



Environmental
Protection
Authority

Atlas Project

Image Resources NL

Report 1759

March 2024

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 Atlas Project proposal by Image Resources Limited.

The Atlas Project was determined under the Commonwealth *Environment Protection and Biodiversity Act 1999* to be a controlled action and to be assessed by the EPA under an accredited process. This document is also the result of the EPA's accredited assessment process.

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

- what the EPA considers to be the key environmental factors identified in the course of the assessment
- an assessment of the matters of national environmental significance
- 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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Summary

Proposal

The Atlas Project is a proposal to develop a greenfields mineral sands project. The proposal is located 18 kilometres from Cervantes, in the Wheatbelt region of Western Australia. The proponent for the proposal is Image Resources NL.

The proposal includes progressive development of mine pits, processing facilities, groundwater bores and water management infrastructure, temporary waste stockpiles, solar drying ponds and associated infrastructure (power supply, communications, workshop, laydown, offices, accommodation camp, etc.).

Environmental values

The development envelopes contain *Banksia Woodlands of the Swan Coastal Plain* Threatened Ecological Community (TEC) (Banksia Woodlands) listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The community is considered a priority ecological community (priority 3) by the Department of Biodiversity, Conservation and Attractions (DBCA).

The Mine Development Envelope also contains a location of the *Herb rich saline shrublands in clay pans* Threatened Ecological Community SPC07 (Claypan TEC) listed as Critically Endangered under the EPBC Act and Endangered under the *Biodiversity Conservation Act 2016* (BC Act).

Seventeen priority flora species were recorded within the development envelopes with one species of taxonomic interest recorded. Moodjar (*Nuytsia floribunda*) trees were identified as important during consultation with Traditional Owners. The mining area and surrounds contain groundwater dependent ecosystems and associated phreatophytic vegetation.

Conservation significant fauna were recorded during surveys of the area and the site contains foraging habitat for the Carnaby's black cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act.

Consultation

The Environmental Protection Authority (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 six weeks. 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 has avoided impacts by:

- reducing the development envelopes and disturbance footprints during the assessment including:
 - Mine Development Envelope – 27.2 ha reduction from 302 ha to 274.8 ha
 - External Infrastructure Development Envelope – 41.2 ha reduction from 70 ha to 28.8 ha
 - footprint – 29.6 ha reduction in the extent of native vegetation clearing, consisting of:
 - 19.8 ha reduction within the Mine Development Envelope from 292 ha to 272.2 ha
 - 9.8 ha reduction within the External Infrastructure Development Envelope from 26 ha to 16.2 ha.
 - reduction in disturbance of Banksia Woodlands by 29.6 ha compared to that in the ERD
 - designing the mine pit to avoid all direct impacts to the Claypan TEC.
- introducing exclusion zones and avoiding impacts for:
 - *Levenhookia preissii* (P1) individuals
 - Claypans of the Swan Coastal Plain Threatened Ecological Community
 - stand of Moodjar (*Nuytsia floribunda*) trees
 - short-range endemic record of *Maratus Maratus* 'BAR130'.
- avoiding the following priority flora that were previously to be impacted:
 - *Acacia benthamii* (P2): the only known occurrence has been avoided
 - *Calectasia palustris* (P2): reduction of impact from 3 individuals to nil individuals
 - *Schoenus badius* (P2): the only known occurrence has been avoided.
- reduction of impacts to priority flora from reduction of development envelopes and disturbance footprints:
 - *Grevillea cooljarloo* (P1): clearing of individuals reduced from 831 to 697, a reduction of 134 individuals
 - *Levenhookia preissii* (P1): clearing of individuals reduced from 14 to 3, a reduction of 11 individuals

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- *Chordifex reseminans* (P2) clearing of individuals reduced from 186 to 62, a reduction of 124 individuals
 - *Angianthus micropodioides* (P3): clearing of individuals reduced from 90,405 to 87,000, a reduction of 3,405 individuals
 - *Babingtonia urbana* (P3): clearing of individuals reduced from 698 to 696, a reduction of 2 individuals
 - *Eryngium pinnatifidum* subsp. *palustre* (G. J. Keighery 13459) (P3): clearing of individuals reduced from 577 to 472, a reduction of 105 individuals
 - *Isopogon panduratus* subsp. *palustris* (P3): clearing of individuals reduced from 986 to 944, a reduction of 42 individuals
 - *Jacksonia carduacea* (P3): clearing of individuals reduced from 13 to 1, a reduction of 12 individuals
 - *Stylidium aceratum* (P3): clearing of individuals reduced from 711 to 710, a reduction of 1 individual
 - *Anigozanthos humilis* subsp. *chrysanthus* (P4): clearing of individuals reduced from 3 to 1, a reduction of 2 individuals
 - *Stylidium longitubum* (P4): clearing of individuals reduced from 3,223 to 1,983, a reduction of 1240 individuals.
- avoiding Mount Jetty Creek and Bibby Creek, and associated wetland and vegetation, through reduction of the development envelopes and disturbance footprints
 - pit dewatering volumes will be reduced from a reduction in the extent and life of mine, through reduction of the development envelopes and disturbance footprints
 - proposing only the dry mining scenario rather than a wet mining scenario which reduces overall groundwater abstraction volumes as significant amounts of externally sourced water are not required to be added to the pit to facilitate dredging
 - reducing disturbance to seasonal ponds and wetlands through reduction of the development envelopes and disturbance footprints
 - reducing the timeframe of mining through the reduction of the development envelopes and disturbance footprints
 - staging of the proposal by advancing mining progressively south to north, with appropriate monitoring, review and reporting of the proposed Drawdown Mitigation Scheme
 - commencing the Drawdown Mitigation Scheme by using a starter pit to inform and update the scheme as mining progresses
 - installation of a ring of infiltration pond monitoring bores around the mine pit prior to commencing dewatering activities to begin monitoring water levels in the proposal area

- use of data loggers to provide real-time monitoring of water levels in infiltration pond monitoring bores
- recording of rainfall and other relevant weather information on site to provide site specific data to input into updates of the Drawdown Mitigation Scheme and reviews of the groundwater modelling.

The proponent has proposed to rehabilitate the disturbance footprint, which includes all the mine, the majority of the processing plant and supporting infrastructure areas, except for 0.6 ha that will be a permanent upgrade to the Bibby Road / Brand Highway intersection. The proponent proposes to commence rehabilitation progressively. The proponent proposes to establish priority species and the banksia woodland in rehabilitation areas, in consultation with DBCA and research organisations. Rehabilitation will directly benefit groundwater levels by allowing better groundwater recharge, and directly benefit fauna by reinstating habitat. The proponent has proposed a range of offsets, including land acquisition that connects to National Parks, restoration of farmland and research designed to improve the knowledge of the species being impacted. The offsets are in addition to rehabilitation to counter-balance impacts from implementation of the proposal.

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.	<p>Clearing of up to 288.4 ha of native vegetation in mainly excellent to pristine condition.</p> <p>Clearing of up to 206.4 ha of Banksia Woodlands TEC/PEC.</p> <p>Loss of individuals of 17 priority flora species and direct impact to priority flora habitat.</p> <p>Clearing of individuals of a species of taxonomic interest.</p> <p>The proposal will result in the loss of vegetation, including Banksia Woodlands and individuals of priority listed flora.</p> <p>The proponent proposes to rehabilitate the disturbance footprint, with the exception of 0.6 ha for Bibby Road / Brand Highway intersection, with native vegetation. The proponent has prepared a Banksia Woodlands Rehabilitation Plan specific to rehabilitation of Banksia Woodlands.</p> <p>The proponent has also proposed exclusion zones for priority species and other species of cultural significance.</p> <p>The proponent has proposed an exclusion zone around the nearby Claypan TEC to ensure no direct impacts to this TEC.</p> <p>The EPA advises that subject to the recommended condition A1 to limit the extent of clearing, condition B1 regarding the exclusion zones and condition B5 for rehabilitation and condition B4 for offsets, the</p>

Residual impact or risk to environmental value		Assessment finding
		significant residual impact can be managed and counterbalanced so that the environmental outcome is likely to be consistent with the EPA objective for this factor.
2.	Indirect impacts to flora and vegetation associated with acid sulfate soils (ASS), spread of weeds and dieback.	The EPA advises there is unlikely to be significant residual impacts from ASS, the spread of weeds or introduction of dieback. The EPA considers that, subject to the recommended outcome and requirement in condition B1 for active weed and dieback management, and the proponent's implementation of the ASS management plan and regulation under Part V of the <i>Environmental Protection Act 1986</i> , the environmental outcome is likely to be consistent with the EPA objective for this factor.

Inland waters

Residual impact or risk to environmental value		Assessment finding
1.	Impacts to groundwater dependent ecosystems outside of the development footprint from drawdown of groundwater, mitigated by proposed managed aquifer recharge.	The EPA has assessed that changes to groundwater levels can be managed through recommended conditions requiring that the water table levels are maintained to prevent potential impacts to groundwater dependent ecosystems, and regulation under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act). Subject to the recommended condition A1 to limit the drawdown, condition B3 to limit impacts to vegetation from drawdown, condition B4 for appropriate contingency offsets, and the regulation under the RIWI Act, the environmental outcome is likely to be consistent with the EPA objective for this factor.
2.	Groundwater supply for processing	The EPA has assessed impacts to groundwater levels from production bores and considers that this activity is unlikely to be a significant residual impact, subject condition A1 to limit abstraction and regulation under the RIWI Act, the environmental outcome is likely to be consistent with the EPA objective for this factor.

Terrestrial fauna

Residual impact or risk to environmental value		Assessment finding
1.	Clearing of 288.4 ha of foraging habitat for Carnaby's black cockatoo.	<p>The EPA considers that the impact to Carnaby's black cockatoo habitat is a significant residual impact.</p> <p>The EPA advises that this residual impact should be subject to reasonable conditions to set clearing limits and require offsets to counterbalance this significant residual impact.</p> <p>Subject to recommended condition A1 to limit the extent of clearing, condition B2 to limit clearing of Carnaby's black cockatoo foraging habitat, and condition B5 for rehabilitation and condition B4 for offsets, the environmental outcome is likely to be consistent with the EPA objective for this factor.</p>
2.	Clearing of native vegetation that supports conservation significant fauna	<p>The EPA considers that the impact to conservation significant fauna habitat is a residual impact.</p> <p>The EPA advises that this residual impact should be subject to reasonable conditions to set clearing limits.</p> <p>Subject to recommended condition A1 to limit the extent of clearing, condition B2 to limit clearing of Carnaby's black cockatoo foraging habitat, the environmental outcome is likely to be consistent with the EPA objective for this factor.</p>
3.	Indirect impact to potential SRE species <i>Maratus Maratus</i> 'BAR130'	<p>The EPA advises that subject to recommended condition A1 to limit the extent of clearing, condition B2 to implement an exclusion zone, the environmental outcome is likely to be consistent with the EPA objective for this factor.</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 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 provides the following information for consideration by the Minister.

The EPA notes that the proponent is commencing rehabilitation of an existing mine at Boonanarring in Western Australia. The EPA expects learnings from other rehabilitation to directly influence rehabilitation at the Atlas Project.

1 Proposal

The Atlas Project is a proposal to develop a greenfields mineral sands project. The proposal is located 18 kilometres from Cervantes, in the Wheatbelt region of Western Australia (see Figure 1).

The proposal includes progressive development of mine pits, processing facilities, groundwater bores and water management infrastructure, temporary waste stockpiles, solar drying ponds and associated infrastructure (power supply, communications, workshop, laydown, offices, accommodation camp, etc). Two development envelopes have been proposed, the Mine Development Envelope for mining related activities and an External Infrastructure Development Envelope for the associated infrastructure (see Figure 2).

The proponent for the proposal is Image Resources NL. The proponent referred the proposal to the Environmental Protection Authority (EPA) on 3 September 2021. The referral information was published on the EPA website for seven days public comment. On 13 October 2021, the EPA decided to assess the proposal at the level Public Environmental Review with a six-week public review.

The proposal was determined under the *Environment Protection and Biodiversity Conservation Act 1999* to be a controlled action and to be assessed by the EPA under an accredited assessment process.

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

Table 1: Proposal content document

Proposal element	Location	Maximum extent or range
<i>Physical elements</i>		
Mine Development Envelope (MDE): <ul style="list-style-type: none"> • open cut mine pits • temporary topsoil/ subsoil/ waste stockpiles • processing facilities • solar drying ponds • supporting infrastructure. 	Figure 2 and indicative footprint in Figure 3	Disturbance of no more than 274.8 ha within the 457 ha MDE, including no more than 272.2 ha of native vegetation clearing.
External Infrastructure Development Envelope (EIDE): <ul style="list-style-type: none"> • transport infrastructure upgrades • accommodation Camp • one or more extraction bore/s and associated pipeline corridors. 	Figure 2	Disturbance of no more than 28.8 ha within the 37.8 ha EIDE, including no more than 16.2 ha of native vegetation clearing.

Proposal element	Location	Maximum extent or range
<i>Construction elements</i>		
Pit dewatering	Superficial aquifer	Dewatering of up to 1.1 GL/a
<i>Operational elements</i>		
Heavy Mineral Concentrate (HMC) production		Up to 250 ktpa
HMC storage		Up to 30 kt HMC prior to haulage for export
Mining method		Dry mining
Pit dewatering	Superficial aquifer	Up to 0.75 GL/a
Groundwater abstraction	Yarragadee and Eneabba Aquifer	Up to 2.2 GL/a from one or more borefields
Power generation		3 MW via onsite diesel generators (potential to replace with grid or renewable generation*)
<i>Proposal elements with greenhouse gas emissions</i>		
<i>Construction elements</i>		
Scope 1 and 2	Maximum of 31 kt CO ₂ -e	
<i>Operation elements</i>		
Scope 1 and 2	Maximum of 55 kt CO ₂ -e/a	
<i>Other elements</i>		
Proposal time	Maximum project life	5 years
	Construction phase	12 months
	Operations phase	3 years
	Decommissioning phase	12 months

Units and abbreviations

ha – hectare

kt – kilotonnes

ktpa – kilotonnes per annum

kt CO₂-e – kilotonnes of CO₂ equivalentskt CO₂-e/a – kilotonnes of CO₂ equivalents per annum

GL/a – gigalitres per annum

MW – megawatts

*Both options would reduce the greenhouse gas emissions.

Proposal amendments

The original proposal is set out in section A of the proponent's referral supporting report (Preston Consulting 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 referral.

The proponent requested changes to the proposal during the assessment under s. 43A of the *Environmental Protection Act 1986* (EP Act). The changes were designed to reduce potential impacts on the environment. The EPA Chair's notice of 6 September 2022 and 19 January 2024 consenting to the change is available on the EPA website.

On 19 June 2023, the EPA consented to the proponent undertaking minor or preliminary works under s. 41A(3) of the EP Act to commence the construction and commissioning of an 82-person accommodation camp. The EPA Chair's notice consenting to the works is available on the EPA website.

The EPA has considered the proponent has substantially reduced its proposal since referral, in which has resulted in:

- a reduction of the Mining Development Envelope from 981 ha to 457 ha
- a revised Mining Development Envelope that will avoid Mount Jetty and Bibby creek lines, and associated wetland and vegetation, and Aboriginal areas of cultural concern identified in recent Aboriginal heritage surveys and during consultation with the Yued People (Traditional Owners)
- the overall amount of clearing of native vegetation being reduced from 506 ha to 288.4 ha
- clearing of Banksia Woodlands of the Swan Coastal Plain being reduced from 236 ha to 206.4 ha
- clearing of Carnaby's black cockatoo foraging habitat being reduced from 289 ha to 257.3 ha
- a reduction in clearing of a number of priority flora species
- pit dewatering during operations reducing from approximately 3 Gigalitres per year (GL/year) to 0.75 GL/year, which will reduce the extent of groundwater drawdown potentially affecting groundwater dependent ecosystems
- groundwater abstraction being reduced from 3.4 GL/year to 2.2 GL/year
- power requirement being reduced from up to 5 Megawatts (MW) to a maximum of 3 MW, reducing greenhouse gas emissions.

The proponent also nominated that the proposal would only consider dry mining methods as opposed to either dry or dredge (wet) mining methods. While proposed pit dewatering volumes will be reduced compared to the original proposal from a reduction in the extent and life of mine, dry mining also reduces overall abstraction volumes as significant amounts of externally sourced water are not required to be added to the pit to facilitate dredging.

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

Proposal alternatives

Due to the nature of the activity, the location of the proposal was largely constrained by the location of the mineral resource. Therefore, the proponent could not consider alternative locations for the proposal. However, the proponent has reduced the proposal and used baseline studies and investigations to inform the location of the infrastructure, such as a further investigation into biodiversity values before and after the publishing of the Environmental Review Document (ERD), and investigating bore locations, so that the impact to the environment can be minimised as far as practicable.

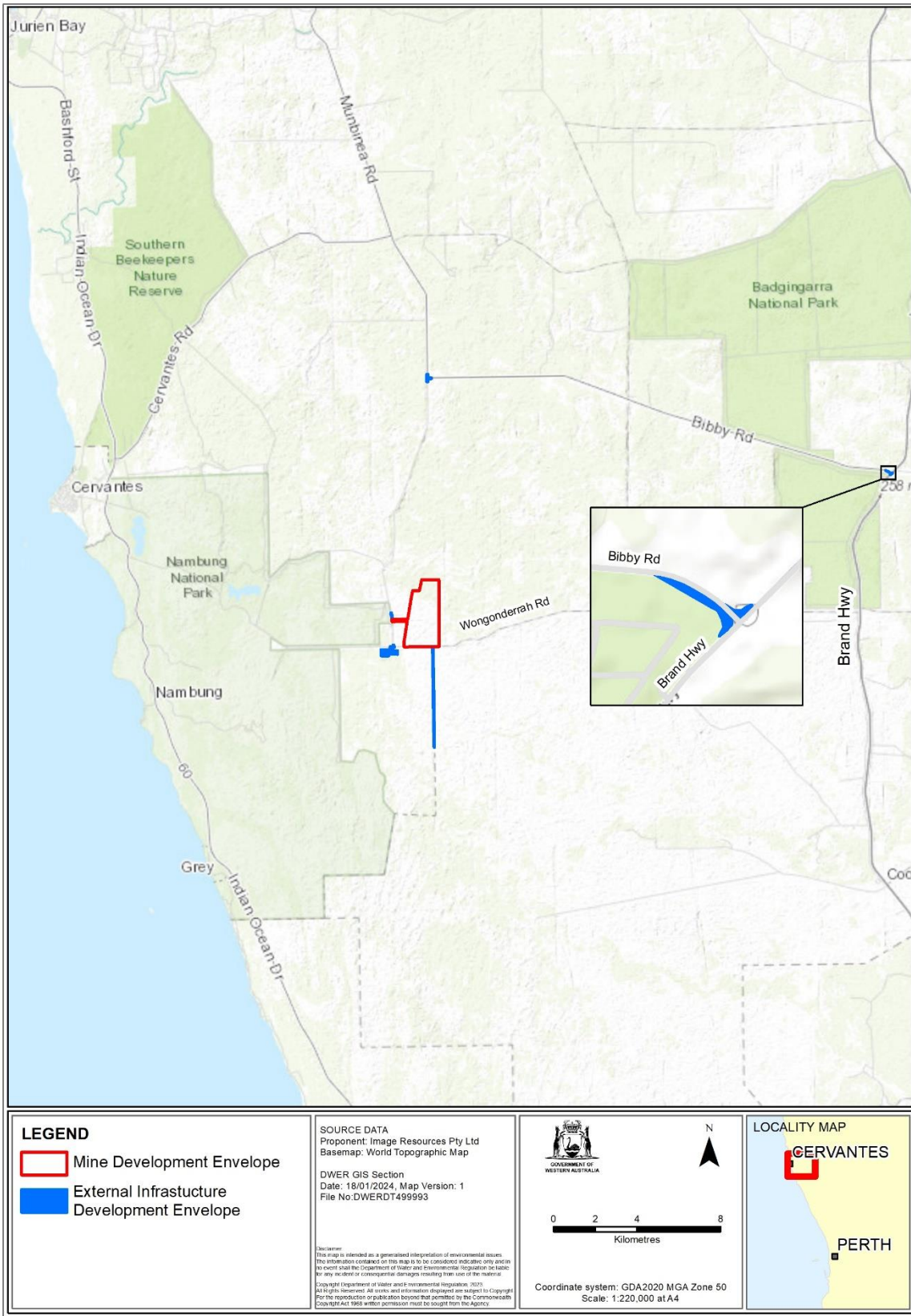


Figure 1: Proposal location



Figure 2: Development envelopes

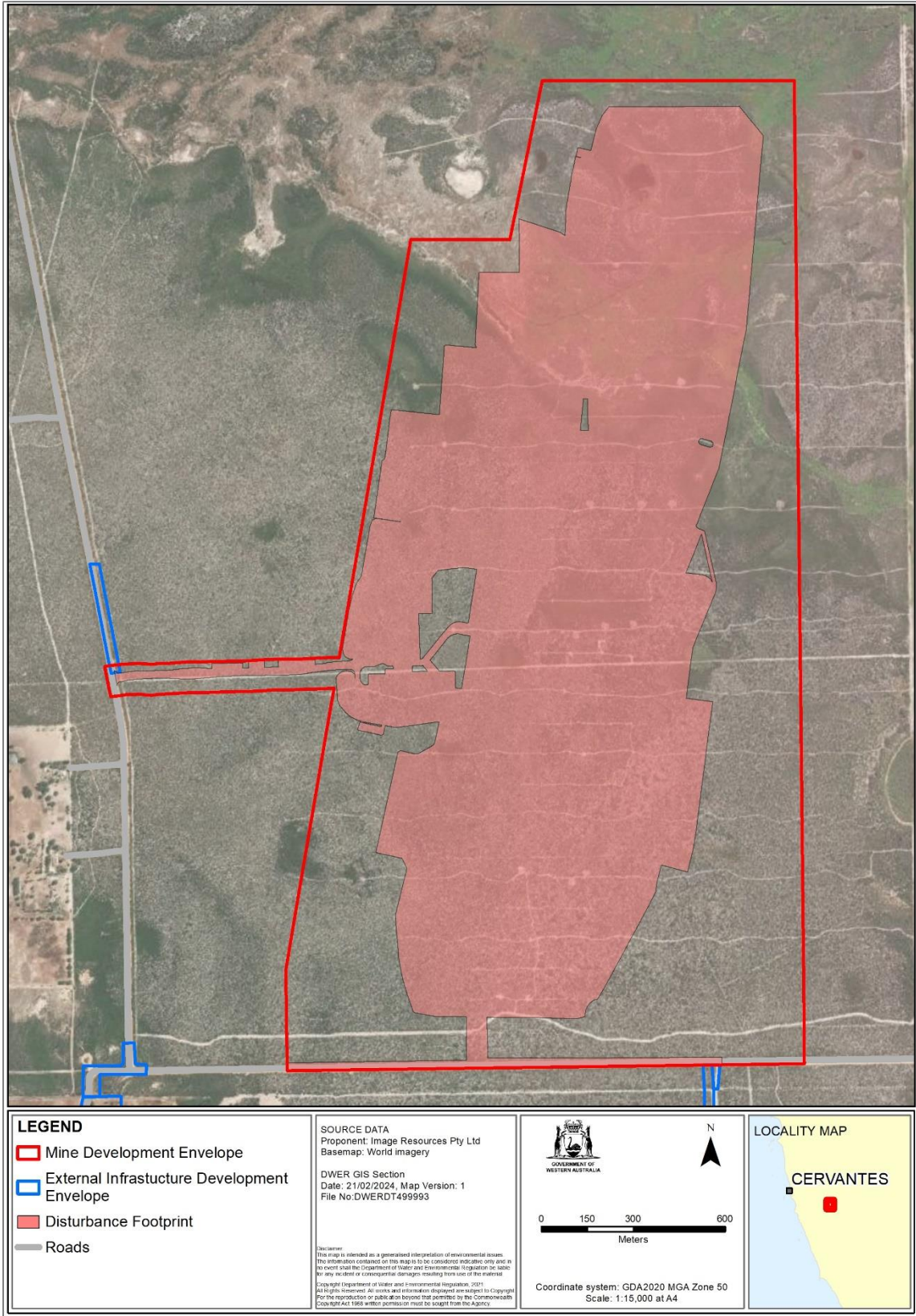


Figure 3: Mine Disturbance Footprint

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 E.

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:

- Level 2 Flora and Vegetation Survey (Appendix 3 of the environmental review document) (360 Environmental 2012a)
- Flora and Vegetation Survey for the Atlas Project (Appendix 4 of the environmental review document) (Morgan 2022)
- Spring Biological Assessment – Bibby Road, Cooljarloo (Appendix 5 of the environmental review document) (360 Environmental 2021)
- Comprehensive and Broadscale Phytophthora Dieback Assessment of the Proposed Atlas Project (Appendix 6 of the environmental review document) (Terratree 2020)
- Spring 2022 Conservation Significance Search (Appendix 1 of the response to submissions) (Morgan 2023a)
- Spring 2023 Conservation Significance Search (Appendix 2 of the response to submissions) (Morgan 2023b)
- CNQ18 vegetation in the Atlas MESA survey area (Appendix 8 of the response to submissions) (Morgan 2023c)
- Post ERD Significant Flora Impact Assessment (Appendix 3 of the response to submissions) (Preston Consulting 2023a)
- Dieback Assessment (Appendix 7 of the response to submissions) (Terratree 2023b).

The surveys were not all consistent with the *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016d) during the assessment of the ERD. Additional surveys were subsequently undertaken to ensure that impacts can be considered. The EPA determined that after additional surveys and information had been provided in the response to submissions, it had enough information to complete its assessment.

2.1.3 Assessment context – existing environment

As defined in the Interim Biogeographic Regionalisation for Australia (IBRA), the proposal occurs within the Perth biogeographic subregion, near the southern boundary of the Geraldton Sandplains biogeographic region (Lesueur Sandplain biogeographic subregion).

The development envelopes are located within the Bassendean System in the Perth biogeographic subregion. The remaining pre-European extent of Bassendean 1030 vegetation system association is 88,950 ha (64%) (Preston Consulting 2022).

The dominant land within and surrounding the development envelopes include areas of remnant bushland, dry-land agriculture, conservation and unallocated crown land. The proposal is located approximately 1 km beyond the eastern edge of the Nambung National Park (Figure 4).

The development envelopes contain *Banksia Woodlands of the Swan Coastal Plain* Threatened Ecological Community (TEC)/ Priority Ecological Community (PEC) (Banksia Woodlands) listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and a priority three ecological community at a state level.

The Mine Development Envelope also contains a location of the *Herb rich saline shrublands in clay pans* Threatened Ecological Community SPC07 (Claypan TEC) listed as Critically Endangered under the EPBC Act and Endangered under the *Biodiversity Conservation Act 2016* (BC Act).

Considering the depth to groundwater in the area is likely to be between 2 and 10 m, and the species in the area, such as *Banksia attenuata*, *Banksia menziesii* and *Banksia prionotes*, are facultative phreatophytes (will use groundwater if it is accessible), the EPA has assessed the proposal and considered the Banksia Woodlands to be groundwater dependent ecosystems (refer to inland waters section 2.2 for assessment of impacts from groundwater drawdown). Work on the degree of groundwater dependence of the Banksia in this area has not been undertaken so this is a conservative position.



Figure 4: Regional context

No species listed under state or commonwealth guidelines listed as 'Threatened flora' species were recorded within the development envelopes. The surveys recorded 35 priority species in the broader area, with the following 17 priority flora species recorded within the development envelopes:

- *Grevillea cooljarloo* (Keighery & Olde) (P1)
- *Levenhookia preissii* (P1)
- *Chordifex reseminans* (P2)
- *Angianthus micropodioides* (P3)
- *Babingtonia urbana* (P3)
- *Conospermum scaposum* (P3)
- *Desmocladius nodatus* (P3)
- *Eryngium pinnatifidum* subsp. *Palustre* (G. J. Keighery 13459) (P3)
- *Hensmania stoniella* (P3)
- *Isopogon panduratus* subsp. *palustris* (P3)
- *Jacksonia carduacea* (P3)
- *Schoenus pennisetis* (P3)
- *Stylidium aceratum* (P3)
- *Anigozanthos humilis* subsp. *chrysanthus* (P4)
- *Schoenus griffinianus* (P4)
- *Stylidium longitubum* (P4)
- *Thysanotus glaucus* (P4).

One species of taxonomic interest (*Jacksonia* aff. *floribunda*) was also recorded within the development envelopes. This species is considered by the DBCA Herbarium Identification Service to be part of the *Jacksonia floribunda* complex but identified it as *Jacksonia* aff. *floribunda* and noted it as a 'taxon of interest'.

Local Moodjar (*Nuytsia floribunda*) trees were identified as important during consultation with Traditional Owners within the Yued Aboriginal Corporation.

No areas within the development envelopes were identified as currently impacted or infested with dieback (*Phytophthora*).

None of the 92 weed species recorded in the survey areas are listed as Weeds of National Significance. One Declared Pest was recorded within the development envelope, a leaf Cape Tulip (*Moraea flaccida*) listed under the *Biosecurity and Agriculture Management Act 2007* (WA) and on the Western Australian Organism List database.

2.1.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (Preston Consulting 2023b). Key issues raised during public consultation on the proposal were clearing of native vegetation, including impacts to Banksia Woodlands and potential impacts to a Claypan TEC, potential impacts to priority flora, the cumulative impacts of vegetation clearing from this proposal and other developments in the region, and the rehabilitation of the Banksia Woodlands.

The EPA consulted with DBCA regarding the proponent's methods used for the survey of the Claypan TEC. The survey was undertaken as a result of public comments (Preston Consulting 2023b). DBCA advised that the survey used appropriate methodology and provided an accurate assessment of the areas representing the Claypan TEC within the development envelope and that the conclusions outlined in the report were satisfactory.

An issue raised during the public consultation about potential impacts to the endangered Matchstick Banksia (*Banksia cuneata*) is considered unlikely to be material because the nearest recorded Matchstick Banksia is 300 km southeast of the development envelopes. The proponent provided further information regarding the Banksia species recorded during surveys and the species is likely to be the Holly-leaved Banksia (*Banksia ilicifolia*), which is closely related to the Matchstick Banksia (DEC 2009), is non-threatened, and was commonly recorded in surveys for the proposal. Therefore, the Matchstick Banksia would not be impacted by the proposal and is not discussed further in this assessment.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in the sections below (sections 2.1.6, 2.1.7, 2.1.8 and 2.1.9).

2.1.5 Potential impacts from the proposal

The proposal has the potential to significantly impact on flora and vegetation from:

- clearing of up to 288.4 ha of native vegetation
- clearing of up to 206.4 ha of Banksia Woodlands
- clearing of individuals of priority flora species
- clearing of individuals of a species of taxonomic interest
- potential indirect impact to a Claypan TEC
- indirect impacts from drawdown of water affecting the quality of groundwater dependent ecosystems and phreatophytic vegetation
- other indirect impacts including:
 - fragmentation of native vegetation
 - introduction and/or spread of weeds
 - introduction of dieback.

2.1.6 Avoidance measures

The proponent has designed the proposal to avoid impacts to flora and vegetation by:

1. Introducing exclusion zones and avoiding impacts for:
 - *Levenhookia preissii* (P1) individuals
 - Claypans TEC
 - Stand of Moodjar (*Nuytsia floribunda*) trees.
2. Avoiding the following priority flora that were previously to be impacted (as stated in the ERD):
 - *Acacia benthamii* (P2): the only known occurrence has been avoided
 - *Calectasia palustris* (P2): reduction of impact from three individuals to nil individuals
 - *Schoenus badius* (P2): the only known occurrence has been avoided
 - *Conostylis pauciflora* subsp. *euryrhipis* (P4): the only known occurrence was a misidentification of *Conostylis crassinerva* subsp. *absens* (not threatened).

2.1.7 Minimisation measures

The proponent has proposed measures to minimise impacts to flora and vegetation.

1. Reducing the development envelopes and disturbance footprints:
 - Mine Development Envelope – 27.2 ha reduction from 302 ha to 274.8 ha
 - External Infrastructure Development Envelope – 41.2 ha reduction from 70 ha to 28.8 ha
 - footprint – 29.6 ha reduction in the extent of native vegetation clearing, consisting of:
 - 19.8 ha reduction within the Mine Development Envelope from 292 ha to 272.2 ha
 - 9.8 ha reduction within the External Infrastructure Development Envelope from 26 ha to 16.2 ha.
2. Reduction of impacts to priority flora from reduction of development envelopes and disturbance footprints (as stated in the ERD):
 - *Grevillea cooljarloo* (P1): clearing of individuals reduced from 831 to 697, a reduction of 134 individuals
 - *Levenhookia preissii* (P1): clearing of individuals reduced from 14 to 3, a reduction of 11 individuals
 - *Chordifex reseminans* (P2) clearing of individuals reduced from 186 to 62, a reduction of 124 individuals
 - *Angianthus micropodioides* (P3): clearing of individuals reduced from 90,405 to 87,000, a reduction of 3,405 individuals

- *Babingtonia urbana* (P3): clearing of individuals reduced from 698 to 696, a reduction of 2 individuals
 - *Eryngium pinnatifidum* subsp. *Palustre* (G. J. Keighery 13459) (P3): clearing of individuals reduced from 577 to 472, a reduction of 105 individuals
 - *Isopogon panduratus* subsp. *palustris* (P3): clearing of individuals reduced from 986 to 944, a reduction of 42 individuals
 - *Jacksonia carduacea* (P3): clearing of individuals reduced from 13 to 1, a reduction of 12 individuals
 - *Stylidium aceratum* (P3): clearing of individuals reduced from 711 to 710, a reduction of 1 individual
 - *Anigozanthos humilis* subsp. *chrysanthus* (P4): clearing of individuals reduced from 3 to 1, a reduction of 2 individuals
 - *Stylidium longitubum* (P4): clearing of individuals reduced from 3,223 to 1,983, a reduction of 1240 individuals.
3. Reduction in disturbance of Banksia Woodlands by 29.6 ha compared to the referral. The proponent has advised that it will continue to investigate measures to further reduce this impact as detailed mine planning continues to progress.

2.1.8 Rehabilitation measures

The proponent has proposed to rehabilitate the disturbance footprint, which includes all the mine, the majority of the processing plant and supporting infrastructure areas, except for 0.6 ha that will be a permanent upgrade to the Bibby Road / Brand Highway intersection.

The proponent proposes to commence rehabilitation progressively, which is expected to be undertaken in stages using conventional dry mineral sands mining techniques to minimise requirements for rehandling of materials and to maximise retention of biological function in topsoil. Progressive rehabilitation usually includes characterisation of materials (including soils and mine waste), backfill of overburden, consolidation, topsoil placement, and rehabilitation measures and monitoring. It is expected that the mining will progress through the landscape quickly with an open area of approximately 200 m, this will allow for the early commencement of backfilling and reestablishment of the water table to then allow for the rehabilitation activities to commence. The proponent proposes to establish priority species and the Banksia woodland in rehabilitation areas, in consultation with DBCA and research organisations.

The proponent has prepared a Banksia Woodlands Rehabilitation Plan, which is Appendix 4 of the proponent's response to submissions (Preston Consulting 2023b) outlining proposed rehabilitation activities. The Banksia Woodlands Rehabilitation Plan will be updated regularly to ensure rehabilitation techniques and methods are improved as operations commence and continue, using monitoring data from reference quadrats for native vegetation to inform mine closure planning. The proponent is considering undertaking germination trials for target species including priority flora as described in the proponent's response to submissions (Preston Consulting 2023b).

2.1.9 Assessment of impacts to environmental values

The EPA considers that the potential impacts to the Banksia Woodlands of the Swan Coastal Plain is likely to be a significant residual impact. The EPA also considers that the proposal has the potential to result in residual impacts to priority flora. The proposal may also result in indirect impacts to surrounding environmental values. These impacts have been assessed below.

Banksia Woodlands of the Swan Coastal Plain

The EPA has assessed the likely residual impacts of the proposal on Banksia Woodlands to be direct disturbance of 206.4 ha of high quality vegetation which is mostly in excellent to pristine condition.

The EPA notes that the proposed impact on the Banksia Woodlands represents the loss of less than 0.06% of its total mapped extent (321,603 ha). The EPA considered the connection of the remaining Banksia Woodland in the local area and that at least 500 m of Banksia Woodland vegetation would remain connecting the east, south and west, thus minimising fragmentation. The EPA notes that Banksia Woodland is more extensive in this region than in the Perth metropolitan area.

The EPA considers that indirect impacts from the spread of weeds and drawdown of the water table could impact the Banksia Woodlands. The EPA supports the proponent's proposed weed and hygiene measures to prevent the introduction or spread of environmental weeds. The EPA notes a Drawdown Management Scheme is proposed to protect the Banksia Woodlands outside of the disturbance footprint from indirect impacts from drawdown of the water table (see section 2.2 Inland Waters).

The EPA has considered the proponent's efforts to avoid and minimise impacts to this community by reducing the disturbance to Banksia Woodlands by 29.6 ha. The EPA has also considered the proposed rehabilitation to Banksia Woodlands and that rehabilitation has been achieved at other locations, such as at Gaskell Sand Quarry. The EPA advises that whilst the proponent has begun rehabilitation at Boonanarring, it will need to partner with an appropriate research organisation and seek advice from DBCA to better inform rehabilitation outcomes. The EPA expects that the proponent will modify and improve its rehabilitation practices through time so that it can meet the environmental outcomes similar to Gaskell Sand Quarry.

The EPA has considered a peer review the proponent has provided by an independent expert that was undertaken on the Banksia Woodlands Rehabilitation Plan (Stantec 2024). This review highlighted that rehabilitation can be achieved with the implementation of a number of recommendations. The EPA notes that the proponent has committed to incorporating the recommendations made in the peer review. The EPA expects that the proponent will continue to improve on its rehabilitation practices through time beyond the initial peer review.

The EPA recommends an updated Banksia Woodlands Rehabilitation Plan is submitted prior to ground disturbance that incorporates the requirements of the recommendations in the peer review, and has proposed a condition incorporating these outcomes. Further to the peer review undertaken for the assessment, the EPA expects the proponent to include regular review of its rehabilitation using research organisations to provide current best practise knowledge of credible research undertaken regarding Banksia Woodlands restoration. The EPA has considered international principles and standards for ecological restoration when recommending conditions.

The EPA's preference is to rehabilitate over solely acquiring land to offset, to achieve an overall net gain for the environment, wherever possible. The return of the Banksia Woodlands in rehabilitation, in conjunction with the proposed offset, which includes restoration of 28 ha of Banksia Woodland vegetation, reflects that preference.

The EPA advises that the residual impact to Banksia Woodlands be subject to implementation conditions limiting clearing to 206.4 ha and to return the Banksia Woodland in rehabilitation. These can be regulated through reasonable conditions (recommended condition B1-1(3)(a)) and condition B5). Condition B5 has been proposed as it also allows for the consideration of restoration, as outlined above. The residual impact on this community aligns with the definition of significant residual impact in the *WA Environmental Offset Guidelines*, which includes areas defined as being critically impacted in a cumulative context (Government of Western Australia 2014).

The EPA advises that rehabilitation will occur over time and the proponent is likely to need to amend and improve its practices as it progressively rehabilitates the site. As a result, it considers that rehabilitation alone is not enough, and a significant residual impact would occur from implementation of the proposal and the proponent has outlined an offset. The offset would be able to be regulated through condition B4-4 so that the Banksia Woodlands and the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation. Further information on offsets is provided in section 4.

Herb rich saline shrublands in clay pans Threatened Ecological Community

The Clay Pans TEC occur where clay soils form an impermeable layer close to the surface, and wetlands form that rely solely on rainfall to fill and then dry to impervious pans in summer (DSEWPAC 2012).

After the release of the ERD, an additional survey of vegetation with a potential affinity to the Claypan TEC was undertaken. The survey defined the area of the Claypan TEC and confirmed that no other vegetation in the Mine Development Envelope was likely to be the Claypan TEC. This conclusion was supported by the DBCA.

The EPA notes that the proponent has proposed avoidance of the Claypan TEC and supports the introduction of an exclusion zone (Figure 5). The EPA supports the proponent's proposed weed and hygiene measures to prevent the introduction or spread of environmental weeds. The EPA notes a Drawdown Management Scheme is proposed to protect the Claypan TEC from indirect impacts from drawdown of the water table (see section 2.2 Inland Waters).

The EPA advises that the potential residual impact to the Claypan TEC should be subject to implementation conditions to ensure no direct or indirect impacts (recommended condition B1-1(1)(b) and B1-3) and the environmental outcome is consistent with the EPA objective for flora and vegetation. Due to the avoidance of impacts to the Claypan TEC, no significant residual impact is likely to be present. The EPA considers that due to critically endangered listing of the TEC, and its ecological values, avoidance is the best mitigation measure in this case.

Priority flora species

Additional targeted conservation significant flora surveys were conducted within and surrounding the proposal area following public comments on the ERD. Flora counts identified during these surveys have predominately resulted in a reduction in the proportion of impacts to local records of individual species.

No threatened flora species were recorded during any surveys. Targeted surveys with appropriate methodologies for potential Threatened species, *Macarthuria keigheryi* and *Paracaleana dixonii*, were undertaken but none were found.

The proposal may directly affect 17 of the priority flora found (Table 2). A species of taxonomic interest is also affected as well as species of interest for the Traditional Owners, the Yued people. The regional impact on these species is likely to be substantially lower as most have broad ranges and a number of regional populations but exact numbers of individuals across their whole range is unknown. Priority species are classified typically due to data limitations across their range.

Table 2: Disturbance to priority flora

Species	Number of individuals recorded (local extent)	Number of individuals in development envelope	Number of individuals to be cleared	Percentage loss of known individuals as a result of clearing*
<i>Priority 1</i>				
<i>Grevillea cooljarloo</i> (Keighery & Olde)	5,755	1,203	697	12.1%
<i>Levenhookia preissii</i>	49	30	3	6.1%
<i>Priority 2</i>				
<i>Chordifex reseminans</i>	2,100	70	62	3.0%
<i>Priority 3</i>				
<i>Angianthus micropodioides</i>	121,941,611	178,000	87,000	0.1%
<i>Babingtonia urbana</i>	7,528	707	696	9.2%
<i>Conospermum scaposum</i>	3,370	1,382	570	16.9%
<i>Desmocladus nodatus</i>	6,897	101	10	0.1%
<i>Eryngium pinnatifidum</i> subsp. <i>Palustre</i> (G. J. Keighery 13459)	5,978	827	472	7.9%
<i>Hensmania stoniella</i>	249	119	32	12.9%
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	7,916	1,153	944	11.9%
<i>Jacksonia carduacea</i>	20	1	1	5.0%
<i>Schoenus pennisetis</i>	15	3	3	20.0%
<i>Stylidium aceratum</i>	5,820	1,010	710	12.2%
<i>Priority 4</i>				
<i>Anigozanthos humilis</i> subsp. <i>chrysanthus</i>	17	3	1	5.9%
<i>Stylidium longitubum</i>	6,984	4,113	1,983	28.4%
<i>Schoenus griffinianus</i>	501	277	103	20.6%
<i>Thysanotus glaucus</i>	83	31	20	24.1%
<i>Other</i>				
<i>Jacksonia aff. floribunda</i> (taxonomic interest)	918	465	194	21.1%

*Impacts to the regional population would be lower.

Species of taxonomic interest: Jacksonia aff. Floribunda

This species was recorded after public comments on the ERD and may have some different features to the common form of the species but was considered to be within the *Jacksonia floribunda* complex, which is not threatened and is abundant between Perth and Mingenew. A range of collections of both *Jacksonia floribunda* and *Jacksonia aff. floribunda* are to be submitted to the WA Herbarium Identification Service for further investigation. The EPA notes that it may or may not be a new species, but it is protected through limitations on removal (recommended condition B1-1(3)(c)) whilst further work on its taxonomy occurs. The EPA considers that if it is a new species, the location is unlikely to contain highly unusual features or habitat which would limit its range, and it has the potential to occur in unsurveyed areas of Banksia Woodland south of the proposal area. The survey reports note that it is likely to occur in areas surrounding the proposal and appears to have the same habitat preferences as the common form (Morgan 2023b).

Species of cultural interest

The EPA understands that Moodjar (*Nuytsia floribunda*) plants are of cultural importance, as was reported during surveys and consultation with the Yued Aboriginal Corporation. The Yued Aboriginal Corporation has asked to be consulted if a plant will be removed and the proponent has proposed an exclusion zone for an important stand of Moodjar trees (Figure 5). These requirements have been reflected in the EPA's recommended conditions B1-1(1)(c) and B1-2.

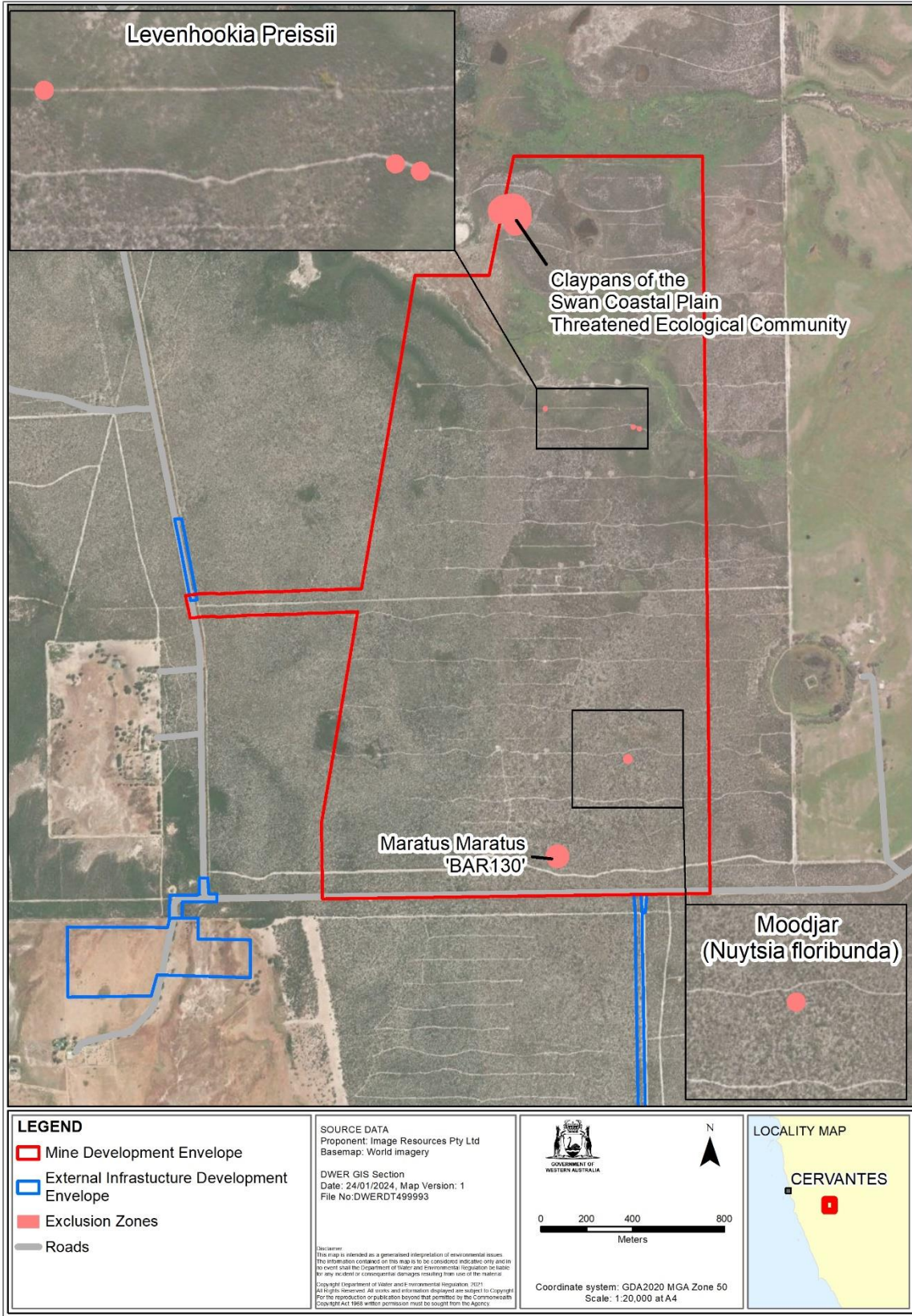


Figure 5: Exclusion zones

Impacts to priority flora

The following species are represented by a large number of individuals in the local area, occur over a relatively broad range and impacts are considered to be very low; therefore, the EPA has not recommended a condition to limit disturbance:

- *Chordifex reseminans* (P2)
- *Angianthus micropodioides* (P3)
- *Babingtonia urbana* (P3)
- *Desmocladius nodatus* (P3)
- *Eryngium pinnatifidum* subsp. *Palustre* (G. J. Keighery 13459) (P3)
- *Stylidium longitubum* (P4)
- *Schoenus griffinianus* (P4)
- *Thysanotus glaucus* (P4).

The EPA has recommended limits for the removal of individuals for *Conospermum scaposum* (P3), *Hensmania stoniella* (P3), *Isopogon panduratus* subsp. *palustris* (P3) and *Stylidium aceratum* (P3), which would be directly impacted by the proposal. The majority of these species have large ranges and occur in a number of populations across their ranges. Even though further surveys on these species are likely to show the level of impact is very low, the EPA has determined that the likelihood of significant impact to these species can be mitigated through limitations on removal in this case.

The EPA has recommended limits for the removal of individuals for *Levenhookia preissii* (P1), *Grevillea cooljarloo* (Keighery & Olde) (P1), *Jacksonia carduacea* (P3), *Schoenus pennisetis* (P3) and *Anigozanthos humilis* subsp. *chrysanthus* (P4), which would be directly impacted by the proposal. These limits are in place either because the species has a smaller range (less than 300 km²) and/or very few individuals were recorded. None of the species is restricted to the development envelopes and most of the species have known regional populations of at least 10 with a range of at least 100 km².

The EPA has considered the proponents avoidance of species through exclusion zones for *Levenhookia preissii* (Figure 5) and completely avoiding several species previously proposed to be impacted by the proposal. The EPA has considered the minimisation of the disturbance of priority flora habitat and reduction of impacts to 11 priority species. The EPA has considered the proposed rehabilitation including the proponent's proposed research to facilitate repopulating priority flora in rehabilitation activities.

The EPA considered that records of all priority flora are found within the wider region which indicates the proposal is unlikely to change the conservation status of the impacted priority flora species. The EPA advises that the residual impact to priority flora be subject to implementation conditions to limit the clearing of vegetation to 288.4 ha, the use of exclusion zones and limit the number of priority flora to be removed. The residual impact on priority flora generally aligns with the definition of significant residual impact in the *WA Environmental Offset Guidelines*, which includes impacts could cause plants to become rare or endangered (Government of Western Australia 2014).

The EPA advises that the potential residual impact to priority flora is likely to be able to be regulated through reasonable conditions (recommended condition A1 and condition B1-1(3)(b)). The EPA has considered whether a significant residual impact occurs and needs to be counter-balanced by offsets for priority flora. The EPA advises that a significant residual impact may occur to the following priority species and has recommended condition B4-5(10) so that research on priority species will improve the knowledge on their use in rehabilitation:

- *Levenhookia preissii* (P1),
- *Grevillea cooljarloo* (Keighery & Olde) (P1)
- *Jacksonia carduacea* (P3)
- *Schoenus pennisetis* (P3)
- *Anigozanthos humilis* subsp. *chrysanthus* (P4).

The EPA has recommended this research is focused on those priority species with smaller ranges and smaller populations, as these species are most impacted from the implementation of the proposal. The EPA advises that the proponent may decide to undertake more regional surveys prior to this research, as most of the species are limited in number due to the lack of regional surveys, to reduce the target species of the research. The EPA considers that with the limitations on impacts, exclusion zones, conditions on indirect impacts and the offset condition, the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.

Cumulative impacts

Cumulative impacts to flora and vegetation will occur from Cooljarloo West Titanium Minerals Project approximately 20 km to the southeast, and from agricultural development and roads. Cumulative impacts to the Banksia Woodlands at a regional scale was undertaken using publicly available data and the environmental assessments for Cooljarloo West (Tronox 2020).

The Cooljarloo West proposal proposed a loss of 3,214 ha of Banksia Woodlands, equating to 14% of the 23,035 ha that was mapped for that proposal. The disturbance footprint for this proposal is 206.4 ha of Banksia Woodlands from the 683.3 ha mapped for the proposal. Across both mining operations the combined losses therefore would be 3,420.4 ha from a mapped extent of 23,718.3 ha.

Cumulative impacts have been reviewed against those predicted at the Cooljarloo mine site (Tronox, 2020), and the full context for these is reported in the response to submissions document (Preston Consulting 2023b). Five species were identified as being impacted at both sites:

1. *Chordifex reseminans* (P2) – clearing 62 individuals at the proposal, in addition to the 92,298 individuals at Cooljarloo West.
2. *Babingtonia urbana* (P3) – clearing 696 individuals are predicted to be impacted at the proposal, in addition to the 26,970 individuals at Cooljarloo West.
3. *Conospermum scaposum* (P3) – clearing 570 individuals at the proposal, in addition to the 1,034 individuals at Cooljarloo West. Surveys for the proposal have increased the known individuals by 3,370 to a new total of 17,433.
4. *Schoenus pennisetis* (P3) – clearing 3 individuals at the proposal, in addition to

the 22 individuals at Cooljarloo West. Surveys for the Proposal have increased the known individuals by 15 to a new total of 1,782.

5. *Anigozanthos humilis* subsp. *chrysanthus* (P4) – clearing of 1 individual at the proposal, in addition to the 2 individuals at Cooljarloo West. Surveys for the proposal have increased the known individuals by 17 to a new total of 258.

The impacts to priority flora from this proposal when compared to Cooljarloo West is small and the changes to species ranges are negligible as the proposal is not removing all the flora identified in surveys. As a result, cumulative impacts are unlikely to result in the proposal not being consistent with the EPA objective for flora and vegetation.

Other matters

Dieback (*Phytophthora cinnamomi*) is a soil-borne pathogen that is widespread in the Southwest region. The proponent undertook a dieback assessment to determine whether the area was at risk of infestation (Preston Consulting 2023b) which showed that no dieback was recorded in the proposal area; however, as species in the Proteaceae family, especially Banksia species, are particularly susceptible, an annual survey is to be undertaken and the proposed Dieback Hygiene Management Plan (Preston Consulting 2023b) regularly updated. The EPA considers that an annual revision the dieback surveys and regular revisions of the Dieback Hygiene Management Plan to maintain the currency of occurrence information throughout the life of the proposal is adequate. The EPA has recommended condition B1-4 to ensure dieback protocols are implemented consistent with *Phytophthora Dieback Management Manual* (DBCA 2020), and associated guidance documents and checklists, and ensure the environmental outcome is consistent with the EPA objective for flora and vegetation.

Generally, the proposal area contains a low number of weeds; however, weeds have the potential to impact conservation significant communities and important habitats. The EPA has recommended condition B1-3 to ensure weeds are managed and ensure the environmental outcome is consistent with the EPA objective for flora and vegetation.

The EPA advised the proponent of the possibility for Potential Acid Sulfate Soils (PASS) to be present in the area based on similar soils at other nearby sites. The proponent has undertaken further investigations and determined that PASS may be present across the project. While the PASS may be present across the project, the EPA notes that the proponent has captured management in an Acid Sulfate Soils (ASS) management plan presented in the proponent's response to submissions (Preston Consulting 2023b), which, on advice of DWER, has been prepared in accordance with DWER guidelines (DER 2015a; DER 2015b).

Groundwater drawdown can result in impacts by exposing PASS, therefore the EPA supports monitoring for PASS at the pit and at infrastructure that supports the Drawdown Mitigation Scheme. This monitoring includes testing excavated soil samples, measuring infiltration pond levels and infiltration pond water pH. The EPA notes that infiltration ponds are only open for a few months and considers that the Drawdown Mitigation Scheme (as discussed in the Inland waters section 2.2), which is proposed to reduce the extent of drawdown and maintain water levels in the area, will also reduce exposure of PASS in the area. The EPA expects that management of PASS would be considered under a future Part V approval under the EP Act.

None of the matters raised above would change the EPA’s view on whether implementation of the proposal would be consistent with the EPA objective for flora and vegetation, and can be managed through reasonable conditions and other DMA regulation.

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 3.

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 3: Summary of assessment for flora and vegetation

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
<p>1. Clearing of up to 288.4 ha of native vegetation in mainly excellent to pristine condition.</p> <p>Clearing of up to 206.4 ha of Banksia Woodlands TEC/PEC.</p> <p>Loss of individuals of 17 priority flora species and direct impact to priority flora habitat.</p> <p>Clearing of individuals of a species of taxonomic interest.</p>	<p>The proposal will result in the loss of vegetation, including Banksia Woodlands and individuals of priority listed flora.</p> <p>The proponent proposes to rehabilitate the disturbance footprint, with the exception of 0.6 ha for Bibby Road / Brand Highway intersection, with native vegetation. The proponent has prepared a Banksia Woodlands Rehabilitation Plan specific to rehabilitation of Banksia Woodlands.</p> <p>The proponent has also proposed exclusion zones for priority species and other species of cultural significance.</p>	<p>Condition A1 (Limitations and extent of proposal)</p> <p>Limit on the extent of the proposal including the development envelope and clearing extent.</p> <p>Condition B1 (Flora and Vegetation)</p> <p>Disturbance limits to the clearing of Banksia Woodlands and individuals of priority flora.</p> <p>Condition B5 (Rehabilitation)</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>The proponent has proposed an exclusion zone around the nearby Claypan TEC to ensure no direct impacts to this TEC.</p> <p>The EPA advises that subject to the recommended conditions to limit the extent of clearing, exclusion zones and the requirement for rehabilitation and offsets, the significant residual impact can be managed and counterbalanced so that the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p> <p>Groundwater drawdown and water quality impacts on flora and vegetation are discussion in Inland Water Section 2.2 below.</p>	<p>Requirement to rehabilitate the disturbance footprint.</p> <p>Condition B4 (Environmental Offsets)</p> <p>Requirement for an offset to counter-balance the significant residual impacts.</p>
<p>2. Indirect impacts to flora and vegetation associated with ASS, spread of weeds and dieback.</p>	<p>The EPA advises there is unlikely to be significant residual impacts from ASS, the spread of weeds or introduction of dieback.</p> <p>The EPA considers that, subject to the recommended outcome and requirement for active weed and dieback management, and the proponent’s implementation of the ASS management plan and regulation under Part V of the EP Act, the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.</p>	<p>Condition B1 (Flora and Vegetation)</p> <p>Environmental outcomes ensuring there are no project attributable adverse impacts from the spread of weeds and/or introduction of dieback.</p> <p>DMA regulation</p> <p>DWER is expected to regulate PASS via an approval under Part V of the EP Act, which will consider monitoring of impacts associated with potential acid generation, and ensure that these are appropriately regulated.</p>

2.2 Inland Waters

2.2.1 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).

2.2.2 Investigations and surveys

The EPA advises the following investigations, surveys were used to inform the assessment of the potential impacts to inland waters:

- Water Sampling and *In-situ* parameters survey (Appendix 14 of the environmental review document) (MWES 2012)
- Hydrogeological and Hydrological Scoping Study (Appendix 15 of the environmental review document) (URS 2013)
- Atlas and Boonanarring Heavy Mineral Sand Proposals, Quarterly Environmental Water Sampling Survey (Appendix 16 of the environmental review document) (MWES 2013)
- Baseline Hydrology Report (Appendix 17 of the environmental review document) (MWES 2022a)
- Groundwater Hydrology Report (Appendix 18 of the environmental review document) (MWES 2022b)
- Atlas Mineral Sands Project Infiltration Pond Testing Report & Managed Aquifer Recharge Application (Appendix 21 of the environmental review document) (MWES 2022c)
- Acid Sulphate Soils Investigation and Management Plan (Appendix 22 of the environmental review document) (Mine Earth 2022)
- (Updated) Baseline Hydrology Report (Appendix 21 of the response to submissions) (MWES 2023a)
- Updated Groundwater Modelling and Water Balance Report (Appendix 22 of the response to submissions) (MWES 2023b)
- Atlas Mineral Sands Project, H3 Hydrogeological Assessment report, Mine Area – Yarragadee Aquifer – Bore APBA (Appendix 23 of the response to submissions) (MWES 2023c).

The EPA notes that the proponent also utilised DWER's water information sites dataset. The EPA determined the information provided by the proponent for inland waters was adequate to proceed with its assessment.

2.2.3 Assessment context – existing environment

Groundwater

Groundwater in both the Superficial and Yarragadee-Cattamarra aquifers is brackish to saline. The mining site comprises four geological layers, with the superficial aquifer showing vertical heterogeneity. The top layer consists of clean, permeable dune sands, the middle layer serves as an aquitard, and the bottom layer is a sandier aquifer connected to deeper Yarragadee and Cattamarra aquifers.

The direction of groundwater flow in the superficial aquifer is from the east to the west, and the depth to water level at the site is from about 2 to 8 m below ground level (bgl).

Aquifer testing suggests a potential hydraulic connection (a wedge fault) between the Superficial and Yarragadee aquifers, which might indicate leaky aquifer behaviour rather than an aquitard.

The mining area and surrounds are likely to contain groundwater dependent ecosystems and associated phreatophytic vegetation. Mining will be undertaken to a maximum depth of approximately 16 m bgl. Dry mining will require the dewatering of the local Superficial Aquifer as well as depressurising the upper part of the underlying Yarragadee and Cattamarra aquifers.

The proposed mining area is in proximity to stock bores and soaks which are located near the Nambung homestead to the south, which are owned by the proponent, and within private land to the west.

Surface water

The proposal is within the Nambung River catchment, which covers a total area of 2,959 km². The proposal area is located in the South catchment, a minor sub-catchment of the Nambung River, which comprises less than 1% of the Nambung River catchment. The catchment is small and relatively flat.

Minor creeks in the south catchment include Bibby Creek and Mount Jetty Creek. Surface water flow lines converge toward the Mt Jetty Creek and Bibby Creek (upstream end of the Nambung River), to the north and outside of the Mine Development Envelope. There are no substantial natural drainage lines across the Mine Development Envelope following the changes to the proposal during the assessment, through two section 43A requests. Runoff rates are likely to be low and runoff would be retained in the catchment within seasonal swales and ponds.

2.2.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (Preston Consulting 2023b). Public consultation on the proposal raised concerns about drawdown of groundwater affecting environmental values, such as groundwater dependent vegetation, and landowners who use groundwater, and the water quality and quantity flowing to the Nambung River.

The EPA considers that abstraction and dewatering will require a 5C licence under the *Rights in Water and Irrigation Act 1914* (RIWI Act) which will consider the impacts of groundwater drawdown. Consultation with DWER has confirmed that a short-term licence is appropriate considering the short-term nature of the proposal, and that water will be reinstated in the area following the drawdown mitigation scheme.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in sections 2.3.6, 2.3.7, 2.3.8 and 2.3.9.

2.2.5 Potential impacts from the proposal

The proposal has the potential to significantly impact on inland waters from drawdown of the water table affecting groundwater resources, wetlands, fauna habitat and groundwater dependent ecosystems.

MODFLOW-USG was used for modelling, featuring a 3D layer structure representing different aquifers. The proponent adopted conservative model parameters, including rainfall recharge, specific yield, and hydraulic conductivities. The bore (APBA) model was developed to assess drawdown when using bore APBA as the primary water supply. The models were calibrated using groundwater level data, and calibration achieved acceptable correlation between observed and calculated groundwater levels.

The pit dewatering model was created to determine pumping rates needed to dewater the saturated sediments at the mine and identify the extent of the drawdown cone with a Drawdown Mitigation Scheme. The maximum extent of drawdown for dry mining without mitigation was modelled at 1.3 km west of the mine pit and 0.4 km towards the east (upgradient) side. Groundwater modeling results showed the effectiveness of the Drawdown Mitigation Scheme in containing drawdown within the disturbance footprint.

The model predicted that operation of the proposal will result in the development of two different, and superimposed cones of drawdown; a fixed location cone at the deeper Yarragadee-Cattamarra aquifer from the APBA operation and a shallow cone in the Superficial aquifer from the pit dewatering, traversing from south to the north, at monthly steps in line with the mining schedule.

A review of the modelling report and the associated model files by DWER indicated that the pit dewatering model was developed according to the standard scientific practice and is fit for the purpose for the dewatering and infiltration program design that for which it is being used.

Surface water

Impacts to surface water may include changes to surface water runoff patterns and impacts to drainage systems. During the assessment of the proposal, the proponent has avoided the Mount Jetty Creek and Bibby Creek areas, and other seasonal ponds, wetland areas and connecting surface water creeks.

Significant runoff is not anticipated in the area due to the sandy soils that are present and progressive rehabilitation will ensure impacts to surface water flows are minor and temporary.

2.2.6 Avoidance measures

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

1. avoiding Mount Jetty Creek and Bibby Creek, and associated wetland and vegetation, through reduction of the development envelopes and disturbance footprints
2. pit dewatering volumes will be reduced from a reduction in the extent and life of mine, through reduction of the development envelopes and disturbance footprints
3. proposing only the dry mining scenario rather than a wet mining scenario which reduces overall abstraction volumes as significant amounts of externally sourced water are not required to be added to the pit to facilitate dredging.

2.2.7 Minimisation measures

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

1. reducing disturbance to seasonal ponds and wetlands through reduction of the development envelopes and disturbance footprints
2. reducing the timeframe of mining through the reduction of the development envelopes and disturbance footprints
3. staging of the proposal by advancing mining progressively south to north, with appropriate monitoring, review and reporting of the proposed Drawdown Mitigation Scheme
4. commencing the Drawdown Mitigation Scheme by using a starter pit to inform and update the scheme as mining progresses
5. installation of a ring of infiltration pond monitoring bores around the mine pit prior to commencing dewatering activities to begin monitoring water levels in the proposal area
6. use of data loggers to provide real-time monitoring of water levels in infiltration pond monitoring bores

7. recording of rainfall and other relevant weather information on site to provide site specific data to input into updates of the Drawdown Mitigation Scheme and reviews of the groundwater modelling.

2.2.8 Rehabilitation measures

The proponent has proposed to rehabilitate the disturbance footprint progressively as discussed in the Flora and Vegetation section 2.1. This progressive rehabilitation will directly benefit groundwater levels by requiring the groundwater to recover prior to the mining being completed.

2.2.9 Assessment of impacts to environmental values

The EPA considered that the key environmental values for inland waters likely to be impacted by the proposal are groundwater dependent ecosystems outside of the disturbance footprint and the groundwater drawdown from abstraction at borefields. These impacts have been assessed below.

The EPA notes that the proponent has prepared a Surface Water Management Plan (SWMP)(Preston Consulting 2023b) and that management of surface water flows would be considered under *Mining Act 1978* approvals, regulated by the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS). The EPA considers with the avoidance measures proposed by the proponent and management of surface water through the SWMP, further consideration of impacts to surface water is not required and the environmental outcome is likely to be consistent with the EPA objective for inland waters.

Groundwater dependent ecosystems outside of the disturbance footprint

The entire area around the disturbance footprint has conservatively been considered to be groundwater dependant. This means that changes to the water table have the potential to impact the vegetation or selected species within the vegetation that depend on groundwater for survival during parts of the year.

The proponent has proposed to implement drawdown mitigation by undertaking managed aquifer recharge around the mining pit, to recharge water into local area to maintain water table levels and prevent impacts to groundwater dependent vegetation.

The following sections outline how the Drawdown Mitigation Scheme is proposed to mitigate drawdown effects of the pit during mining operations.

Drawdown Mitigation Scheme – infiltration ponds

The Drawdown Mitigation Scheme consists of a series of excavated narrow ponds located a minimum distance of 100 m from the edge of mining pit, in the nearest cleared area (Figure 6). The proponent has proposed ponds as recharge points for ease of rehabilitation and the ability to change the size of ponds as required to facilitate recharge. A full description of the Drawdown Mitigation Scheme, including the indicative layout of the infiltration ponds (Figure 6), is presented in the Groundwater Operating Strategy (Preston Consulting 2023b).

The Drawdown Mitigation Scheme will commence at the ‘starter pit.’ This starter pit will allow for initial collection of data and modification of elements of the Drawdown Mitigation Scheme as mining progresses. Starter pit infiltration ponds will be installed around the operating area in existing cleared areas (i.e. drill tracks), where available.

Infiltration ponds will then be installed as the mine footprint progresses from south to north. Infiltration ponds are open for several months, actively recharged until the surrounding groundwater returns to pre-mining levels, and after use, rehabilitated by filling the pond in with the previously excavated material.

Prior to installation of a new infiltration pond, a review of available monitoring bores will confirm whether additional monitoring bores are available outside the potential cone of drawdown.

The water to be used at the infiltration ponds will be from external borefields. Infiltration water quality will be similar or better quality than the local groundwater as measured at the water table during the late dry season.

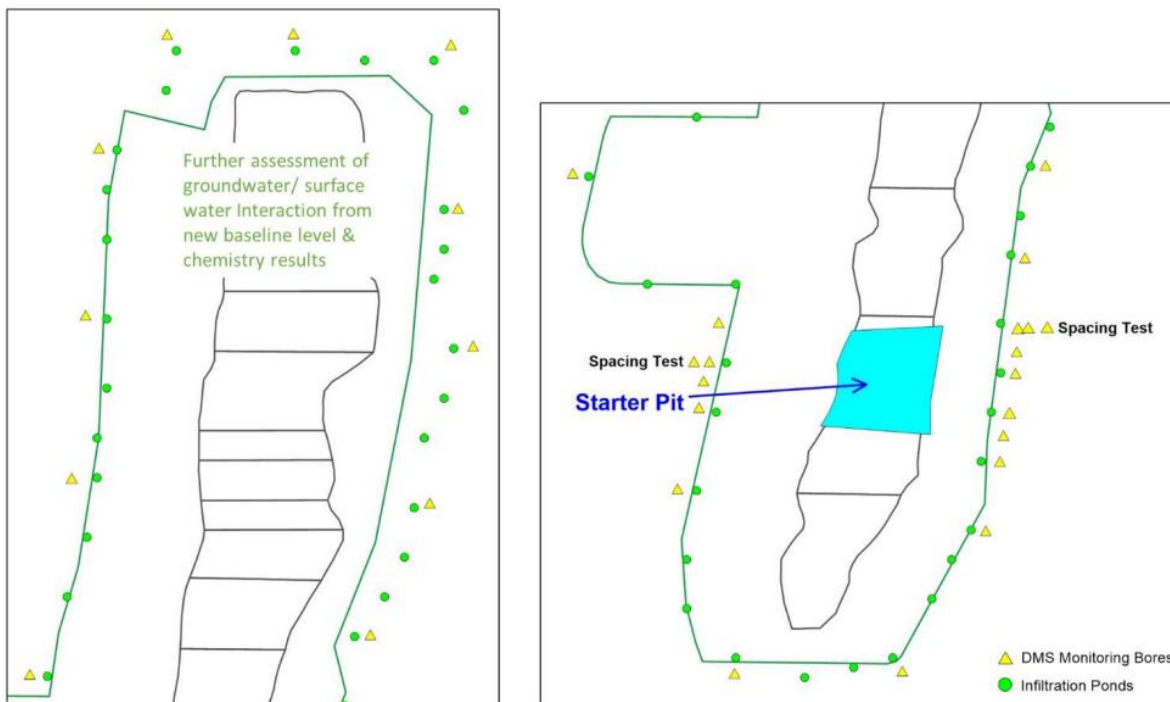
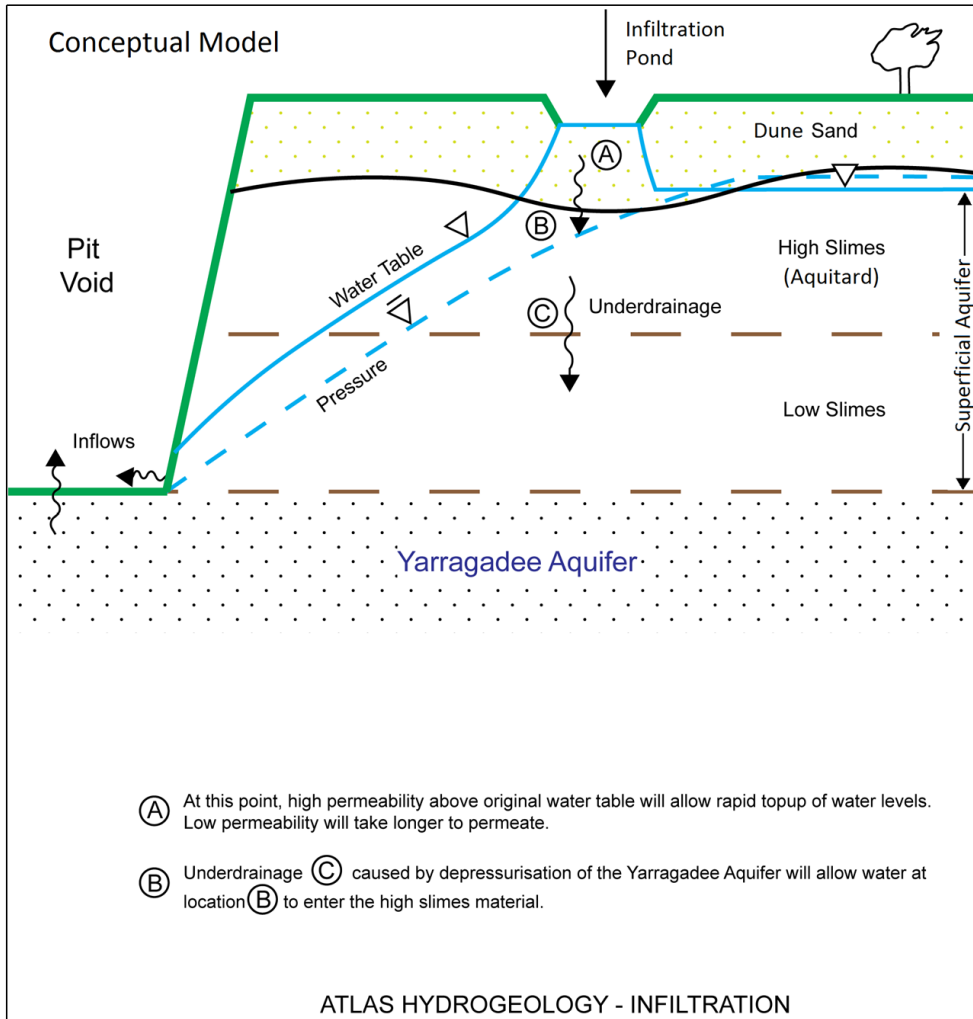


Figure 6: Conceptual model and indicative layout of the Drawdown Mitigation Scheme (from the Groundwater Operating Strategy (Preston Consulting 2023b))

Drawdown Mitigation Scheme – Infiltration pond monitoring bores

Drawdown Mitigation Scheme monitoring bores will be installed in an initial ‘ring’ of at least thirty bores around the pit shell prior to mining commencing. These bores will be used to collect background data prior to the operations advancing. A system of monitoring bores will be installed during operations to monitor the water table and water quality adjacent to each infiltration pond. Bores will also be located between each infiltration pond.

Upon commencement of infiltration at the starter pit, water table levels will be monitored using dataloggers to measure real time water table fluctuations. Water quality will be monitored on a weekly basis. As mining progresses, additional bores will be added as required to ensure that the monitoring data around the active pit is maintained. As mining progresses, water levels in new monitoring bores will be compared with historical values from the nearest existing network of monitoring bores using pre-mining groundwater level, with due consideration of the annual rainfall.

Monthly monitoring of water table level measurements from selected control (monitoring) bores outside of the potential drawdown curve is also proposed to provide data for future mining activities and to calibrate the Drawdown Mitigation Scheme monitoring bores for seasonal changes.

Drawdown Mitigation Scheme – other monitoring

Four dual-level monitoring bores are proposed to be installed along the eastern edge of Nambung National Park to monitor groundwater levels.

A weather station will be installed on site to record rainfall and other relevant weather information.

The proponent will undertake monitoring of vegetation condition via:

- monthly visual monitoring, using photographs, field observations and/or drone footage, of vegetation condition adjacent to the mining area
- annual vegetation survey to assess the condition of vegetation adjacent to mining areas.

Impacts to Groundwater Dependant Ecosystems

The EPA considers the proponent has supplied sufficient information to support the Drawdown Mitigation Scheme to protect the groundwater dependent ecosystems outside of the disturbance area. The EPA considers that the proposed monitoring of water and the update of the groundwater model as data is being collected will provide confidence that the scheme is behaving as predicted. The EPA has proposed conditions B3 and C4 requiring the monitoring of the water table and water quality to support the data collection, and has also required the proponent to provide information on alternate mitigation measures, such as re-injection of water, as a contingency.

As mining progresses north, the water table becomes shallower which indicates the groundwater dependent ecosystems will become more sensitive to changes in water levels, but the EPA considered that the proposed maximum drawdown, which is dependent on the original water level in the area, adequately reflects this changing sensitivity and provides protection to the vegetation outside of the disturbance footprint. Additionally, the EPA considers that installation of monitoring bores prior to undertaking dewatering activities, especially in the northern section of the Mine Development Envelope, as per condition B3-2, will allow for multi-seasonal data (water level and water quality) to be collected in advance of mining in the area.

The EPA has considered the proposed rehabilitation measures for the mine pit, which would allow groundwater recovery to start prior to the mining being completed, and the rehabilitation of the infiltration ponds after they are no longer in use (further discussion on rehabilitation is provided in section 2.1 flora and vegetation).

The EPA advises that the residual impact to groundwater dependent ecosystems outside the disturbance footprint should be subject to implementation conditions (as noted above) to support the licensing of abstraction under the RIWI Act by DWER to limit drawdown and require monitoring and reporting, to ensure protection of the groundwater dependent ecosystems and ensure the environmental outcome is likely to be consistent with the EPA objective for inland waters.

Groundwater supply

The proposal requires a supply of raw groundwater for mineral processing, as well as for dust suppression and domestic requirements. The source of this water is from the Yarragadee Aquifer via a western borefield within the Mine Development Envelope and a southern borefield 2 km south in the External Infrastructure Development Envelope. At each production bore, an adjacent monitoring bore will be installed.

Aquifer testing suggests a potential hydraulic connection between aquifers. Aquifer behaviour will be monitored in the vicinity of the wedge fault during the operation phase in the western borefield. Remedial measures will be put in place, if required, such as spreading pumping across multiple abstraction points or installation of a new borefield further away from the wedge fault. The EPA notes that impacts to stock bores and soaks to the south of the site are located in an area that the proponent owns. The proponent has proposed to install monitoring bores to measure groundwater levels between the proposal and the private lands to the west to identify impacts and protect the future use of those sites.

The EPA considers that as the DWER licensing under the RIWI Act will include the abstraction from the production bores, which will consider location of bores and monitoring of impacts associated with groundwater drawdown, and that this abstraction will be appropriately regulated. The EPA considers with the regulation of abstraction under RIWI Act, the environmental outcome is likely to be consistent with the EPA objective for inland waters.

Cumulative impacts

There are no proposals in close proximity to this proposal that would have a cumulative impact on dewatering of the mine pit and abstraction at the borefields; however, the wider area has been affected by agricultural practises. The largest water allocation in the area is for Cooljarloo West; however, the proposal is unlikely to overlap considering the 20 km distance. It is noted that the Cooljarloo West has not yet used its full water allocation in the past two years.

2.2.10 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 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 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 4: 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 to groundwater dependent ecosystems outside of the development footprint from drawdown of groundwater, mitigated by proposed managed aquifer recharge.</p>	<p>The EPA has assessed that changes to groundwater levels can be managed through recommended conditions requiring that the water table levels are maintained to prevent potential impacts to groundwater dependent ecosystems, and regulation under the RIWI Act.</p> <p>Subject to these recommended conditions, and regulation under the RIWI Act the environmental outcome is likely to be consistent with the EPA objective for inland waters.</p>	<p>Condition A1 (Limitations and extent of proposal)</p> <p>Limit on the extent of the proposal including dewatering and groundwater abstraction during construction and operation.</p> <p>Condition B3 (Inland waters)</p> <p>Ensure that a drawdown mitigation scheme is implemented to ensure no impacts to vegetation from drawdown beyond the disturbance footprint for the mine, and that seasonal water table data is captured.</p> <p>Condition B4 (Environmental Offsets)</p>

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
		<p>Requirement for contingencies if the proposed drawdown mitigation scheme is not successful.</p> <p>DMA controls</p> <p>DWER can regulate pit dewatering through RIWI Act licenses.</p>
2.	Groundwater supply for processing	<p>The EPA has assessed impacts to groundwater levels from production bores and considers that this activity is unlikely to be a significant residual impact, subject to limits to the abstraction and noting regulation under the RIWI Act, the environmental outcome is likely to be consistent with the EPA objective for this factor.</p> <p>Condition A1 (Limitations and extent of proposal)</p> <p>Limit on the extent of the proposal including dewatering and groundwater abstraction during construction and operation.</p> <p>DMA controls</p> <p>DWER can regulate groundwater abstraction at production bores through RIWI Act licenses, which will consider location of bores and monitoring of impacts associated with groundwater drawdown, and ensure that these are appropriately regulated.</p>

2.3 Terrestrial Fauna

2.3.1 Environmental objective

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

2.3.2 Investigations and surveys

The EPA advises the following investigations, surveys were used to inform the assessment of the potential impacts to terrestrial fauna:

- Spring Biological Assessment (Appendix 5 of the environmental review document) (360 Environmental 2021)
- Atlas Tenement Level 2 Vertebrate Fauna Survey (Single Phase) (Appendix 8 of the environmental review document) (360 Environmental 2012b)
- Atlas Project Detailed Fauna Assessment (Appendix 10 of the environmental review document) (Spectrum 2022a)
- Atlas Project Subterranean Fauna Desktop Report and Stygofauna Survey (Appendix 11 of the environmental review document) (Bennelongia 2021)
- Baseline Stygofauna Survey at the Image Resources Atlas Project Borefield (Appendix 12 of the environmental review document) (Bennelongia 2022)
- Atlas Project Regional SRE Survey (Appendix 13 of the environmental review document) (Spectrum 2022b).

The terrestrial fauna surveys were consistent with the *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for environmental impact assessment* (EPA 2020).

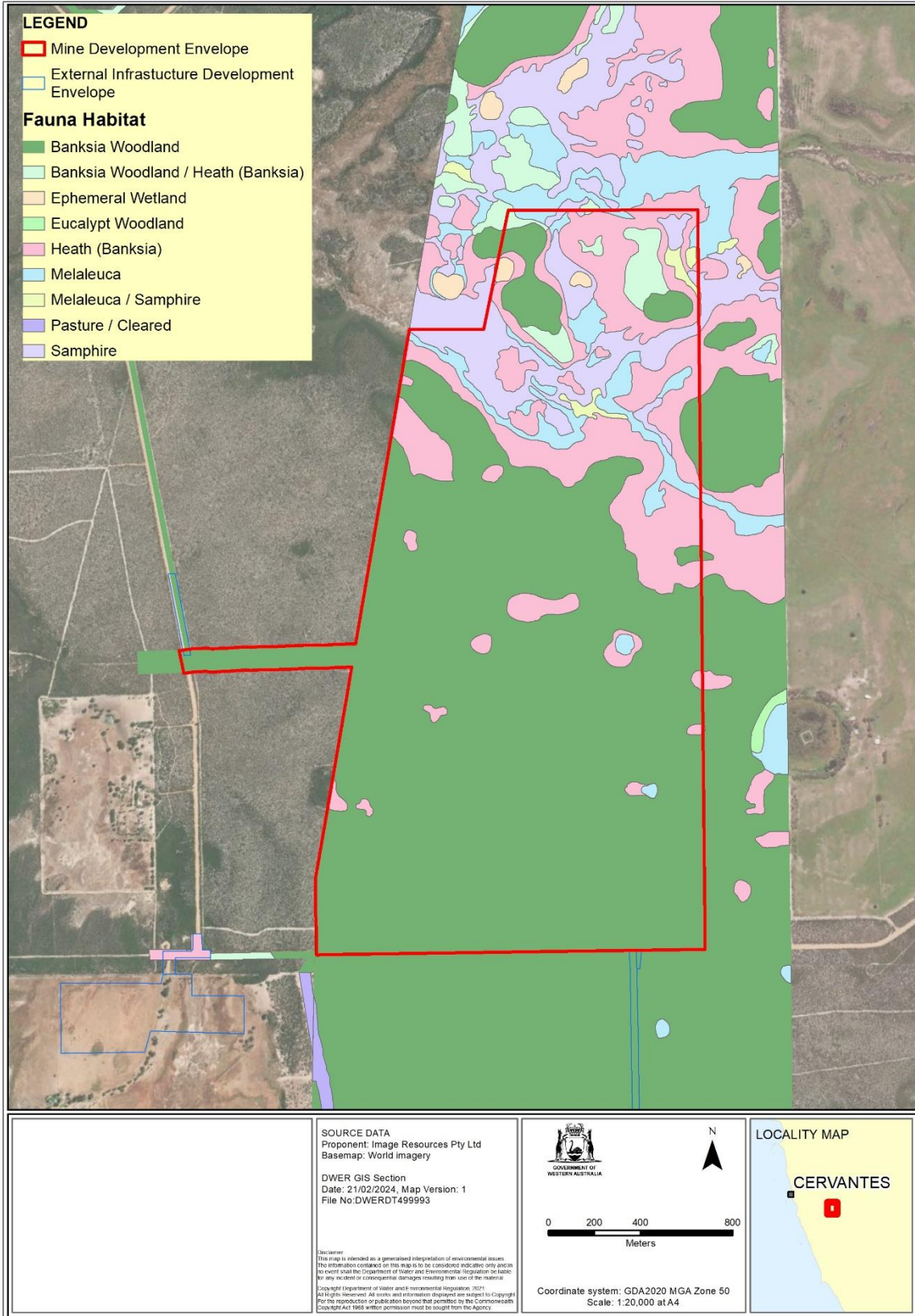
The short range endemic invertebrate fauna surveys were consistent with *the Technical Guidance – Sampling of Short-range Endemic Invertebrate Fauna* (EPA 2016e).

The stygofauna surveys were consistent with the *Technical Guidance – Subterranean Fauna Surveys for environmental impact assessment* (EPA 2021c).

2.3.3 Assessment context – existing environment

Terrestrial fauna and habitat

Nine terrestrial fauna habitat types were identified within the survey areas, including Banksia woodlands and heath, Eucalypt woodlands, Wetlands, Melaleuca and Samphire, and cleared/pasture areas (Figure 7).



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Unique Record ID

Figure 7: Fauna habitats

A total of 132 vertebrate fauna species (17 mammals, 95 birds, 25 reptiles and eight amphibians) were recorded in the surveys. Of these, the following conservation significant fauna were recorded:

- Carnaby's black cockatoo (*Zanda latirostris*) – Endangered under the EPBC Act and BC Act
- Common greenshank (*Tringa nebularia*) – Migratory under the EPBC Act and BC Act. (changed to endangered under the EPBC Act after a determination to assess was made)
- Black-striped burrowing snake (*Neelaps calonotos*) – DBCA priority 3 fauna
- Western brush wallaby (*Notamacropus Irma*) – DBCA priority 4 fauna.

Other fauna with a high likelihood of occurring is the:

- Fork-tailed swift (*Apus pacificus*) – Migratory under the EPBC Act and BC Act
- Jewelled southwest ctenotus (*Ctenotus gemmula*) – DBCA priority 3 fauna
- Bothriembryontid land snail (Moore River) (*Bothriembryon perobesus*) – DBCA priority 1 fauna.

Suitable shrubland and heath habitat exists for the Malleefowl (*Leipoa ocellata*) – Vulnerable under the EPBC Act and BC Act, though no individuals or secondary evidence in the form of nesting mounds (contemporary or historical) or tracks were observed.

Three introduced fauna species were recorded:

- European cattle (*Bos primigenius taurus*)
- red fox (*Vulpes vulpes*)
- rabbit (*Oryctolagus cuniculus*).

Conservation significant fauna

The terrestrial fauna most likely to be impacted by the proposal is the Carnaby's black cockatoo. Other species were either not recorded during surveys, are likely to use the habitat opportunistically, or represent a smaller residual impact.

Carnaby's black cockatoo (*Zanda latirostris*; Endangered)

Carnaby's black cockatoos were recorded during surveys in small and large flocks moving through the local region using Banksia woodland habitats 6 km north of the proposal at the intersection of Munbinea Road and Bibby Road. A large flock of up to 100 individuals were also observed flying over Banksia woodland to the west of the proposal. Foraging evidence of the species (chewed Banksia flowers) was recorded along the eastern edge and at a site south of the survey areas.

Further contextual information on the occurrence of the habitat for the Carnaby's black cockatoo is located within the proponents ERD (Section 6.3.12) and response to submissions documents (Preston Consulting 2023b).

Western brush wallaby (*Notamacropus Irma*; P4)

Western brush wallaby was recorded on one occasion in Banksia woodland habitat. Two additional observations were made outside the survey areas. Habitat types with the exception of the Wetland and Samphire habitats are suitable for the Western Brush Wallaby. Extensive habitat for this species occurs around the proposal area.

Common greenshank (*Tringa nebularia*; Migratory)

Common greenshank were recorded on six occasions at three locations during surveys using a shallow pool within the Wetland habitat (ephemeral wetland) and then utilising artificial dams within pasture areas. Natural habitat for the common greenshank is temporary, available predominantly after rainfall. Seasonally inundated low-lying samphire and wetlands within the survey area provides temporary habitat for this species.

Fork-tailed swift (*Apus pacificus*; Migratory)

The Fork-tailed swift is a migratory, non-breeding visitor to Australia. Records are most abundant in coastal areas of the southwest WA, Pilbara, and Kimberly regions. The species is known to be highly nomadic and forage high in the canopy, rarely landing.

This species may occur infrequently but due to the aerial lifestyle of this species it is unlikely to directly use any terrestrial habitats within the survey areas.

Jewelled southwest ctenotus (*Ctenotus gemmula*; P3)

Habitat for the Jewelled southwest ctenotus of pale sandplain with heath and woodland is present in the survey area, though no individuals were recorded. Closest other records are 15 km east southeast of the proposal.

Black-striped burrowing snake (*Neelaps calonotos*; P3)

This species was recorded opportunistically in Banksia woodland habitat. Banksia woodland and heath habitat most suitable for the black-striped burrowing snake though detection can be difficult due to their mostly subterranean behaviour.

Bothriembryontid land snail (Moore River) (*Bothriembryon perobesus*; P1)

The Bothriembryontid land snail (Moore River) has a likelihood of occurrence but was not found in surveys. The closest record is 18 km west near Cervantes and records exist elsewhere in the region, including 20 km south east of the proposal at Cooljarloo West.

Malleefowl (*Leipoa ocellata*; Vulnerable)

The Malleefowl is known within 40 km of the proposal area, with all recent records in the Nambung National Park. Fauna surveys showed that heath and Banksia woodland/heath fauna habitats (191 ha; 15.4% of the area surveyed) are considered marginally suitable for the species but would not be suitable for nesting.

Given habitat within the survey area is only marginally suitable for Malleefowl, this species was therefore considered unlikely to occur in the development envelopes and no further assessment was undertaken.

Short Range Endemic fauna

Short Range Endemic (SRE) invertebrate fauna habitat was present in the Melaleuca fauna habitat type. Samphire and Banksia Woodland and heaths were not considered to be typical habitats, but some potential SRE species were recorded in these areas. Twenty-two potential SRE species were recorded. None of the species found in the development envelopes were restricted to the disturbance footprint.

Within the northern Swan Coastal Plain region, the snail Bothriembryontid land snail (Moore River) (P1) is recognised as an SRE species, and as identified above, has a likelihood of occurrence although not recorded during surveys.

A specimen of spider, *Maratus Maratus* 'BAR130,' that was collected in Banksia Woodland habitat during the surveys is a potential SRE and appears to be an undescribed species. While *Maratus Maratus* 'BAR130' was located outside the disturbance footprint, the proponent has considered it to be a potential SRE and proposed an exclusion zone (Figure 5).

2.3.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the response to submissions document (Preston Consulting 2023b). Key issues raised during public consultation on the proposal included impacts to threatened fauna habitat, particularly the clearing foraging habitat for the Carnaby's black cockatoo.

The key issues raised during the public consultation on the proposal and how they have been considered in the assessment are described in sections 2.2.6, 2.2.7, 2.2.8 and 2.2.9.

2.3.5 Potential impacts from the proposal

The proposal has the potential to significantly impact on terrestrial fauna from:

- impacts to 288.4 ha of fauna habitat
- potential reduction of habitat health from other indirect impacts such as groundwater drawdown, weed spread and spread of dieback
- injury, mortality or displacement during construction and operation
- indirect impacts including fragmentation of fauna habitat.

2.3.6 Avoidance measures

The proponent has designed the proposal to avoid impacts to terrestrial fauna by introducing exclusion zone for a potential SRE record of *Maratus Maratus* 'BAR130'.

The proponent has avoided habitats containing the Claypan TEC and other areas which would be subject to period inundation, and represent potential habitats for migratory species.

2.3.7 Minimisation measures

The proponent has proposed measures to minimise impacts to terrestrial fauna by reducing clearing of fauna habitat by reducing the development envelopes and disturbance footprints (refer to Flora and Vegetation section 2.1.7).

2.3.8 Rehabilitation measures

The proponent has proposed to rehabilitate the disturbance footprint as discussed in Flora and Vegetation section 2.1. This rehabilitation will directly benefit fauna by reinstating habitat.

2.3.9 Assessment of impacts to environmental values

The EPA considers that the impacts requiring the main focus of the assessment, is impact to Carnaby's black cockatoo habitat which includes a significant residual impact. The EPA also considers that the proposal has the potential to result in residual impacts to other terrestrial fauna but these can be managed through reasonable conditions. These impacts have been assessed below.

Carnaby's black cockatoo foraging habitat

The EPA has assessed the likely residual impacts of the proposal on Carnaby's black cockatoo foraging habitat to be direct clearing of up to 257.3 ha of foraging habitat.

It is noted that foraging habitat for the Carnaby's black cockatoo are not as restricted in the Sandplain regions as they are in the metropolitan area. The proposal area is outside the known breeding range for Carnaby's black cockatoo (DAWE 2022) and limited roosting habitat is available, with no evidence of roosting recorded within the proposal area.

The EPA has considered the proponent's efforts to minimise impacts to Carnaby's black cockatoo foraging habitat by reducing the disturbance by 29.6 ha. The EPA has also considered the information provided in the Banksia Woodland Rehabilitation Plan (Preston Consulting 2023b), and the proponents commitment to update the plan as well as the peer review of the plan. The rehabilitation of the Banksia woodland would provide Carnaby's black cockatoo foraging habitat values.

The EPA considers that indirect impacts from drawdown of the water table has the potential to impact Carnaby's black cockatoo foraging habitat outside the disturbance footprint. The EPA notes a Drawdown Management Scheme is proposed to protect the Carnaby's black cockatoo foraging habitat values outside of the disturbance footprint from indirect impacts from drawdown of the water table (see section 2.2 Inland Waters).

The EPA advises that the residual impact to Carnaby's black cockatoo foraging habitat should be subject to implementation conditions limiting clearing to 257.3 ha and to return Carnaby's black cockatoo foraging habitat in rehabilitation. The residual impact on Carnaby's black cockatoo foraging habitat aligns with the definition of significant residual impact in the *WA Environmental Offset Guidelines*, which includes impacts to rare and endangered animals (Government of Western Australia 2014).

The EPA's preference is to rehabilitate over solely acquiring land to offset, wherever possible. The return of the Carnaby's black cockatoo foraging habitat in rehabilitation, in conjunction with the proposed offset, which includes restoration of 28 ha of Carnaby's black cockatoo foraging habitat, reflects that preference.

The EPA advises that the significant residual impact is likely to be able to be regulated through reasonable conditions (recommended condition B2-1 and condition B5) and counter-balanced by offsets (recommended condition B4-4) so that the Carnaby's black cockatoo foraging habitat is protected; and the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna. Further details on the offset are provided in section 4 offsets.

Cumulative impacts

Cumulative impacts to Carnaby's black cockatoo foraging habitat will occur from Cooljarloo West Titanium Minerals Project approximately 20 km to the southeast, and from agricultural development and roads.

Cumulative impacts to the Carnaby's black cockatoo foraging habitat at a regional scale was undertaken using publicly available data and the environmental assessments for Cooljarloo West (Tronox 2017).

The Cooljarloo West proposal proposed a loss of 1,890 ha of native vegetation clearing that includes Carnaby's black cockatoo foraging habitat, representing 7.2% of the 27,960 ha foraging habitat available within the total native vegetation extent for that proposal. The disturbance footprint for the proposal is 257.3 ha of Carnaby's black cockatoo foraging habitat from the approximately 879 ha mapped for the proposal. Across both mining operations the combined losses therefore would be 2,147.3 ha from a mapped extent of 28,838.5 ha. Considering the smaller scale of impact from this proposal, rehabilitation and offsets proposed, the degree of cumulative impact from this proposal does not alter the EPA's view on the proposal against its objective for this factor.

Other conservation significant fauna

The EPA has considered the proponent's efforts to minimise impacts to conservation significant fauna by reducing clearing of fauna habitat through reducing the development envelopes and disturbance footprints. The EPA has also considered the proponents proposed progressive rehabilitation, which will reinstate fauna habitat.

The Black-striped burrowing snake (*Neelaps calonotos*; P3) are less mobile than birds, so pre-clearing surveys to relocate individuals has been proposed (recommended condition B2). The EPA notes that due to the progressive nature of mining, short time frame of the proposal, the proposed management of groundwater drawdown to protect vegetation outside the disturbance footprint and habitat for the species not being restricted in the area, the use of a translocation condition is reasonable.

The Western brush wallaby (*Notamacropus Irma*; P4), Common greenshank (*Tringa nebularia*; Migratory) and the Jewelled southwest ctenotus (*Ctenotus gemmula*; P3) are generally mobile indicating that they would vacate the area during clearing activities, however, if an individual is identified during ground disturbing activities within the disturbance footprint, a condition has been proposed (recommended condition B2) to ensure that individuals can be relocated or allowed to move on from the area. The EPA notes that due to the progressive nature of mining, short time frame of the proposal, the proposed management of groundwater drawdown to protect vegetation outside the disturbance footprint and habitat for the species not being restricted in the area, this condition would reasonably minimise impact to these species.

The EPA advises that the residual impact to conservation significant fauna should be subject to implementation conditions (recommended condition A1 and condition B2) limiting vegetation clearing to 288.4 ha and requiring management of fauna during clearing to ensure protection of the conservation significant fauna, and ensure the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.

Short Range Endemic fauna

While the Bothriembryontid land snail (Moore River) has a high likelihood of occurrence, it was not located during surveys. It has been recorded near Cervantes and at Cooljarloo West, and the Banksia Woodland and heath habitats that support the snail are not restricted and extend outside the development envelopes. The EPA considers the potential impact to the Bothriembryontid land snail (Moore River) is low and is not subject to implementation conditions.

No further specimens of the *Maratus* genus were collected during SRE surveys. The EPA has considered the proposed avoidance measure to implement an exclusion zone at the location and surrounding vegetation where the *Maratus Maratus* 'BAR130' was collected to protect this location from direct impact (Figure 5). A Drawdown Management Scheme is proposed to protect vegetation from indirect impacts from drawdown of the water table which could affect habitat of the *Maratus Maratus* 'BAR130' (see Inland Waters section 2.2).

The EPA has also considered the proponent's minimisation measures by reducing clearing of fauna habitat through reducing the development envelopes and disturbance footprints, and has also considered the proponent's proposed progressive rehabilitation measures which will reinstate fauna habitat values in the area.

The EPA advises that the residual impact to the *Maratus Maratus* 'BAR130', should be subject to implementation conditions (recommended condition B2-1(1)) to ensure protection of the *Maratus Maratus* 'BAR130' collection location and ensure the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.

2.3.10 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 5.

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 5: Summary of assessment for terrestrial fauna

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
1. Clearing of 288.4 ha of foraging habitat for Carnaby's black cockatoo.	The EPA considers that the impact to Carnaby's black cockatoo habitat is a significant residual impact.	Condition A1 (Limitations and extent of proposal) Limit on the extent of the proposal including the

Residual impact or risk to environmental value	Assessment finding or Environmental outcome	Recommended conditions and DMA regulation
	<p>The EPA advises that this residual impact should be subject to reasonable conditions to set clearing limits and require offsets to counterbalance this significant residual impact.</p> <p>Subject to these recommended conditions, the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.</p>	<p>development envelopes and clearing extent.</p> <p>Condition B2 (Terrestrial fauna)</p> <p>Disturbance limits to the clearing of habitat that supports Carnaby's black cockatoo.</p> <p>Condition B5 (Rehabilitation)</p> <p>Requirement to rehabilitate the disturbance footprint.</p> <p>Condition B4 (Environmental Offsets)</p> <p>Requirement for an adequate offset.</p>
<p>2. Clearing of native vegetation that supports conservation significant fauna.</p>	<p>The EPA considers that the impact to conservation significant fauna habitat is a residual impact.</p> <p>The EPA advises that this residual impact should be subject to reasonable conditions to set clearing limits.</p> <p>Subject to these recommended conditions, the environmental outcome is likely to be consistent with the EPA objective for this factor.</p>	<p>Condition A1 (Limitations and extent of proposal)</p> <p>Limit on the extent of the proposal including the development envelopes and clearing extent.</p> <p>Condition B2 (Terrestrial fauna)</p> <p>Removal and other management of terrestrial fauna prior to and during ground disturbing activities.</p>
<p>3. Indirect impact to potential SRE species <i>Maratus Maratus</i> 'BAR130'.</p>	<p>The EPA advises that subject to the recommended condition to implement an exclusion zone, the environmental outcome is likely to be consistent with the EPA objective for this factor.</p>	<p>Condition A1 (Limitations and extent of proposal)</p> <p>Limit on the extent of the proposal including the development envelopes and clearing extent.</p> <p>Condition B2 (Terrestrial fauna)</p> <p>Requirement to implement an exclusion zone for the species.</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 flora and vegetation, terrestrial fauna and inland waters, 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

There is a high level of interconnectivity between the environmental factors of flora and vegetation, terrestrial fauna, and inland waters. The water level in the area supports the groundwater dependent ecosystem, which is habitat for threatened ecological communities, and conservation significant flora and fauna values. Minimising impacts to inland waters (i.e. minimising the impact of groundwater drawdown) will also minimise the impacts to these values.

The conservation significant flora and vegetation itself also provides habitat for the conservation significant fauna occurring within the proposal area. Minimising the direct and indirect impacts to flora and vegetation will also minimise impacts to conservation significant fauna habitat.

The EPA considers that the short time frame of the mining process, proposed mitigation and management measures, recommended conditions for residual impacts and provision of offsets to counterbalance the significant residual impacts to flora and vegetation will also mean the inter-related impacts to the values of other factors of the environment including the values associated with terrestrial fauna and inland waters are likely to be consistent with the EPA environmental factor objectives.

The EPA considered whether a longer, slower time would be beneficial for the potential groundwater impacts, but assessed this would have more adverse impacts for the vegetation and flora as it would keep the pit open longer and water drawdown longer.

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.

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

- clearing of 206.4 ha of Banksia Woodlands
- clearing of 257.3 ha of high quality Carnaby's black cockatoo foraging habitat
- potential impacts to priority flora.

Environmental offsets are not appropriate in all cases. In this case the EPA considers offsets are appropriate given the scale of the environmental impacts are not minor (principle 2 of the WA Environmental Offsets Policy) and, in accordance with principle 1 of the WA Environmental Offsets Policy, the proponent has applied avoidance and mitigation measures by amending the proposal during assessment to avoid or minimise impacts to environmental value.

The proponent has proposed to include land acquisition of two locations (one that is directly south of the proposal area) and on-ground measures (restoring vegetation) at one of the two locations, as detailed in the offset strategy (Image Resources, December 2023). The proposed offset areas are (Figure 8):

1. Protection and maintenance of the entire mapped extents of Banksia Woodlands and Carnaby's black cockatoo foraging habitat across Lot 4113 on plan 2125/58 (2269 Wongonderrah Road, Nambung) consisting of:
 - a. 641.73 ha of excellent quality Banksia Woodlands
 - b. 937 ha of high quality Carnaby's black cockatoo foraging habitat.
2. Protection and maintenance of the entire mapped extents of Banksia Woodlands and Carnaby's black cockatoo foraging habitat across Lot 501 on plan 13536 (5919 Brand Highway, Beermullah) consisting of:
 - a. 175.56 ha of excellent quality Banksia Woodlands
 - b. 467.96 ha of high quality Carnaby's black cockatoo foraging habitat.
3. 28 ha of Banksia Woodlands and Carnaby's black cockatoo foraging habitat restoration within a suitable area of Lot 4113 on plan 2125/58 (2269 Wongonderrah Road, Nambung).

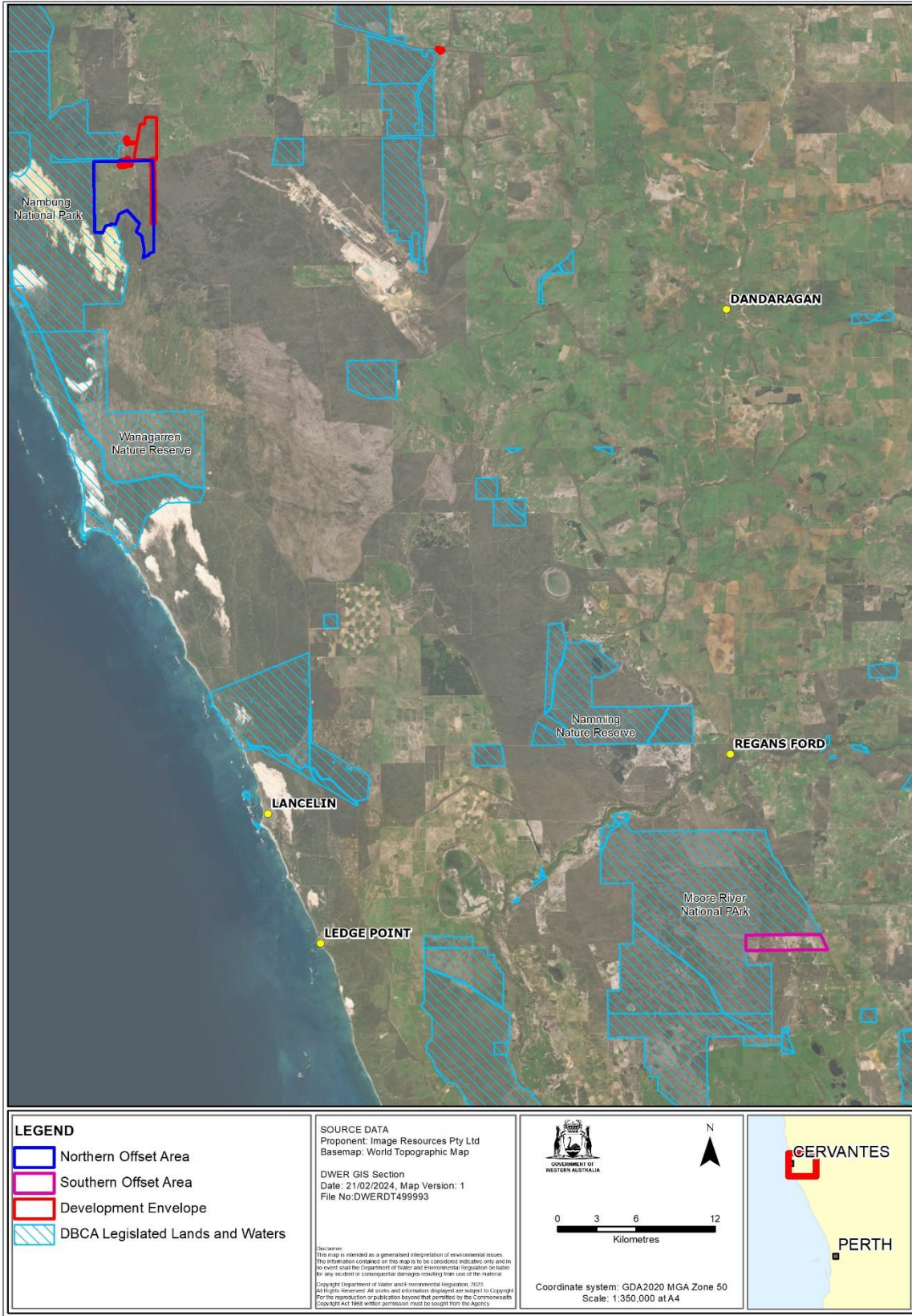


Figure 8: Offset areas

The proponent has identified the land acquisition of 817.29 ha of excellent quality Banksia Woodlands and 1,404.96 ha of high quality Carnaby's black cockatoo foraging habitat, with restoration of 28 ha of Banksia Woodlands and Carnaby's black cockatoo foraging habitat, to counterbalance the significant residual impacts of the proposal.

Lot 4113 on plan 2125/58 is directly south of the proposal area and connects to remnant native vegetation to the north, east and south of the property and Nambung National Park to the west. Evidence of Carnaby's Cockatoo foraging activities was recorded throughout the area. No potential breeding trees were recorded, and several pine trees may provide roosting habitat. In addition, the Banksia Woodlands contained within this property may provide habitat for some priority flora directly impacted by the proposal.

Lot 4113 on plan 2125/58 also contains cleared areas for agriculture, providing an opportunity to restore 28 ha of Banksia Woodlands and Carnaby's black cockatoo foraging habitat. The EPA notes that the restoration will use the learnings from the rehabilitation work, such as the updated Banksia Woodland Rehabilitation Plan, and the research offset to undertake field trials to populate relevant priority flora in this restoration area.

Lot 501 on plan 13536 is approximately 70 km south of the proposal area direct and connects to remnant native vegetation to the north, west and south of the property including Moore River National Park to the north and west. Evidence of Carnaby's Cockatoo foraging activities was recorded at several locations within the foraging habitat. Five Marri trees were identified as potential breeding trees (DBH >500 mm).

The EPA has considered whether the offsets are likely to counter-balance the significant residual impacts for Banksia Woodlands and Carnaby's black cockatoo foraging habitat. The EPA's view is that the values of the offset site are relevant to the environmental values being impacted. Surveys of the offset sites indicate that the properties identified to-date are likely to contain sufficient extent of Banksia Woodlands and Carnaby's black cockatoo foraging habitat, to counterbalance the significant residual impacts.

The EPA accepts the use of a Conservation Covenant under the *Soil and Land Conservation Act 1945* for the conservation protection applied to the offset sites or alternate covenant or protection regime. Management of the offset sites is proposed to be undertaken for 20 years and the proponent will either engage a local land management organisation (such as Traditional Owners), a land contractor or provide funds to DBCA if the offset site(s) are approved for management by DBCA. The EPA expects the proponent to liaise with DBCA to determine if native vegetation adjacent to the National Parks could be included within the boundaries of those national parks.

The EPA has considered contingency offsets (condition B4-6) in the case where the proposal has not met the environmental objectives in the offsets strategy or proposed managed aquifer recharge is not successful and impacts to vegetation outside the disturbance footprint has occurred. Based on advice from DBCA, the EPA is confident that there are other available offsets in the local area that could accommodate these contingency offsets.

The EPA considers that impacts associated with implementation of the proposal on priority flora may be a potentially significant residual impact, and therefore, offsets are considered to preventively counterbalance the significant residual impacts of the proposal (recommended condition B4-2(4)) and improve the knowledge on these species. In this case, the offset for the priority flora is that research is undertaken to ensure that the species can be used, where appropriate, in the third offset proposed, to restore 28 ha of vegetation. The EPA notes that the proponent has proposed germination trials. The EPA supports germination trials and advises that field trials also need to be considered. The EPA has also considered the opportunity for priority species to be reintroduced back into rehabilitation.

The EPA recommends condition B4 be implemented to ensure the offsets can offset the likely significant residual impacts. The EPA notes that the DCCEEW has advised that it generally supports the offset strategy and additional details may be required to finalise the plan. In the interest of having one consistent plan that outlines the offsets, the EPA has recommended that the offset strategy, including at minimum the offsets set out above, in condition B4 be implemented to avoid inconsistencies between plans.

5 Matters of national environmental significance

The Commonwealth Minister for the Environment has determined that the proposal is a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as it is likely to have a significant impact on one or more MNES. It was determined that the proposed action is likely to have a significant impact on the following matters protected by the EPBC Act:

- Listed threatened species and communities (sections 18 & 18A)
- Nuclear actions (sections 21 & 22A).

The EPA has assessed the controlled action on behalf of the Commonwealth as an accredited assessment under the EPBC Act.

This assessment report would be provided to the Minister for Environment (Cmwth) who will decide whether or not to approve the proposal under the EPBC Act along with other information required. This is separate from any Western Australian approval that may be required.

Commonwealth policy and guidance

The EPA had regard to the following relevant Commonwealth guidelines, policies and plans during its assessment:

- *Commonwealth EPBC Act Environmental Offsets Policy* (DSEWPAC 2012a)
- *Approved Conservation Advice for Clay Pans of the Swan Coastal Plain* (DSEWPAC 2012b)
- *Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community* (DoEE 2016).
- *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black cockatoo* (DAWE 2022)
- *Conservation Advice for *Tringa nebularia* (common greenshank)* (DCCEEW 2024)
- *Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan* (DPAW 2013).

EPA assessment

Impacts to the environment relating to MNES are also covered under the key environmental factors of inland waters, flora and vegetation and terrestrial fauna of this report.

Listed threatened species and communities (sections 18 and 18A)

Listed threatened species and communities that occur or may occur include:

- *Banksia Woodlands of the Swan Coastal Plain* Threatened Ecological Community listed as Endangered under the EPBC Act occurs in the proposal area.
- *Herb rich saline shrublands in clay pans* Threatened Ecological Community SPC07 listed as Critically Endangered under the EPBC Act occurs in the Mine Development Envelope but not in the disturbance footprint.
- Threatened fauna recorded during surveys:
 - Carnaby's black cockatoo (*Zanda latirostris*) – Endangered under the EPBC Act
 - Common greenshank (*Tringa nebularia*) – Migratory under the EPBC Act (noting the listing was amended to Endangered after a controlled action was determined.)
- Threatened fauna high likelihood of occurrence:
 - Fork-tailed swift (*Apus pacificus*) – Migratory under the EPBC Act and BC Act.
- Potential habitat for the Malleefowl (*Leipoa ocellata*) listed as Vulnerable under the EPBC Act.

No Threatened flora were recorded during surveys. The nearest records of Threatened flora are the Slender Andersonia (*Andersonia gracilis*) listed as Endangered and dwarf green kangaroo paw (*Anigozanthos viridis* subsp. *terraspectans*) listed as Vulnerable in the vicinity of the proposal.

The occurrence of the above-listed threatened species and communities is discussed in sections 5, 6 and 13 of the proponent's ERD (Image Resources 2022) and in the proponent's response to submissions (Preston Consulting 2023b). Discussion of these species and communities is provided in sections 2.1 and 2.3 of this report.

Potential impacts to listed species are primarily a result of clearing of vegetation and habitat loss. The proposal will result in the loss of up to 288.4 ha of native vegetation and fauna habitat.

The assessment of the potential impacts to other listed species is discussed in sections 2.1 Flora and Vegetation, section 2.2 Inland Waters, 2.3 Terrestrial Fauna, and section 4 of this report.

Nuclear actions (sections 21 and 22A)

The HMC storage stockpile and transport of HMC have been assessed under Sections 21 and 22A of the EPBC Act.

Background monitoring of Radon (^{222}Rn) and Thoron (^{220}Rn) has been completed at the proposal. During operations further sampling will be completed and compared to background to determine ongoing monitoring requirements. At the Boonanarring Project, which was operated by the proponent and has comparable radiation levels to the proposal, measured Radon and Thoron levels were similar to background levels.

It was considered that, significant radiological impacts from the proposed action on workers, the public or non-human biota would be unlikely, and that the proponent had shown through qualitative comparison to the similar scale Boonanarring Project that:

- worker and public doses from radon and thoron for the proposed project will be low because measured levels at Boonanarring are similar to background
- public doses from radioactivity in dust will be low because measured levels at Boonanarring are low and below the investigation level
- non-human biota doses from radon and radioactivity in dust will be low because of the low levels measured at Boonanarring.

It was considered that non-radiological environmental impacts from the proposed action relevant to Sections 21 and 22A of the EPBC Act, including dust and transport of HMC, are unlikely to be significant. The impacts of clearing for the stockpile are assessed under the above section regarding listed threatened species and communities.

The proponent has also committed to conduct additional measurements of background dust to allow for differences attributable to seasonal variations. HMC will be transferred from the final product stockpile by front-end loaders, loaded onto haul trucks and transported to either Geraldton Port or Bunbury Port for export via Brand Highway. Haulage from site will be via Munbinea Road which connects to the Brand Highway via Bibby Road to the north of the Proposal.

A Radiation Management Plan has been provided in Appendix 15 of the proponent's response to submissions (Image Resources, 2023) and has been prepared to ensure that exposure to radiation is eliminated or reduced to 'as low as reasonably achievable', in accordance with the *Radiation Safety Act 1975*.

The Radiation Management Plan advises that as the HMC specific activity concentration is expected to be well below 10 Bq/g, it is not classified as 'radioactive' for the purposes of transport, the WA Radiation Safety (Transport of Radioactive Substances) Regulations 2002 do not apply.

Summary

The EPA recommends the following environmental conditions to minimise impacts on MNES:

- condition A1 – limits the location and authorised extent of the clearing of vegetation to 288.4 ha
- condition B1-1(1)(b) – ensures no impacts to the Herb rich saline shrublands in clay pans Threatened Ecological Community SPC07
- condition B1-1(3)(a) – limits on the authorised extent of disturbance of *Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community* to 206.4 ha
- condition B2-1(2) – limits on the authorised extent of disturbance of foraging habitat for Carnaby's black cockatoo (*Zanda latirostris*) to 257.3 ha

- condition B2-3 – ensures the presence of fauna handlers during ground disturbing activities to manage fauna
- condition B3-1 – ensures no impacts to vegetation, that represents listed communities and/or habitat for threatened species, beyond the disturbance footprint for mining from drawdown of the seasonal water table
- condition B4 for proposed offsets
- condition B5 for rehabilitation activities.

The EPA considers that there will be a significant residual impact from the clearing of *Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community* and habitat for Carnaby's black cockatoo (*Zanda latirostris*). The EPA has recommended an offset in condition B4 (see section 4) which takes into account the significant residual impact due to implementation of the proposal.

The EPA is satisfied that potential radioactivity will be managed through the Radiation Management Plan in accordance with the *Radiation Safety Act 1975* and that the WA Radiation Safety (Transport of Radioactive Substances) Regulations 2002 do not apply, and has not recommended any conditions in this case.

The EPA's view is that the impacts from the proposal on the above-listed species and potential radioactivity are therefore not expected to result in an unacceptable or unsustainable impact on any matters of national environmental significance.

6 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 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.

7 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.

The EPA provides the following information for consideration by the Minister.

Mine closure and rehabilitation

The EPA notes that the proponent is commencing rehabilitation of an existing mine at Boonanarring in WA. The EPA expects learnings from other rehabilitation to directly influence rehabilitation at the Atlas Project.

The EPA also notes that for future mineral sands proposals and other proposals in this area, that cumulative impacts need to be considered and provided for the EPA's consideration.

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 Conditions

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

ATLAS PROJECT

Proposal: To develop a greenfields mineral sands project, located at Nambung, approximately 18 km east of Cervantes in the Wheatbelt region of Western Australia. The proposal includes the progressive development of mine pits, processing facilities, groundwater bores and water management infrastructure, temporary waste stockpiles, solar drying ponds and associated infrastructure.

Proponent: Image Resources NL
Australian Company Number 063 977 579

Proponent address: Level 2, 7 Ventnor Avenue,
West Perth WA 6872

Assessment number: 2311

Report of the Environmental Protection Authority: 1759

Introduction: Pursuant to section 45 of the *Environmental Protection Act 1986*, it has been agreed that the proposal entitled Atlas Project described in the 'Proposal Content Document' attachment of the referral of 3 September 2021, as amended by the change to proposal approved under s. 43A on 6 September 2022 and 19 January 2024, 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

A1 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		
Mine development envelope	Figure 1	No more than 457 ha
Disturbance footprint within the mine development envelope	Within the development envelope shown in Figure 1	Disturbance of no more than 274.8 ha within the mine development envelope
Direct disturbance of native vegetation within the mine development envelope	Within the development envelope shown in Figure 1	Clearing no more than 272.2 ha of native vegetation within the mine development envelope shown in Figure 1
External infrastructure development envelope	Figure 1	No more than 37.8 ha
Disturbance footprint within the external infrastructure development envelope	Within the development envelope shown in Figure 1	Disturbance of no more than 28.8 ha within the external infrastructure development envelope
Direct disturbance of native vegetation in the external infrastructure development envelope	Within the development envelope shown in Figure 1	Clearing no more than 16.2 ha of native vegetation within the external infrastructure development envelope
Construction elements		
Pit dewatering	Superficial aquifer	Up to 1.1 GL/a
Operational elements		
Pit dewatering	Superficial aquifer	Up to 0.75 GL/a
Groundwater abstraction	Yarragadee and Eneabba Aquifer	Up to 2.2 GL/a
Timing elements		
Project life		Up to 5 years from the date of substantial commencement

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 outcomes:

- (1) No **adverse impacts** to the following exclusion areas shown in Figure 2:
 - (a) *Levenhookia preissii* (P1) exclusion areas;
 - (b) Claypans of the Swan Coastal Plain Threatened Ecological Community (*Herb rich saline shrublands in clay pans Threatened Ecological Community SPC07*) exclusion area; and
 - (c) Moodjar (*Nuytsia floribunda*) exclusion area.
- (2) No **adverse impacts** to native vegetation outside the disturbance footprint; and
- (3) **Disturb** no more than the following environmental values:
 - (a) 206.4 **ha** of the Banksia woodlands of the Swan Coastal Plain ecological community;
 - (b) Priority flora within the **known populations** as described in Table 1; and

Table 1: Disturbance of Priority flora species

Species	Disturbance of known populations
<i>Levenhookia preissii</i>	Up to 3 individuals
<i>Grevillea cooljarloo</i> (Keighery & Olde)	Up to 697 individuals
<i>Jacksonia carduacea</i>	Up to 1 individual
<i>Schoenus pennisetis</i>	Up to 3 individuals
<i>Anigozanthos humilis</i> subsp. <i>chrysanthus</i>	Up to 1 individual
<i>Conospermum scaposum</i>	Up to 570 individuals
<i>Hensmania stoniella</i>	Up to 32 individuals
<i>Isopogon panduratus</i> subsp. <i>palustris</i>	Up to 944 individuals
<i>Stylidium aceratum</i>	Up to 710 individuals

- (c) Up to 194 individuals of the **known population** of the *Jacksonia* aff. *Floribunda*.

- B1-2 Yued Aboriginal Corporation cultural monitors shall be offered the opportunity to be present for initial ground disturbing work associated with the removal of any Moodjar (*Nuytsia floribunda*) trees within the **development envelopes**, but outside the exclusion zone in condition B1-1(1)(C).
- B1-3 The proponent must implement weed hygiene measures during **construction activities** and operations to prevent the introduction or spread of **environmental weeds** in the **development envelopes** and in surrounding areas as a result of the proposal.
- B1-4 The proponent must implement the proposal subject to dieback hygiene protocols consistent with the *Phytophthora Dieback Management Manual, October 2020*, as amended or replaced from time to time.

B2 Terrestrial Fauna

- B2-1 The proponent must ensure the implementation of the proposal achieves the following environmental outcome:
- (1) No **adverse impacts** to the *Maratus Maratus* 'BAR130' exclusion area shown in Figure 2; and
 - (2) Directly **disturb** no more than 257.3 ha of foraging habitat for Carnaby's black cockatoo (*Zanda latirostris*).
- B2-2 Prior to **ground disturbing activities**, the proponent must undertake the following action:
- (1) within seven (7) days prior to clearing, using a suitably trained and licensed **fauna handler**, remove ground-dwelling fauna from the disturbance footprint and re-locate the fauna to adjacent vegetated areas.
- B2-3 During **ground disturbing activities**, the proponent must undertake the following actions:
- (1) ensure the presence of **fauna handlers** during **clearing activities**;
 - (2) cease **ground disturbing activities** in any area where Carnaby's black cockatoo (*Zanda latirostris*), Common greenshank (*Tringa nebularia*), Black-striped burrowing snake (*Neelaps calonotos*), the Jewelled Southwest Ctenotus (*Ctenotus gemmula*) and Western brush wallaby (*Notamacropus Irma*) individual(s) are identified until:
 - (a) the individual(s) has been relocated by a **fauna handler**; or

- (b) the individual(s) has been observed by the **fauna handler** to have moved on from the area to adjoining suitable habitat; and/or
- (c) the **fauna handler** considers that the individual no longer occurs in the area.

B3 Inland waters

B3-1 The proponent must ensure the implementation of the proposal results in:

- (1) No adverse impacts to Banksia woodlands of the Swan Coastal Plain ecological community beyond the disturbance footprint, from drawdown of the **seasonal water table**.

B3-2 Prior to **dewatering activities**, the proponent must undertake the following actions:

- (1) implement the Drawdown Mitigation Scheme starter pit as described in condition B3-4; and
- (2) install monitoring bores around the pit shell as defined in the Drawdown Mitigation Scheme as described in condition B3-4 to capture water level and quality data and use this data to further define the **seasonal water table**.

B3-3 During **dewatering activities**, the proponent must undertake the following actions:

- (1) continue implementing the Drawdown Mitigation Scheme as described in condition B3-4.

B3-4 The proponent must review and update the Drawdown Mitigation Scheme and Groundwater Monitoring Program as described in the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions) that demonstrates how achievement of the **outcomes** of condition B3-1(1), will be monitored, substantiated and satisfies the requirements of condition C4, and submit it to the **CEO**.

B4 Environmental Offsets

B4-1 The proponent must implement offsets to counterbalance the significant residual impacts of the proposal on the following environmental values:

- (1) Banksia woodlands of the Swan Coastal Plain ecological community;
- (2) foraging habitat for Carnaby's black cockatoo (*Zanda latirostris*); and
- (3) priority flora.

B4-2 In order to meet the requirements of condition B4-1, the proponent must ensure the implementation of the offsets achieves the following environmental outcomes and objectives:

- (1) counterbalance the significant residual impacts to the environmental values identified in condition B4-1;
- (2) maintain and improve where practicable the resilience of excellent quality of Banksia woodlands of the Swan Coastal Plain ecological community and Carnaby's black cockatoo foraging habitat in the proposed offset areas listed in Table 2;
- (3) restore at least twenty eight (28) **ha** of land within fifty (50) kilometres of the development envelope to provide **self-sustaining** Banksia woodlands of the Swan Coastal Plain ecological community and foraging habitat for Carnaby's black cockatoo;
- (4) contribute to research on ecological restoration of the following flora being **disturbed** to enable them to be introduced into the Mine Development Envelope and restoration of land outlined in B4-2(3):
 - (a) *Levenhookia preissii*;
 - (b) *Grevillea cooljarloo* (Keighery & Olde);
 - (c) *Schoenus pennisetis*;
 - (d) *Jacksonia carduacea*;
 - (e) *Anigozanthos humilis* subsp. *chrysanthus*; and
 - (f) *Jacksonia* aff. *floribunda*, if it is a new species.

Offset Environmental Management Plan

B4-3 The proponent must review and revise the Offset Environmental Management Plan (Version 1, IMG-ATL-OFF-01, 5 September 2023) that demonstrates how the environmental outcomes and objectives in condition B4-2 will be achieved, and how this achievement will be substantiated, and submit it to the **CEO**.

B4-4 The Offset Environmental Management Plan must include the implementation of the offset measures to the extent and at the locations as set out and described in Table 2.

Table 2: Environmental values, locations and extent and type of offset measures required to meet condition B4-1

Environmental value	Offset locations	Extent of area to receive offset measures (hectares)	Type of offset measures
Banksia woodlands of the Swan Coastal Plain ecological community and foraging habitat for Carnaby's black cockatoo (<i>Zanda latirostris</i>)	2269 Wongonderrah Road, Nambung (Lot 4113 on plan 2125/58)	Acquire and manage at least 937 ha which includes: <ul style="list-style-type: none"> • 641.73 ha of Excellent quality Banksia Woodlands TEC/PEC • Carnaby's Cockatoo foraging habitat 937 ha of high quality foraging habitat. 	land acquisition
		Restoration by revegetation of at least 28 ha of cleared land to Banksia Woodlands TEC/PEC and Carnaby's Cockatoo foraging habitat.	on-ground management
Banksia woodlands of the Swan Coastal Plain ecological community and foraging habitat for Carnaby's black cockatoo (<i>Zanda latirostris</i>)	5919 Brand Highway, Beermullah (Lot 501 on plan 13536)	Acquire and manage at least 467.96 ha which includes: <ul style="list-style-type: none"> • 175.56 ha of Excellent quality Banksia Woodlands TEC/PEC • Carnaby's Cockatoo foraging habitat 467.96 ha of high quality foraging habitat. 	land acquisition

B4-5 The Offset Environmental Management Plan must:

- (1) demonstrate that the environmental outcomes and objectives in condition B4-2 will be met;
- (2) describe how the offset measures will be implemented consistent with condition B4-4;
- (3) Include reporting of the progress of environmental outcomes and objectives in condition B4-2 each three (3) years until the **CEO** advises that restoration requirements have been met;

- (4) be prepared in consultation with the Department of Biodiversity, Conservation and Attractions;
- (5) spatially identify the areas (**Proposed Offset Conservation Areas**) in condition B4-4 and any other areas proposed as:
 - (a) **acquired** lands offset areas to receive **on-ground management** offset measures; and
 - (b) offset areas or lands to receive restoration or revegetation **on-ground management** offset measures.
- (6) demonstrate how the environmental values within the **Proposed Offset Conservation Areas** will be maintained and improved or managed to counterbalance the significant residual impact to the environmental values in condition B4-1 and achieve the environmental outcomes and objectives in condition B4-2;
- (7) demonstrate application of the principles of the WA Environmental Offsets Policy, the *WA Environmental Offsets Metric* and the WA Offsets Template, as described in the *WA Environmental Offsets Guidelines*, and the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy Assessment Guide*, or any subsequent revisions of these document;
- (8) identify how the ongoing performance of the offset measures, and whether they are achieving the outcomes and objectives in condition B4-2, will periodically be made publicly available;
- (9) for the land acquisition offsets identified in condition B4-4:
 - (a) demonstrate that the **Proposed Offset Conservation Areas** contain the minimum extents of the environmental values identified in condition B4-4;
 - (b) identify how the **Proposed Offset Conservation Areas** will be protected, being either the sites are ceded to the Crown for the purpose of management for conservation, or the sites are managed under other suitable mechanism for the purpose of conservation as agreed by the **CEO** by notice in writing;
 - (c) specify the quantum of works associated with establishing the **Proposed Offset Conservation Areas**, including a contribution for maintaining the offset for at least twenty (20) years after completion of purchase; and
 - (d) identify the **relevant management body** for the on-going management of the **Proposed Offset Conservation Areas**,

including its role, and the role of the proponent, and confirmation in writing that the **relevant management body** accepts responsibility for its role.

- (10) For **on-ground management** offsets identified in condition B4-4:
- (a) state the targets for each environmental value to be achieved by the **on-ground management**, including completion criteria, which will result in a **tangible improvement** to the environmental values being offset. For restoration offsets, this must include, but not be limited to:
 - (i) completion criteria to measure (at a minimum) whether the objective in condition B4-2(4) and condition B4-2(4) has been achieved; and
 - (ii) adaptive management to ensure successful revegetation.
 - (b) demonstrate the consistency of the targets with the environmental outcomes and objectives in condition B4-2 and the objectives of any relevant guidance, including but not limited to, recovery plans or area management plans;
 - (c) detail the **on-ground management** actions, with associated timeframes for implementation and completion, to achieve the targets identified in condition B4-5(10)(a); and
 - (d) detail the monitoring, reporting and evaluation mechanisms for the targets and actions identified under condition B4-5(10)(a) and condition B4-5(10)(c).
- (11) For the research offset identified in condition B4-2(4), within six (6) months of the date of this statement, or an alternative date agreed to by the **CEO**, prepare a research program that:
- (a) identifies the **objectives** and intended **outcomes**, and specifies the deliverables and completion criteria;
 - (b) identifies how the research will result in a positive conservation **outcome** or **tangible improvement**, and will either improve management and protection or address priority knowledge gaps that have been identified as a research priority needed to improve management and protection, for the **environmental values** identified in condition B4-1(1);
 - (c) demonstrate the consistency of the **objectives** in condition B4-5(11)(a) with any relevant guidance, including but not limited to, recovery plans or area management plans, the principles of the

WA Environmental Offsets Policy, the WA Environmental Offsets Guidelines, or any subsequent revisions of these documents;

- (d) identifies and justifies the how the research will support **on-ground management** in achieving a positive conservation **outcome**;
- (e) provides an implementation and reporting schedule, including an outline of key activities, all deliverables, stages of implementation, reporting of research results (including interim results), reporting on implementation status, and milestones towards completion criteria;
- (f) identifies the governance arrangements including responsibilities for implementing, and oversight of, the research program, agreements with government agencies, agreements with any third parties, and **contingency measures**;
- (g) identify how a research program summary, and the results (including interim results) of the research program will be communicated and/or published in an open access format;
- (h) identifies the third party to carry out the work required to meet the **outcomes** of condition B4-5(10)(a), who is satisfactory for the role to the **CEO**. In applying to the **CEO** for endorsement of the selected third parties, the proponent shall provide:
 - (i) demonstration of the track record, experience, qualifications and competencies of the proposed third party to carry out the work and achieve the outcomes.

Contingency offsets

- B4-6 If, after receiving the ongoing performance review of the offsets and monitoring, reporting and evaluation required by condition B4-5(10)(d) and B4-5(11)(d), the **CEO**, in consultation with Department of Climate Change, Energy, the Environment and Water, determines that the proposal has not met the environmental objectives in condition B4-2, and after notifying the proponent in writing, the proponent must undertake an additional offset to counterbalance the significant residual impact that is not counterbalanced to the Banksia Woodlands of the Swan Coastal Plain ecological community of Carnaby's black cockatoo foraging habitat.
- B4-7 If, the environmental objective in condition B3-1 is determined by the **CEO**, in consultation with Department of Climate Change, Energy, the Environment and Water, to not be met by the proposal, and after notifying the proponent in writing, the proponent must undertake an additional offset to counterbalance the

additional impact that is not counterbalanced to Banksia Woodlands of the Swan Coastal Plain ecological community.

- B4-8 Within six (6) months of receiving notice in writing from the **CEO** that an additional offset is required under condition B4-6 or condition B4-7 the proponent must update the Offset Environmental Management Plan required by condition B4-3 to include acquiring additional offsets to counterbalance the significant residual impacts.

B5 Rehabilitation

- B5-1 The proponent must implement the proposal to ensure the following environmental **outcomes** are achieved:

- (1) all **cleared** areas, with the exception of 0.6 ha for Bibby Road / Brand Highway intersection, are to be **progressively rehabilitated**;
- (2) rehabilitated areas are capable of sustaining achievement of the other environmental **outcomes** in condition B1, conditions B2 and condition B3 after the life of the proposal;
- (3) Rehabilitated landforms are stable and do not cause **adverse impacts** to adjacent areas, cause **pollution** or **environmental harm**;
- (4) rehabilitated vegetation is self-sustaining, including not **adversely impacted** by **environmental weeds** or **dieback**; and
- (5) rehabilitated areas are aligned with industry best practise for the species diversity and abundance of native vegetation within comparative analogue or reference sites.

- B5-2 The proponent must rehabilitate all disturbed areas not reasonably expected to be required for ongoing operational activities, with the exception of 0.6 ha for Bibby Road / Brand Highway intersection, until the CEO has determined that the proponent has met the outcomes of condition B5-1.

- B5-3 The proponent must review and update the Banksia Woodland Rehabilitation Environmental Management Plan (IMA-ATL-REH-01, Version 1, 31 August 2023, or any future revisions) to be consistent with the findings of the Peer Review and to take into account international principles and standards for the ecological restoration and recovery of mine sites and that demonstrates how achievement of the **outcomes** of condition B5-1, will be monitored, substantiated and satisfies the requirements of condition C4, and submit it to the **CEO**.

- B5-4 The proponent must ensure that the rehabilitation process includes:

- (1) retaining the vegetative material and topsoil removed by **clearing** and stockpiling the vegetative material and topsoil within the **development envelopes**; and
- (2) ripping the ground on the contour to remove soil compaction.

B5-5 The proponent must take reasonable steps to consult on the design and outcomes of rehabilitation with the Yued Aboriginal Corporation, including but not limited to providing annual rehabilitation reports.

B5-6 The report required in condition B5-5 must be submitted to the Yued Aboriginal Corporation and the **CEO** and must include but not be limited to completion criteria that are agreed within rehabilitation plans for the proposal, the return of the soil profiles, all vegetation and foraging habitats, and indicators of diversity and species richness including but not limited to priority species.

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 not undertake, unless otherwise authorised by the **CEO**:

- (1) **dewatering activities** until the **CEO** has confirmed in writing that the Drawdown Mitigation Scheme and Groundwater Monitoring Program as described in the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions) required by condition B3-4 meets the requirements of that condition and condition C4;
- (2) **ground disturbing activities** until the **CEO** has confirmed in writing that the Offset Environmental Management Plan (Version 1, IMG-ATL-OFF-01, 5 September 2023) required by condition B4-3 meets the requirements of that condition and condition C5; and
- (3) **ground disturbing activities** until the **CEO** has confirmed in writing that the Banksia Woodland Rehabilitation Environmental Management Plan (IMA-ATL-REH-01, Version 1, 31 August 2023, or any future revisions) required by condition B5-3 meets the requirements of that condition and condition C4.

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 Despite condition C2-1, but subject to conditions C2-4 and C2-5, 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.

C2-4 If the proponent is to implement minor revisions to an environmental management plan under condition C2-3, 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.

C2-5 The proponent must cease to implement any revisions which the **CEO** notifies the proponent (at any time) in writing may not be implemented.

C2-6 **Confirmed** environmental management plans, and any revised environmental management plans under condition C2-4(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 documents required under condition B3-4 and condition B5-3 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;
- (8) reporting requirements.

C4-2 The Drawdown Mitigation Scheme and Groundwater Monitoring Program as described in the Groundwater Operating Strategy (Version 1.4, 25 August 2023 or its future revisions) required under condition B3-4 is also required to include:

- (1) unless a different date or frequency is approved by the **CEO**, three (3) monthly review and reporting to the **CEO** capturing the changes to the Drawdown Mitigation Scheme and Groundwater Monitoring Program as described in the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions) using the data captured in Part B and Part C, with the first review and reporting occurring three (3) months after **dewatering activities** commence, and reporting occurring two (2) months after the end of each reporting period;
- (2) unless a different date or frequency is approved by the **CEO**, independent peer review of the information required by condition C4-2(1) is to be undertaken every three (3) months and results reported to the **CEO** with the first peer review occurring three (3) months after

- dewatering activities** commence, and reporting occurring two (2) months after the end of each reporting period;
- (3) predicted water-levels for each Drawdown Mitigation Scheme infiltration pond monitoring bore, reported against in the review required by condition C4-2(1) and condition C4-2(2);
 - (4) **threshold criteria**, including but not limited to:
 - (a) drawdown at any Drawdown Mitigation Scheme infiltration pond monitoring bore must not exceed the levels defined in Table 5 of the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions); and
 - (b) degradation of quality or death of vegetation in **monitoring quadrats** as compared to **reference quadrats**.
 - (5) **trigger criteria**, including but not limited to:
 - (a) exceeding drawdown of 0.1 m/year below the predicted water level for the period of the year at any Drawdown Mitigation Scheme infiltration pond monitoring bore; and
 - (b) salinity, pH and temperature trigger values.
 - (6) installation of a minimum of 30 Drawdown Mitigation Scheme infiltration pond monitoring bores around the mine pit prior to **dewatering activities**, with appropriate slots to coincide with the water table and seasonal water level fluctuations;
 - (7) baseline superficial aquifer water-levels, trigger criteria, threshold criteria and groundwater monitoring program for the nominated superficial aquifer monitoring bores from Table 1 and Table 2 of the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions) to be agreed with the **CEO** on advice of the Department of Water and Environmental Regulation. Trigger and threshold criteria are to be based on the drawdown rules defined in Section 5.1 of the Groundwater Operating Strategy Environmental Management Plan (Version 1.4, 25 August 2023, or any future revisions);
 - (8) identify the network of monitoring bores used for baseline monitoring;
 - (9) monitoring of the bores in condition C4-2(4), condition C4-2(5) and condition C4-2(6) commencing prior to **dewatering activities**;
 - (10) monitoring of **monitoring quadrats** as compared to **reference quadrats** every three (3) months;

- (11) monitoring parameters at each Drawdown Mitigation Scheme infiltration pond monitoring bore and regional monitoring bore, including but not limited to:
 - (a) water levels; and
 - (b) salinity as Total Dissolved Solids (TDS) (mg/L) and pH.
- (12) monitoring methodology and data to be collected at each Drawdown Mitigation Scheme infiltration pond monitoring bore, including but not limited to:
 - (a) water-level monitoring using data-loggers, or method as agreed with the Department of Water and Environmental Regulation, and monitoring interval; and
 - (b) weekly sampling of water quality, unless otherwise authorised by the **CEO**.
- (13) monitoring methodology at each regional monitoring bore, including but not limited to:
 - (a) water-level monitoring using data-loggers, or method as agreed with the Department of Water and Environmental Regulation, and monitoring interval; and
 - (b) weekly sampling of water quality, unless otherwise authorised by the **CEO**.
- (14) monitoring of monitoring bores to be undertaken after mining has been completed until monitoring bore groundwater-levels are consistent with the pre-dewatering water-levels;
- (15) data collection and investigations for describing the **seasonal water table**;
- (16) the local geology, hydrogeology and soil profile for each infiltration pond;
- (17) monitoring parameters at each infiltration pond, including but not limited to:
 - (a) average pond infiltration rates; and
 - (b) salinity as TDS (mg/L), pH and Total Suspended Solids (TSS) and/or Turbidity.
- (18) monitoring timing and frequencies at the starter pit infiltration ponds:
 - (a) daily inspections of float switches (if used) or hourly water level monitoring of active infiltration ponds; and

- (b) weekly water quality monitoring of active infiltration ponds.
- (19) monitoring timing and frequencies at the infiltration ponds outside the starter pit:
 - (a) daily inspections of float switches (if used) or hourly water level monitoring of active infiltration ponds, unless different timing or frequency is approved by the **CEO**; and
 - (b) weekly water quality monitoring of active infiltration ponds, unless different timing or frequency is approved by the **CEO**.
- (20) groundwater quality at the Drawdown Mitigation Scheme infiltration pond monitoring bores to not significantly different to the baseline, or another methodology as agreed with the **CEO**, on advice of the Department of Water and Environmental Regulation;
- (21) recording of rainfall and other relevant weather information;
- (22) review and/or validate groundwater model within three (3) months of commencing **dewatering activities** by comparing modelled versus actual superficial aquifer drawdowns; and
- (23) if the infiltration ponds are not operating adequately to meet **threshold criteria, contingency measures** to be implemented include, but are not limited to:
 - (a) reduction in speed of operations;
 - (b) reduction in depth of operations;
 - (c) replacing infiltration with re-injection of water; and
 - (d) **stop operations** if other contingency measures are not supplying adequate contingency to meet the **threshold criteria**.

C4-3 The Banksia Woodland Rehabilitation Plan (IMA-ATL-REH-01, Version 1, 31 August 2023, or any future revisions) required under condition B5-3 is also required to include:

- (1) an overview of dieback status and conditions to give context for the hygiene measures proposed;
- (2) information such as site characteristics, including soil/landform associations;
- (3) targets for soil profile reconstruction, including proposed soil reconstruction process and strategies developed to enhance the properties of tailings materials;

- (4) measures to restore topography as the mine is backfilled;
- (5) topsoil management, including:
 - (a) direct return of fresh topsoil is prioritised over stockpiling;
 - (b) when stockpiling is necessary, long-term stockpiles designed to be shallow as possible, protected with vegetation, ripped to remove compaction (if required) and plant re-establishment encouraged;
 - (c) topsoil stripping and respreading depths to maximise use of the seedbank resource; and
 - (d) segregating topsoil from each vegetation type with plans in place to return topsoil to a commensurate landscape position.
- (6) methods for and management of salvage of cleared vegetation, including application to rehabilitated areas;
- (7) techniques for plant establishment and Banksia woodlands of the Swan Coastal Plain ecological community restoration that have been developed in similar mining operations and environments;
- (8) detail on approach to managing erosion as it relates to rehabilitation;
- (9) the proponent must continue rehabilitation required by Part B, and report every one (1) year from commencing rehabilitation, unless different timing or frequency is approved by the **CEO**, to the **CEO** until the **CEO** confirms by notice in writing that it has been demonstrated that the relevant requirements in Part B have been met; and
- (10) review of rehabilitation report in condition C4-3(9) using an independent **experienced expert** regarding Banksia woodlands of the Swan Coastal Plain ecological community restoration.

C4-4 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 plan required under condition B4-3 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.

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 usually 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 fourteen (14) days after the expiration of period specified in condition D4-1.

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
Acquired	The protection of environmental values on an area of initially unprotected land for the purpose of conservation through improved security of tenure or restricting the use of land (e.g. ceding land to the Crown or perpetual conservation covenants). This includes upfront costs of establishing the offset site and the on-going management of costs of maintaining the offset for the long term (20 years).
Adverse impacts / adversely impacted	<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 environmental value. Adverse impacts can arise from direct or indirect impacts, or other impacts from the proposal.</p> <p>In relation to flora and vegetation, includes but is not limited to, a definable change in spatial coverage or a change in the health, species diversity, structure and plant density of vegetation, vegetation and flora mortality, spread or introduction of environmental weeds, introduction or spread of disease and edge effects.</p> <p>In relation to inland waters, includes but is not limited to, reduction of the watertable that results in a definable change in spatial coverage or a change in the health, species diversity, structure and plant density of vegetation.</p> <p>In relation to terrestrial fauna, includes but is not limited to, a definable change in spatial coverage of vegetation, vegetation and flora mortality, spread or introduction of environmental weeds, introduction or spread of disease and edge effects.</p>
CEO	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 CEO's delegate.
Clearing activities	Any activity where the removal of vegetation will be undertaken.
Confirmed	In relation to a plan required to be made and submitted to the CEO , means, at the relevant time, the plan that the CEO confirmed, by notice in writing, meets the requirements of the relevant condition.

Acronym or abbreviation	Definition or term
	In relation to a plan required to be implemented without the need to be first submitted to the CEO , means that plan until it is revised, and then means, at the relevant time, the plan that the CEO confirmed, by notice in writing, meets the requirements of the relevant condition.
Contingency measures	Planned actions for implementation if it is identified that an environmental outcome, environmental objective, threshold criteria, or management target are likely to be, or are being, exceeded. Contingency measures include changes to operations or reductions in disturbance or adverse impacts to reduce impacts and must be decisive actions that will quickly bring the impact to below any relevant threshold, management target and to ensure that the environmental outcome and/or objective can be met.
Construction activities	Activities that are associated with the substantial implementation of a proposal including but not limited to, earthmoving, vegetation clearing, 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 clearing of vegetation is required.
Detecting	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 CEO.
Development envelopes	Mine development envelope and external infrastructure development envelope combined.
Dewatering activities	Drawing water from the ground to facilitate mining activities.
Disturb	<p>Means directly has or materially contributes to the disturbance effect on the health, diversity or abundance of the receptor/s being impacted or on an environmental value.</p> <p>In relation to flora, vegetation, or fauna habitat, includes to result in the death, destruction, removal, severing or doing substantial damage to an environmental value.</p> <p>In relation to fauna, includes to have the effect of altering the natural behaviour of fauna to its detriment.</p>

Acronym or abbreviation	Definition or term
Disturbance footprint	The indicative disturbance footprint is provided within the mine development envelope as shown within Figure 2. The disturbance footprint was designed with “worst case” scenarios in mind and has included appropriate buffer space around infrastructure areas; however, actual infrastructure would be positioned based on site conditions (e.g. to avoid a group of Banksia trees) to optimise the design during mining activities. The proponent is still to adhere to the limits of clearing of vegetation and priority flora as is document in these conditions.
Environmental value	A beneficial use, or ecosystem health condition.
Environmental harm	Has the meaning provided by section 3A(2) of the <i>Environmental Protection Act 1986</i> .
Environmental weeds	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 the Department of Biodiversity, Conservation and Attractions’ Midwest Impact and Invasiveness Ratings list, as amended or replaced from time to time.
Excellent	The condition of native vegetation rated in accordance with the Technical guidance – Flora and vegetation surveys for environmental impact assessment (EPA 2016) including any revision to this technical guidance.
External infrastructure development envelope	The area shown within Figure 1 and defined by coordinates in Schedule 1.
Experienced expert	Expert with 15 or more years of directly relevant experience regarding propagation or rehabilitation of Banksia Woodland species that are being disturbed .
Fauna handler	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 Biodiversity Conservation Regulations 2018.
GL/a	Gigalitres per annum

Acronym or abbreviation	Definition or term
Ground disturbing activities	Any activity or activities undertaken in the implementation of the proposal, including any clearing, civil works or construction.
ha	hectares
Known populations	Known population at the time of assessment as outlined in Atlas Project response to submissions.
Management action	The identified actions implemented with the intent of to achieving the environmental objective.
Management target	A type of indicator to evaluate whether an environmental objective is being achieved.
Mine development envelope	The area shown within Figure 1 and defined by coordinates in Schedule 1.
Monitoring quadrat	Area of vegetation outside the disturbance footprint that would be within the groundwater drawdown zone if no mitigation was undertaken, and which contains groundwater dependent vegetation species.
On-ground management	This includes revegetation (re-establishment of native vegetation in degraded areas) and rehabilitation (repair of ecosystem processes and management of weeds, disease or feral animals) with the objective to achieve a tangible improvement to the environmental values in the offset area.
Pollution	Has the meaning provided by section 3A(1) of the <i>Environmental Protection Act 1986</i> .
Progressive rehabilitation/ progressively rehabilitated	Progressive rehabilitation is expected to be undertaken in stages using conventional dry mineral sands mining techniques to minimise requirements for rehandling of materials and to maximise retention of biological function in topsoil. Progressive rehabilitation usually includes characterisation of materials (including soils and mine waste), backfill, consolidation, topsoil placement, and rehabilitation measures and monitoring.
Proposed Offset Conservation Areas	The area of land identified in condition B4-4.
Reference bores	Reference bores are in the same aquifer as the monitoring bores but are outside the area of influence of the proposal.

Acronym or abbreviation	Definition or term
Reference quadrat	Area of vegetation outside the disturbance footprint that is not within the groundwater drawdown zone (whether or not any mitigation was undertaken), and which contains groundwater dependent vegetation species.
Relevant management body	A party or parties that has a role in the establishment and/or on-going management of the Proposed Offset Conservation Area. Note: This includes the role of the proponent.
Seasonal water table	Water table below ground level as determined through bore monitoring over several different seasons.
Self-sustaining	Refers to vegetation that can survive (continue indefinitely) without on-going management actions such as watering, weed control or infill planting.
Stop operations	No mining to be undertaken with the exception of works required to make the mine void safe.
Tangible improvement	A perceptible, measurable and definable improvement that provides additional ecological benefit and/or value.
Trigger criteria	Indicators that have been selected for monitoring to provide a warning that, if exceeded, the environmental outcome may not be achieved. They are intended to forewarn of the approach of the threshold criteria and trigger response actions.
Threshold criteria	The indicators that have been selected to represent limits of impact beyond which the environmental outcome is not being met.

Figures (attached)

Figure 1 Atlas Project Development envelopes (This figure is a representation of the co-ordinates referenced in Schedule 1)

Figure 2 Atlas project development envelope and exclusion zones



Figure 1. Atlas project development envelopes

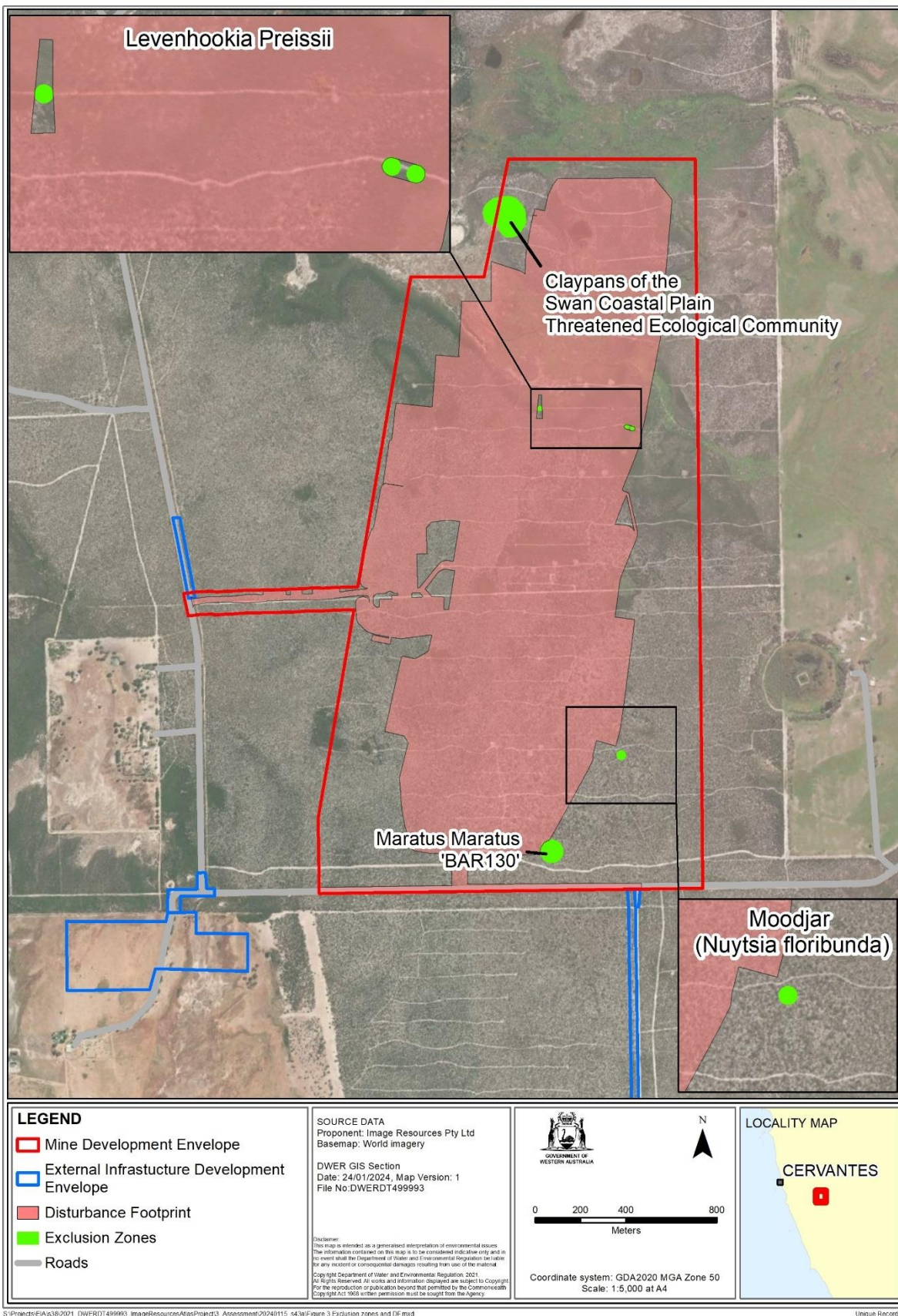


Figure 2. Atlas project development envelope and exclusion zones

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 (GDA2020).

Spatial data depicting the figures are held by the Department of Water and Environmental regulation. Record no. DWER-801164602-322547.

Appendix B: Regulation by other DMA processes

Table B1: Identified relevant decision-making authorities for the regulation of outcomes for the proposal

Statutory decision-making process	Environmental outcome
<i>Rights in Water and Irrigation Act 1914</i>	<ol style="list-style-type: none"> 1. No adverse impacts to Banksia woodlands of the Swan Coastal Plain ecological community beyond the disturbance footprint from drawdown. 2. No adverse impacts to nearby private stock bores and soaks associated with abstraction from the production bores and, if required, source an alternative water supply for users that have been adversely impacted. It is noted that the proponent has proposed to install monitoring bores to measure groundwater levels between the proposal and the private lands to the west to identify impacts and protect the future use of those sites.
<i>Mining Act 1978</i>	<ol style="list-style-type: none"> 1. Management of surface water flows, noting the prepared Surface Water Management Plan (Preston Consulting 2023b). 2. Rehabilitated landforms are stable and do not cause pollution or environmental harm. 3. Rehabilitated areas, not associated with Banksia Woodlands, are consistent with the species diversity and abundance of native vegetation within comparative analogue or reference sites. 4. Rehabilitated vegetation, not associated with Banksia Woodlands, is self-sustaining. 5. Rehabilitated areas, not associated with Banksia Woodlands, use native seeds collected from native vegetation adjacent to the proposal. 6. Closure planning and rehabilitation are undertaken in a progressive manner consistent with achievement of the above outcomes during operations, where practicable, and as soon as practicable upon closure.
<i>Environmental Protection Act 1986</i> - part V works approval and licence <i>Environmental Protection (Noise) Regulations 1997</i>	Regulate emissions and discharges from construction and operations to achieve the following outcomes: <ol style="list-style-type: none"> 1. No adverse impacts from potential generation of Acid Sulfate Soils. 2. Protect sensitive receptors from noise and dust.
<i>Aboriginal Heritage Act 1972</i> - section 18 consent to impact a registered Aboriginal heritage site)	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.

Statutory decision-making process	Environmental outcome
Department of Climate Change, Energy, the Environment and Water (DCCEEW)	The EPA has recommended conditions in relation to impacts on listed threatened species and communities protected by the EPBC Act. The DCCEEW may impose additional conditions under the EPBC Act.

Appendix C: Decision-making authorities

Table C1: 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 - section 45 authority to modify occurrence of a threatened ecological community
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 interfere with beds and banks - permit to take water - groundwater abstraction licence - licence to construct bores - dewatering licence <i>Water Services Act 2012</i> - water supply services <i>Water Agencies (Powers) Act 1984</i>
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 Dangerous Goods Officer, Department of Energy, Mines, Industry Regulation and Safety	<i>Dangerous Goods Safety Act 2004</i> - storage and handling of dangerous goods
7. Executive Director Resource and Environmental Compliance, Department of Energy, Mines, Industry Regulation and Safety	<i>Mining Act 1978</i> - mining proposal
8. State Mining Engineer, Department of Energy, Mines, Industry Regulation and Safety	<i>Mines Safety and Inspection Act 1994</i> - mine safety - approval to commence mining operations
9. Chief Executive Officer, Department of Water and Environmental Regulation	<i>Environmental Protection Act 1986</i> - part V works approval and licence - water licensing - part IV compliance (Ministerial statements)

Decision-Making Authority	Legislation (and approval)
10. Secretary, Radiological Council	<i>Radiation Safety Act 1975</i> - permit to mine radioactive materials
11. Chief Executive Officer, Shire of Dandaragan	<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 D: Environmental Protection Act principles

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

EP Act principle	Consideration
<p>1. The precautionary principle</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 flora and vegetation, terrestrial fauna and inland waters.</p> <p>The proponent has investigated the biological and physical environment to identify environmental values of the proposal area. The EPA notes that the proponent has undertaken avoidance and mitigation measures to avoid potential serious or irreversible damage to the environment by:</p> <ul style="list-style-type: none"> • avoiding Mount Jetty Creek and Bibby Creek, and associated wetland and vegetation • avoiding impacts to <i>Levenhookia preissii</i> (P1) individuals by introducing exclusion zone • avoiding impacts to <i>Herb rich saline shrublands in clay pans Threatened Ecological Community SCP07</i> by introducing exclusion zone • avoiding impacts to a potential SRE record of <i>Maratus Maratus</i> 'BAR130' by introducing exclusion zone • engaging in meaningful consultation with Traditional Owners <p>The EPA has recommended conditions to address impacts to vegetation by limiting the extent of impact.</p> <p>The EPA has recommended conditions to avoid important communities and species, such as the exclusion zones for the <i>Levenhookia preissii</i>, the <i>Herb rich saline shrublands in clay pans Threatened Ecological Community SCP07</i> and the <i>Maratus Maratus</i> 'BAR130'.</p> <p>The EPA has also recommended conditions in a managed aquifer proposal, supported by numerical modelling, to address potential for drawdown impacts to vegetation surrounding the disturbance footprint.</p> <p>In relation to offsets, the offset condition for research has been recommended to provide additional scientific certainty to support better understanding of long-term environmental outcomes associated with protection and restoration of priority flora.</p>

EP Act principle	Consideration
	From its assessment of this proposal, the EPA has concluded that there is no threat of serious or irreversible harm.
<p>2. The principle of intergenerational equity</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 flora and vegetation, terrestrial fauna and inland waters.</p> <p>The EPA notes that the proponent has identified measures to avoid and minimise impacts to the key environmental factors for flora, vegetation and terrestrial fauna. The EPA has considered these measures during its assessment and has recommended conditions to ensure that appropriate measures are implemented. The EPA recommends rehabilitation of the disturbance footprint is undertaken to reinstate important vegetation, such as Banksia Woodland of the Swan Coastal Plain Ecological Community and priority flora species, and to reinstate fauna habitat, such as Carnaby's black cockatoo foraging habitat.</p> <p>The EPA recommends offsets imposed to ensure that the significant residual impacts for flora, vegetation and terrestrial fauna are counterbalanced, including restoration of at least 28 ha of Banksia Woodlands of the Swan Coastal Plain Ecological Community and Carnaby's black cockatoo foraging habitat which will enhance the environment for future generations.</p> <p>The EPA has concluded that the environmental values will be protected and that the health, diversity and productivity of the environment will be maintained and enhanced for the benefit of future generations.</p>
<p>3. The principles of the conservation of biological diversity and ecological integrity</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, and terrestrial fauna.</p> <p>The EPA has considered to what extent the potential impacts from the proposal to flora, vegetation and terrestrial fauna can be ameliorated to ensure consistency with the principle of conservation of biological diversity and ecological, including by the provision of offsets.</p> <p>The EPA has concluded that given the nature of the impacts are significant (areas of vegetation and habitat for conservation significant flora and fauna species that will be cleared) that the proposed offsets are likely to counterbalance the impacts of the loss of biological diversity and ecological integrity.</p>

EP Act principle	Consideration
<p>4. Principles relating to improved valuation, pricing and incentive mechanisms</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 flora and vegetation, and terrestrial fauna.</p> <p>The EPA notes that the proponent will be responsible for bearing the cost of rehabilitation and acquisition and management of the proposed offsets.</p>
<p>5. The principle of waste minimisation</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 the proposal.</p> <p>The EPA notes that the proponent will implement appropriate management of wastes on site and will be avoiding and minimising discharge of emissions into the environment. The EPA notes the proponent is proposing to minimise the discharge of waste into the environment during construction, operation and closure by adopting the hierarchy of waste controls; avoid, minimise, reuse, recycle and safe disposal.</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
Land			
Subterranean fauna	Potential removal of subterranean fauna habitat. Potential impacts due to de-watering and infiltration. Potential to impact on populations in the Nambung National Park due to dewatering.	<p><u>Public comments</u></p> <ul style="list-style-type: none"> the proponent has not provided a thorough Subterranean Fauna Assessment. <p><u>Agency comments</u></p> <ul style="list-style-type: none"> no agency comments were received. 	<p>The assessment of subterranean fauna within the proposal area concluded that:</p> <ul style="list-style-type: none"> the area does not have cave, karst or other groundwater environments that usually support subterranean fauna the two stygofauna surveys undertaken showed that a low number and variation of stygofauna is present. <p>Accordingly, the EPA did not consider subterranean fauna to be a key environmental factor at the conclusion of its assessment.</p>
Terrestrial environmental quality	Potential for acid sulfate soils to be in the mining area, which could affect water quality and vegetation.	<p><u>Public comments</u></p> <ul style="list-style-type: none"> post closure monitoring and maintenance to address any structural failures of the tailings containment that may present after closure. <p><u>Agency comments</u></p> <ul style="list-style-type: none"> DWER Contaminated Sites Branch advised that the proposed management of acid sulfate soils appeared to be generally in accordance with departmental guidelines DEMIRS recommended that groundwater management should reflect national leading practice for dewatering acid sulphate soils 	<p>Acid Sulfate Soils (ASS) was identified to be an issue with other sand mines in the area, and that some land units may present an ASS risk (waterlogged with high carbon e.g. wetland areas and creek lines/rivers) within the development envelopes.</p> <p>The proponent advised that Potential Acid Sulfate Soils (PASS) had been detected in some samples and that further assessment of PASS would be undertaken within the deposit during operations to quantify distribution and volumes of PASS material.</p> <p>An ASSMP has been prepared to minimise pollution risks from the disturbance of ASS (Preston Consulting 2023b). Proposed management of ASS appeared to be generally in accordance with DWER guidelines, with some additions for the proponent to consider. The proponent should provide an updated plan to address these concerns, and this plan could form a part of management under a future Part V approval under the EP Act.</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>(https://www.waterquality.gov.au/sites/default/files/documents/dewatering-acid-sulfate-soils.pdf)</p> <ul style="list-style-type: none"> DCCEEW have raised concerns with ASS contamination and that the monthly monitoring is not frequent enough – if there is contamination, this may not be picked up for weeks. 	Accordingly, the EPA did not consider terrestrial environmental quality to be a key environmental factor at the conclusion of its assessment.
Air			
Air quality	No significant air emissions expected other than dust emissions.	<p><u>Public comments</u></p> <ul style="list-style-type: none"> no public comments received. <p><u>Agency comments</u></p> <ul style="list-style-type: none"> no agency comments were received. 	<p>The EPA did not consider that the proposal would impact air quality, other than potential for dust impacts which have been assessed under the Social Surroundings factor.</p> <p>Accordingly, the EPA did not consider air quality to be a key environmental factor at the conclusion of its assessment.</p>
Greenhouse gas emissions	Projected Scope 1 greenhouse emissions are maximum 55,000 t CO ₂ -e per year.	<p><u>Public comments</u></p> <ul style="list-style-type: none"> total emissions of the Project the emissions estimate increases to an unacceptable level. <p><u>Agency comments</u></p> <ul style="list-style-type: none"> no agency comments were received. 	<p>Greenhouse gas emissions from the proposal are not expected to exceed the 100,000 tCO₂-e threshold for Scope 1 or Scope 2 emissions as per the EPA's Environmental Factor Guideline – Greenhouse Gas Emissions (EPA 2023).</p> <p>Accordingly, the EPA did not consider greenhouse gas emissions to be a key environmental factor at the conclusion of its assessment.</p>
People			
Social surroundings	<p>Five sensitive receptors (residences) are located close to the proposal area. Potential impacts could arise from noise and dust emissions in the local area.</p> <p>The proposal is within traditional land held by the</p>	<p><u>Public comments</u></p> <ul style="list-style-type: none"> noise, dust and light will significantly impact the social surrounds potential impact near the Nambung National Park, a premier tourism asset Aboriginal Heritage of the area should also be sufficiently considered 	<p>Nambung National Park:</p> <ul style="list-style-type: none"> the proposal will not be visible from areas frequently utilised by visitors to the Nambung National Park. If portions are visible this will be short-term over the three year life of the proposal. No permanent visual amenity impacts are anticipated considering the rehabilitation proposed the Offset Strategy also specifically proposes to focus revegetation efforts at the offset site on areas that would

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>Yued People (Traditional Owners). The Nambung National Park begins 1 km to the west.</p>	<ul style="list-style-type: none"> consultation with traditional owners should be undertaken. <p><u>Agency comments</u></p> <ul style="list-style-type: none"> comments on dust/ore composition and the suitability of the proposed Dust Management Plan noise impacts to residences within 2 km of the proposal area the location of the proposed development does not intersect with any known Aboriginal sites or reported Aboriginal heritage places under the Register of Places and Objects, as well as the DPLH Aboriginal Heritage Database. 	<p>improve vegetation connectivity to the Nambung National Park.</p> <p><u>Noise</u></p> <ul style="list-style-type: none"> noise modelling to date shows that that noise can meet the assigned levels at the sensitive receptors. mitigation proposed includes: <ul style="list-style-type: none"> haul trucks will only be used if they have a sound power level no greater than 108 dB(A) night-time running is required (10 pm to 7 am) haul truck movements will be altered and reduced. the EPA expects that management of noise impacts would be considered under Part V approval under the EP Act, with input from DWER Noise Branch to ensure the appropriate details are considered to manage noise. <p><u>Dust:</u></p> <ul style="list-style-type: none"> the Dust Management Plan (DMP) outlines how the proponent will implement management controls to ensure dust impacts are mitigated the EPA considers, on advice of DWER, that the Dust Management Plan (Preston Consulting 2023b) identifies potential dust impacts and include reasonable mitigation measures the EPA expects that management of dust would be considered under a future Part V approval under the EP Act, with input from DWER Air Quality Branch to ensure the appropriate details are included to facilitate management of dust as mining progresses. <p><u>Light:</u></p> <ul style="list-style-type: none"> the primary light sources will be the processing area and the mine face as night works are proposed, all light sources will be carefully considered and designed to ensure light glow is minimised and is not excessive

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
			<ul style="list-style-type: none"> at the detailed design stage, each significant light sources will assessed in terms of its purpose, location and intensity in order to minimise light spill. <p>Aboriginal heritage:</p> <ul style="list-style-type: none"> the proponent modified the proposal under a s43A (approved 6 September 2022) to avoid impacts to aboriginal heritage areas. No direct impact to areas of cultural concern, and no impact to Bibby Creek or Mount Jetty Creek. Bibby Creek and Mount Jetty Creek were noted for the Traditional Owners, and have been identified to hold contemporary social, cultural, and aesthetic significance during consultation with the Yued People. <p>Accordingly, the EPA did not consider social surroundings to be a key environmental factor at the conclusion of its assessment.</p>
Human health	<p>The temporary stockpiling and transport of HMC for the Proposal has the potential to cause elevated radiation exposures of workers during operations. Members of the public and non-human biota will be exposed to lower levels of exposure than workers.</p>	<p><u>Public comments</u></p> <ul style="list-style-type: none"> legacy of radioactive tailings and degraded landscapes radiation will be present in dust which could be deposited offsite. <p><u>Agency comments</u></p> <ul style="list-style-type: none"> proponent has adequately addressed all the relevant exposure pathways to workers, but no justification provided for not including the radon pathway proponent has not assessed all the relevant exposure pathways to the public and non-human biota significant radiological impacts from the proposed action on workers, the public or non-human biota would probably be unlikely 	<p>The proposal will involve mining a deposit which contains naturally occurring Uranium and Thorium within heavy minerals. Most of the ore mined will be returned to the pit as tailings with the heavy mineral removed as HMC. The main minerals in the ore with a radioactive component report to the HMC and will be removed from site, meaning tailings should be less radioactive than the pre-mining material.</p> <p>A baseline radiation pre-mining survey of the Atlas deposit was conducted. Gamma radiation ($\mu\text{Sv} / \text{hr}$) and Radon/Thoron (Bq / m^2) monitoring was performed over the which contains the Atlas deposit.</p> <p>Radon is not expected to be generated in measurable amounts due to the relatively low content of uranium in the HMC. Thoron is expected to be detectable but exposures are expected to be insignificant due to low thorium concentrations in the HMC and the very short half-life of thoron.</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
		<ul style="list-style-type: none"> Radiation Management Plan should be prepared. 	<p>Inhalation of radionuclides in dust is not likely due to the large size of the mineral grains and the sand being transported as a wet slurry.</p> <p>Given the closest residence is approximately 1,200 m from the mine pit, radiation exposures are likely to remain below the dose limits identified in <i>Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing</i> (Australian Radiation Protection and Nuclear Safety Agency 2005).</p> <p>The proponent is expected to obtain the relevant approval for its Radiation Management Plan via the Department of Energy, Mines, Industry, Regulation and Safety (DEMIRS) under the <i>Mines Safety and Inspection Act 1994</i>, to manage radiation exposure to employees and members of the public. A Radiation Management Plan (RMP) has been prepared and was approved by DEMIRS for use in December 2022.</p> <p>Accordingly, the EPA did not consider human health to be a key environmental factor at the conclusion of its assessment.</p>

Appendix F: Relevant policy, guidance and procedures

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

- *Environmental factor guideline – Flora and vegetation* (EPA 2016)
- *Environmental factor guideline – Inland waters* (EPA 2018)
- *Environmental factor guideline – Subterranean fauna* (EPA 2016)
- *Environmental factor guideline – Terrestrial fauna* (EPA 2016)
- *Environmental impact assessment (Part IV Divisions 1 and 2) procedures manual* (EPA 2021)
- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014)
- *Statement of environmental principles, factors, objectives and aims of EIA* (EPA 2021)
- *Environmental impact assessment (Part IV Divisions 1 and 2) administrative procedures 2021* (State of Western Australia 2021)
- *Technical guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016)
- *Technical guidance – Sampling of short-range endemic invertebrate fauna* (EPA 2016)
- *Technical guidance – Subterranean fauna surveys for environmental impact assessment* (EPA 2021)
- *Technical guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020).

Appendix G: List of submitters

7-day comment on referral

Organisations and public

- Private submitter

Public review of proponent information

Organisations and public

- Wetlands Conservation Society Inc.
- Yued Aboriginal Corporation
- BirdLife Western Australia
- Conservation Council of WA Inc
- Private submitter (36)

Government agencies

- Department of Climate Change, Energy, the Environment and Water (Commonwealth)
- Department of Biodiversity, Conservation and Attractions
- Department of Energy, Mines, Industry Regulation and Safety
- Department of Planning, Lands and Heritage
- Department of Water and Environmental Regulation.

Appendix H: Assessment timeline

Date	Progress stages	Time (weeks)
13 October 2021	EPA decided to assess – level of assessment set	
5 May 2022	EPA approved Environmental Scoping Document	29
13 December 2022	EPA accepted Environmental Review Document	32
23 December 2022	Environmental Review Document released for public review	1
2 February 2023	Public review period for Environmental Review Document closed	6
5 January 2024	EPA accepted proponent's Response to Submissions	48
22 January 2024	EPA received final information for assessment	2
1 February 2024	EPA completed its assessment	6
8 March 2024	EPA provided report to the Minister for Environment	6
13 March 2024	EPA report published	3 days
3 April 2024	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.

The EPA must give the Assessment report to the Minister so far as is practicable, no later than 6 weeks after the EPA completes its assessment or reassessment (s. 44(2b)).

In this case, the EPA met its timeline objective to complete its assessment and provide a report to the Minister.

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