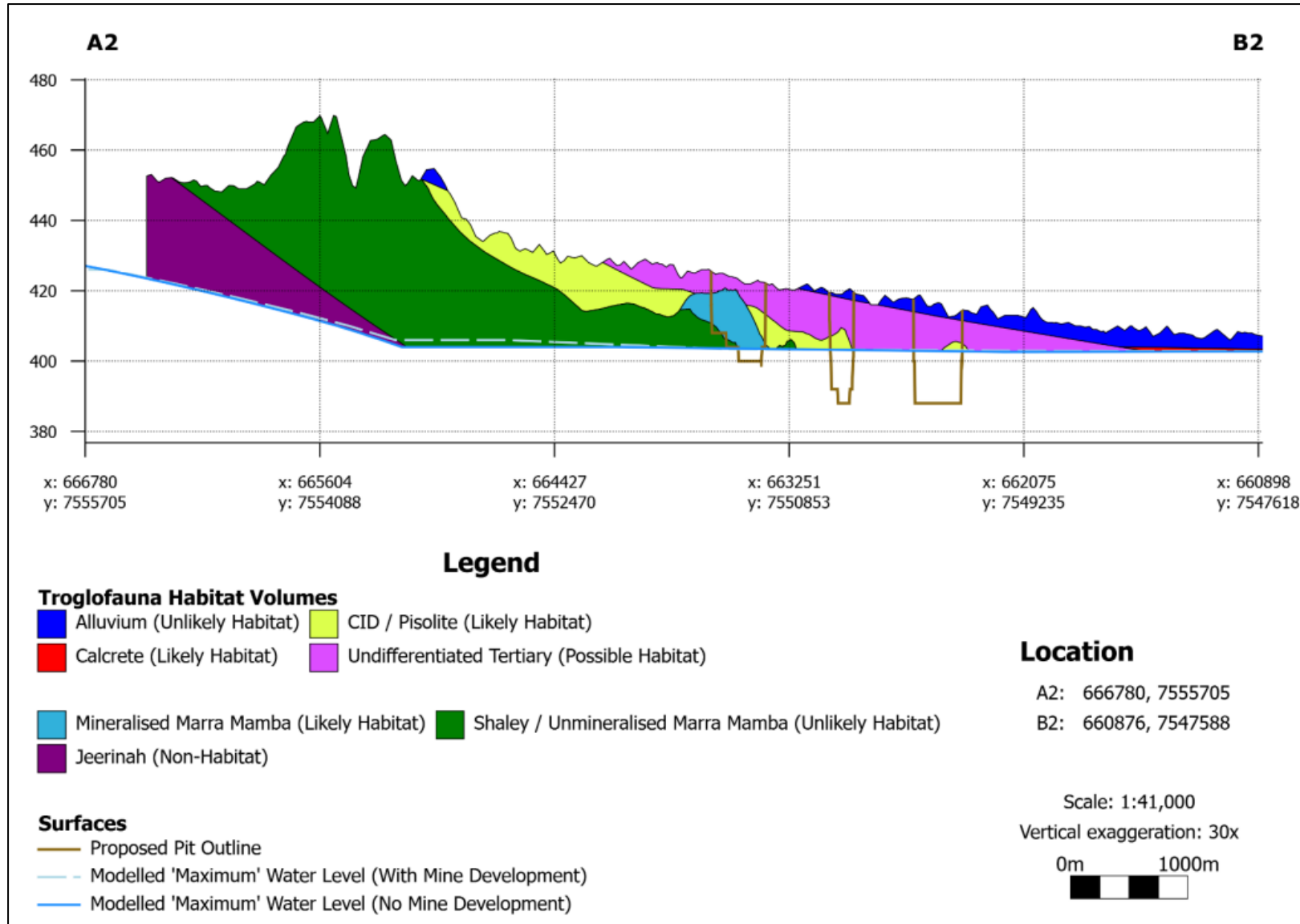


Figure 13: Geological cross section of modelled troglofauna habitat (Figure 4.2 of AQ2 2024b)

Of the taxa recorded, 42 were initially identified as having linear ranges indicative of being potentially restricted, including many singletons. None of the troglofauna OTU or associated communities recorded within the development envelope are listed, or recognised, as having conservation significance under the BC Act or listed as Priority species. Table 3-3 of the revised troglofauna risk assessment (JBS&G 2025d) provides a detailed summary of troglofauna taxa identified as having limited linear ranges and collected from locations within predicted impact areas.

The upper calcrete and CID/pisolite lithological units that represent highly prospective troglofauna habitat occur throughout the development envelope (see Figure 13).

### Stygofauna

Palaeovalleys, such as the Fortescue Valley, are typically highly prospective for stygofauna habitat, often with extensive aquifers and high hydraulic conductivity. As discussed in section 2.3, the hydrogeological conceptual understanding of the proposal area indicates that the quaternary / tertiary aquifer and underlying fractured rock / bedrock aquifers are broadly in hydraulic connection, with only localised areas of hydraulic disconnection associated with isolated occurrences of low permeability sediments (AQ2 2025). Prospective stygofauna habitat in the area is as follows:

- the saturated upper calcrete and CID / pisolite, and mineralized / hydrated Marra Mamba bedrock, including the 'vuggy' hardcap.
- low clay content areas of the undifferentiated tertiary between the upper calcrete and CID / pisolite
- isolated weathered and vuggy portions of the lowermost tertiary unit (basal crete).

A tabulated discussion of subterranean fauna habitat prospective for lithological groupings within the development envelope is provided in Table 8-5 of JBS&G 2025c. As discussed in section 2.3, groundwater in the area is variable with TDS values around 180 mg/L along the slopes of the Chichester Ranges, to saline in the valley, with TDS values around 18,000 mg/L. A mound of saline groundwater occurs beneath the overlying claypans, with fresher groundwater along the valley sides. A halocline is present at the edges of the saline mound at depths of around 40 – 80 mbgl, with salinity increasing to 20,000-30,000 mg/L at around 120 mbgl (Bennelongia 2024b).

A typical geological cross-section of modelled stygofauna habitat is shown in Figure 14 below, across a broadly north-east to south-west section through the central portion of the mine area.

Surveys over a 15-year period have recorded a very high abundance and diversity of stygofauna within and proximal to the development envelope, with 12,045 specimens collected belonging to 150 stygofauna OTUs. Groups represented in the stygofauna surveys include copepods (45 species), ostracods (31 species), amphipods (23 species), annelid worms (19 species), syncarids (18 species), rotifers (five species), isopods (three species), mites (three species), spelaeogriphacids (one species), flatworms (one species) and nematode worms (Bennelongia 2024a).

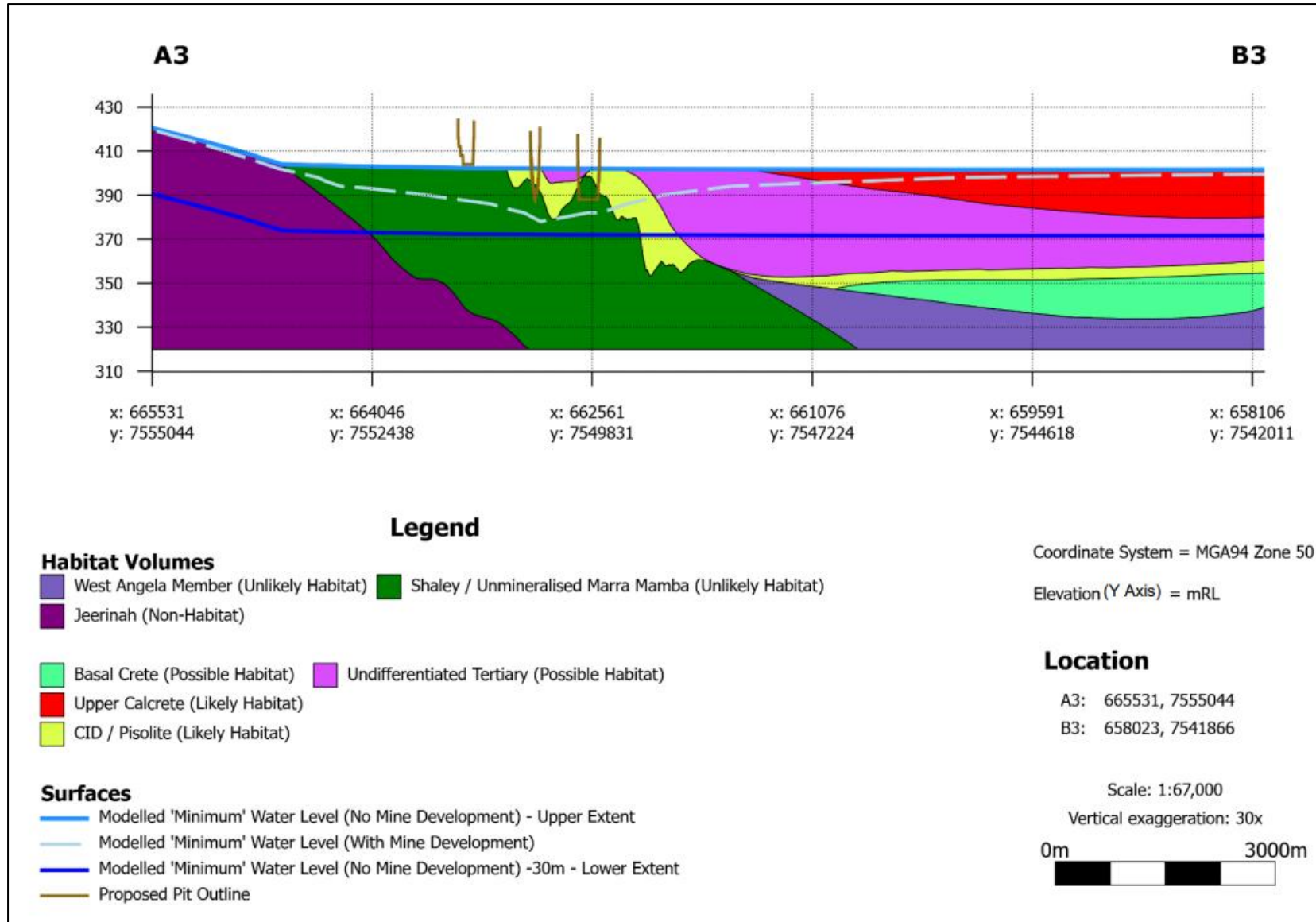


Figure 14: Geological cross section of modelled stygofauna habitat (Figure 4.3 of AQ2 2024b)

Of the stygofauna species identified, 14 were initially considered to be known only from areas within the predicted area of groundwater drawdown (more than 2 m decline) and/or groundwater mounding (more than 1 m increase). Nearly half of the species recorded had linear ranges exceeding 70 km, when stygophiles are included in the dataset. However, 8 of the 14 species only known from predicted impact areas were collected from a single sampling hole, indicating these species may be restricted in their range (Bennelongia 2024a). None of the stygofauna taxa / OTU or associated communities recorded within the development envelope are listed, or recognised, as having conservation significance under the BC Act or listed as Priority species.

#### 2.4.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (HanRoy 2025b). Public consultation on the proposal raised concerns about:

- the adequacy of subterranean fauna survey effort
- the high biodiversity in the area and equivalence with other listed threatened/priority subterranean fauna ecological communities
- the significance of the residual impacts of the proposal and consideration of offsets
- the adequacy of monitoring and management measures.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in the following sections.

#### 2.4.5 Potential impacts from the proposal

##### Direct impacts

The proposal has the potential to have significant direct impacts on subterranean fauna from:

- loss of troglifauna habitat due to development of the mine pits
- impacts to restricted troglifauna species
- loss of stygofauna habitat due to development of mine pits below the water table and from changes in groundwater levels from dewatering
- impacts to restricted stygofauna species.

##### Indirect impacts

The proposal has the potential to have significant indirect impacts on subterranean fauna from:

- adverse impacts to stygofauna and troglifauna habitat from vegetation clearing, contamination, changes to surface water infiltration and construction of infrastructure (e.g. waste rock landforms)
- adverse impacts to troglifauna habitat from changes to groundwater affecting humidity in the vadose zone

- reduction in or changes to stygofauna habitat quality due to salinity changes associated with discharge of mine dewater.

The EPA considers that the potential indirect impacts associated with vegetation clearing, potential contamination, and the changes to infiltration from the placement of waste rock landforms and infrastructure on subterranean fauna habitat are unlikely to be material, including considering the proponent's minimisation measures described in section 2.3.7. Therefore, these issues are not considered further in this assessment.

#### 2.4.6 Avoidance measures

As discussed previously the proponent has substantially reduced the scale of the proposal compared to the originally referred proposal. The proponent has identified that through the reduced mining rate the number of pits has been reduced, therefore avoiding some direct impacts to subterranean fauna. The proposal amendments also included:

- the removal of mine dewater injection within the Malay Well tenement thereby avoiding impacts to likely habitat associated with the calcrete in that area
- removal of wet processing, therefore eliminating the need for a tailings storage facility and avoiding potential indirect impacts on subterranean fauna habitat.

#### 2.4.7 Minimisation measures (including regulation by other DMAs)

The proponent has proposed measures to minimise impacts to subterranean fauna (JBS&G 2025c):

- limit the extent of direct disturbance on formations that are likely habitat for subterranean fauna
- minimise dewatering through staged mine scheduling
- manage reinjection of excess mine dewater to minimise groundwater mounding
- minimise waste rock landform size by backfilling pits with waste rock
- implement measures to reduce the risk of groundwater contamination.

#### 2.4.8 Rehabilitation measures

The proponent has proposed the following rehabilitation measures relevant to subterranean fauna (JBS&G 2025c):

- construction and operational areas that are no longer required will be progressively rehabilitated throughout the life of the mine
- backfilling of mine pits above the groundwater level.

The EPA notes that the progressive rehabilitation and revegetation of disturbed areas will have the indirect effect of reestablishing nutrient flows into the subterranean environment to the benefit of subterranean fauna.

### 2.4.9 Assessment of impacts to environmental values

The EPA considers that the key environmental values for subterranean fauna likely to be impacted by the proposal are the loss of subterranean fauna habitat and taxa. The EPA recognises that the subterranean community identified within the proposal area is particularly diverse and is, for both stygofauna and troglofauna, indicative of being considered globally significant (Culver et al. 2021; Halse et al. 2014). The EPA advises that the subterranean fauna community recorded at the site is important and at risk of impact from mining operations given many of the species are locally endemic, potentially new species and/or occupy restricted habitat.

#### Troglofauna

Likely troglofauna habitat within the proposal area has been defined through surveys and 3D habitat modelling and consists of Upper Calcrete, CID / Pisolites, and Mineralised / Hydrated BIF (AQ2 2024b). Further targeted troglofauna surveys in 2025 identified records from the deeper Shaley / Unmineralised Marra Mamba unit, indicating this also represents likely habitat for troglofauna (Biologic 2025a). Development of the mine pits will result in an unavoidable impact to troglofauna and the removal of approximately 100,460,240 m<sup>3</sup> of likely troglofauna habitat. Additionally, groundwater mounding associated with injection of mine dewater will impact approximately 651,945,700 m<sup>3</sup> of likely troglofauna habitat based on the modelled maximum groundwater level of the duration of the proposal.

The EPA notes that many of the troglofauna taxa identified from within proposed pit boundaries exhibit short-range endemism. However, the proponent's assessment found that troglofauna are generally found in habitats which are contiguous and extend outside of areas of impact. The exception being the Mineralised Marra Mamba unit, which consists as discontinuous pods.

The proponent has estimated that the development of mine pits and groundwater mounding from dewater discharge will result in the loss of 3% and 15% respectively of the total likely habitat within the mapped impact area (JBS&G 2025c). The EPA recognises the potential temporary nature of habitat loss from groundwater mounding and notes that at the cessation of dewater injection groundwater levels will recede and, over time, approach pre-mining levels. While the loss of habitat from groundwater mounding may not be permanent, given the uncertainties associated with the ability of troglofauna to recolonise these areas the EPA's assessment has conservatively assumed that the habitat loss will be permanent.

The EPA has also considered that while the lateral extent of groundwater mounding is large (Figure 11), the extent of vertical increase in groundwater and hence loss of troglofauna habitat decreases with increasing distance from the injection bores. The EPA advises that substantial increases in groundwater depth are predicted to occur in locations where the overall thickness of the troglofauna habitat is such that the proportional loss of habitat in that location is unlikely to significantly impact the persistence of the troglofauna community in that area.

Table 3-4 of the proponent's revised risk assessment for troglofauna (JBS&G 2025d) provides a systematic and detailed assessment of impacts to key troglofauna taxa

identified as being at risk of impact from the proposal. The assessment concluded that the proposal will not result in the loss of any troglofauna taxa based on their habitats being largely contiguous and conducive to a broader distribution. This is supported by survey data which found that for taxa only recorded from pit areas, taxa from co-occurring families were recorded outside of these impact areas (JBS&G 2025d). Taxa recorded only from the discontinuous Mineralised Marra Mamba unit were assessed as not being at risk given up to 30% of this habitat will be retained.

The EPA notes that eight taxa were recorded only from areas expected to be impacted by mine pits and/or groundwater mounding and their presence beyond these zones has not been definitively confirmed. However, the EPA considers that there is sufficient evidence available to indicate that suitable habitat exists beyond these impact areas, including:

- occurrence of chthoniid OTUs related to *Austrochthonius* `BPS257` and representatives of two coleopteran families in Mineralised Marra Mamba outside both the mine pit and groundwater mounding footprints suggests habitat availability for diverse troglofauna groups beyond the impact area
- representatives of a further 31 troglofauna OTUs/species from seven classes were recorded widely across sites associated with Mineralised Marra Mamba (Biologic 2025a).

While connectivity between these habitats cannot be inferred, the EPA advises that the widespread occurrence of troglofauna within this geology indicates a broader distribution across suitable habitat.

The EPA is of the view that although the proposal will impact range-restricted troglofauna, the habitat modelling and assessment provides confidence that suitable, well-connected habitats for troglofauna will remain intact throughout the project area. It is therefore reasonable to expect that potentially restricted species should occur in suitable habitats beyond the proposed and approved pits. The EPA therefore considers that, subject to recommended condition limiting the scale of troglofauna habitat disturbance (A1 and B3), the environmental outcome is unlikely to be inconsistent with the EPA objective for subterranean fauna.

### Stygofauna

Likely stygofauna habitat within the proposal area has been defined through surveys and 3D habitat modelling. It consists of Upper Calcrete, CID / Pisolites, and Mineralised / Hydrated Marra Mamba bedrock (AQ2 2024b). The EPA notes that the Upper Calcrete is continuous across a large area including to the south of the proposal and to the east and west along the Fortescue Valley. Similarly, the Mineralised Marra Mamba and CID / Pisolite extends along the Chichester Range, with the PID / Pisolite forming a continuous unit while the Mineralised Marra Mamba occurs in discontinuous pods (Figure 15).



Figure 15: Stygofauna habitat within the proposal area (Figure 8.18 of JBS&G 2025c)

The EPA notes that modelled baseline salinity indicates uniform salinity in the upper 30 m, i.e. depths that are most preferential for stygofauna habitation, and that potential habitat fragmentation due to salinity differences does not occur at depths above 40 mbgl (JBS&G 2025a). The EPA considers that the hydrological regime and associated stygofauna habitat in the proposal area is continuous.

As noted above, the EPA recognises the particularly abundant and diverse stygofauna community identified within the proposal area, and the potential for several taxa to be endemic to the area and range restricted. Table 8-7 of the proponent's Environmental Review Document (JBS&G 2025c) provides a consolidated assessment of impacts to potentially restricted stygofauna taxa identified as being at risk of impact from the proposal. The EPA acknowledges that the assessment of impacts to stygofauna has been hindered by residual taxonomic uncertainty. While the EPA recognises the proponent attempts to resolve this uncertainty through genomic sequencing (Bennelongia 2024a), it is noted that this residual uncertainty may lead to some taxa or OTUs appearing to have an artificially restricted distribution.

The EPA notes that stygofauna records indicate a distribution of all taxonomic groups across all modelled habitat types and within identified drainage lines outside the model boundary (JBS&G 2025c). This broadly indicates that stygofauna can disperse across large areas and that there is biological connectivity across the study area.

The key impacts to stygofauna are through loss of habitat and individuals due to development of pits below water table, groundwater drawdown from dewatering, and changes to water quality from mine dewater discharge. The proponent's habitat modelling and groundwater modelling has been used to predict the volume of stygofauna habitat expected to be impacted by the proposal (Table 8).

**Table 8: Predicted percentage of stygofauna habitat loss (JBS&G 2025c)**

Stygofauna habitat type	Habitat likelihood	Total habitat in impact area (Pre-mining) (m <sup>3</sup> )	Predicted volume of habitat loss (m <sup>3</sup> )	Predicted percentage of habitat lost within area of impact
Upper Calcrete	Likely	3,554,200,000	556,380,000	16%
CID / Pisolite		2,978,200,000	112,770,000	4%
Undifferentiated Tertiary	Possible	7,687,100,000	482,930,000	6%
Basal Crete		2,151,500,000	0	0%
Alluvium	Unlikely	3,776	3,776	100%
Total		16,371,003,776	1,152,083,776	7%

The EPA notes that a substantial portion of likely and possible stygofauna habitat will not be impacted by the advancement of the pits and associated groundwater drawdown and will remain available for dispersal out of the impact area. The EPA considers that there is sufficient information available to indicate that stygofauna habitat in the proposal area is continuous and extends outside of the predicted area of impact. This is supported by the distribution of fauna records which indicates stygofauna can disperse across a broad area. A detailed assessment of the risk of impact to potentially restricted stygofauna taxa is provided in Table 8-13 of JBS&G (2025c). The EPA therefore considers that, subject to recommended conditions, including limits on groundwater abstraction, groundwater drawdown and loss of stygofauna habitat, the environmental outcome is unlikely to be inconsistent with the EPA objective for subterranean fauna.

As discussed in section 2.3, injection of excess mine dewater is predicted to result in changes in groundwater salinity that adversely impact stygofauna habitat. The predicted increase in salinity is up to approximately 4,500 mg/L TDS (JBS&G 2025c).

The proponent commissioned a series of work to better understand the tolerance of stygofauna in the impact area to changes in salinity. This included a novel statistical approach to model predicted salinity tolerance ranges for potential restricted stygofauna species based on inferred baseline salinity data at depth (JBS&G 2025a). This study concluded that most stygofauna have salinity ranges in excess of the predicted change in salinity resulting from dewater injection. However, the EPA considers that the relationship between stygofauna populations and salinity was statistically weak and accounted for a small portion of the overall variance observed in the dataset. Further, the EPA recognises that salinity tolerances for stygofauna are typically geographically and taxonomically variable, and that species are likely to be adapted to local conditions and any change from background levels may result in adverse impacts (Dillon et al. 2009). The EPA considers that the residual uncertainty associated with the modelled salinity ranges are such that they could not be used with a high degree of reliability to determine appropriately protective salinity tolerance triggers and thresholds.

Notwithstanding the above, the EPA is confident that there is a low likelihood of a significant impact to stygofauna resulting from salinity changes in groundwater due to:

- the aquifer units representing stygofauna habitat are continuous and extend outside the areas of predicted impact
- evidence of biological connectivity and apparent ability of stygofauna to disperse across connected habitat beyond the impact area
- stygofauna taxa have been recorded throughout locations with varying levels of groundwater salinity, indicating that the stygofauna assemblage in the area has a degree pre-existing tolerance to variable salinity levels
- the areal extent of predicted salinity changes (as shown in Figure 16) is representative of the modelled extent of a discernible change in salinity, whereas the extent of more material changes to salinity (i.e. up to the maximum predicted

value of 5,600 mg/L down-slope of the Murray's Hill mining / MAR area) is expected to be more localised.

Given the particularly high diversity of stygofauna recorded and the uncertainties associated with the impact of increased salinity, the EPA considers that a conservative approach is warranted to ensure that the outcome for stygofauna is consistent with the EPA's objective. The EPA's recommended conditions B3-1 and B3-2 requires the proponent to implement the proposal such that changes to groundwater quality are minimised to maintained stygofauna habitat, and that there is no detectable decrease in stygofauna diversity within the development envelope. The EPA notes that these outcomes are consistent with the proponent's assessment conclusions.

The EPA notes that the Water Management Plan will be required to be revised to incorporate a program of stygofauna monitoring during implementation to demonstrate achievement of the outcome for stygofauna diversity. This is complemented by recommended condition C2-3 that requires the Water Management Plan to be reviewed after 5 years, and for this review to include a revised analysis of stygofauna salinity tolerance utilising empirical data collected during the preceding 5 years of implementation. The review of the Water Management Plan is also required to incorporate scientific research outcomes from implementation of the subterranean research program (recommended condition C2-4).

Noting the uncertainty regarding appropriate triggers and thresholds for salinity for the protection of stygofauna, the EPA's recommended conditions require the following outcomes to be achieved:

- maintaining groundwater quality, including salinity, in the development envelope to support stygofauna habitat (recommended condition B3)
- ensuring no detectable reduction in stygofauna diversity relative to baseline (recommended condition B3).

The EPA considers that if the proposal is implemented subject to these recommended conditions, the environmental outcome is unlikely to be inconsistent with the EPA objective for subterranean fauna.

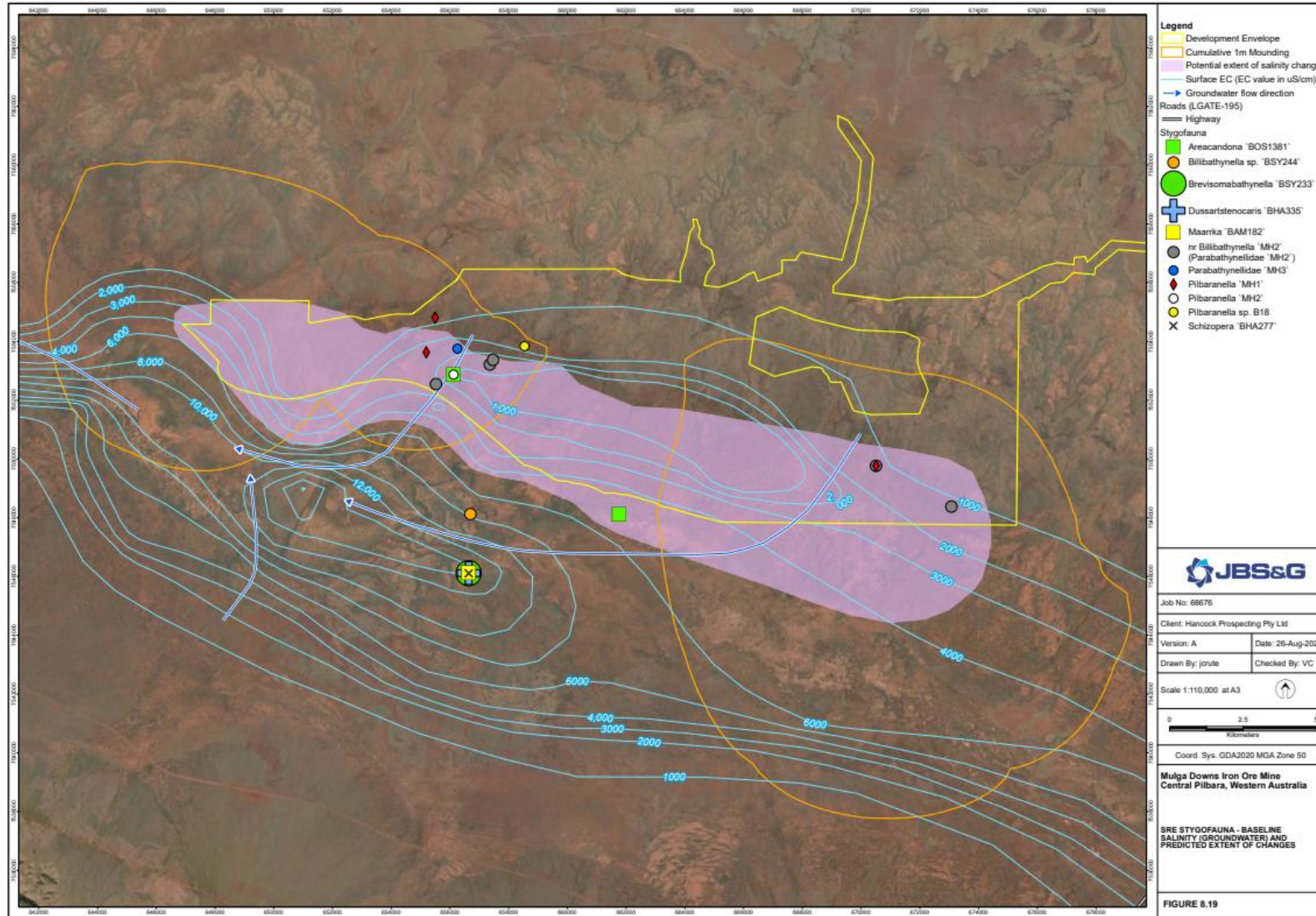


Figure 16: Potentially restricted stygofauna taxa locations relative to baseline salinity and the predicted extent of salinity change (Figure 8.19 of JBS&G 2025c)

## Cumulative impacts

The related Murray's Hill Project and Mulga Downs Hub and Spur Project are the primary proposals in the area that may contribute to cumulative impacts. The Mulga Downs Hub and Spur Project is an infrastructure project with limited potential to significantly impact subterranean fauna. The Murray's Hill Project is an above water table mining proposal that will contribute to cumulative impacts to troglofauna through loss of habitat. The EPA notes that potential impacts to troglofauna associated with the Murray's Hill Project were incorporated into the proponent's impact assessment for subterranean fauna. The EPA therefore advises that significant cumulative impacts to subterranean fauna are not expected for this proposal. However, given the potential impacts on subterranean fauna and the unique biodiversity identified in the area, the EPA advises that any future proposals, including possible expansions, must carefully assess cumulative impacts. To support such assessments and improve understanding of subterranean fauna in the Middle Fortescue Valley, the EPA recommends implementing a targeted research program (see below).

## Subterranean fauna research program

Prior to proposal-related surveys, knowledge of the subterranean fauna community of the Middle Fortescue Valley area was largely undocumented. The surveys completed have greatly contributed to the scientific knowledge of this area and have identified a significant abundance and diversity of subterranean fauna that is comparable to, or exceeds, other locations within the Pilbara region. However, the surveys have inherently focused primarily on areas of predicted impact, and proximal areas of inferred connected habitat. The EPA notes that whilst the assessment information is suggestive of widely distributed subterranean fauna habitat and taxa that can disperse through connected habitat, it is not known if the subterranean fauna assemblage identified is unique to the proposal area or representative of subterranean fauna diversity throughout the broader Middle Fortescue Valley.

In recognition of this uncertainty, the EPA's recommended condition B8 requires the proponent to develop and implement a subterranean fauna research program with the objective of furthering the scientific knowledge of the subterranean fauna of the Middle Fortescue Valley. The research program will also require the proponent to complete studies to determine the potential for troglofauna to recolonise of backfilled mine pits. Further, to address uncertainty regarding the salinity tolerance of stygofauna, the research program is to include specific studies, including utilising groundwater and stygofauna survey monitoring data collected during implementation, to better understand stygofauna salinity tolerance in this area.

The EPA advises that the findings of this program, which are required to be made public, will assist with the management of impacts to subterranean fauna from the proposal, and will enable strategic protection of subterranean fauna ecological values in the area from future cumulative impacts, including any potential expansion of this proposal in the future. The EPA's recommended condition B2-4 also requires the revision of the Water Management Plan to be informed by the outcomes of research program, to ensure that advancements in scientific knowledge contribute to improved environmental outcomes for this proposal through adaptive management.

### 2.4.10 Summary of key factor assessment and recommended regulation

The EPA has considered the likely residual impacts of the proposal on subterranean fauna. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can ensure consistency with the EPA factor objective. The EPA assessment findings are presented in Table 9.

The EPA has also considered the principles of the *Environmental Protection Act 1986* (see Appendix D) in assessing whether the residual impacts will be consistent with its environmental factor objective and whether reasonable conditions can be imposed (see Appendix A).

**Table 9: Summary of assessment for subterranean fauna**

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
<p>1. Impacts to troglofauna habitat and individuals.</p>	<p>The proposal will result in the loss of troglofauna individuals and habitat due to the development of mine pits and groundwater mounding into the vadose zone. The troglofauna assemblage identified within the proposal area is abundant and diverse, with several taxa/OTUs exhibiting short-range endemism. Extensive surveys and habitat modelling indicates that the troglofauna habitat is contiguous and extends beyond the areas of impact. The distribution of troglofauna records indicates that the suitable habitat supports a diversity of taxa, and that troglofauna are unlikely to be restricted to impact areas. With the retention of suitable connected habitat, and limiting the extent of mounding, the EPA considers that the proposal is unlikely to have a significant impact on troglofauna diversity. Through implementation of the recommended conditions, the EPA considers that the environmental outcome is likely to be consistent with the factor objective for subterranean fauna. Further understanding of the potential for troglofauna to recolonise backfilled pit voids will be obtained through implementation of the subterranean fauna research</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b> Limit on reinjection volume. Proposal limits that effectively constrain depth and size of pits.</p> <p><b>Condition B3 (inland waters and subterranean fauna)</b> Groundwater mounding does not exceed the predicted mounding extent. Ensure that at least 30% of the discontinuous Mineralised Marra Mamba habitat unit is retained. Limit the percentage loss of likely habitat within the 3D habitat model area due to pits and mounding.</p> <p><b>Condition B4 (water management plan)</b> Management and monitoring relating to groundwater mounding.</p> <p><b>Condition B8 (subterranean fauna research program)</b> Improved scientific knowledge to contribute to mitigation of cumulative impacts and to inform adaptive management.</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	program (recommended condition B8).	
<p>2. Impacts to stygofauna habitat and individuals from mine pits and groundwater drawdown.</p>	<p>The proposal will result in the loss of stygofauna individuals and habitat due to the development of mine pits below the water table and associated groundwater drawdown. The stygofauna assemblage identified within the proposal area is abundant and diverse, with several taxa/OTUs exhibiting short-range endemism.</p> <p>The EPA notes that prospective habitat for stygofauna is likely to be extensive and continuous, with taxa distribution indicating dispersal ability.</p> <p>The EPA considers that the proposal is unlikely to have significant impacts on stygofauna from the reduction in habitat through mining and groundwater drawdown. Through implementation of the recommended conditions to limit impacts to stygofauna habitat, combined with the recommended conditions for inland waters, the EPA considers that the environmental outcome is likely to be consistent with the factor objective for subterranean fauna.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b> Limit on groundwater abstraction.</p> <p><b>Condition B3 (inland waters and subterranean fauna)</b> Groundwater drawdown does not exceed the predicted drawdown extent.</p> <p>Limit the percentage loss of likely and possible stygofauna habitat within the 3D habitat model area due to pits and groundwater drawdown.</p> <p><b>Condition B4 (water management plan)</b> Management and monitoring relating to groundwater drawdown.</p> <p><b>Condition B8 (subterranean fauna research program)</b> Improved scientific knowledge to contribute to mitigation of cumulative impacts and to inform adaptive management.</p>
<p>3. Impacts to stygofauna habitat and individuals from water quality changes.</p>	<p>The proposal will result in changes to groundwater quality primarily through increases in salinity in proximity to dewater injection areas. A number of potentially restricted stygofauna taxa are located within the area of predicted salinity change, however, there is evidence available to indicate stygofauna within the area are tolerant of elevated levels of salinity. The EPA also notes that prospective stygofauna is likely to be extensive and continuous, with taxa distribution indicating dispersal ability.</p> <p>The EPA considers that the proposal is unlikely to have a significant impact on stygofauna from increases</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b> Limit on reinjection volume.</p> <p><b>Condition B3 (inland waters and subterranean fauna)</b> Maintain groundwater quality to support stygofauna habitat.</p> <p>No detectable decrease in stygofauna diversity relative to baseline.</p> <p><b>Condition B4 (water management plan)</b> Management and monitoring relating to groundwater quality changes.</p> <p><b>Condition B8 (subterranean fauna research program)</b></p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>in salinity associated with aquifer reinjection. Through implementation of the recommended conditions to limit impacts to stygofauna habitat, combined with the recommended conditions for inland waters, the EPA considers that the environmental outcome is likely to be consistent with the factor objective for subterranean fauna.</p> <p>Further understanding of the potential for troglofauna to recolonise backfilled pit voids will be obtained through implementation of the subterranean fauna research program (recommended condition B8).</p>	<p>Improved scientific knowledge to contribute to mitigation of cumulative impacts and to inform adaptive management.</p>

## 2.5 Social Surroundings

### 2.5.1 Environmental objective

The EPA environmental objective for social surroundings is to protect social surroundings from significant harm (EPA 2023a).

### 2.5.2 Investigations and surveys

The EPA advises the following investigations and surveys were used to inform the assessment of the potential impacts to social surroundings:

- Asbestiform minerals and asbestos containing material, preliminary environmental site assessment (appendix 13 of the environmental review document) (JBS&G 2023a)
- Voluntary auditor's report (appendix 14 of the environmental review document) (Senversa 2023)
- Mulga East Iron Ore Project – Baseline soil and landform assessment (appendix 15 of the environmental review document) (Mine Earth 2021)
- Phase 2 Mulga East Iron Ore Project – Ambient air quality monitoring program technical report (appendix 18 of the environmental review document) (SLR Consulting 2020a)
- Phase 2 Mulga East Iron Ore Project – Noise monitoring program technical report (appendix 19 of the environmental review document) (SLR Consulting 2020b)
- Mulga Downs Iron Ore Mine – Noise and vibration desktop assessment (appendix 20 of the environmental review document) (JBS&G 2023c)
- Mulga Downs Iron Ore Mine – Visual impact assessment (appendix 21 of the environmental review document) (Ecoscape 2024)
- Report of an ethnobotanical survey of Mulga Downs Iron Ore Mine & Hub and Rail Spur (appendix 23 of the environmental review document) (ACHM 2024a) [confidential]
- Environmental noise assessment – Mulga Downs mining operations (appendix 27 of the environmental review document) (Lloyd George Acoustics 2024)
- Social Surroundings Assessment 6-10 May 2024 - Section 38 Mulga Downs Iron Ore Project (appendix 30 of the environmental review document) (ACHM 2024b) [confidential]

The EPA considered that the relevant studies are appropriate to inform the assessment of the potential impacts to the above environmental factor.

The EPA sought advice from the Department of Health in relation to the potential impacts associated with the Wittenoom Asbestos Management Area.

### 2.5.3 Assessment context: existing environment

#### Land use and tenure

The proposal is located within the Mulga Downs Pastoral Station. The area is sparsely populated with the closest regional town, Tom Price, located approximately 110 km to the southwest. In addition, the Wirrilimarra community is located approximately 7.5 km southeast of the development envelope, and the Youngaleena community is approximately 10 km to the south.

The Wittenoom Asbestos Management Area is located approximately 4.3 km to the west, with the town of Wittenoom degazetted in 2007 and closed in 2013.

Karijini National Park is located approximately 16 km to the southwest of the proposal, and contains significant cultural, environmental, and tourism values.

#### Aboriginal cultural heritage

The proposal is located entirely within the Banjima native title claim (WAD6096/1998), which was determined in 2011 (Figure 17). The Banjima Traditional Owners are represented by BNTAC.

Results of desktop research indicated that there were six registered sites and 134 lodged heritage places, of which five registered and 33 lodged intersected the indicative disturbance footprint. Surveys completed in conjunction with the Banjima People recorded a total of 303 heritage sites within the development envelope, and 41 within the indicative disturbance footprint.

An important cultural heritage site, referred to as Mungurrdu (ACH-00040484), is associated with the Goodiadarrie Swamp to the south of the development envelope. During the assessment process, the proponent amended the proposal to excise this site from the development envelope and reduced the pit depth and mining rate to minimise impacts associated with groundwater drawdown and mounding.

### 2.5.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (HanRoy 2025b).

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in the following sections. As described in Section 1 above, the EPA has considered comments received from BNTAC within and outside consultation periods in its assessment of impacts to social surroundings values.

### 2.5.5 Potential impacts from the proposal

The proponent has identified that the proposal has the potential to impact on social surroundings through:

- disturbance of Aboriginal heritage sites and values from clearing and ground disturbance

- impacts to Aboriginal heritage sites due to vibration associated with blasting, including rock shelters
- changes to hydrological regimes resulting in impacts to culturally significant places (such as Mungurrdu), flora, and fauna.
- constraints on access to Country for traditional use
- increase traffic on public roads
- reduced amenity from noise, dust, vibration, or light
- reduced visual amenity from clearing and the construction of infrastructure, including permanent waste rock dumps and pit voids.

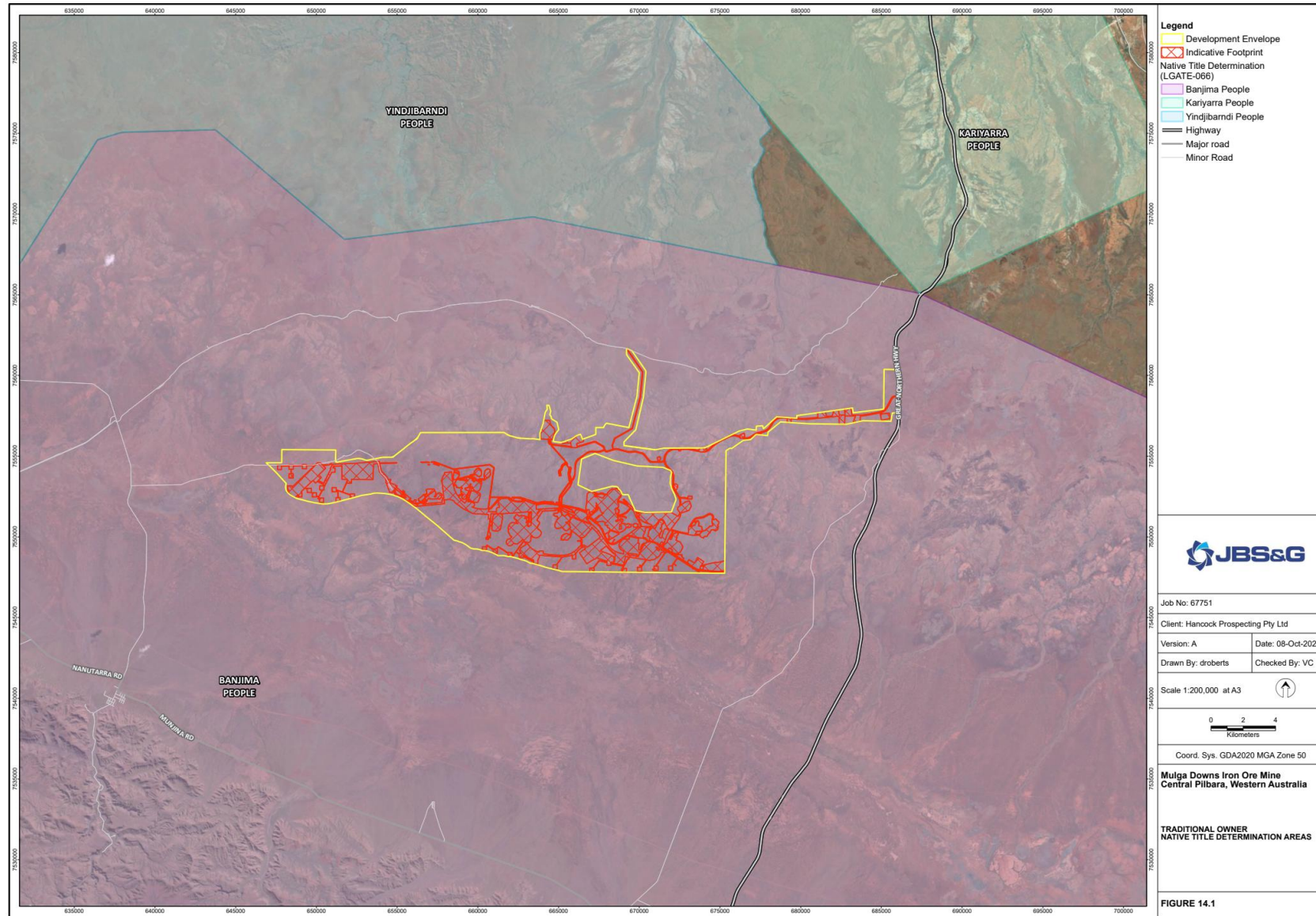


Figure 17: Native title determination areas (Figure 14-1 of JBS&Gc)

### 2.5.6 Avoidance measures

The proponent has proposed the following avoidance measures:

- removal of the culturally significant site Mungurrdu from the development envelope to avoid direct impacts
- design the proposal to avoid direct disturbance to certain Aboriginal heritage sites.

### 2.5.7 Minimisation measures (including regulation by other DMAs)

The proponent outlined the following minimisation measures to reduce both direct and indirect impacts to social surroundings:

- ongoing access to Country used for cultural or traditional purposes
- ongoing consultation regarding monitoring and management of impacts to cultural values
- sealing of the haul road to reduce generation of dust emissions
- cultural awareness training for on-site personnel
- design permanent landforms and implement progressive rehabilitation to blend into the surrounding landscape
- backfilling of pits to above the pre-mining water table.

#### Aboriginal Heritage Act 1972

Approval under the *Aboriginal Heritage Act 1972* (AH Act) is required prior to directly disturbing registered heritage sites. This approval process requires consultation with relevant traditional owners, in this case being the Banjima People. The proponent has advised that a cultural heritage management plan is currently being developed with BNTAC, on behalf of the Banjima People, which will be used to support any applications for consent under section 18 of the AH Act. The EPA notes that the AH Act does not apply to sites outside the development envelope, or to indirect impacts within the development envelope.

#### Part V of the EP Act and the Mining Act

Approval processes under Part V of the EP Act and the Mining Act are required for the construction, operation, and closure of waste rock landforms to ensure these landforms are safe, stable, and non-polluting. The EPA considers that these regulatory processes can assist in minimising potential impacts, including ensuring safe access to Country post-closure.

### 2.5.8 Rehabilitation measures

The proponent has proposed the following rehabilitation measures (JBS&G 2025c):

- construction and operational areas that are no longer required will be progressively rehabilitated throughout the life of the mine

- permanent landforms to be designed in consultation with the Banjima Traditional Owners
- rehabilitation will include native species of local provenance and will be informed by consultation with the Banjima Traditional Owners.

The issues raised during the public consultation have been partially addressed through the proposed minimisation measures, including progressive rehabilitation.

### 2.5.9 Assessment of impacts to environmental values

The EPA considered that the key social surroundings values likely to be impacted by the proposal are Aboriginal cultural heritage, noise, and visual amenity. It is noted that impacts to Aboriginal cultural heritage values may occur through impacts to flora and vegetation, terrestrial fauna, inland waters, and subterranean fauna (see Sections 2.1, 2.2, 2.3, and 2.4).

One non-Aboriginal heritage site was identified near the development envelope, the Mulga Downs shearing shed (ID 01745). The EPA considers that there is unlikely to be residual impacts to this site and therefore has not discussed this further. There is unlikely to be any residual impacts to non-Aboriginal heritage sites.

#### Direct impacts to Aboriginal heritage

The proponent expects to directly impact up to 41 sites of Aboriginal cultural heritage through implementation of the proposal. These sites are understood to be artefact scatters (22), culturally modified trees (15), and rockshelters (4). The EPA is aware that consultation is ongoing with the Banjima traditional owners regarding recently identified cultural heritage sites. The EPA understands that some of these sites are currently within the indicative disturbance footprint but will be avoided, with buffer zones, as determined through consultation between the proponent and BNTAC.

Other sites of particular importance to the Banjima people have been identified and discussed during consultation and heritage surveys. This includes Mungurrdu (ACH-00040484), the Koodjeepindarranna Pool, Ngarlganoona Pool (also referred to as Gnalka Gnoona Pool), and Wolly Paddock Law Ground, all of which are outside the development envelope. Numerous heritage sites were also located within the FHEZ. It is unlikely that these sites will be directly impacted by the proposal but may be subject to indirect impacts, as discussed below.

Noting that other regulatory processes can minimise impacts to values of Aboriginal cultural heritage (see Section 2.5.7), the EPA considers that the direct impacts can be further minimised through reasonable conditions. Subject to recommended conditions A1-1 (limits and extents), B6-1 (no disturbance of sites without consent), B6-2 (avoid and minimise adverse impacts), and B6-3 (ongoing consultation), the direct impacts to Aboriginal cultural heritage are unlikely to be significant residual impacts.

## Culturally significant flora and fauna

Implementation of the proposal is likely to result in direct and indirect impacts to flora and fauna of cultural significance. The proponent conducted an ethnobotanical survey with the Banjima Traditional Owners and identified a (non-exhaustive) list of 20 plants use for traditional or cultural purposes (Table 14-7 of JBS&G 2025c). During the survey, the Banjima Traditional Owners also provided recommendations for the cultural and environmental management of significant species, such as establishing native plant nurseries to ensure endemic species are used in rehabilitation efforts.

The EPA notes that recommended conditions as discussed under the flora and vegetation, terrestrial fauna, and inland waters factor are likely to assist in minimising impacts to culturally significant flora and fauna (see Sections 2.1, 2.2, and 2.3).

Subject to the recommended conditions, A1-1 (limits and extents), B1-2 (avoid and minimise impacts to vegetation), B2 (avoid and minimise impacts to fauna), B5 (rehabilitation including local species), and B6-3 (ongoing consultation), the EPA considers that the direct and indirect impacts to culturally significant flora and fauna are unlikely to be significant residual impacts.

## Noise, dust, and vibration

There is potential for noise, dust and vibration from implementation of the proposal to impact the amenity of cultural heritage sites within and outside the development envelope. The proponent has committed to undertaking monitoring and implementing noise, dust, and vibration reduction measures through the CSFMP in the context of flora and vegetation and terrestrial fauna values.

The EPA expects that the cultural heritage management plan being developed is likely to further address impacts from noise, dust, and vibration on sensitive receptors. However, the EPA does not have visibility on this plan as it confidential and still being developed. It is noted that the proponent has committed to sealing the haul road within the development envelope to minimise the generation of dust emissions and revised the haulage route during the assessment process to provide greater separation from the Wirrilimurra community. The proponent has also committed to monitoring and managing dust emissions at the Wirrilimurra and Youngaleena communities, as considered against the air quality factor in Appendix E.

The noise and vibration assessment for the proposal indicates predicted operational noise levels at the nearest communities, homesteads, tourism sites and accommodation facilities are well below Environmental Protection (Noise) Regulations 1997 and relevant guidance for all human receptors. Modelled maximum noise levels at Wirrilimurra and Youngaleena communities are likely to remain lower than existing ambient noise conditions (LGA 2024). Cumulative noise modelling, incorporating mine operations, hub and rail infrastructure, and haulage activities, does not suggest impact to human receptors. Only certain heritage sites located within 100–150 m of haul roads or pit edges are predicted to experience elevated noise levels. Overall, the EPA's assessment considers that the proposal will

not adversely impact human health or amenity at surrounding communities, homesteads or tourism sites. .

The EPA has recommended condition B6-2 (avoid and minimise adverse impacts to Aboriginal cultural heritage) to ensure the proponent avoids and minimises adverse impacts to Aboriginal cultural heritage, including from noise, dust, and vibration. The Banjima Traditional Owners will also be required to be consulted on the achievement of this objective, through recommended condition B6-3. The buffer zones around significant sites, as discussed above, are also likely to minimise impacts from noise, dust, and vibration.

Subject to the EPA's recommended conditions A1-1 (limits and extents of proposal), B1-2 (avoid and minimise impacts from dust), B5 (progressive rehabilitation), B6-2 (avoid and minimise adverse impacts to Aboriginal cultural heritage), B6-3 (consultation on achievement of outcomes and objectives), and regulation under the Mining Act and AH Act, there is unlikely to be significant residual impacts from noise, dust, and vibration.

### Loss of access to Country

The EPA recognises that the land within and near the development envelope is used by the Banjima people for cultural and traditional purposes , such as hunting places, plant resources, and water sources. This includes the site of Mungurrdu and sites within, or near, the FHEZ. The proponent notes that as Mungurrdu is outside of the development envelope, access will not be directly restricted but some areas may have reduced access (such as from the north) during implementation of the proposal.

The proponent states that consultation related to ongoing access is being considered through the development of the cultural heritage management plan with BNTAC, however, access to sites will remain open where safe to do so. Due to safety reasons, pits are likely to remain inaccessible post-closure.

Subject to the EPA's recommended conditions A1-1 (limits and extents of proposal), B5 (progressive rehabilitation), B6-1 (no interruption of access to Country), and B6-3 (consultation on achievement of outcomes and objectives), there is unlikely to be significant residual impacts from the loss of access to land used for cultural or traditional purposes.

### Visual and landscape amenity

Implementation of the proposal will result in temporary and permanent changes to visual amenity, such as the permanent alteration of landforms. The proponent's reduction in the size and scale of mining since referral has reduced the volume of material needed to be moved or extracted. Meaning, upon closure, mine pits are not likely to be as wide or as deep as initially referred. Backfilling of pits to at least above pre-mining groundwater level is also likely to reduce the size of any permanent waste rock dumps.

A visual impact assessment was undertaken to understand the potential impacts on visual amenity at potentially sensitive receptors (Ecoscape 2024). Aside from the

Mulga Downs homestead, which is located 0.3 km to the north of the development envelope and was given a 'moderate' visual impact rating, all other sites, including the Wirrilimurra and Youngaleena communities, were given a rating of 'low'.

The EPA considers that the construction of waste rock landforms will reduce the visual amenity of the surrounding landscape, however, this can be reasonably minimised through proper design and adherence to requirements under Part V of the EP Act and under the Mining Act. The EPA expects that the Banjima traditional owners are consulted on the design of waste rock landforms and has therefore recommended condition B6-4(2) to ensure consultation occurs as part of the approval processes under Part V of the EP Act and the Mining Act.

Subject to the EPA's recommended conditions A1-1 (limits and extents of proposal), B5 (backfilling and progressive rehabilitation), B6-3 (consultation on achievement of outcomes and objectives), and B6-4 (consultation on design of waste rock dumps), the residual impacts to visual amenity are unlikely to be significant.

### Cumulative impacts

The proponent has conducted an assessment of the cumulative impacts across the Banjima Native Title Determination Area (Section 17.9 of JBS&G 2025bc). The EPA has considered the potential cumulative impacts to Aboriginal heritage values in the local area and across the Banjima Native Title Determination Area.

The Banjima Traditional Owners have expressed concern about cumulative impacts to Country in consultation with the proponent and in providing commentary to the EPA. The EPA considers the proponent's commitments to ongoing consultation with Banjima Traditional Owners and the avoidance of sites such as Mungurrdu will contribute to minimising potential cumulative impacts to values of Aboriginal cultural heritage. In addition, the EPA's recommended conditions for no disturbance without consent (B6-1), avoid and minimise adverse impacts (B6-2), and ongoing consultation (B6-3) will reduce the potential for significant cumulative impacts. The EPA's recommended conditions for flora and vegetation, terrestrial fauna, inland waters, and subterranean fauna (see Sections 2.1, 2.2, 2.3, and 2.4) are expected to minimise potential impacts to related culturally important values. Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for social surroundings.

### Rehabilitation and closure

The EPA advises that rehabilitation and closure of the proposal should include timely consideration of environmental outcomes. For long-lived mines, there is a specific need to ensure they are closure ready well in advance of decommissioning through appropriate research, field trials and progressive rehabilitation.

The EPA considers that the regulatory framework under the Mining Act is appropriate to consider some aspects of mine closure, such as landform stability. However, certain environmental outcomes are required to ensure that rehabilitation and closure of the proposal minimise impacts to values of social surroundings. The EPA has recommended condition B5 to include specific environmental outcomes

relating to rehabilitation, including progressive rehabilitation, and recommended condition B6 to ensure the Traditional Owners are consulted on the achievement of these outcomes.

## 2.5.9 Summary of key factor assessment and recommended regulation

**Table 10: Summary of assessment for social surroundings**

Residual impact		Assessment finding	Recommended conditions and DMA regulation
1.	Direct impacts to Aboriginal heritage features/sites.	<p>The EPA considers that there are residual impacts to sites of Aboriginal cultural heritage associated with the clearing for the proposal. This includes disturbance of ethnographic or archaeological sites.</p> <p>It is noted that the proponent is required to seek approval to directly disturb Aboriginal cultural heritage sites.</p> <p>The EPA advises that the proposal should be subject to recommended condition B6 to ensure there is no disturbance to heritage sites unless consent is granted under the AH Act and has involved consultation with the Traditional Owners.</p> <p>Subject to the recommended conditions and DMA regulation, the environmental outcome is likely to be consistent with the EPA's objective for social surroundings.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B5 (Rehabilitation)</b></p> <p>Rehabilitated areas are stable, self-sustaining, and consistent of diverse species of local provenance.</p> <p><b>Condition B6 (Aboriginal cultural heritage)</b></p> <p>No direct disturbance of sites unless consent is granted under the ACH Act.</p> <p>Requirement to consult with the Traditional Owners on management and monitoring of direct impacts.</p> <p>Avoid and minimise adverse impacts to Aboriginal cultural heritage.</p> <p><b>DMA legislation</b></p> <p>The Department of Planning, Lands and Heritage can regulate disturbance of cultural heritage sites under the AH Act.</p>
2.	Indirect impacts to Aboriginal heritage features/sites.	<p>The EPA considers that there is a risk of residual indirect impacts on Aboriginal heritage sites. This includes potential disturbance from noise, dust, and vibration on sensitive receptors, and changes to hydrological regimes impacting Mungurrdu.</p> <p>The EPA considers that the proponent should implement measures to reduce the risk of indirect impacts. It is noted that the proponent has committed to dust monitoring at the Wirrilimurra and Youngaleena communities and relocated the haulage route away</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B1 (Flora and vegetation)</b></p> <p>Avoid and minimise impacts to locally significant vegetation and surface water dependent vegetation.</p> <p><b>Condition B3 (Inland waters)</b></p> <p>Groundwater drawdown and mounding to do not exceed the extent predicted.</p>

Residual impact	Assessment finding	Recommended conditions and DMA regulation
	<p>from the community to minimise disturbance. The proponent will be required to monitor surface and groundwater regimes and minimise impact to surface water dependent vegetation.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for social surroundings.</p>	<p><b>Condition B6 (Aboriginal cultural heritage)</b></p> <p>Requirement to consult with the Traditional Owners on management and monitoring of direct impacts.</p> <p>Avoid and minimise adverse impacts to Aboriginal cultural heritage.</p>
3.	<p>Loss or restriction of access to land for cultural purposes.</p> <p>The EPA considers that there is a residual impact to Aboriginal cultural heritage through the loss or restriction of access to land used for traditional or cultural purposes. The EPA recommends condition B6-1(2) to ensure access to land is maintained.</p> <p>Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA's objective for social surroundings.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B6 (Aboriginal cultural heritage)</b></p> <p>No interruption of ongoing access to land utilised for traditional use or custom by the relevant Traditional Owners.</p>
4.	<p>Visual and landscape impacts.</p> <p>The EPA advises that there is a residual impact to visual and landscape amenity from implementation of the proposal. The EPA considers that the Traditional Owners should be consulted on the end land use post-closure. This includes the design of permanent landforms, such as waste rock dumps, which are regulated under Part V of the EP Act and under the Mining Act. Subject to the recommended conditions and regulation under the Mining Act, the environmental outcome is likely to be consistent with the EPA's objective for social surroundings.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p><b>Condition B5 (Rehabilitation)</b></p> <p>Rehabilitated areas are stable, self-sustaining, and consistent of diverse species of local provenance.</p> <p><b>Condition B6 (Aboriginal cultural heritage)</b></p> <p>Consultation on the design of waste rock landforms must involve the Traditional Owners.</p> <p><b>DMA legislation</b></p> <p>DMPE can regulate rehabilitation, including progressive rehabilitation, through the MDCP, required under the Mining Act as supported by recommended condition B5.</p>

## 2.6 Greenhouse gas emissions

### 2.6.1 Environmental objective

The EPA environmental objective for greenhouse gas emissions is to minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable (EPA 2024a).

### 2.6.2 Assessment context

Greenhouse gas emissions (GHG) emissions from a cumulative range of sources have an impact on Western Australia's environment, even if the specific impact of a particular proposal's emissions may not be known with certainty. This is because there is an established link between GHG emissions and the risk of climate change. The EPA recognises that climate change will have an impact on Western Australia's environment and environmental values. For example, climate change has already caused a significant drying of the state's south-west, which in turn places significant additional pressures on water resources, flora and fauna, marine environmental quality, and social surroundings. The EPA therefore considers GHG emissions to be a key environmental factor in the assessment of the proposal.

There is also an established correlation between global temperature rise and greenhouse gas emissions. The EPA advises that for every 1,000 billion tonnes of CO<sub>2</sub> emitted by human activity, global surface temperature rises by 0.45°C, as a best estimate, with a likely range from 0.27°C to 0.63°C (IPCC 2023). The EPA's guidance on GHG emissions (EPA 2024a) provides that GHG emissions from a proposal will be considered where they are reasonably likely to exceed 100,000 tonnes (t) of carbon dioxide equivalents (CO<sub>2</sub>-e) of scope 1 or scope 2 emissions in any year. This is the same as the (scope 1) threshold criteria for designation of a large facility under the Australian Government's Commonwealth Safeguard Mechanism. The annual average scope 1 emissions estimates provided by the proponent exceed this threshold. Scope 3 emissions for the proposal are also expected to exceed 100,000 t CO<sub>2</sub>-e per annum.

### 2.6.3 Potential emissions from the proposal

Scope 1 GHG emissions resulting from construction activities relate to diesel consumption and vegetation clearing. Peak annual scope 1 emissions during the construction phase are estimated to be 62,393 t CO<sub>2</sub>-e per year. Vegetation clearing for construction of the proposal is estimated to result in a total of 210,421 t CO<sub>2</sub>-e GHG emissions over the life of the proposal.

The proponent has estimated that annual average scope 1 emissions during operations will be 256,102 t CO<sub>2</sub>-e, peaking at 334,641 t CO<sub>2</sub>-e in year three (nominally 2028). Scope 1 emissions primarily arise from the combustion of fuels (diesel and gas) for mining activities, electricity production, groundwater abstraction, haul truck operation, haulage of ore via road trains to rail siding (Hillside Siding), and rail haulage of ore to Utah Point.

No scope 2 emissions are expected noting that electricity demand will be met through on-site generation, captured in the scope 1 emissions estimates.

Scope 3 emissions have not been comprehensively estimated noting that some indirect emissions, such as the supply of materials for construction and operations, were unable to be reasonably estimated given the stage of project definition. The majority of scope 3 emissions for the proposal relate to the downstream sea freight and processing of iron ore for production of steel. Annual average Scope 3 emissions were estimated to be 14.584 million t CO<sub>2</sub>-e, with approximately 99% of this being associated with the smelting of iron ore into steel.

The EPA considers that the proponent's estimated GHG emission quantities are a reasonable basis for the assessment.

### Cumulative impacts

The annual scope 1 GHG from the proposal without mitigation of 256,102 t of CO<sub>2</sub>-e would constitute approximately 0.3% of Western Australia's total emissions and 0.05% of Australia's reported GHG emissions for the 2022/2023 financial year (DCCEE 2025b).

#### 2.6.4 Consultation

Stakeholder consultation did not raise any concerns relating to GHG.

#### 2.6.5 Avoidance and minimisation measures

The proponent has identified the following measures to avoid and minimise GHG emissions:

- use of a connected electricity distribution network to avoid the use of small-scale diesel generators
- development of a centralised power station incorporating gas engines, battery storage and solar production
- implementation of various energy efficiency initiatives to reduce vehicle fuel consumption
- use of existing rail infrastructure for the transport of ore to port.

### Best practice

The proponent stated that best practice measures have been incorporated throughout the project planning process to avoid and minimise GHG emissions. In particular, the EPA notes the proposed implementation of a hybrid power station incorporating gas and solar power generation. The proponent has forecast that solar generation will, at commencement, provide approximately 38% of the base load electrical demand. Further GHG emissions reductions may be achieved through electrification of the mining fleet combined with increased renewable electricity generation. The EPA notes that the proponent may consider expanding solar generation capacity to support increased electrification in the future as technology advances and becomes commercially available.

## Benchmarking

The proponent has benchmarked the proposal against comparable iron ore operations in the Pilbara and demonstrated that its emissions intensity of 0.0070 t CO<sub>2</sub>-e per tonne of iron ore is comparable to, or lower than, other identified operations. Although this intensity is higher than the Safeguard Mechanism's iron ore default (0.00476 t CO<sub>2</sub>-e per tonne of iron ore) and best-practice benchmark (0.00188 t CO<sub>2</sub>-e per tonne of iron ore), these emission intensities reflect the performance of Australia's most efficient iron ore operations. The EPA considers the proponent's emission intensity estimate reasonable given the proposal's compassion to other operations with similar geological and operational conditions that inherently impact energy use.

### 2.6.6 Scope 3 GHG emissions

Scope 3 emissions relating to this proposal predominantly (>99%) relate to the processing of mined iron ore into steel products and are estimated to be 14.584 million t CO<sub>2</sub>-e per annum. The EPA recognizes the proponent's participation in research activities exploring low emission steel production technologies that may result in a reduction to scope 3 emissions in the future. The EPA also notes that the proponent has identified that downstream processing of iron ore is likely to occur within countries that are signatories to the Paris Agreement or have legislated carbon reduction (Taiwan). The EPA considers that scope 3 emissions for this proposal will represent scope 1 emissions in jurisdictions with independent emissions reductions targets. The EPA encourages the proponent to take all reasonable measures to reduce scope 3 emissions.

### 2.6.7 Commonwealth Safeguard Mechanism

The proponent has advised that the proposal is unlikely to be classified as a Safeguard Facility under the Australian Government's Safeguard Mechanism given that the road haulage and mining operation will be treated as separate facilities under the National Greenhouse and Energy Reporting Scheme. Consistent with current practice, the EPA regards emissions associated with haulage of ore from the proposal to be proposal-related scope 1 emissions, which is reflected in the proponent's scope 1 estimate of 256,102 t CO<sub>2</sub>-e per annum. The EPA is of the view that in this instance the Safeguard Mechanism will not require the reduction of scope 1 emissions, however, the proponent has committed to achieve consistency with the EPA's environmental factor for GHG emissions (see section 2.6.8), with this commitment reflected in recommended condition A1.

### 2.6.8 Emissions trajectory and offsets

The proponent has provided an emissions trajectory for the life of the proposal with the application of emissions reductions actions and offsets (Figure 18).

The EPA notes that the proponent has committed to maintain net scope 1 greenhouse gas emissions under 100,000 t CO<sub>2</sub>-e per annum for the life of the proposal (JBS&G 2025c). This commitment was formalised through an amendment to the proposal under s43A of the EP Act in September 2025. As shown in Figure 18, the proponent has committed to net scope 1 emissions of no more than 100,000 t CO<sub>2</sub>-e per annum through emissions avoidance and reduction measures and, where required, offsets.

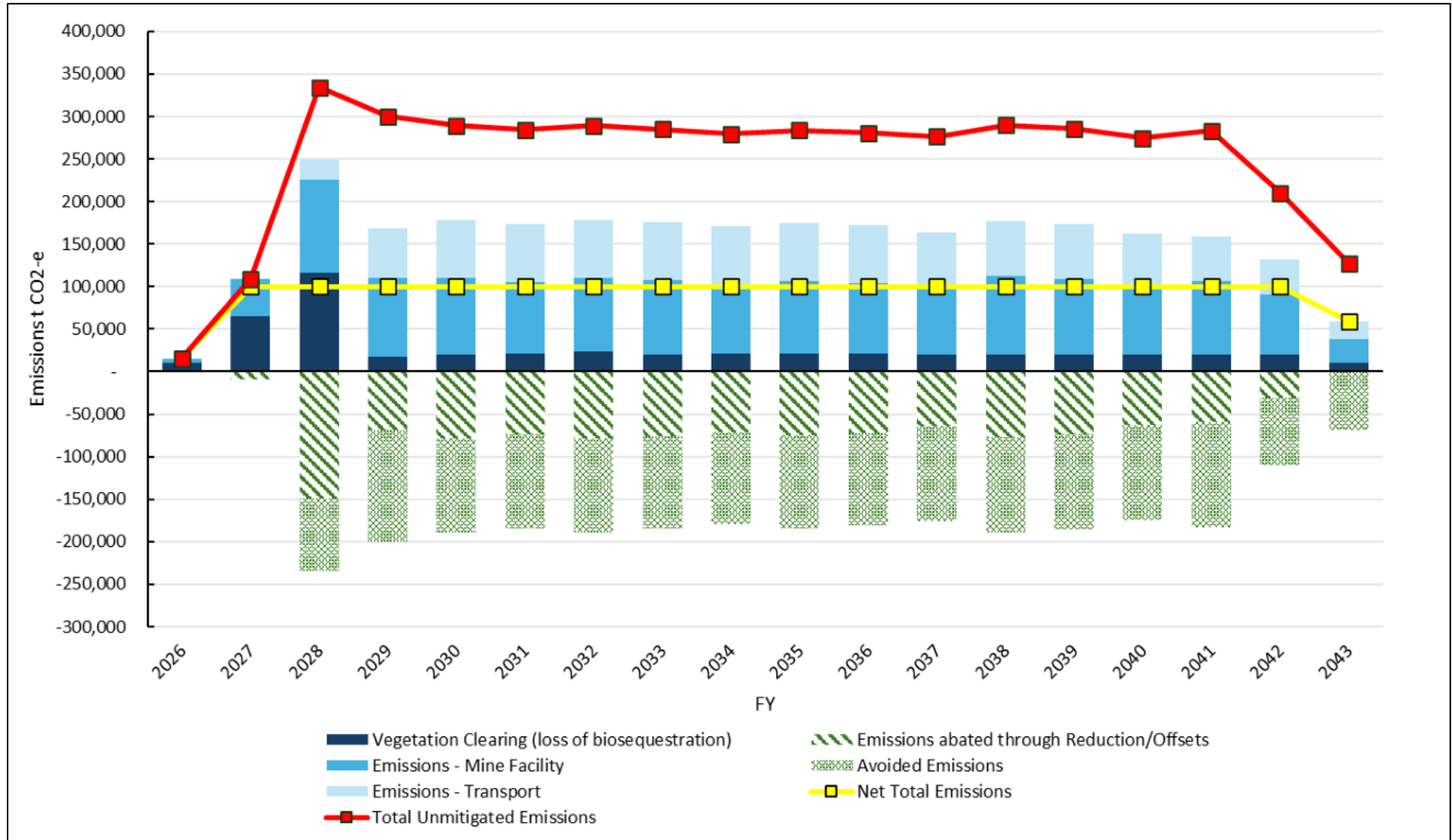


Figure 18: Proposal emissions trajectory (Figure 12.1 of JBS&G 2025c)

The EPA notes that the proponent has forecast that a substantial proportion (approximately 40% of emissions reductions) of offsets will be required to maintain net scope 1 emissions below the 100,000 t CO<sub>2</sub>-e per annum threshold. The proponent has stated that the required offsets will be through recognised carbon offset programs, such as:

- Australian Carbon Credit Units issued under the *Carbon Credits (Carbon Farming Initiative) Act 2011*
- Safeguard Mechanism Credits issued under the *Safeguard Mechanism (Crediting) Amendment Act 2023*.

The EPA notes that the proponent has undertaken due diligence investigations and has advised that sufficient offsets are likely to be available over the timeframe of the proposal. The EPA advises that carbon offsets required should demonstrate they meet offset integrity principles, and be based on clear, enforceable and accountable methods.

### 2.6.8 Summary of key factor assessment and recommended regulation

The EPA considers that the emissions avoidance, minimisation and offsets proposed by the proponent are generally consistent with the EPA factor objective to minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable.

The EPA recognises that based on the proponent's emissions estimates the Commonwealth Safeguard Mechanism is not expected to apply to the proposal and require the proponent to take action to reduce GHG emissions. The EPA notes that the proposal under assessment has been amended to reflect the proponent's commitment to maintain net scope 1 emissions, including haulage, below the 100,000 t CO<sub>2</sub>-e per annum threshold through the application of emissions reduction measures and offsets as required. The EPA's recommended conditions (recommended condition A1) require the proponent to adhere to the above stated commitment to ensure that net scope 1 emissions do not exceed 100,000 t CO<sub>2</sub>-e per annum. The EPA therefore considers that emissions reductions through implementing best practice measures as part of this proposal, in conjunction with the EPA's recommended condition limiting annual net scope 1 emissions to under 100,000 t CO<sub>2</sub>-e, is likely to reduce GHG gas emissions as far as practicable for this proposal and achieve consistency with the environmental factor objective for GHG emissions.

Scope 3 emissions form a large proportion of the total GHG emissions over the life of the combined proposal and are estimated to be, on average, 14.584 million t CO<sub>2</sub>-e per annum. The EPA encourages the proponent to take further reasonable opportunities to reduce scope 3 emissions as they arise through the life of the proposal.

**Table 11: Summary of assessment for greenhouse gas emissions**

Emissions	Assessment finding	Recommended conditions and DMA regulation
<p>1. Without mitigation Scope 1 emissions, inclusive of haulage, are expected to average 256,102 t CO<sub>2</sub>-e per annum (up to a maximum of 334,641 t CO<sub>2</sub>-e in the third year of implementation).</p> <p>There are no scope 2 emissions associated with this proposal.</p> <p>Scope 3 GHG emissions are estimated to be 14.584 million t CO<sub>2</sub>-e per annum.</p>	<p>The proponent has adopted avoidance and mitigation measures to reduce GHG emissions at commencement of the proposal. Scope 1 emissions from road haulage and mining operations are regarded as separate facilities under the National Greenhouse and Energy Reporting Scheme, as a result the proposal scope 1 emissions are not expected to be covered under the Safeguard Mechanism.</p> <p>The proponent has committed to achieving net proposal scope 1 emissions below the default threshold of 100,000 t CO<sub>2</sub>-e per annum for the life of the proposal. The EPA notes that this limit is likely to be achieved through a combination of direct emissions reductions measures and offsets. The proponent has undertaken due diligence that indicates that offsets, that meet relevant integrity principles, will be available over the course of the proposal.</p> <p>The EPA advises that emissions reductions through implementing best practice measures, and the EPA's recommended condition limiting annual net scope 1 emissions to under 100,000 t CO<sub>2</sub>-e, is likely to reduce GHG gas emissions as far as practicable for this proposal and achieve consistency with the environmental factor objective for GHG emissions.</p>	<p><b>Condition A1 (Limitations and extent of proposal)</b></p> <p>Net scope 1 emissions limited to no more than 100,000 t CO<sub>2</sub>-e per annum.</p>

### 3 Holistic assessment

While the EPA assessed the impacts of the proposal against the key environmental factors and environmental values individually in the key factor assessments above, given the link between inland waters, flora and vegetation, terrestrial fauna, subterranean fauna, social surroundings, and greenhouse gas emissions the EPA also considered connections and interactions between them to inform a holistic view of impacts to the whole environment.

#### Flora and vegetation – terrestrial fauna – inland waters – subterranean fauna

There is a high-level of connectivity between flora and vegetation, terrestrial fauna, inland waters, and subterranean fauna. Flora and vegetation, terrestrial fauna, and subterranean fauna have an integral reliance on inland waters to sustain and maintain growth.

The surface water catchments and groundwater aquifers support vegetation, including riparian vegetation, and fauna habitat. Surface water pools and waterways provide a source of water for flora, vegetation, and terrestrial fauna. In addition, surface water promotes growth of habitat that supports conservation significant and short-range endemic species. Minimising impacts to values of inland waters will also minimise impacts to significant flora and fauna species, vegetation, subterranean fauna, and fauna habitat.

Flora and vegetation provide shelter, dispersal, foraging, breeding, and/or roosting habitat for significant fauna, such as the Pilbara leaf-nosed bat, northern quoll, and grey falcon. Minimising impacts to flora and vegetation will minimise impacts to terrestrial fauna.

The EPA considers that the proposed mitigation and management measures and recommended conditions for managing impacts to inland waters will also mean the interrelated impacts to the health of other factors, including the values associated with flora and vegetation, terrestrial fauna, and subterranean fauna, are likely to be consistent with the EPA environmental factor objectives. In addition, the EPA considers that the recommended conditions and proposed mitigation and management measures for impacts to flora and vegetation will also mean the interrelated impacts to values of terrestrial fauna are likely to be consistent with the EPA environmental factor objective.

#### Greenhouse Gas Emissions

There is an established link between GHG emissions and the risk of climate change. The EPA recognises that climate change will impact on Western Australia's environment and environmental values.

The EPA considers that the proposed limit on net scope 1 greenhouse gas emissions of 100,000 tonnes CO<sub>2</sub>-e per annum (recommended condition A1-1) will

ensure that the impacts to other factors and values of the environmental are likely to be consistent with the EPA environmental factor objectives.

#### Social surroundings

There is a direct link between Aboriginal culture and the physical or biological aspects of the environment. Access to land, ability to carry out traditional Aboriginal customs and areas of cultural importance may be impacted through impacts to environmental factors of flora and vegetation, terrestrial fauna and inland waters. Water resources are important to the Banjima Traditional Owners, and the EPA recognises the strong cultural links between the Banjima People and values of inland waters, flora and vegetation, and terrestrial fauna.

In particular, the adjacent culturally significant site Mungurrdu is intrinsically linked to the health of physical and biological aspects, as the Mungurrdu site encapsulates an important wetland that is fed by surface water runoff and supports such values as conservation significant fauna, migratory bird species, priority flora, and PECs.

The EPA considers that the proposed mitigation and management measures, recommended conditions, and management under other regulatory processes for impacts to values of flora and vegetation, terrestrial fauna and inland waters will also mean the interrelated impacts to the values of social surroundings will likely be consistent with the EPA environmental factor objectives.

#### Summary of holistic assessment

When the separate environmental factors and values affected by the proposal were considered together in a holistic assessment, the EPA formed the view that the impacts from the proposal would not alter the EPA's views about consistency with the EPA's factor objectives as assessed in section 2.

## 4 Offsets

Environmental offsets are actions that provide environmental benefits which counterbalance the significant residual impacts of a proposal.

Consistent with the *WA Environmental Offsets Guidelines* (Government of Western Australia 2014), the EPA may consider the application of environmental offsets to a proposal where it determines that the residual impacts of a proposal are significant, after avoidance, minimisation and rehabilitation have been pursued.

The EPA considers that the clearing of native vegetation and impacts on other associated environmental values in the Pilbara IBRA bioregion is significant where the cumulative impact may reach critical levels if not managed (EPA 2014). The Pilbara's unique land tenure hampers the delivery of offsets, and the Pilbara Environmental Offsets Fund (PEOF) has been established to provide a strategic landscape-scale approach that builds on regional programs to deliver environmental offset outcomes greater than can be achieved by individual proposals.

Projects currently being delivered through the PEOF include weed management and coordinated fire management at the Woodstock Abydos Aboriginal Reserve, , feral predator management in the area adjacent to the Purungunya – Meentheena Conservation Park, and an eradication program of *Parkinsonia aculeata* along parts of the Shaw and Oakover Rivers. Together, these programs are aiming to control threatening processes to improve vegetation condition and habitat for threatened fauna. The DBCA is also reviewing and developing management and research priorities for northern quoll, greater bilby, ghost bat, Pilbara leaf-nosed bat and Pilbara olive python to guide future investment in fauna programs (Government of Western Australia 2023b).

In the case of this proposal, likely (and potential) significant impacts are:

- loss of flora and vegetation values
- loss of significant fauna habitat values.

In applying the residual impact significance model (Government of Western Australia 2014), the EPA considers the proposal would result in significant residual impacts to:

- 'Good' to 'Excellent' condition native vegetation
- Wona Land System PEC
- riparian vegetation
- critical habitat for the greater bilby, grey falcon, night parrot, northern quoll, and Pilbara olive python
- supporting habitat for the ghost bat, greater bilby, grey falcon, night parrot, northern quoll, Pilbara leaf-nosed bat, and Pilbara olive python.

The EPA has concluded that the clearing of habitat is a significant residual impact on its own, in the context of the proposal, and in the context of the biological diversity and ecological integrity in the local area, as it provides habitat for threatened fauna

species. Due to the remaining quantity and quality of habitat types in the local area and region, the EPA considers that some of the significant residual impacts could be counterbalanced through a contribution to the PEOF. The EPA considers future PEOF projects are expected to be able to collectively counterbalance the significant impacts from the clearing of native vegetation and critical fauna habitat of the proposal. The EPA notes the PEOF Governance Framework (DWER 2019) states that projects will aim to counterbalance the significant residual impacts that have been identified in Ministerial Statements with projects that are designed to deliver enduring and long-term strategic conservation outcomes in the Pilbara. The PEOF Implementation Plans identify the significant residual impacts for which contributions to the Fund have been made and how they will be addressed.

The EPA recommends condition B7 be imposed on the proponent to provide an offset in the form of a contribution to the PEOF, to counterbalance most of the significant residual impacts of the proposal. PEOF has been consulted regarding this proposal and has been informed of the environmental values requiring offset through the program. PEOF has confirmed that the environmental values anticipated to be impacted by this proposal are consistent with those addressed by projects currently being implemented or developed under the PEOF program.

The EPA recommends that the offset rates included in recommended condition B7 (calculated on the 2024-2025 financial year, subject to annual indexation) should apply in the form of a contribution to the PEOF for landscape-scale actions to protect biodiversity in the Pilbara.

## 5 Recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values which may be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- likely environmental outcomes which can be achieved with the imposition of conditions
- consistency of environmental outcomes with the EPA's objectives for the key environmental factors
- EPA's confidence in the proponent's proposed mitigation measures
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment
- principles of the EP Act.

The EPA recommends that the proposal may be implemented subject to the conditions recommended in Appendix A.

## 6 Other advice

The EPA may, if it sees fit, include other information, advice or recommendations relevant to the environment in its assessment reports, even if that information has not been taken into account by the EPA in its assessment of a proposal.

### Rehabilitation

The EPA may, where appropriate, include additional information, advice, or recommendations relevant to the environment in its assessment reports, even if such information was not directly considered in the assessment of a proposal. In this context, the EPA reiterates its section 16(e) advice to the Minister on the cumulative environmental impacts of development in the Pilbara region (EPA 2014), noting that mining has occurred in the Pilbara for over 60 years, yet there is limited evidence that proponents have successfully rehabilitated areas subject to large-scale mining.

Through the recommended conditions for this proposal and broader strategic engagement with proponents, the EPA expects to see tangible progress toward demonstrating that rehabilitation can be achieved at appropriate rates and scales post-mining, and that the widening gap between cleared and rehabilitated areas is being progressively reduced.

The technical and practical feasibility of proposed rehabilitation measures will remain a key consideration in the environmental impact assessment of future mining projects in the Pilbara. Accordingly, understanding the successes and challenges of current rehabilitation efforts, as well as forward planning, will be critical for future assessments. The EPA also emphasises that rehabilitation and closure planning should actively involve Traditional Owners at all stages, including the design of waste landforms.

## Appendix A: Recommended conditions

Section 44(2)(b) of *Environmental Protection Act 1986* specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This appendix contains the EPA's recommended conditions and procedures.

### Recommended Environmental Conditions

#### STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (*Environmental Protection Act 1986*)

##### MULGA DOWNS IRON ORE MINE

**Proposal:** The proposal is for the development of the Mulga Downs Iron Ore Mine located 210 km south of Port Hedland and 180 km north west of Newman in the Pilbara Region of Western Australia.

The proposal includes the development of above and below water table mine pits, dry ore crushing and screening plant(s), groundwater abstraction, surplus water management via managed aquifer recharge and/or in pit infiltration, waste rock dumps, infrastructure to manage surface water, linear infrastructure, mine associated infrastructure and support facilities, and transport of the ore via the Great Northern Highway to Port Hedland, or to a siding along Roy Hill railway infrastructure for export.

**Proponent:** Hancock Prospecting Pty Ltd  
Australian Business Number 69 008 676 417

**Proponent address:** 28-42 Ventnor Avenue  
WEST PERTH WA 6005

**Assessment number:** 2326

**Report of the Environmental Protection Authority:** 1803

**Introduction:** Pursuant to section 45 of the *Environmental Protection Act 1986*, it has been agreed that the proposal entitled Mulga Downs Iron Ore Mine described in the 'Proposal Content Document' attachment of the referral of 24 December 2021, as amended by the change to proposal approved under s. 43A on 26 May 2023, 23 February 2024, 4 October 2024, and 30 September 2025, may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

**Conditions and procedures**

**Part A: Proposal extent**

**Part B: Environmental outcomes, prescriptions and objectives**

**Part C: Environmental management plans and monitoring**

**Part D: Compliance and other conditions**

## PART A: PROPOSAL EXTENT

### Limitations and Extent of Proposal

A1-1 The proponent must ensure that the proposal is implemented in such a manner that the following limitations or maximum extents / capacities / ranges are not exceeded:

Proposal element	Location	Maximum extent
Physical elements		
<b>Development envelope</b>	Figure 1	No more than 16,848.53 ha.
<b>Disturbance footprint</b>	Within the <b>development envelope</b> shown in Figure 1	No more than 4,339.16 ha.
Direct <b>disturbance</b> of native vegetation	Within the <b>development envelope</b> shown in Figure 1	<b>Clearing</b> of no more than 4,296.93 ha of <b>'Good' to 'Excellent' condition native vegetation.</b>
<b>Riparian vegetation</b>	Shown in Figure 3	<b>Clearing</b> of no more than 17.27 ha.
<b>Wona Land System PEC</b>	Shown in Figure 5	<b>Clearing</b> of no more than 70.31 ha.
<b>Freshwater Claypan PEC</b>	Shown in Figure 5	No direct <b>disturbance</b> , excluding <b>monitoring and management activities.</b>
<b>FHEZ</b>	Shown in Figure 2	No direct <b>disturbance</b> , excluding <b>monitoring and management activities.</b>
<b>FHEZ Corridor</b>	Shown in Figure 2	No direct <b>disturbance</b> , excluding <b>monitoring and management activities.</b>
<b>LIAA</b>	Shown in Figure 2	<b>Clearing</b> of no more than 5.0 ha.
<b>Bat caves</b>	Shown in Figure 3	No direct <b>disturbance</b> of any <b>bat caves</b> , excluding: <ul style="list-style-type: none"> <li>• MEC036</li> <li>• MEC037</li> </ul>

		<ul style="list-style-type: none"> <li>• MEC038</li> <li>• MEC041</li> <li>• MEC042</li> <li>• MEC048</li> <li>• MEC075</li> <li>• MEC079</li> <li>• MEC080.</li> </ul>
Surface water pools	Shown in Figure 5	No direct <b>disturbance</b> , excluding <b>monitoring and management activities</b> .
Operational elements		
<b>Groundwater abstraction</b>	N/A	Up to 12.0 <b>GL/a</b> .
Disposal of surplus dewater	N/A	No more than 11.0 <b>GL/a</b> disposed through <b>MAR</b> and/or pit infiltration.
Aquifer reinjection	N/A	No groundwater mounding, caused by aquifer reinjection, within 2.5 <b>m</b> of the natural ground surface.
Processing	N/A	Dry processing to produce up to 12.0 <b>Mtpa</b> of iron ore product.
Waste rock	N/A	Up to 160 <b>Mt</b> .
Timing elements		
Mine life	N/A	Up to 18 years from the date of <b>ground disturbing activities</b> (closure not included).
Greenhouse gas emissions		
<b>Net scope 1 emissions</b>	N/A	100,000 <b>t CO<sub>2</sub>-e</b> per annum.
Scope 2 emissions	N/A	Zero <b>t CO<sub>2</sub>-e</b> per annum.

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## PART B – ENVIRONMENTAL OUTCOMES, PRESCRIPTIONS AND OBJECTIVES

### B1 Flora and vegetation

B1-1 The proponent must ensure the implementation of the proposal achieves the following environmental **outcome**:

- (1) **disturb** no more than the following within the **local area**:
  - (a) 14.7% of *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) (P1);  
and
  - (b) 14.4% of *Triodia veniciae* (P1).

B1-2 The proponent must implement the proposal to meet the following environmental **objectives**:

- (1) avoid, and where unavoidable, minimise impacts to the **Freshwater Claypan PEC, critical habitat, supporting habitat, locally significant vegetation, and surface water dependent vegetation** from changes to hydrological regimes, sediment deposition, altered fire regimes, and/or the introduction or spread of **environmental weeds**, compared to **baseline**.

### B2 Terrestrial fauna

B2-1 The proponent must ensure the implementation of the proposal achieves the following environmental **outcomes**:

- (1) **disturb** no more than:
  - (a) 813.97 ha of **stony spinifex plains and hillslopes** habitat;
  - (b) 520.80 ha of **rocky hills** habitat;
  - (c) 71.26 ha of **drainage line/floodplain** habitat; and
  - (d) 15.27 ha of **chenopod/cracking clay floodplain** habitat.
- (2) no **detectable** change to the structural integrity of **bat caves** MEC008, MEC009, MEC010, MEC016, MEC025, MEC039, MEC070, MEC073, and MEC074, compared to **baseline**;
- (3) no **detectable** decrease in the **abundance** of Pilbara leaf-nosed bat (*Rhinonictis aurantia* Pilbara form) in **exclusion areas** from **baseline** levels, that is sustained for three consecutive years, over the life of the proposal;
- (4) no **detectable** decrease in the **abundance** of northern quoll (*Dasyurus hallucatus*) in **exclusion areas** compared to comparable analogue or

reference sites, that is sustained over three consecutive years, over the life of the proposal; and

- (5) no **detectable** increase in feral animal **abundance** in the **development envelope** and/or in the **FHEZ** from **baseline** levels over the life of the proposal.

B2-2 The proponent must implement the proposal to meet the following environmental **objectives**:

- (1) avoid, and where unavoidable, minimise **clearing** of:
  - (a) **foraging and dispersal habitat**;
  - (b) **hollow forming trees**; and
  - (c) **potential grey falcon nests**.
- (2) avoid, and where unavoidable, minimise impacts to **critical habitat** and **supporting habitat** from habitat fragmentation and/or **contamination**.

B2-3 The proponent shall:

- (1) ensure that all artificial lighting is installed in accordance with the **National Light Pollution Guidelines for Wildlife**, and all artificial lighting within 500 m of the **exclusion areas** uses directional, adaptive and/or shielded lighting and uses the minimum number and intensity of lights required, to minimise **disturbance** to nocturnal fauna;
- (2) only install barbed wire fencing if it is required by other legislation, and where barbed wire is required, it shall be installed with the top strand as a single strand wire and with suitable **bat and bird deterrents**;
- (3) not conduct blasting during **night-time hours**;
- (4) ensure all haul roads and sealed access roads within the **LIAA** and **Speed Limit Restriction Zone** are constructed with **fauna crossings**; and
- (5) ensure all culverts are suitable for the movement of fauna, except where the culvert would connect fauna habitat to an **active mining area**.

B2-4 Prior to **ground disturbing activities**, the proponent must undertake the following actions:

- (1) within seven (7) days prior to **clearing critical habitat**, using a **fauna spotter**, undertake **pre-clearance surveys** of the areas to be **cleared** to detect presence of Pilbara olive python (*Liasis olivaceous barroni*) and **potential grey falcon nests**;

- (2) within seven (7) days prior to **clearing critical habitat** or **supporting habitat**, using a **fauna spotter**, undertake **pre-clearance surveys** of the areas to be **cleared** to detect presence of northern quoll (*Dasyurus hallucatus*) and night parrot (*Pezoporus occidentalis*);
- (3) within seven (7) day prior to **clearing bat caves**, using a **fauna spotter**, undertake **pre-clearance surveys** of the areas to be **cleared** to detect presence of ghost bat (*Macroderma gigas*) and Pilbara leaf-nosed bat (*Rhinonictoris aurantia* Pilbara form);
- (4) where ghost bat (*Macroderma gigas*), night parrot (*Pezoporus occidentalis*), northern quoll (*Dasyurus hallucatus*), Pilbara leaf-nosed bat (*Rhinonictoris aurantia* Pilbara form), Pilbara olive python (*Liasis olivaceous barroni*), or **potential grey falcon nests** are identified, **ground disturbing activities** shall not commence in that location until:
  - (a) the finding has been notified to the **CEO** and **DBCA**; and
  - (b) either:
    - (i) the northern quoll (*Dasyurus hallucatus*) or Pilbara olive python (*Liasis olivaceous barroni*) has been relocated by a **fauna handler** to **critical habitat**; or
    - (ii) the **fauna spotter** has verified that the **potential grey falcon nest** is not being used for breeding and any juvenile grey falcon (*Falco hypoleucos*) have fledged and permanently left the nest; or
    - (iii) the northern quoll (*Dasyurus hallucatus*) or Pilbara olive python (*Liasis olivaceous barroni*) has been observed by the **fauna spotter** to have moved on from the area to adjoining **critical habitat**; or
    - (iv) the **fauna spotter** considers that the individual no longer occurs in the area to be **cleared**.

B2-5 Vehicle and machinery speed limits within the **development envelope** shall not exceed:

- (1) 90 **km/hr** on sealed roads;
- (2) 60 **km/hr** on unsealed roads;
- (3) 60 **km/hr** on haul roads and access roads within the **Speed Limit Restriction Zone**; and
- (4) 40 **km/hr** on haul roads and access roads within the **Speed Limit Restriction Zone** during **night-time hours**.

### B3 Inland waters and subterranean fauna

B3-1 The proponent must ensure the implementation of the proposal achieves the following environmental **outcomes**:

- (1) groundwater drawdown does not exceed the **predicted drawdown extent**;
- (2) groundwater mounding does not exceed the **predicted mounding extent**;
- (3) no impact to the water level or quality at the **Aboriginal community water supply bores**;
- (4) no interruption to the supply of **livestock drinking water** for pastoral station groundwater users;
- (5) **disturb** no more than 70% of the total volume of the **Mineralised Marra Mamba unit** within the **troglofauna 3D habitat modelling area**;
- (6) **disturb** no more than 6% of the total volume of **likely troglofauna habitat** within the **troglofauna 3D habitat modelling area** as a result of pit excavation;
- (7) **disturb** no more than 25% of the total volume of **likely troglofauna habitat** within the **troglofauna 3D habitat modelling area** as a result of groundwater mounding;
- (8) no **detectable** decrease in stygofauna diversity within the **development envelope** relative to **baseline**;
- (9) **disturb** no more than 6% of the total volume of the **Undifferentiated Tertiary unit** within the **stygofauna 3D habitat modelling area**; and
- (10) **disturb** no more than 11% of the total volume of **likely stygofauna habitat** within the **stygofauna 3D habitat modelling area**.

B3-2 The proponent must implement the proposal to meet the following environmental **objectives**:

- (1) avoid, and where unavoidable, minimise impacts to claypans and surface water pools within the Fortescue Valley from changes to surface water hydrology; and
- (2) avoid, and where unavoidable, minimise impacts to groundwater quality, including **salinity** and **hardness**, from aquifer reinjection to maintain stygofauna habitat.

## B4 Environmental Management Plans

- B4-1 The proponent must review and update the *Conservation Significant Fauna Management Plan (Revision 5 dated 29 August 2025)* that satisfies the requirements of condition C4 and C5 and demonstrates how achievement of the **outcomes** in condition B2-1, the **objectives** in condition B2-2, and the prescriptive requirements in condition B2-3, condition B2-4, and B2-5 will be monitored and substantiated and submit it to the **CEO**.
- B4-2 The proponent must review and update the *Water Management Plan (Revision 7 dated 29 August 2025)* that satisfies the requirements of condition C4 and C5 and demonstrates how achievement of the **outcomes** in condition B3-1, the **objective** in condition B1-2 and condition B3-2 will be monitored and substantiated and submit it to the **CEO**.

## B5 Rehabilitation

- B5-1 The proponent must ensure the implementation of the proposal achieves the following environmental **outcomes**:
- (1) rehabilitated vegetation and fauna habitat are **self-sustaining**;
  - (2) rehabilitated areas are consistent with the species diversity and **abundance** of native vegetation within comparative analogue or reference sites;
  - (3) habitat connectivity for **significant fauna species** is maintained within the **exclusion areas**;
  - (4) rehabilitated landforms are stable and do not cause **pollution** or **environmental harm**;
  - (5) pits are backfilled to at least two (2) m above the pre-mining groundwater level;
  - (6) the post-mining profile, including rehabilitated landforms, is designed in consideration of visually integrating into the surrounding undisturbed landscape; and
  - (7) pre-mining surface water flow regimes are re-established.
- B5-2 The proponent must ensure:
- (1) rehabilitation uses seeds and/or propagated material of **local provenance**, including *Hibiscus* sp. Mulga Downs (S. Hitchcock SH 638) and *Triodia veniciae*;

- (2) rehabilitation includes the preferential use of seeds and propagated material collected from native vegetation within the proposal **disturbance footprint**;
- (3) closure planning and rehabilitation are undertaken in a **progressive manner** consistent with achievement of the **outcomes** in condition B5-1 and prescriptive requirements in condition B5-2(1) and condition B5-2(2) during **operations**; and
- (4) rehabilitation of areas **cleared** commences within eighteen (18) months of that area longer being required.

B5-3 The proponent must include the environmental **outcomes** of condition B5-1 and prescriptive requirements of condition B5-2 in the Mine Development and Closure Proposal and subsequent Mine Closure Plans required under the *Mining Act 1978* and submit for approval to **DMPE**.

## **B6 Aboriginal cultural heritage**

B6-1 The proponent must implement the proposal to meet the following environmental **outcomes**:

- (1) no **disturbance** of the **Aboriginal sites** or to **Aboriginal cultural heritage** in the proposal **disturbance footprint** other than where consent is granted for the use of the land under the *Aboriginal Heritage Act 1972*; and
- (2) subject to reasonable health and safety requirements, no interruption of ongoing access to land utilised for traditional use or custom by the **native title party/ies**.

B6-2 The proponent must implement the proposal to meet the following environmental **objective**:

- (1) avoid, and where unavoidable, minimise **adverse impacts** to **Aboriginal cultural heritage** within and surrounding the **development envelope**.

B6-3 The proponent must undertake ongoing consultation and engagement with the **native title party/ies** about the achievement of the **outcomes** in condition B3-1(3), condition B5-1, and condition B6-1(2), the **objectives** in condition B1-2, condition B3-2(1), and condition B6-2, and the prescriptive requirements in condition B5-2 for the life of the proposal.

B6-4 The proponent must take **reasonable steps to consult** with the **native title party/ies** about:

- (1) the environmental management plans required by condition B4-1 and condition B4-2; and

- (2) the design of **waste rock landforms** as part of approval processes under Part V of the *Environmental Protection Act 1986* and the *Mining Act 1978*.

## **B7 Pilbara Environmental Offsets Fund**

B7-1 The proponent must contribute funds to the **Pilbara Environmental Offsets Fund** calculated pursuant to condition B7-2, to achieve the **objective** of counterbalancing the significant residual impacts to:

- (1) **'Good' to 'Excellent' condition native vegetation;**
- (2) **Wona Land System PEC;**
- (3) **riparian vegetation;**
- (4) **critical habitat** for the grey falcon (*Falco hypoleucos*), night parrot (*Pezoporus occidentalis*), northern quoll (*Dasyurus hallucatus*), and Pilbara olive python (*Liasis olivaceus barroni*) subject to any reduction approved by the **CEO** under condition B7-9; and
- (5) **supporting habitat** for the ghost bat (*Macroderma gigas*), night parrot (*Pezoporus occidentalis*), northern quoll (*Dasyurus hallucatus*), and Pilbara leaf-nosed bat (*Rhinonictoris aurantia* Pilbara form) subject to any reduction approved by the **CEO** under condition B7-9.

B7-2 The proponent's contribution to the **Pilbara Environmental Offsets Fund** must be paid biennially, with the amount to be contributed calculated based on the **clearing** undertaken in each year of the biennial reporting period in accordance with the rates in condition B7-3. The first biennial reporting period must commence from **ground disturbing activities** of the **environmental values** identified in condition B7-3.

B7-3 Calculated on the 2024-2025 financial year, the contribution rates are:

- (1) \$960 AUD (excluding GST) per hectare of the following values **cleared** within the Chichester **IBRA** subregion as a result of the proposal:
  - (a) **'Good' to 'Excellent' condition native vegetation;**
  - (b) ghost bat (*Macroderma gigas*) **supporting habitat;**
  - (c) night parrot (*Pezoporus occidentalis*) **supporting habitat;**
  - (d) northern quoll (*Dasyurus hallucatus*) **supporting habitat;** and
  - (e) Pilbara leaf-nosed bat (*Rhinonictoris aurantia* Pilbara form) **supporting habitat.**
- (2) \$1,920 AUD (excluding GST) per hectare of the following values **cleared** within the Chichester **IBRA** subregion as a result of the proposal:

- (a) **Wona Land System PEC;**
  - (b) grey falcon (*Falco hypoleucos*) **critical habitat;**
  - (c) night parrot (*Pezoporus occidentalis*) **critical habitat;**
  - (d) northern quoll (*Dasyurus hallucatus*) **critical habitat;** and
  - (e) Pilbara olive python (*Liasis olivaceus barroni*) **critical habitat.**
- (3) \$2,031 AUD (excluding GST) per hectare of the following values **cleared** within the Fortescue **IBRA** subregion as a result of the proposal:
- (a) **'Good' to 'Excellent' condition native vegetation;**
  - (b) ghost bat (*Macroderma gigas*) **supporting habitat;**
  - (c) night parrot (*Pezoporus occidentalis*) **supporting habitat;**
  - (d) northern quoll (*Dasyurus hallucatus*) **supporting habitat;** and
  - (e) Pilbara leaf-nosed bat (*Rhinonictis aurantia* Pilbara form) **supporting habitat.**
- (4) \$4,062 AUD (excluding GST) per hectare of the following values **cleared** within the Fortescue **IBRA** subregion as a result of the proposal:
- (a) **riparian vegetation;** and
  - (b) grey falcon (*Falco hypoleucos*) **critical habitat;**
  - (c) night parrot (*Pezoporus occidentalis*) **critical habitat;**
  - (d) northern quoll (*Dasyurus hallucatus*) **critical habitat;** and
  - (e) Pilbara olive python (*Liasis olivaceus barroni*) **critical habitat.**

B7-4 The rates in condition B7-3 change annually each subsequent financial year in accordance with the percentage change in the **CPI** applicable to that financial year.

B7-5 To achieve the **objective** in condition B7-1 the proponent must review and update the *Impact Reconciliation Procedure – Mulga Downs Iron Ore Mine, Hancock Prospecting Pty Ltd, 10 April 2025*, and submit to the **CEO** for approval. This procedure must:

- (1) spatially define the **environmental values** identified in condition B7-1;
- (2) spatially define the areas where offsets required by condition B7-1 are to be exempt;

- (3) include a methodology to calculate the amount of **clearing** undertaken during each year of the biennial reporting period for each of the **environmental values** identified in condition B7-3;
  - (4) state that **clearing** calculation for the first biennial reporting period will commence from **ground disturbing activities** in accordance with condition B7-2 and end on the second 30 June following commencement of **ground disturbing activities**;
  - (5) state that **clearing** calculations for each subsequent biennial reporting period will commence on 1 July of the required reporting period, unless otherwise agreed by the **CEO**; and
  - (6) be prepared in accordance with *Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports* (March 2024) (or any subsequent revisions).
- B7-6 The proponent must submit an Impact Reconciliation Report in accordance with the **confirmed** Impact Reconciliation Procedure in condition B7-5.
- B7-7 The Impact Reconciliation Report required pursuant to condition B7-6 must:
- (1) provide the location and spatial extent of the **clearing** undertaken as a result of the proposal during each year of each biennial reporting period;
  - (2) include evidence that **clearing** undertaken in any area was necessary for the commencement of proposal-related activities or **operations** in that **cleared** area within six (6) months of the **clearing** having occurred; and
  - (3) be prepared in accordance with *Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports* (March 2024) (or any subsequent revisions).
- B7-8 The proponent may apply in writing and seek the written approval of the **CEO** to reduce all or part of the contribution payable under condition B7-2 where:
- (1) a payment has been made to satisfy a condition of an approval under the *Environment Protection and Biodiversity Conservation Act 1999* in relation to the proposal; and
  - (2) the payment is made for the purpose of counterbalancing impacts of the proposal on matters of national environmental significance.

B7-9 The **CEO** may grant approval to discount the amount payable under condition B7-1(4) and B7-1(5) if the **CEO** is satisfied that the payment will offset the significant residual impacts of the proposal.

B7-10 Condition C2 applies to the **confirmed** Impact Reconciliation Procedure required by condition B7-5 as if it were an environmental management plan.

B7-11 Failure to implement a **confirmed** Impact Reconciliation Procedure or submit an Impact Reconciliation Report as required by condition B7-6 represents a non-compliance with these conditions.

## **B8 Subterranean Fauna Research Program**

B8-1 The proponent must undertake a research program to address knowledge gaps associated with subterranean fauna within the **Middle Fortescue Valley**. The **objectives** of the Subterranean Fauna Research Program must include:

- (1) characterise the stygofauna and troglifauna assemblages within the **Middle Fortescue Valley**;
- (2) further characterise the subterranean fauna habitat within the **Middle Fortescue Valley**, including any barriers to dispersal;
- (3) evaluate the ability and effectiveness of troglifauna to recolonise backfilled pit voids; and
- (4) advance the understanding of stygofauna tolerance to changes in groundwater quality resulting from mining activities, including but not limited to increases in **salinity**.

B8-2 The proponent must develop an environmental management plan for the implementation of the Subterranean Fauna Research Program as required by condition B8-1 that:

- (1) includes **objectives**, timing, milestones and methodology;
- (2) includes the design for the proposed research and completion criteria to meet the **objectives** of condition B8-1; and
- (3) detail how all sampling, taxonomy, and habitat information will be published, including, where appropriate, publication of research findings in peer-reviewed journals, and through Index of Biodiversity Surveys for Assessments.

B8-3 Within two (2) years of the substantial commencement of the proposal and then every five (5) years thereafter, or otherwise agreed to by the **CEO**, the proponent must submit a report to the **CEO** documenting the progress and **outcomes** of the Subterranean Fauna Research Program as required by condition B8-1.

B8-4 The reports required in condition B8-5 must include an evaluation of whether the subterranean diversity identified is consistent with criteria that could be considered a Priority Ecological Community or a Threatened Ecological Community that has been informed by consultation with **DBCA** and/or the Threatened Species Scientific Community as appropriate.

## **B9 Pilbara Leaf-nosed Bat Research Program**

B9-1 The proponent must undertake a research program to address knowledge gaps associated with the Pilbara leaf-nosed bat (*Rhinonicteris aurantia* Pilbara form) within 50 km of the **development envelope**. The **objectives** of the Pilbara Leaf-nosed Bat Research Program must include:

- (1) investigate the presence and distribution of diurnal roosts;
- (2) define cave habitat characteristics, including suitability of roosting habitat, and year-round usage including colony size;
- (3) characterise the foraging habitat surrounding the roost sites, including the presence of water sources; and
- (4) characterise the movement of the species, including timing of dispersal, limitations to dispersal, and how habitat corridors facilitate dispersal.

B9-2 The proponent must develop an environmental management plan for the implementation of the Pilbara Leaf-nosed Bat Research Program as required by condition B9-1 that:

- (1) includes **objectives**, timing, milestones and methodology;
- (2) includes the design for the proposed research and completion criteria to meet the **objectives** of condition B9-1; and
- (3) details how all sampling, habitat information, and assessment findings will be reported and published, including, where appropriate, publication of research findings in peer-reviewed journals, and through Index of Biodiversity Surveys for Assessments.

B9-3 Within two (2) years of the substantial commencement of the proposal and then every five (5) years thereafter, or otherwise agreed to by the **CEO**, the proponent must submit a report to the **CEO** documenting the progress and **outcomes** of the Pilbara Leaf-nosed Bat Research Program as required by condition B9-1.

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## PART C – ENVIRONMENTAL MANAGEMENT PLANS AND MONITORING

### C1 Environmental Management Plans: Conditions Related to Commencement of Implementation of the Proposal

C1-1 The proponent must:

- (1) not undertake **dewatering** until the **CEO**, has confirmed in writing that the environmental management plan required by condition B4-2 meets the requirements of that condition, condition C4 and condition C5;
- (2) not undertake **ground disturbing activities** until the **CEO** has confirmed in writing that the Impact Reconciliation Procedure required by condition B7-5 meets the requirements of that condition;
- (3) within twelve (12) months of commencing **ground disturbing activities**, or otherwise agreed to by the **CEO**, submit the Subterranean Fauna Research Program required by condition B8-2 to the **CEO** for approval; and
- (4) within twelve (12) months of commencing **ground disturbing activities**, or otherwise agreed to by the **CEO**, submit the Pilbara Leaf-nosed Bat Research Program required by condition B9-2 to the **CEO** for approval, on advice from **DBCA**.

### C2 Environmental Management Plans: Conditions Relating to Approval, Implementation, Review and Publication

C2-1 Upon being required to implement an environmental management plan under Part B, or after receiving notice in writing from the **CEO** under condition C1-1 that the environmental management plan(s) required in Part B satisfies the relevant requirements, the proponent must:

- (1) implement the most recent version of the **confirmed** environmental management plan; and
- (2) continue to implement the **confirmed** environmental management plan referred to in condition C2-1(1), other than for any period which the **CEO** confirms by notice in writing that it has been demonstrated that the relevant requirements for the environmental management plan have been met, or are able to be met under another statutory decision-making process, in which case the implementation of the environmental management plan is no longer required for that period.

C2-2 The proponent:

- (1) may review and revise a **confirmed** environmental management plan provided it meets the relevant requirements of that environmental

management plan, including any consultation that may be required when preparing the environmental management plan;

- (2) must review and revise a **confirmed** environmental management plan and ensure it meets the relevant requirements of that environmental management plan, including any consultation that may be required when preparing the environmental management plan, as and when directed by the **CEO**; and
- (3) must revise and submit to the **CEO** the **confirmed** environmental management plan if there is a material risk that the **outcomes** or **objectives** it is required to achieve will not be complied with, including but not limited to as a result of a change to the proposal.

C2-3 Within five (5) years of the commencement of **dewatering**, or otherwise agreed to by the **CEO**, the proponent must review and revise the environmental management plan required by condition B4-2 and submit it to the **CEO**.

C2-4 The revision to the environmental management plan required under condition C2-3 must include:

- (1) consideration of relevant environmental monitoring data collected since the substantial commencement of the proposal;
- (2) revalidation and calibration of groundwater model(s);
- (3) consideration of additional data and research outcomes resulting from implementation of the Subterranean Fauna Research Program as required by condition B8;
- (4) a revised analysis of stygofauna **salinity** tolerance; and
- (5) revisions, where applicable, to **trigger criteria**, **threshold criteria**, monitoring and **contingency measures** that demonstrate how achievement of the environmental **outcomes** in condition B3-1 and **objective** in B3-2 will be monitored and substantiated.

C2-5 Despite condition C2-1, but subject to conditions C2-6 and C2-7, the proponent may implement minor revisions to an environmental management plan if the revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, **outcomes** or **objectives** which the environmental management plan is required to achieve.

C2-6 If the proponent is to implement minor revisions to an environmental management plan under condition C2-5, the proponent must provide the **CEO** with the following at least twenty (20) business days before it implements the revisions:

- (1) the revised environmental management plan clearly showing the minor revisions;
- (2) an explanation of and justification for the minor revisions; and
- (3) an explanation of why the minor revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, **outcomes** or **objectives** which the environmental management plan is required to achieve.

C2-7 The proponent must cease to implement any revisions which the **CEO** notifies the proponent (at any time) in writing may not be implemented.

C2-8 **Confirmed** environmental management plans, and any revised environmental management plans under condition C2-6(1), must be published on the proponent's website and provided to the **CEO** in electronic form suitable for on-line publication by the Department of Water and Environmental Regulation within twenty (20) business days of being implemented, or being required to be implemented (whichever is earlier).

### **C3 Conditions Related to Monitoring**

C3-1 The proponent must undertake monitoring capable of:

- (1) substantiating whether the proposal limitations and extents in Part A are exceeded; and
- (2) **detecting** and substantiating whether the environmental **outcomes** identified in Part B are achieved (excluding any environmental **outcomes** in Part B where an environmental management plan is expressly required to monitor achievement of that **outcome**).

C3-2 The proponent must submit as part of the Compliance Assessment Report required by condition D2, a compliance monitoring report that:

- (1) outlines the monitoring that was undertaken during the implementation of the proposal;
- (2) identifies why the monitoring was capable of substantiating whether the proposal limitation and extents in Part A are exceeded;
- (3) for any environmental **outcomes** to which condition C3-1(2) applies, identifies why the monitoring was scientifically robust and capable of **detecting** whether the environmental **outcomes** in Part B are met;
- (4) outlines the results of the monitoring;
- (5) reports whether the proposal limitations and extents in Part A were exceeded and (for any environmental **outcomes** to which condition C3-

1 (2) applies) whether the environmental **outcomes** in Part B were achieved, based on analysis of the results of the monitoring; and

- (6) reports any actions taken by the proponent to remediate any potential non-compliance.

#### **C4 Environmental Management Plans: Conditions Relating to Monitoring and Adaptive Management for Outcomes Based Conditions**

C4-1 The environmental management plan required under conditions B4-1 and B4-2 must contain provisions which enable the substantiation of whether the relevant **outcomes** of those conditions are met, and must include:

- (1) **threshold criteria** that provide a limit beyond which the environmental **outcomes** are not achieved;
- (2) **trigger criteria** that will provide an early warning that the environmental **outcomes** are not likely to be met;
- (3) monitoring parameters, sites, control/reference sites, methodology, timing and frequencies which will be used to measure **threshold criteria** and **trigger criteria**. Include methodology for determining alternate monitoring sites as a contingency if proposed sites are not suitable in the future;
- (4) **baseline** data;
- (5) data collection and analysis methodologies;
- (6) adaptive management methodology;
- (7) **contingency measures** which will be implemented if **threshold criteria** or **trigger criteria** are not met; and
- (8) reporting requirements.

C4-2 Without limiting condition C3-1, failure to achieve an environmental **outcome**, or the exceedance of a **threshold criteria**, regardless of whether threshold **contingency measures** have been or are being implemented, represents a non-compliance with these conditions.

#### **C5 Environmental Management Plans: Conditions Related to Management Actions and Targets for Objective Based Conditions**

C5-1 The environmental management plans required under conditions B4-1 and B4-2 must contain provisions which enable the achievement of the relevant **objectives** of those conditions and substantiation of whether the **objectives** are reasonably likely to be met, and must include:

- (1) **management actions;**
- (2) **management targets;**
- (3) **contingency measures** if **management targets** are not met; and
- (4) reporting requirements.

C5-2 Without limiting condition C2-1, the failure to achieve an environmental **objective**, or implement a **management action**, regardless of whether **contingency measures** have been or are being implemented, represents a non-compliance with these conditions.

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## PART D – COMPLIANCE, TIME LIMITS, AUDITS AND OTHER CONDITIONS

### D1 Non-compliance Reporting

D1-1 If the proponent becomes aware of a potential non-compliance, the proponent must:

- (1) report this to the **CEO** within seven (7) days;
- (2) implement **contingency measures**;
- (3) investigate the cause;
- (4) investigate environmental impacts;
- (5) advise rectification measures to be implemented;
- (6) advise any other measures to be implemented to ensure no further impact;
- (7) advise timeframe in which contingency, rectification and other measures have and/or will be implemented; and
- (8) provide a report to the **CEO** within twenty-one (21) days of being aware of the potential non-compliance, detailing the measures required in conditions D1-1(1) to D1-1(7) above.

D1-2 Failure to comply with the requirements of a condition, or with the content of an environmental management plan required under a condition, constitutes a non-compliance with these conditions, regardless of whether the **contingency measures**, rectification or other measures in condition D1-1 above have been or are being implemented.

### D2 Compliance Reporting

D2-1 The proponent must provide an annual Compliance Assessment Report to the **CEO** for the purpose of determining whether the implementation conditions are being complied with.

D2-2 Unless a different date or frequency is approved by the **CEO**, the first annual Compliance Assessment Report must be submitted within fifteen (15) months of the date of this Statement, and subsequent reports must be submitted annually from that date.

D2-3 Each annual Compliance Assessment Report must be endorsed by the proponent's Chief Executive Officer, or a person approved by proponent's Chief Executive Officer to be delegated to sign on the Chief Executive Officer's behalf.

D2-4 Each annual Compliance Assessment Report must:

- (1) state whether each condition of this Statement has been complied with, including:
  - (a) exceedance of any proposal limits and extents;
  - (b) achievement of environmental **outcomes**;
  - (c) achievement of environmental **objectives**;
  - (d) requirements to implement the content of environmental management plans;
  - (e) monitoring requirements;
  - (f) implement **contingency measures**;
  - (g) requirements to implement adaptive management; and
  - (h) reporting requirements;
- (2) include the results of any monitoring (inclusive of any raw data) that has been required under Part C in order to demonstrate that the limits in Part A, and any **outcomes** or any **objectives** are being met;
- (3) provide evidence to substantiate statements of compliance, or details of where there has been a non-compliance;
- (4) include the corrective, remedial and preventative actions taken in response to any potential non-compliance;
- (5) be provided in a form suitable for publication on the proponent's website and online by the Department of Water and Environmental Regulation; and
- (6) be prepared and published consistent with the latest version of the Compliance Assessment Plan required by condition D2-5 which the **CEO** has confirmed by notice in writing satisfies the relevant requirements of Part C and Part D.

D2-5 The proponent must prepare a Compliance Assessment Plan which is submitted to the **CEO** at least six (6) months prior to the first Compliance Assessment Report required by condition D2-2, or prior to implementation of the proposal, whichever is sooner.

D2-6 The Compliance Assessment Plan must include:

- (1) what, when and how information will be collected and recorded to assess compliance;
- (2) the methods which will be used to assess compliance;

- (3) the methods which will be used to validate the adequacy of the compliance assessment to determine whether the implementation conditions are being complied with;
- (4) the retention of compliance assessments;
- (5) the table of contents of Compliance Assessment Reports, including audit tables; and
- (6) how and when Compliance Assessment Reports will be made publicly available, including being published on the proponent's website within sixty (60) days of being provided to the **CEO**.

### **D3 Contact Details**

D3-1 The proponent must notify the **CEO** of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

### **D4 Time Limit for Proposal Implementation**

D4-1 The proposal must be substantially commenced within five (5) years from the date of this Statement.

D4-2 The proponent must provide to the **CEO** documentary evidence demonstrating that they have complied with condition D4-1 no later than thirty (30) days after the substantial commencement.

D4-3 If the proposal has not been substantially commenced within the period specified in condition D4-1, implementation of the proposal must not be commenced or continued after the expiration of that period.

### **D5 Public Availability of Data**

D5-1 Subject to condition D5-2, within a reasonable time period approved by the **CEO** upon the issue of this Statement and for the remainder of the life of the proposal, the proponent must make publicly available, in a manner approved by the **CEO**, all validated environmental data collected before and after the date of this Statement relevant to the proposal (including sampling design, sampling methodologies, monitoring and other empirical data and derived information products (e.g. maps)), environmental management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

D5-2 If:

- (1) any data referred to in condition D5-1 contains trade secrets; or

- (2) any data referred to in condition D5-1 contains particulars of confidential information (other than trade secrets) that has commercial value to a person that would be, or could reasonably be expected to be, destroyed or diminished if the confidential information were published,

the proponent may submit a request for approval from the **CEO** to not make this data publicly available and the **CEO** may agree to such a request if the **CEO** is satisfied that the data meets the above criteria.

- D5-3 In making such a request the proponent must provide the **CEO** with an explanation and reasons why the data should not be made publicly available.

## **D6 Independent Audit**

- D6-1 The proponent must arrange for an independent audit of compliance with the conditions of this statement, including achievement of the environmental **outcomes** and/or the environmental **objectives** and/ or environmental performance with the conditions of this statement, as and when directed by the **CEO**.
- D6-2 The independent audit must be carried out by a person with appropriate qualifications who is nominated or approved by the **CEO** to undertake the audit under condition D6-1.
- D6-3 The proponent must submit the independent audit report with the Compliance Assessment Report required by condition D2, or at any time as and when directed in writing by the **CEO**. The audit report is to be supported by credible evidence to substantiate its findings.
- D6-4 The independent audit report required by condition D6-1 is to be made publicly available in the same timeframe, manner and form as a Compliance Assessment Report, or as otherwise directed by the **CEO**.

Table 1: Abbreviations and definitions

Acronym or abbreviation	Definition or term
<b>Aboriginal community water supply bores</b>	Groundwater abstraction bores utilised for the supply of water to the Wirrilimarra and Youngaleena Aboriginal communities. This includes the existing water supply bores as at the date of this Ministerial Statement, and any subsequent water supply bores installed for the purposes of providing water supply to these communities. Subsequent water supply bores are to be installed within 400 m of existing water supply bores.
<b>Aboriginal cultural heritage</b>	Means the tangible and intangible elements that are important to the Aboriginal people of the state, and are recognised through social, spiritual, historical, scientific or aesthetic values, as part of Aboriginal tradition to the extent they directly affect or are affected by physical or biological surroundings.
<b>Aboriginal sites</b>	As defined in section 4 and 5 under the <i>Aboriginal Heritage Act 1972</i> .
<b>Abundance</b>	The total number of individuals of a particular species or group of species in a defined area measuring how common or numerous that species or group of species is.
<b>Active mining area</b>	Areas within the <b>development envelope</b> used for operational purposes, including open pits and <b>waste rock landforms</b> . Does not include rehabilitated areas, access roads, pipeline corridors, and borefield infrastructure.
<b>Adverse impact(s)</b>	<p>Negative change that is neither trivial nor negligible that could result in a reduction in health, diversity or abundance of the receptor/s being impacted, or a reduction in <b>environmental value</b>. Adverse impacts can arise from direct or indirect impacts, or other impacts from the proposal.</p> <p>In relation to <b>Aboriginal cultural heritage</b>, includes but is not limited to, hydrological change, structural damage, introduction or spread of non-indigenous flora and/or fauna, alteration of fauna behaviour, dust, light, and noise emissions.</p>
<b>ANZECC &amp; ARMCANZ 2000</b>	ANZECC & ARMCANZ 2000, Australian and New Zealand guidelines for fresh and marine water quality, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand.
<b>Authorised offsets</b>	Units representing <b>greenhouse gas emissions</b> issued under one of the following schemes and cancelled or retired in accordance with any rules applicable at the relevant time governing the cancellation or retiring of units of that kind:

	<p>(a) Australian Carbon Credit Units issued under the Carbon Credits (Carbon Farming Initiative) Act 2011 (Cth);</p> <p>(b) Verified Emission Reductions issued under the Gold Standard program;</p> <p>(c) Verified Carbon Units issued under the Verified Carbon Standard program; or</p> <p>(d) other offset units that the Minister has notified the proponent in writing meet integrity principles and are based on clear, enforceable and accountable methods.</p>
<b>Baseline</b>	Initial conditions measured before <b>disturbance</b> associated with the proposal, as captured in the environmental management plans required by condition B4-1 and condition B4-2, which is used for comparison with data collected during and after <b>disturbance</b> to identify and measure changes in conditions.
<b>Bat caves</b>	<p>Caves utilised by the Pilbara leaf-nosed bat (<i>Rhinonicteris aurantia</i>, Pilbara form) and/or ghost bat (<i>Macroderma gigas</i>), as characterised in <i>A review of ghost bat ecology, threats and survey requirements, Bat Call WA, May 2021</i> and <i>A review of Pilbara leaf-nosed bat ecology, threats and survey requirements, Bat Call WA, May 2021</i>.</p> <p>Known bat caves are described in <i>Conservation Significant Fauna Management Plan (Revision 5 dated 29 August 2025)</i> and depicted in Figure 3.</p>
<b>Bat and bird deterrents</b>	Suitable design, feature or modification to barbed wire fencing to increase its visibility and reduce bat and bird collision and entanglement, such as flagging wire.
<b>Boulder piles</b>	The habitat type as depicted in Figure 3 and as described in the <i>Mulga Downs Iron Ore Mine - Consolidated terrestrial fauna report, Attexo, 25 April 2023</i> .
<b>CEO</b>	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the <i>Environmental Protection Act 1986</i> , or the <b>CEO's</b> delegate.
<b>Chenopod/ cracking clay floodplain</b>	The habitat type as depicted in Figure 3 and as described in the <i>Mulga Downs Iron Ore Mine - Consolidated terrestrial fauna report, Attexo, 25 April 2023</i> .
<b>Cleared/clearing</b>	Has the same meaning as in section 51A of the <i>Environmental Protection Act 1986</i> .

<b>Confirmed</b>	<p>In relation to a plan required to be made and submitted to the <b>CEO</b>, means, at the relevant time, the plan that the <b>CEO</b> confirmed, by notice in writing, meets the requirements of the relevant condition.</p> <p>In relation to a plan required to be implemented without the need to be first submitted to the <b>CEO</b>, means that plan until it is revised, and then means, at the relevant time, the plan that the <b>CEO</b> confirmed, by notice in writing, meets the requirements of the relevant condition.</p>
<b>Construction</b>	<p>Activities that are associated with the substantial implementation of a proposal including but not limited to, earthmoving, vegetation <b>clearing</b>, grading or construction of right of way. Construction activities do not include geotechnical investigations (including potholing for services and the installation of piezometers) and other preconstruction activities where no <b>clearing</b> of vegetation is required.</p>
<b>Contamination</b>	<p>Having a substance present at above background concentrations that presents, or has the potential to present, a risk or harm to human health, the environment or any <b>environmental value</b>.</p>
<b>Contingency measures</b>	<p>Planned actions for implementation if it is identified that an environmental <b>outcome</b>, environmental <b>objective</b>, <b>threshold criteria</b>, or <b>management target</b> are likely to be, or are being, exceeded. Contingency measures include changes to operations or reductions in <b>disturbance</b> or <b>adverse impacts</b> to reduce impacts and must be decisive actions that will quickly bring the impact to below any relevant threshold, <b>management target</b> and to ensure that the environmental <b>outcome</b> and/or <b>objective</b> can be met.</p>
<b>CPI</b>	<p>The All Groups Consumer Price Index numbers for Perth compiled and published by the Australian Bureau of Statistics.</p>

<b>Critical habitat</b>	<p>The fauna habitat types described in the <i>Mulga Downs Iron Ore Mine - Consolidated terrestrial fauna report, Attexo, 25 April 2023</i> and <i>Mulga Downs - Consolidated terrestrial fauna report Hub and Rail Spur Option 8B, Attexo, 25 October 2022</i>.</p> <p>For the grey falcon (<i>Falco hypoleucos</i>), this includes mixed eucalypt/mulga floodplain, and drainage line/floodplain.</p> <p>For the night parrot (<i>Pezoporus occidentalis</i>), this includes mature spinifex within chenopod/cracking clay floodplains, drainage line/floodplain, and stony spinifex plains and hillslopes.</p> <p>For the northern quoll (<i>Dasyurus hallucatus</i>), this includes rocky hills and <b>foraging and dispersal habitat</b>.</p> <p>For the Pilbara olive python (<i>Liasis olivaceus</i>), this includes rocky hills, stony spinifex plains and hillslopes, and drainage line/floodplain.</p>
<b>DBCA</b>	<p>The government agency responsible for the administration of the <i>Biodiversity Conservation Act 2016</i>, which at the time of publication of this Ministerial Statement is the Department of Biodiversity, Conservation and Attractions.</p>
<b>Detecting/ Detectable</b>	<p>The smallest statistically discernible effect size that can be achieved with a monitoring strategy designed to achieve a statistical power value of at least 0.8 or an alternative value as determined by the <b>CEO</b>.</p>
<b>Dewatering</b>	<p>The extraction of groundwater from below the water table to access an ore body.</p>
<b>Development envelope</b>	<p>The maximum area within which the proposal will be located, and consistent with the Proposal Content Document for the proposal as referred to in the Introduction to this Statement, as depicted in Figure 1, and as defined by geographic coordinates in Schedule 1.</p>
<b>Disturb / disturbance</b>	<p>Means directly has or materially contributes to the disturbance effect on health, diversity or <b>abundance</b> of the receptor/s being impacted or on an <b>environmental value</b>.</p> <p>In relation to inland waters, includes to have the effect of altering hydrological regimes or water quality to the detriment of the <b>environmental values</b> supported by or dependent on surface water and/or groundwater.</p> <p>In relation to flora, vegetation or fauna habitat, includes to result in the death, destruction, removal, severing or doing substantial damage.</p>

	<p>In relation to fauna, includes to have the effect of altering the natural behaviour of fauna to its detriment.</p> <p>In relation to subterranean fauna means the loss of habitat through groundwater drawdown and the direct removal of habitat as a result of mining activity.</p> <p>In relation to <b>Aboriginal cultural heritage</b>, includes direct physical or biological effects on the tangible and intangible elements that are important to Aboriginal people, and are recognised through social, spiritual, historical, scientific or aesthetic values, as part of Aboriginal tradition.</p>
<b>Disturbance footprint</b>	The location within which the physical proposal elements will occur.
<b>DMPE</b>	The Department of Mines, Petroleum and Exploration.
<b>Drainage line/floodplain</b>	The habitat type as depicted in Figure 3 and as described in the <i>Mulga Downs Iron Ore Mine - Consolidated terrestrial fauna report, Attexo, 25 April 2023</i> .
<b>Environmental harm</b>	Has the meaning provided by section 3A(2) of the <i>Environmental Protection Act 1986</i> .
<b>Environmental value(s)</b>	A beneficial use, or ecosystem health condition.
<b>Environmental weeds</b>	Any plant declared under section 22(2) of the <i>Biosecurity and Agriculture Management Act 2007</i> , any plant listed on the Weeds of National Significance List and any weeds listed on <b>DBCA's</b> Pilbara Impact and Invasiveness Ratings list, as amended or replaced from time to time.
<b>EPA technical guidance</b>	Refers to the <i>Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment</i> , EPA 2020, including any revision to this technical guidance.
<b>Exclusion areas</b>	Refers to the <b>FHEZ, FHEZ corridor, and LIAA</b> .
<b>Fauna crossings</b>	Infrastructure that has been designed to give native fauna unrestricted access between habitat that has been fragmented by the construction of linear infrastructure.
<b>Fauna handler</b>	A person who is qualified and has attained the appropriate licence/s and authorisation/s under section 40 of the <i>Biodiversity Conservation Act 2016</i> and the Biodiversity Conservation Regulations 2018.
<b>Fauna spotter</b>	A person who is suitably trained in species identification, who does not perform any handling of animals where a licence to do so is required.

<b>FHEZ</b>	The Fauna Habitat Exclusion Zone, as depicted in Figure 2 and defined by geographic coordinates in Schedule 1.
<b>FHEZ corridor</b>	The Fauna Habitat Exclusion Zone Corridor, as depicted in Figure 2 and defined by geographic coordinates in Schedule 1.
<b>Foraging and dispersal habitat</b>	Comprises native vegetation within 1 km of <b>rocky hills</b> , considered <b>critical habitat</b> for the northern quoll ( <i>Dasyurus hallucatus</i> ).
<b>Freshwater Claypan PEC</b>	The priority ecological community for flora and vegetation, referred to as 'Freshwater claypans of the Fortescue Valley' in the <i>Priority ecological communities for Western Australia version 35, Department of Biodiversity, Conservation and Attractions, 19 June 2023</i> .
<b>GL/a</b>	Gigalitre(s) per annum.
<b>'Good' to 'Excellent' condition native vegetation</b>	Means the condition of native vegetation rated in accordance with the <i>Technical guidance – Flora and vegetation surveys for environmental impact assessment, Environmental Protection Authority, December 2016</i> including any revision to this technical guidance.
<b>Greenhouse gas</b>	Has the meaning given by Section 7A of the <i>National Greenhouse and Energy Reporting Act 2007</i> (Cth) or, if that definition is amended or repealed, the meaning set out in an Act, regulation or instrument concerning greenhouse gases as specified by the Minister.
<b>Greenhouse gas emissions</b>	<b>Greenhouse gas</b> emissions expressed in <b>t CO<sub>2</sub>-e</b> as calculated in accordance with the definition of 'carbon dioxide equivalence' in Section 7 of the <i>National Greenhouse and Energy Reporting Act 2007</i> (Cth), or, if that definition is amended or repealed, the meaning set out in an Act, regulation or instrument concerning greenhouse gases as specified by the Minister.
<b>Ground disturbing activities</b>	Any activity or activities undertaken in the implementation of the proposal, including any <b>clearing</b> , civil works or <b>construction</b> .
<b>Groundwater abstraction</b>	The process of taking water from a ground source.
<b>ha(s)</b>	Hectare(s).
<b>Hardness</b>	The measure of the concentration of dissolved calcium and magnesium ions in water. Typically expressed as <b>mg/L</b> of calcium carbonate.

<b>Hollow forming trees</b>	Trees within <b>drainage line/floodplain</b> habitat that could be used for roosting or denning by <b>significant fauna species</b> such as the northern quoll ( <i>Dasyurus hallucatus</i> ) and Northern Coastal Free-tailed Bat ( <i>Ozimops cobourgianus</i> ), as determined by a <b>fauna spotter</b> .
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia.
<b>km</b>	Kilometre(s).
<b>km/hr</b>	Kilometre(s) per hour.
<b>LIAA</b>	The Low Impact Activity Area, as depicted in Figure 2 and defined by geographic coordinates in Schedule 1.
<b>Likely stygofauna habitat</b>	Geological units referred to as: <ul style="list-style-type: none"> <li>- Upper Calcrete</li> <li>- Channel Iron Deposits / Pisolite</li> </ul> As described in <i>Mulga Downs Iron Ore Mine – Stygofauna habitat assessment</i> , AQ2, 18 December 2024.
<b>Likely troglofauna habitat</b>	Geological units referred to as: <ul style="list-style-type: none"> <li>- Channel Iron Deposits / Pisolite</li> <li>- Mineralised Marra Mamba</li> <li>- Undifferentiated Sediments/Tertiary</li> <li>- Upper Calcrete</li> </ul> As described in <i>Memo: Mulga Downs Iron Ore Mine: Revised risk assessment on troglofauna and environmental outcomes</i> , JBS&G, 21 November 2025.
<b>Livestock drinking water</b>	Water quality that meets the livestock drinking water guidelines for beef cattle as set out in the <b>ANZECC &amp; ARMCANZ 2000</b> water quality guidelines, including total dissolved solids not exceeding 4,000 <b>mg/L</b> .
<b>Local area</b>	Within 10 <b>km</b> of the <b>development envelope</b> .
<b>Local provenance</b>	Means the Chichester (PIL01) and Fortescue (PIL02) <b>IBRA</b> subregions as delineated by <i>Interim Biogeographic Regionalisation for Australia, Version 7, 17 October 2023</i> including any revisions to this dataset.
<b>Locally significant vegetation</b>	Vegetation types MTGW, THG (1), THG (2), and TvHG as described in the <i>Strategen-JBS&amp;G: Mulga Downs Iron Ore Project, mine and borefield study area - detailed flora and vegetation assessment 2019-2022</i> , Maia, 12 September 2022.
<b>m</b>	Metre(s).
<b>Management action(s)</b>	The identified actions implemented with the intent of achieving the environmental <b>objective</b> .

<b>Management target(s)</b>	A type of indicator to evaluate whether an environmental <b>objective</b> is being achieved.
<b>MAR</b>	Managed aquifer recharge.
<b>mg/L</b>	Milligram(s) per litre.
<b>Mineralised Marra Mamba</b>	The geological unit defined in <i>Memo: Mulga Downs Iron Ore Mine – Revised Troglifauna Habitat Assessment</i> , AQ2, 5 December 2024.
<b>Middle Fortescue Valley</b>	The area encompassing the Fortescue Valley between the Goodiadarrie Hills in the east and Millstream in the west, inclusive of the southern slopes of the Chichester Ranges.
<b>Monitoring and management activities</b>	Means activities involving minimal <b>disturbance</b> of ground or vegetation that are required for monitoring of fauna, vegetation or water, or management activities associated with feral fauna control or weed control. Excludes the <b>construction</b> of infrastructure associated with proposal implementation (e.g. access tracks).
<b>Mt</b>	Million tonne(s).
<b>Mtpa</b>	Million tonne(s) per annum.
<b>National Light Pollution Guidelines for Wildlife</b>	Means the <i>National light pollution guidelines for wildlife, 2023, Version 2.0</i> , Department of Climate Change, Energy the Environment and Water, May 2023, including any revision to this document.
<b>Native title party/ies</b>	As defined in section 18(1AA) under the <i>Aboriginal Heritage Act 1972</i> .
<b>Net scope 1 emissions</b>	<b>Scope 1 greenhouse gas emissions</b> for a period less any <b>authorised offsets</b> which: (a) were cancelled or retired between the first day of the period until 1 March in the year after the period has ended; (b) have not been used to offset <b>greenhouse gas emissions</b> other than <b>proposal greenhouse gas emissions</b> ; and (c) were not generated by avoiding <b>proposal greenhouse gas emissions</b> .
<b>Night-time hours</b>	Means any time between 30 minutes prior to sunset and 30 minutes after sunrise, as specified on the Australian Government Bureau of Meteorology weather station at Karijini North (station number 005098).

<b>Objective(s)</b>	An objective is the proposal-specific desired state for an environmental factor/s to be achieved from the implementation of <b>management actions</b> .
<b>Operations</b>	Operation of the plant infrastructure for the proposal and includes pre-commissioning, commissioning, start-up and operation of the plant infrastructure for the proposal.
<b>Outcome(s)</b>	A proposal-specific result to be achieved when implementing the proposal.
<b>Pilbara Environmental Offsets Fund</b>	A special purpose account created pursuant to section 16(1)(d) of the <i>Financial Management Act 2006</i> by the Department of Water and Environmental Regulation.
<b>Pollution</b>	Has the meaning provided by section 3A(1) of the <i>Environmental Protection Act 1986</i> .
<b>Potential grey falcon nest/s</b>	Nest/s that are suitable for use by grey falcon ( <i>Falco hypoleucos</i> ), such as for breeding and raising young. The known potential grey falcon nests are described in <i>Mulga Downs Iron Ore Mine – Targeted grey falcon survey, Spectrum, 8 September 2023</i> .
<b>Pre-clearance surveys</b>	Surveys designed to identify the presence or evidence of threatened fauna listed under the <i>Biodiversity Conservation Act 2016</i> prior to <b>ground disturbing activities</b> , undertaken by a suitably qualified specialist in alignment with relevant <b>EPA technical guidance</b> , Commonwealth guidance, and/or <b>DBCA</b> guidance.
<b>Predicted drawdown extent</b>	The modelled groundwater drawdown extent, representing the two (2) m drawdown contour, as depicted in Figure 4 and defined by the geographic coordinates in Schedule 1.
<b>Predicted mounding extent</b>	The modelled groundwater mounding extent, representing the one (1) m mounding contour, as depicted in Figure 4 and defined by the geographic coordinates in Schedule 1.
<b>Progressive manner</b>	In relation to rehabilitation, the stage treatment of <b>disturbed</b> areas during exploration, <b>construction</b> , development, and <b>operations</b> as soon as these areas become available.
<b>Reasonable steps to consult</b>	As outlined in the EPA's <i>Technical Guidance Environmental impact assessment of Social surroundings – Aboriginal cultural heritage</i> , as amended from time to time.
<b>Riparian vegetation</b>	Vegetation types AdEvWL and MSW as described in <i>Strategen-JBS&amp;G: Mulga Downs Iron Ore Project, mine and borefield study area - Detailed flora and vegetation assessment 2019-2022, Maia, 12 September 2022</i> and in <i>Mulga Downs Hub and Rail Spur</i> :

	<i>Alignment 8B flora and vegetation consolidated report, Attexo, 7 October 2022.</i>
<b>Rocky hills</b>	The habitat type as depicted in Figure 3 and as described in the <i>Mulga Downs Iron Ore Mine - Consolidated terrestrial fauna report, Attexo, 25 April 2023.</i>
<b>Salinity</b>	The concentration of dissolved salts in water, typically expressed in <b>mg/L</b> , or electrical conductivity.
<b>Scope 1</b>	Scope 1 emissions of <b>greenhouse gas</b> , in relation to a proposal, means the release of <b>greenhouse gas</b> into the atmosphere as a direct result of one or more activities, which are part of the proposal, that generate <b>greenhouse gas emissions</b> , including emissions resulting from the transport of ore via road or rail to port for export.
<b>Self-sustaining</b>	Refers to vegetation or fauna habitat that can survive without on-going <b>management actions</b> such as watering, weed control, or in-fill planting.
<b>Sheetflow dependent vegetation</b>	Vegetation types AaAxSL, ASL (1), ASL (2), AWL (1), AWL (2), AWL (3), AxAsSL, and MTG (1) as described in the <i>Strategen-JBS&amp;G: Mulga Downs Iron Ore Project, mine and borefield study area - Detailed flora and vegetation assessment 2019-2022, Maia, 12 September 2022.</i>
<b>Significant fauna species</b>	Threatened fauna listed under the <i>Biodiversity Conservation Act 2016</i> and Priority fauna listed by <b>DBCA</b> .
<b>Speed Limit Restriction Zone</b>	The spatial area as depicted in Figure 2.
<b>Stony spinifex plains and hillslopes</b>	The habitat type as depicted in Figure 3 and as described in the <i>Mulga Downs Iron Ore Mine - Consolidated terrestrial fauna report, Attexo, 25 April 2023.</i>
<b>Stygofauna 3D habitat modelling area</b>	The spatial area as defined by the stygofauna habitat model extents in Fig 1.1 of <i>Mulga Downs Iron Ore Mine – Stygofauna habitat assessment, AQ2, 18 December 2024</i>
<b>Supporting habitat</b>	The fauna habitat types described in the <i>Mulga Downs Iron Ore Mine - Consolidated terrestrial fauna report, Attexo, 25 April 2023</i> and <i>Mulga Downs - Consolidated terrestrial fauna report Hub and Rail Spur Option 8B, Attexo, 25 October 2022.</i>  For the ghost bat ( <i>Macroderma gigas</i> ), this includes drainage line/floodplain, gibber cracking clay, mulga woodland, rocky hills,

	<p>rocky plains and footslopes, and stone spinifex plains and hillslopes.</p> <p>For the night parrot, this includes chenopod/cracking clay floodplains, cracking clay, drainage line/floodplain, and stony spinifex plains and hillslopes.</p> <p>For the northern quoll (<i>Dasyurus hallucatus</i>), this includes drainage line/floodplain and stony spinifex plains and hillslopes.</p> <p>For the Pilbara leaf-nosed bat (<i>Rhinoicteris aurantia</i> Pilbara form), this includes chenopod/cracking clay floodplain, drainage line/floodplain, mulga woodland, rocky hills, rocky plains and footslopes, and stone spinifex plains and hillslopes.</p>
<b>Surface water dependent vegetation</b>	Refers to <b>sheetflow dependent vegetation</b> and <b>riparian vegetation</b> .
<b>TDS</b>	Total dissolved solids.
<b>Threshold criteria</b>	The indicators that have been selected to represent limits of impact beyond which the environmental <b>outcome</b> is not being met.
<b>t CO<sub>2</sub>-e</b>	Tonnes of carbon dioxide equivalent.
<b>Trigger criteria</b>	Indicators that have been selected for monitoring to provide a warning that, if exceeded, the environmental <b>outcome</b> may not be achieved. They are intended to forewarn of the approach of the <b>threshold criteria</b> and trigger response actions.
<b>Troglofauna 3D habitat modelling area</b>	The spatial area as defined by the troglofauna habitat model extents in Fig 1.1 of <i>Mulga Downs Iron Ore Mine – Revised troglofauna habitat assessment</i> , AQ2, 5 December 2024.
<b>Undifferentiated Tertiary unit</b>	The geological unit referred to as Undifferentiated Tertiary in <i>Mulga Downs Iron Ore Mine – Stygofauna habitat assessment</i> , AQ2, 18 December 2024.
<b>Waste rock landforms</b>	Landform that consists of rocks removed in the mining process to provide access to the ore.
<b>Wona Land System PEC</b>	The priority ecological community for flora and vegetation, referred to as ‘Four plant assemblages of the Wona Land System’ in the <i>Priority ecological communities for Western Australia version 35, Department of Biodiversity, Conservation and Attractions, 19 June 2023</i> .

**Figures (attached)**

- Figure 1 Mulga Downs Iron Ore Mine location and development envelope (This figure is a representation of the co-ordinates referenced in Schedule 1)
- Figure 2 Mulga Downs Iron Ore Mine development envelope and indicative disturbance footprint and maximum wetting front extent (This figure is a representation of the co-ordinates referenced in Schedule 1)
- Figure 3 Terrestrial fauna habitat types and known bat caves.
- Figure 4 Maximum groundwater drawdown and mounding (This figure is a representation of the co-ordinates referenced in Schedule 1)
- Figure 5 Priority Ecological Communities and known surface water pool locations (This figure is a representation of the co-ordinates referenced in Schedule 1)



Figure 1: Mulga Downs Iron Ore Mine location and development envelope

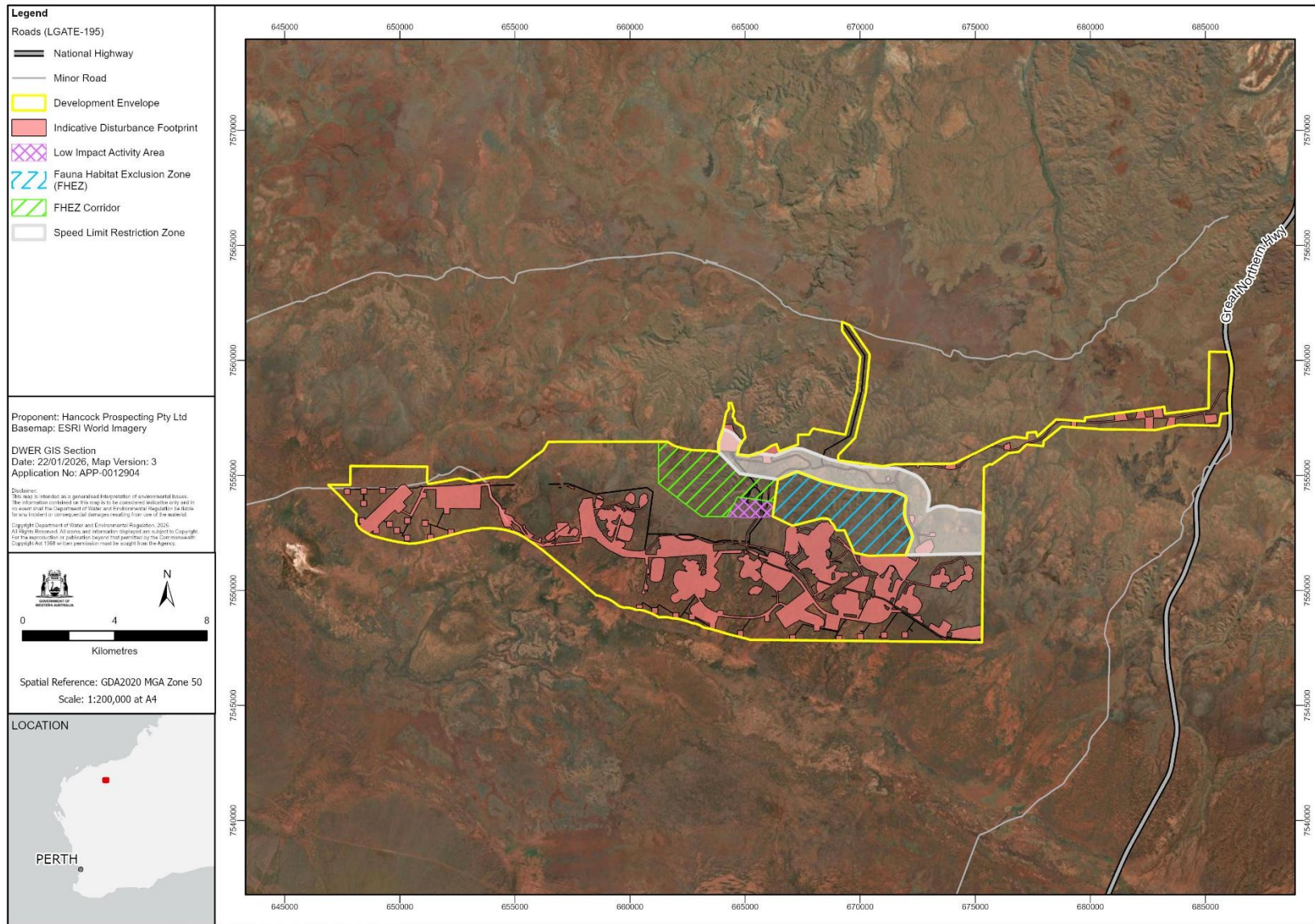


Figure 2: Mulga Downs Iron Ore Mine development envelope and indicative disturbance footprint

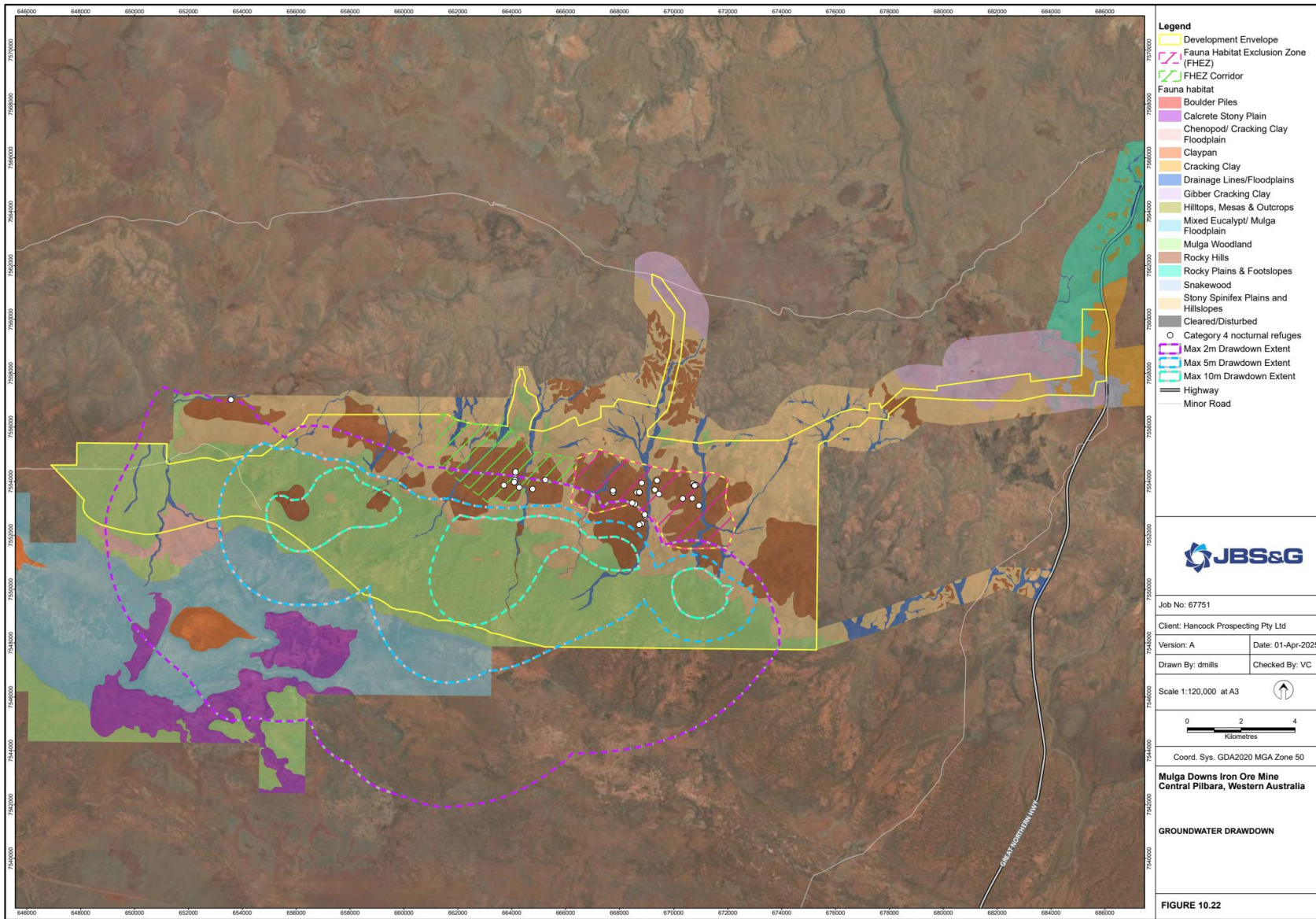


Figure 3: Terrestrial fauna habitat types, known bat caves, and groundwater drawdown extents

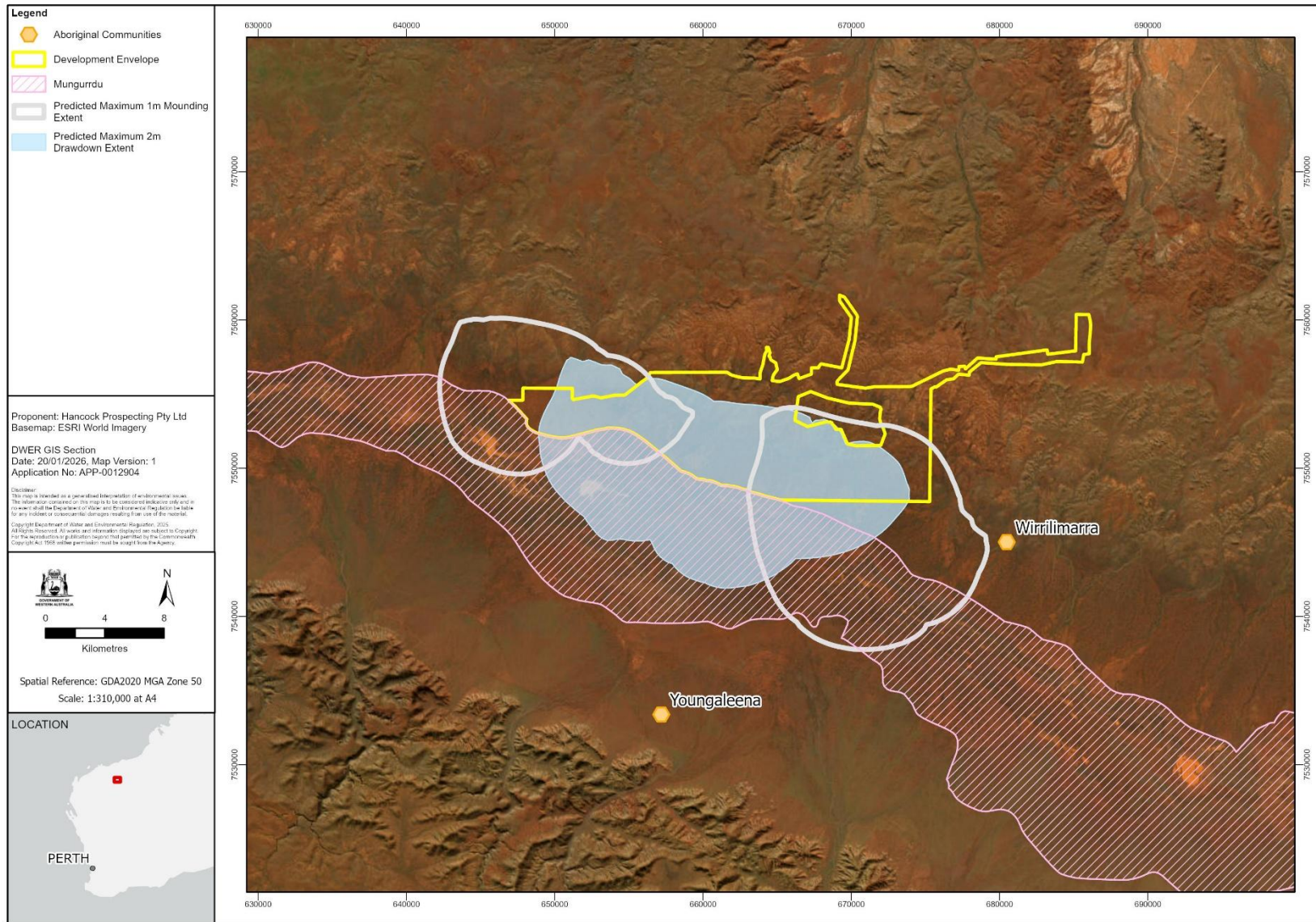


Figure 4: Maximum groundwater drawdown and mounding extents

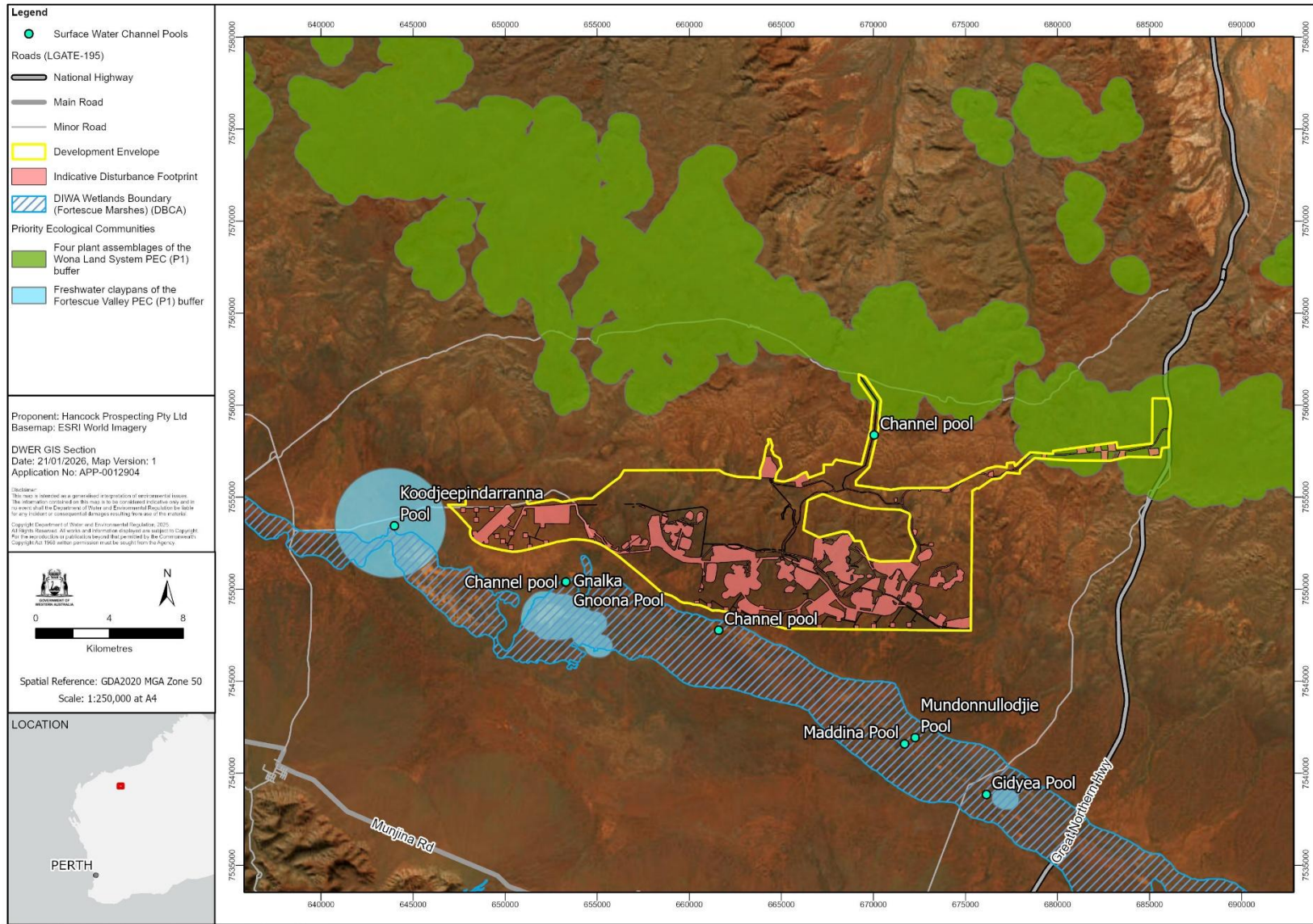


Figure 5: Priority Ecological Communities and known surface water pool locations

**Schedule 1**

All co-ordinates are in metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geocentric Datum of Australia 2020 (GDA20).

Spatial data depicting the figures are held by the Department of Water and Environmental regulation. Record no. DWER-801164602-480101.

## Appendix B: Decision-making authorities

**Table B1: Identified relevant decision-making authorities for the proposal**

Decision-Making Authority	Legislation (and approval)
1. Minister for Aboriginal Affairs	<i>Aboriginal Heritage Act 1972</i> - section 18 consent to impact a registered Aboriginal heritage site
2. Minister for Environment	<i>Biodiversity Conservation Act 2016</i> - section 40 authority to take or disturb threatened species and <i>Contaminated Sites Act 2003</i> - section 58 disturbance of contaminated sites
3. Minister for Mines and Petroleum	<i>Mining Act 1978</i> - granting of a new mining lease
4. Minister for Water	<i>Rights in Water and Irrigation Act 1914</i> - permit to take water - groundwater abstraction licence - licence to construct bores - dewatering licence
5. Chief Executive Officer, Department of Biodiversity, Conservation and Attractions	<i>Biodiversity Conservation Act 2016</i> - authority to take flora and fauna (other than threatened species)
6. Chief Health Officer Department of Health	<i>Health Act 1911</i> Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974
7. Chief Dangerous Goods Officer Department of Mines, Industry Regulation and Safety	<i>Dangerous Goods Safety Act 2004</i> - storage and handling of dangerous goods
8. Executive Director Resource and Environmental Compliance, Department of Mines, Industry Regulation and Safety	<i>Mining Act 1978</i> - mining proposal
9. Department of Mines, Industry Regulation and Safety	<i>Mining Act 1978</i> - miscellaneous license
10. State Mining Engineer, Department of Mines, Industry Regulation and Safety	<i>Mines Safety and Inspection Act 1994</i> - mine safety - approval to commence mining operations

Decision-Making Authority	Legislation (and approval)
11. Chief Executive Officer, Department of Water and Environmental Regulation	<i>Environmental Protection Act 1986</i> - part V works approval and licence - part IV compliance (Ministerial statements)
12. Chief Executive Officer Shire of Ashburton	<i>Local Government Act 1995</i> - development approval and scheme amendment <i>Health Act 1911</i> - permit for treatment of sewage <i>Health Act 1911 and Health (Treatment of            Sewage and Disposal of Effluent and Liquid            Waste) Regulation 1974</i> <i>Building Act 2011</i> - permit for worker accommodation

## Appendix C: Regulation under other statutory processes

**Table C1: Regulation under other statutory processes.**

Statutory decision-making process	Environmental outcome
<i>Aboriginal Heritage Act 1972</i>	No disturbance to Aboriginal cultural heritage, unless consent is granted to disturb that site under the <i>Aboriginal Heritage Act 1972</i> and has involved reasonable steps to consult with relevant Traditional Owners.
<i>Biodiversity Conservation Act 2016</i>	The taking of threatened flora, fauna and ecological communities does not result in any species or community being listed under a higher conservation status.
<i>Contaminated Sites Act 2003</i>	The Wittenoom Asbestos Management Area (ID 80831) and the Mulga Downs Pastoral Station homestead (ID 20175) were classified under the <i>Contaminated Sites Act 2003</i> as Contaminated – remediation required on 28 January 2008 and 1 August 2018, respectively. Both sites are outside, but near, the development envelope.  Where a change in the contamination status of the facility occurs, the <i>Contaminated Sites Act 2003</i> is the primary legislation responsible for its assessment and management.
<i>Dangerous Goods Safety Act 2004</i>	Regulation and licencing of the safe storage, handling, and transport of dangerous goods.
<i>Environmental Protection Act 1986</i> Part V works approval and license Environmental Protection (Noise) Regulations 1997	Regulate emissions and discharges from construction and operations to achieve the following outcomes: <ul style="list-style-type: none"> <li>• no adverse impacts to soil, surface water and groundwater quality</li> <li>• maintain air quality and minimise emissions so that environmental values are protected</li> <li>• protect sensitive receptors from dust and noise.</li> </ul>
<i>Mining Act 1978</i>	Mining activities and associated closure and rehabilitation to be managed via a Mine Development and Closure Plan under the Mining Act and achieve the following outcomes: <ul style="list-style-type: none"> <li>• rehabilitated landforms are stable and do not cause pollution or environmental harm</li> <li>• rehabilitated vegetation is self-sustaining</li> <li>• rehabilitated areas are consistent with the species diversity and abundance of native</li> </ul>

	<p>vegetation within comparative analogue or reference sites</p> <ul style="list-style-type: none"> <li>• rehabilitation includes the use of native seeds collected from native vegetation within the proposal</li> <li>• rehabilitated drainage lines are stable, not prone to erosion, and support ecological processes</li> <li>• closure planning and rehabilitation are undertaken in a progressive manner consistent with achievement of the above outcomes during operations, where practicable.</li> </ul>
<i>Rights in Water and Irrigation Act 1914</i>	No adverse impacts to groundwater or surface water.
<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>	The EPA has recommended conditions in relation to impacts on listed threatened species and communities protected by the EPBC Act. The Department of Climate Change, Energy, the Environment and Water may impose additional conditions under the EPBC Act.

## Appendix D: Environmental Protection Act principles

**Table D1: Consideration of principles of the *Environmental Protection Act 1986***

EP Act principle	Consideration
<p><b>1. The precautionary principle</b></p> <p><i>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</i></p> <p><i>In application of this precautionary principle, decisions should be guided by –</i></p> <p><i>(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</i></p> <p><i>(b) an assessment of the risk-weighted consequences of various options.</i></p>	<p>The EPA has considered the precautionary principle in its assessment and has had particular regard to this principle in its assessment of inland waters, flora and vegetation, terrestrial fauna, subterranean fauna, social surroundings and greenhouse gas emissions.</p> <p>The proponent has undertaken appropriate studies and investigations to provide scientific information to identify environmental values and understand the potential risks on the environment and human health.</p> <p>The EPA notes that the proponent has considered alternatives in designing the proposal to avoid, where practicable, impacts on the environment. This includes:</p> <ul style="list-style-type: none"> <li>• excising 1,320.82 ha from the development envelope associated with the Fauna Habitat Exclusion Zone (FHEZ), and avoiding a further 991.45 ha for the FHEZ corridor</li> <li>• excising the culturally significant Mungurrdu site from the development envelope</li> <li>• proceeding with a smaller scale mining operation (reduced from 20 Mtpa to 12 Mtpa and from a 30-year to 18-year life of proposal), resulting in reduced pit depth, groundwater abstraction, waste rock volume, and so on</li> <li>• removal of wet processing, tailings storage facilities, and pit lake formation post-closure.</li> </ul> <p>The proponent also proposed limits and clear outcomes as a mitigation measure to reduce impacts on the environment, such as clearing limits for conservation significant fauna habitat types. Where there is uncertainty to prevent or avoid impacts from occurring, the EPA has recommended conditions. Subject to the implementation of these recommended conditions, the proposal is unlikely to result in serious or irreversible harm.</p> <p><u>Greenhouse gas emissions</u></p> <p>The EPA notes that climate change because of cumulative GHG emissions has the potential to cause serious damage to WA's environment. The specific impacts</p>

EP Act principle	Consideration
	<p>of any single proposal's GHG emissions are not able to be known with certainty at this time. However, the EPA has not used this as a reason for postponing assessment of the proposal's contribution to the State's GHG emissions or recommending reasonable conditions to limit emissions to minimise the risk of environmental harm associated with climate change. The EPA notes that because of proposal implementation residual scope 1 emissions will be emitted.</p> <p>The EPA considers the maximum extent on net scope 1 greenhouse gas emissions of 100,000 tonnes CO<sub>2</sub>-e per annum (recommended condition A1-1), as committed to by the proponent, is a reasonable limit on the proposal's GHG emissions.</p>
<p><b>2. The principle of intergenerational equity</b></p> <p><i>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</i></p>	<p>The EPA has considered the principle of intergenerational equity in its assessment and has had particular regard to this principle in its assessment of inland waters, flora and vegetation, terrestrial fauna, social surroundings, and greenhouse gas emissions. The EPA notes that the proponent has considered this principle by:</p> <ul style="list-style-type: none"> <li>• consulting with Traditional Owners on the potential impacts to social and cultural values and to ensure values and traditional knowledge associated with Country is not compromised, and</li> <li>• progressively rehabilitating throughout the life of the proposal and at the cessation of mining.</li> </ul> <p>The EPA considers consistency with this principle could be achieved with the implementation of its recommended conditions, which require the proponent to:</p> <ul style="list-style-type: none"> <li>• maintain levels of ecological protection within the terrestrial environment such as limits on the extent of disturbance to flora and vegetation, terrestrial fauna habitat, and subterranean fauna habitat</li> <li>• ensure ongoing access to Country for traditional use or custom is maintained throughout the life of the proposal</li> <li>• consult with the Traditional Owners about the design of waste rock landforms</li> <li>• consult with relevant stakeholders to ensure the post-mining landscape is maintained and enhanced for future generations</li> <li>• rehabilitate landforms, vegetation, and fauna habitat to an appropriate state, including consideration of species diversity and abundance.</li> </ul>

EP Act principle	Consideration
	<p>The EPA has concluded that the environmental values will be protected, and the health, diversity and productivity of the environment will be maintained for the benefit of future generations.</p> <p><u>Greenhouse gas emissions</u></p> <p>The EPA has noted that GHG emissions pose a risk to future generations, however, also notes that the proponent's obligations under the Australian Government's Safeguard Mechanism to net zero emissions by 2050 consistent with the Paris Agreement and IPCC 1.5 report, and to use offsets should these targets not be met by continuous improvement. The EPA has recommended condition A1-1 which requires the proponent to maintain net scope 1 GHG emissions under 100,000 tonnes CO<sub>2</sub>-e per annum as per the proponent's commitment.</p>
<p><b>3. The principles of the conservation of biological diversity and ecological integrity</b></p> <p><i>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</i></p>	<p>The EPA has considered the principle of conservation of biological diversity and ecological integrity in its assessment and has had particular regard to this principle in its assessment of flora and vegetation, terrestrial fauna and subterranean fauna.</p> <p>The EPA notes that the proponent has designed the proposal to avoid areas of critical habitat by excising 1,320.82 ha from the development envelope for the FHEZ and incorporated a FHEZ corridor to connect this the FHEZ with habitat outside the development envelope.</p> <p>To ensure biodiversity and ecological integrity of environmental values within the development envelope, the EPA has recommended conditions including disturbance limits for terrestrial fauna habitat and priority flora species and ensuring vegetation and fauna habitat are appropriately considered in rehabilitation efforts. The EPA has also set limits on the maximum disturbance of stygofauna habitat types to ensure species are able to persist beyond the boundaries of the development envelope.</p> <p>The EPA has concluded that the actions to avoid and minimise impacts to environmental values, which are also recommended as conditions, would likely ensure that environmental outcomes are achieved. The application of limits on disturbance and any associated conditions are to ensure there is no significant residual impact on the biodiversity diversity and ecological integrity of these values.</p>

EP Act principle	Consideration
<p><b>4. Principles relating to improved valuation, pricing and incentive mechanisms</b></p> <p>(1) <i>Environmental factors should be included in the valuation of assets and services.</i></p> <p>(2) <i>The polluter pays principle — those who generate pollution and waste should bear the cost of containment, avoidance or abatement.</i></p> <p>(3) <i>The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes.</i></p> <p>(4) <i>Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.</i></p>	<p>In considering this principle, the EPA notes that the proponent will bear the costs relating to implementing the proposal to achieve environmental outcomes, and management and monitoring of environmental impacts during construction, operation and decommissioning of the proposal. The EPA has had particular regard to this principle in considering inland waters, flora and vegetation, terrestrial fauna, subterranean fauna, social surroundings, and greenhouse gas emissions.</p> <p>The EPA notes that the proponent has pursued these principles by:</p> <ul style="list-style-type: none"> <li>• undertaking surveys to identify environmental values within and near the development envelope</li> <li>• minimising clearing to the extent required</li> <li>• committing to progressive rehabilitation to restore natural ecosystems throughout the life of the proposal.</li> </ul> <p><u>Greenhouse gas emissions</u></p> <p>The proponent will be responsible for bearing the costs of implementing measures to reduce and offset GHG emissions, including the costs of adopting advances in process management and other measures in the future to further reduce and offset GHG emissions to achieve net zero along a linear trajectory to net zero by 2050.</p>
<p><b>5. The principle of waste minimisation</b></p> <p><i>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</i></p>	<p>The EPA has considered the principle of waste minimisation in its assessment and has had particular regard to this principle in its assessment of inland waters, flora and vegetation, terrestrial fauna, social surroundings, and greenhouse gas emissions.</p> <p>The proponent has considered the principle of waste minimisation in designing the proposal, such as:</p> <ul style="list-style-type: none"> <li>• implementing recycling schemes to reduce waste to landfill</li> <li>• utilising excess dewater for dust suppression and domestic water use prior to reinjection and/or pit infiltration.</li> </ul> <p>The EPA notes that the disposal of excess dewater which will also be limited by recommended condition A1-1.</p>

# Appendix E: Other environmental factors

**Table E1: Evaluation of other environmental factors**

Environmental factor	Description of the proposal’s likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
<b>Land</b>			
Landforms	Potential impacts include reduced visual amenity and a reduction in landscape connectivity and diversity.	<p><u>Public comments</u></p> <ul style="list-style-type: none"> <li>No public comments were received during the 7-day public comment period.</li> <li>One public comment was received during the 6-week public environmental review period regarding the uncertainty of final landform designs.</li> </ul> <p><u>Agency comments</u></p> <ul style="list-style-type: none"> <li>No agency responses were received regarding landforms.</li> </ul>	<p>Landforms was not identified as a preliminary key environmental factor when the EPA set the level of assessment for this proposal. The proposal is expected to alter visual amenity through construction and operation, however, impacts to visual amenity were considered under the social surroundings factor.</p> <p>The Goodiadarrie Swamp is considered a landform of note, however, impacts to the Goodiadarrie Swamp were addressed through the assessment of flora and vegetation, inland waters, and social surroundings factors.</p> <p>The EPA considers that the impacts to landforms can be adequately managed under other key environmental factors. Accordingly, the EPA did not consider landforms to be a key environmental factor at the conclusion of its assessment.</p>
Terrestrial environmental quality	<p>Potential impacts include:</p> <ul style="list-style-type: none"> <li>disturbance of natural asbestiform minerals or asbestos containing materials</li> <li>leaching of acid-forming material from waste rock or within pits</li> <li>inadequate storage and handling of</li> </ul>	<p><u>Public comments</u></p> <ul style="list-style-type: none"> <li>Three public comments were received during the 7-day public comment period regarding terrestrial environmental quality, namely from potential impacts from asbestiform material, the handling of hydrocarbons, and acid mine drainage.</li> <li>One public response was received during the 6-week public environmental review</li> </ul>	<p>Terrestrial environmental quality was identified as a preliminary key environmental factor when the EPA set the level of assessment for this proposal. The proposal initially intersected with the Wittenoom Asbestos Management Area (WAMA), and it was unclear to what extent the proposal would interact with both natural and anthropomorphic asbestiform material. Naturally asbestiform is typically found within the Dales Gorge Member of the Brockman Iron Formation.</p> <p>The EPA approved an Environmental Scoping Document (Roy Hill 2022) requiring the proponent to provide further information and studies on the potential impacts and remediation options for asbestos-contaminated areas. The proponent provided an environmental site assessment (JSB&amp;G 2023), voluntary auditors</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
	<p>hydrocarbons, chemical, and waste.</p>	<p>period regarding terrestrial environmental quality.</p> <p><u>Agency comments</u></p> <ul style="list-style-type: none"> <li>The former Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised that sufficient investigations had not been undertaken on the presence of naturally occurring asbestiform. However, this is not considered an issue (as detailed in the adjacent evaluation column) as the proposal no longer intersects areas where asbestiform minerals were identified during exploration drilling (e.g. Malay Well tenement).</li> </ul> <p>DEMIRS also advised that there is unlikely to be impact from acid-forming materials, and that waste rock management can be regulated under the <i>Mining Act</i>.</p> <ul style="list-style-type: none"> <li>The EPA received advice from DWER regarding the potential impacts from asbestiform material, including the management of unexpected finds through the asbestos management plan.</li> </ul>	<p>report (Senversa 2023), and an asbestos management plan (JBS&amp;G 2024) that identifies management and remediation options, as consistent with the Environmental Scoping Document.</p> <p>Since it was referred to the EPA for consideration, the proponent has amended the proposal on numerous occasions which has had the effect of reducing potential impacts to values of terrestrial environmental quality. The proposal now does not intersect with the WAMA and there will be minimal disturbance along tracks in proximity (to the east of the development envelope), which will reduce the likelihood of disturbing anthropomorphic asbestos material. Regarding the disturbance of natural asbestiform minerals, the proponent has reduced the depth of pits and will not excavate any of the Brockman Iron Formation.</p> <p>Exploration drilling identified the presence of asbestiform minerals within the Malay Well tenement (E47/2117) at depth (120 mbgl), however, this tenement is outside the development envelope and at depths beyond which the proponent is mining. The proponent has performed extensive drilling within the Mulga East tenement (M 47/1621) and has not detected asbestiform containing materials.</p> <p>The EPA considers that, while there remains a risk of impacts to terrestrial environmental quality from asbestiform material, the proponent's mitigation and management measures, and other statutory decision-making processes, are sufficient to ensure the environmental outcome is likely to be consistent with the EPA's factor objective for terrestrial environmental quality.</p> <p>The proponent commissioned a waste characterisation report (Mine Earth 2023) and a geochemical assessment (SRK Consulting 2024) to understand the potential risk of acid mine drainage. The reports indicate that 95% of waste will be non-acid forming. The EPA considers that the risk from potentially acid-forming material is low, as the proponent is avoiding the carbonaceous shales within the Jeerinah Member. In addition, based on advice from the former DEMIRS, the EPA considers that waste rock management can be regulated under the Mining Act, and that the environmental</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
		<p>DWER also advised on the potential impacts of mining potentially acid forming material.</p>	<p>outcome is likely to be consistent with the EPA's factor objective for terrestrial environmental quality.</p> <p>Some of the potential impacts associated with hydrocarbon or chemical spills and leaching of waste has been considered under the inland waters factor assessment (see Section 2.3). DMPE can regulated the storage, handling, and transport of dangerous goods under the <i>Dangerous Goods Act 2004</i>. Overall, the EPA considers that the potential impacts can be mitigated and managed through the proponent's mitigation measures and through other statutory processes such as the Mining Act.</p> <p>Accordingly, the EPA did not consider terrestrial environmental quality to be a key environmental factor at the conclusion of its assessment.</p>
<b>Air</b>			
Air quality	<p>Potential impacts include:</p> <ul style="list-style-type: none"> <li>disturbance of natural asbestiform minerals or asbestos containing materials</li> <li>dust emissions from construction and operation of the proposal.</li> </ul>	<p><u>Public comments</u></p> <ul style="list-style-type: none"> <li>Three public comments were received during the 7-day public comment period regarding the generation of dust emissions.</li> <li>One public response was received during the 6-week public environmental review period regarding a lack of air quality monitoring and dust mitigation measures.</li> </ul> <p><u>Agency comments</u></p> <ul style="list-style-type: none"> <li>The EPA received advice from DWER regarding the air quality monitoring program and potential impacts from dust emissions on air quality.</li> </ul>	<p>Air quality was identified as a preliminary key environmental factor when the EPA set the level of assessment.</p> <p>As discussed against terrestrial environmental quality above, the proponent has provided additional investigations regarding the potential impacts associated with asbestiform material and has reduced the overall scale of the mine. The EPA considers that the potential impacts associated with asbestiform material can be adequately mitigated through the proponent's mitigation and management measures, and through other statutory process such as the Mining Act.</p> <p>The EPA considered potential the impacts from dust emissions in its assessment of other environmental factors, including flora and vegetation and social surroundings. The EPA recommended conditions to address potential impacts from dust emissions on environmental values (conditions B1-2 and B5). The proponent has also committed to monitoring of air quality at the Wirrilimurra and Youngaleena communities and sealing the haul road to minimise dust emissions.</p>

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			<p>Subject to the recommended conditions and other statutory decision-making processes, the environmental outcome is likely to be consistent with the EPA's factor objective for air quality. Accordingly, the EPA did not consider air quality to be a key environmental factor at the conclusion of its assessment.</p>
<b>People</b>			
Human health	<p>Potential impacts include:</p> <ul style="list-style-type: none"> <li>disturbance of natural asbestiform minerals or asbestos containing materials</li> <li>dust emissions</li> <li>contamination of drinking water.</li> </ul>	<p><u>Public comments</u></p> <ul style="list-style-type: none"> <li>One public comment was received during the 7-day public comment period regarding the potential impacts from asbestiform material on human health.</li> <li>No public comments were received during the 6-week public comment period regarding impacts to human health.</li> </ul> <p><u>Agency comments</u></p> <ul style="list-style-type: none"> <li>The Department of Health provided advice on the requirement of the proponent to maintain compliance with the Health Regulations 1974 and with the Australian Drinking Water Quality Guidelines 2011.</li> <li>DWER advised on the potential impacts from managed aquifer recharge on other groundwater users.</li> </ul>	<p>Human health was not identified as a preliminary key environmental factor when the EPA set the level of assessment.</p> <p>As discussed against terrestrial environmental quality above, the proponent has provided additional investigations regarding the potential impacts associated with asbestiform material and has reduced the overall scale of the mine. The EPA considers that the potential impacts associated with asbestiform material can be adequately mitigated through the proponent's mitigation and management measures, and through other statutory process such as the Mining Act.</p> <p>The EPA considered the potential impacts from dust emissions in its assessment of other environmental factors, including flora and vegetation and social surroundings. The EPA recommended conditions to address potential impacts from dust emissions on environmental values (conditions B1-2 and B5). It is noted that Youngaleena community is 12 km to the south, and Wirrilimurra community is 8.5 km to the east, and therefore dust emissions are unlikely to impact these receptors. The proponent also amended the proposal under s43A of the EP Act to relocate the haulage route away from the Wirrilimurra community and avoid impacts to human health.</p> <p>The EPA considered the potential impacts to human receptors from changes to groundwater in the inland waters factor (see Section 2.3). Subject to the recommended conditions (A1 and B3) and other statutory processes, there is unlikely to be residual impacts to values of human health.</p>

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Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			Subject to the recommended conditions and other statutory decision-making processes, the environmental outcome is likely to be consistent with the EPA's factor objective for human health. Accordingly, the EPA did not consider human health to be a key environmental factor at the conclusion of its assessment.

## Appendix F: List of submitters

### 7-day comment on referral

#### Organisations and public

- 31 submissions were received from the public during the 7-day public comment period.

#### Government agencies

- Department of Biodiversity, Conservation and Attractions
- Department of Mines, Industry Regulation and Safety
- Department of Water and Environmental Regulation

### Public review of proponent information

#### Organisations and public

- 3 submissions were received from the public during the 6-week public comment period.

#### Government agencies

- Department of Biodiversity, Conservation and Attractions
- Department of Energy, Mines, Industry Regulation and Safety
- Department of Health
- Department of Water and Environmental Regulation

## Appendix G: Assessment timeline

Date	Progress stages	Time (weeks)
24 February 2022	EPA decided to assess – level of assessment set	
24 August 2022	EPA approved Environmental Scoping Document	26
11 April 2025	EPA accepted Environmental Review Document	137
17 April 2025	Environmental Review Document released for public review	1
2 June 2025	Public review period for Environmental Review Document closed	6
8 December 2025	EPA accepted proponent's Response to Submissions	27
18 December 2025	EPA completed its assessment	2
11 February 2025	EPA provided report to the Minister for Environment	6
16 February 2025	EPA report published	3 days
9 March 2025	Appeals period closed	3

Timelines for an assessment may vary according to the complexity of the proposal and are usually agreed with the proponent soon after the EPA decides to assess the proposal and records the level of assessment.

In this case and taking into consideration the occurrence of public holidays and the Christmas close-down period<sup>2</sup>, EPA met its timeline objective to complete its assessment and provide a report to the Minister.

<sup>2</sup> Consistent with section 36 of the *Acts Interpretations Act 1901*

## Appendix H: Relevant policy, guidance, procedures and references

The EPA had particular regard to the policies, guidelines and procedures listed below in the assessment of the proposal.

4DGeotechnics 2023, *Mulga Hub and Spur geotechnical engineering services separable portion 2: Ground breaking investigation – Hub factual geotechnical report*, 28 November 2023.

Alaibakhsh, M., Emelyanova, I. & Barron, O. 2017, *Large-scale regional delineation of riparian vegetation in the arid and semi-arid Pilbara region, WA*, Hydrological Processes, 31, 4269–4281.

ANZECC & ARMCANZ 2000, *Australian and New Zealand guidelines for fresh and marine water quality*, Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand. <https://www.waterquality.gov.au/anz-guidelines/resources/previous-guidelines/anzecc-armcanz-2000>.

AQ2 2024a, *Mulga Downs groundwater, surface water & ecohydrological - Impact assessment*, 19 December 2024.

AQ2 2024b, *Mulga Downs Iron Ore Mine – Revised Troglifauna Habitat Assessment*, 5 November 2024.

AQ2 2025, *Mulga Downs groundwater, surface water & ecohydrological studies – Baseline assessment*, 27 March 2025.

Attexo 2022a, *Mulga Downs Consolidated Terrestrial Fauna Report Hub and Rail Spur Option 8B*, 25 October 2022.

Attexo 2022b, *Mulga Downs Hub and Rail Spur: Alignment 8B Flora and Vegetation Consolidated Report*, 7 October 2022.

Attexo 2023, *Mulga Downs Iron Ore Mine – Consolidated terrestrial fauna report*, 25 April 2023.

Australian Cultural Heritage Management (ACHM) 2024a, *Report of an ethnobotanical survey of Mulga Downs Iron Ore Mine & Hub and Rail Spur*, 26 August 2024.

ACHM 2024b, *Social Surroundings Assessment 6-10 May 2024 – Section 38 Mulga Downs Iron Ore Project*, 12 June 2024.

Barrett, M. 2017, *Population survey for Triodia veniciae in the East Pilbara, June 2017 – A report to Roy Hill Iron Ore*, Botanic Gardens and Parks Authority.

Barrett, M. 2019, *Triodia veniciae (Poaceae), a new species from the Pilbara region, Western Australia*, Nuytsia, 30, 221-228.

Bennelongia 2019, *Mulga east subterranean fauna desktop*, 27 April 2019.

Bennelongia 2021, *Mulga east subterranean fauna baseline survey*, 24 June 2021.

Bennelongia 2024a, *Mulga Downs Iron Ore Mine: Subterranean fauna survey (Attachment A of JBS&G 2024b)*.

Bennelongia 2024b, *Salinity tolerance of stygofauna at Mulga Downs Iron Ore Mine*, 20 October 2024.

Biologic 2022a, *Mulga Downs Iron Ore Project: Mulga west borefield and mulga east southern corridor terrestrial fauna survey*, 19 August 2022.

Biologic 2022b, *Mulga Downs Iron Ore Project: Transport corridor to Great Northern Highway terrestrial fauna survey*, 19 August 2022.

Biologic 2023, *Mulga Downs Iron Ore Mine: Freshwater claypans desktop assessment*, 29 September 2023.

Biologic n.d.-a, *MDIOM stygofauna baseline peer review*.

Biologic n.d.-b, *MDIOM stygofauna salinity tolerance peer review*.

Biologic 2025a, *Mulga Downs Iron Ore Mine: Targeted troglofauna survey* (Attachment A of JBS&G 2025dc), 18 November 2025.

Biologic 2025b, *Mulga Downs targeted troglofauna survey: Molecular systematics analysis* (Attachment B of JBS&G 2025dc), 25 November 2025. Biota Environmental Sciences 2024, *Mulga Downs Iron Ore Mine Pilbara leaf-nosed bat assessment*, December 2024.

Bradley, H.S., Armstrong K.N., Bullen, R.D., Ellis, R, Knuckey, C.G., Ottewell, K., Reiffer, S., Somaweera, R., Umbrello, L. & van Leeuwen, S. 2024, *Conserving the Pilbara leaf-nosed bat: directions for future research and management*, Pacific Conservation Biology, 30.

Commonwealth of Australia (CoA) 2016, *EPBC Act referral guideline for the endangered northern quoll *Dasyurus hallucatus**.

Cowan, M.A., Dunlop., J.A., Gibson, L.A., Moore, H.A., Setterfield, S.A. & Nimmo, D.G. 2024, *Movement ecology of an endangered mesopredator in a mining landscape*, Movement Ecology, 12, 5.

Culver, D.C., Deharveng, L., Pipan, T., and Bedos, A. 2021, *An overview of subterranean biodiversity hotspots*, Diversity, 13, 487.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2021. *Directory of Important Wetlands in Australia. Australian Wetlands Database*. <https://www.dcceew.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands>.

DCCEEW 2023a, *Australian national greenhouse accounts factors workbook 2023*, Department of Climate Change, Energy, the Environment and Water.

DCCEEW 2023b, *Recovery plan for the greater bilby (*Macrotis lagotis*)*, Department of Climate Change, Energy, the Environment and Water.

DCCEEW 2024a, *Safeguard Mechanism: Prescribed production variables and default emissions intensities*, Department of Climate Change, Energy, the Environment and Water, Canberra, ACT.

DCCEEW 2024b, *State and territory greenhouse gas inventories: annual emissions*, Department of Climate Change, Energy, the Environment and Water, Canberra, ACT.

DCCEEW 2025a, *Conservation Advice for *Pezoporus occidentalis* (night parrot)*. Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW 2025b, *National Inventory Report 2023 - The Australian Government Submission to the United Nations Framework Convention on Climate Change*, May 2025, Canberra: Department of Climate Change, Energy, the Environment and Water.

Department of Environment Regulation (DER) 2015, *Guidance Statement Setting Conditions, Part V, Division 3, Environmental Protection Act 1986*, Perth, WA.

Department of Mines, Petroleum and Exploration (DMPE) 2025a, *Guideline for preparing mine closure plans*, DMPE, November 2025 Perth, WA.

DMPE 2025b, *Guideline for preparing mining development and closure proposals*, DMPE, November 2025 Perth, WA.

Dillon, P., Kumar, A., Kookana, R., Leijes, R., Reed, D., Parsons, S. & Ingleton, G. 2009, *Managed aquifer recharge - risks to groundwater dependent ecosystems - a review*, For a healthy country flagship report to Land & Water Australia, CSIRO.

DWER 2019, *Pilbara Environmental Offsets Fund governance framework 2019*, Department of Water and Environmental Regulation.

DWER 2020a, *Policy: Use of mine dewatering surplus*, Department of Water and Environmental Regulation, Perth WA.

DWER 2020b, *Policy: Use of operating strategies in the water licensing process*, Department of Water and Environmental Regulation, Perth WA.

Ecologia Environmental (Ecologia) 2020, *Mulga East short-range endemic invertebrate fauna assessment*, 7 December 2020.

Ecologia 2021a, *Mulga East baseline terrestrial vertebrate fauna assessment*, 23 February 2021.

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