GOVERNMENT OF WESTERN AUSTRALIA

Environmental Protection Authority

Hemi Gold Project

De Grey Mining Ltd

Report 1785

June 2025

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 Hemi Gold Project proposal by De Grey Mining Ltd.

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

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

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Proposal

The Hemi Gold Project proposal involves the excavation of open pits, mine dewatering, surplus water management including reinjection and controlled discharge. Associated supporting infrastructure includes an integrated waste landform tailings storage facility, waste rock landforms, low-grade stockpiles, airstrip, accommodation village, sealed access and haulage roads, power and pipeline corridors, wastewater treatment plant, and landfills. The proposal is located 85 kilometres south of Port Hedland, in the Pilbara region of Western Australia.

The proponent for the proposal is De Grey Mining Ltd.

The disturbance footprint for the proposal is 5,830 hectares (ha) within a development envelope of 22,194 ha. The proposal will have a maximum 15-year life, followed by mine closure.

Assessment of key environmental factors

The EPA has identified the key environmental factors listed below for consistency with the EPA environmental factor objectives. The EPA has also considered the potential impacts to other environmental factors such as terrestrial environmental quality, air quality, and human health in Appendix E.

Environmental Factor: Inland waters	
Residual impact on key value	**Assessment finding/environmental outcome**
Reduction in groundwater quality from aquifer reinjection. Reduction in surface water quality in the Turner River from discharge of excess water. Reduction in groundwater availability for third parties, the Yule River public drinking water supply area (PDWSA), and pools within the Yule River. Formation of pit lakes post-closure.	The proposed groundwater abstraction of 30 GL/a (reducing to 15 GL/a between years 4 and 8, and to 10 GL/a from year nine onwards) will permanently reduce the groundwater availability in the local area. The formation of pit lakes post closure will ensure that the groundwater resource does not recover entirely. The groundwater drawdown extent at the end of mine life (year 15) is predicted to extend into the Yule River PDWSA. Groundwater reinjection proposed by the proponent is likely to reduce the extent of groundwater drawdown during operational life. The proponent has committed to deepening and/or replacing bores in consultation with third parties, such as the Indee Pastoral Station, if affected. Subject to the proponent's commitments, and groundwater drawdown not exceeding the predicted extent, there is unlikely to be significant residual impacts to the groundwater aquifer. The proposed discharge of excess water to 10 GL/a (reducing to 4 GL/a between years 4 and 6, and 2 GL/a from year seven onwards) to the Turner River is likely to temporarily alter the hydrological regime of the river system. This includes changing the persistence of water in the river system and the seven intermittent and semi-permanent pools within the predicted maximum wetting front.

	The potential impacts to values of inland waters can be regulated through reasonable conditions including recommended conditions A1-1 (limits of abstraction, discharge, and mounding) and B1-1 (maintaining hydrological regimes and water quality). Subject to these recommended conditions, and other statutory decision-making processes, the environmental outcome is likely to be consistent with the EPA's objective for inland waters.

Environmental Factor: Flora and vegetation	
Residual impact on key value	**Assessment finding/environmental outcome**
Clearing of up to 5,830 ha of 'Good' to 'Excellent' condition native vegetation. Clearing of the following with the development envelope: • 18.4% of *Abutilon* sp. *pritzelianum* (priority 3 (P3)) • 33.7% of *Euploca mutica* (P3) • 30.2% of *Gymnanthera cunninghamii* (P3) • 32.4% of *Rothia indica* subsp. *Australis* (P3) • 6.3% of *Triodia chichesterensis* (P3) • 13.7% of *Polymeria* sp. *nov* (unconfirmed, but likely a P3). Indirect impacts to riparian vegetation and the Gregory Land Systems Priority Ecological Community (PEC).	Vegetation mapped across the development envelope is predominately in 'Very good' to 'Excellent' condition. 14 vegetation types were mapped across the development envelope. One of these, vegetation type (VT) 16, is likely to contain considerable value. VT16 is associated with the Turner River and therefore is somewhat spatially restricted and dependent on the flow of water in the river channel. VT16 contains riparian vegetation (including groundwater dependent vegetation) and provides habitat for priority flora, as well as having terrestrial fauna and social surroundings values (discussed further below). The proponent has proposed to clear 10 ha of VT16, reduced from 45 ha in the original referral. To ensure the proponent minimises the potential impact to VT16, the EPA has recommended the proposed clearing limits of 10 ha is included as condition B3-1(1)(b). The proponent has designed the proposal to avoid direct impacts to VT17, the Gregory Land Systems P3 PEC. Subject to the recommended condition to avoid indirect impacts to this PEC, there is unlikely to be any significant residual impacts. The other vegetation types are widespread across the Pilbara region. The associated terrestrial fauna values are discussed further below. Six priority flora species were recorded within the development envelope, with five recorded as P3 species and one unconfirmed (according to the Department of Biodiversity, Conservation and Attractions, it is also likely to be a P3 species). The proponent has also reduced the clearing extents of these species compared to the original referral. To ensure the proponent does not clear above the extents it has proposed, it is recommended that maximum clearing extents be included in the recommended conditions. Subject to the recommended conditions, the environmental outcome for flora and vegetation is likely to be consistent with the EPA's objective for this factor.

Environmental Factor: Terrestrial fauna

Residual impact on key value	Assessment finding/environmental outcome
Removal of up to: • 5,786.7 ha of the spinifex sandplain and sandplain drainage habitat types • 10 ha of major river habitat type • 33.3 ha of stony hills habitat type. Reduction in quality of habitat from introduction or spread of weeds. Fauna strikes and increase in abundance of feral species. Indirect impacts to conservation significant fauna from noise, dust, vibration, and light emissions during construction and operation.	Four habitat types were recorded within the development envelope: spinifex sandplain, sandplain drainage, stony hills, and major river. The major river habitat type coincides with VT16, as discussed in the flora and vegetation table above. Conservation significant species recorded within the development envelope, and respective habitat types: • greater bilby (VU) – spinifex sandplain, sandplain drainage • grey falcon (VU) – major river • northern quoll (EN) – major river • Pilbara olive python (VU) – major river • Pilbara leaf-nosed bat (VU) – all habitat types • northern coastal free-tailed bat (P1) – major river • brushtailed mulgara (P4) – spinifex sandplain, sandplain drainage • western pebble-mound mouse (P4) – stony hills. Conservation significant species with a possible or likely occurrence, and respective types: • night parrot (CE) – spinifex sandplain, sandplain drainage • ghost bat (VU) – all habitat types • pin-striped finesnout ctenotus (P1) – poorly known, potentially all habitat types • Gane's blind snake (P1) – poorly known, potentially spinifex sandplain • spectacled hare-wallaby (P4) – spinifex sandplain, sandplain drainage. While the Pilbara leaf-nosed bat and ghost bat are likely to visit the development envelope to forage, critical habitat is not present. The foraging habitat types are widespread in the Pilbara region, and therefore there is not likely to be any significant residual impacts to these species. While potentially suitable spinifex sandplain and sandplain drainage habitat is present for the night parrot and spectacled hare-wallaby, both species prefer long unburnt, ring-forming spinifex. The proponent has advised that due to recent fires, mature spinifex habitat is likely to be limited across the development envelope. The sandplain habitat types are considered widespread in the local area and across the Pilbara region. The EPA has recommended limits on the clearing of the fauna habitat types, including no clearing of hollow-forming trees within major river habitat. Due to the conservation status of the night parrot, it is recommended that pre-clearance surveys are undertaken to detect the potential presence at least 7 days prior to clearing.

	Similarly, pre-clearance surveys are recommended for the northern quoll, Pilbara olive python and grey falcon for clearing within major river habitat. Subject to the recommended conditions, the environmental outcome for terrestrial fauna is likely to be consistent with the EPA's objective for this factor.

Environmental Factor: Subterranean fauna	
Residual impact on key value	**Assessment finding/environmental outcome**
Loss of individuals of five potentially restricted stygofauna taxa and stygofauna habitat (loss of up to 31% Type 1 and 31% Type 2 within the 3D modelling extent. Changes to surface inputs of flow/volume of water, nutrients and oxygen. Changes to structure and presence of underground voids. Desiccation of subterranean habitat. Contamination from spills, leaching and incidents.	The proponent identified four viable stygofauna/troglofauna habitat types, namely: • Upper Aeolian, Colluvium and Alluvium (Type 1) • Lower Colluvium and Alluvium (Type 2) • Saprolite and Saprock (Type 3) • Joint Weathered Bedrock Basement (Type 4). Habitat types 1 and 2 were considered core viable habitat for stygofauna, and was found to be extensive and well-connected. Noting that viable habitat for troglofauna is restricted by the depth to ground water (around 4 and 10 metres below ground level), available habitat was predominately limited to Type 1 habitat across the development envelope. 27 species of stygofauna were recorded within the groundwater drawdown impact area, of which five were not recorded elsewhere. All four viable stygofauna habitat types were identified as extensive and well-connected with no obvious barriers to dispersal. Based on knowledge about habitat distribution, it is unlikely that these stygofauna species would be limited to the impact area, particularly as 69%, 84%, and 93% of stygofauna habitat types 1, 2, and 3 across the study area would remain at the cessation of mining. The EPA has recommended condition B1-1(6) to limit the disturbance of stygofauna habitat to that proposed by the proponent. Sampling results for troglofauna strongly indicate that the troglofauna community within the proposal area is depauperate and that in such circumstances any troglofauna species present will be wide ranging rather than endemic. The restricted troglofauna taxon was found to occur within the Type 1 habitat (above groundwater level), which is extensive and well connected. Approximately 99% of the mapped above water table Type 1 habitat will remain post implementation of the proposal. Noting the recommended conditions as discussed under inland waters, such as the limit on groundwater mounding, there is not likely to be any significant residual impacts to troglofauna species. Subject to the recommended conditions, and other statutory decision-making processes, the environmental outcome for subterranean fauna is likely to be consistent with the EPA's objective for this factor.

Environmental Factor: Greenhouse gas emissions	
Residual impact on key value	**Assessment finding/environmental outcome**
Cumulative greenhouse gas (GHG) emissions contribute to climate change, which impacts on Western Australia's environment. Proponent's 'base case' operational (13 yrs) emissions estimates: Scope 1 • 197,230 tonnes of carbon dioxide equivalents (t CO_2-e) per annum, on average. • 2.56 million t CO_2-e total. Scope 2 • 140,846 t CO_2-e per annum, on average. • 1.83 million t CO_2-e total. Scope 3 • 290,500 t CO_2-e per annum, on average. • 3.77 million t CO_2-e total.	**Avoidance and minimisation measures to reduce scope 1:** The proponent has adopted avoidance and mitigation measures to reduce GHG emissions at proposal commencement. The processing method (pressure oxidation) is considered best practice as an emissions efficient gold extraction option. The 'low carbon scenario' proposed sets out a path for further staged emissions reductions, primarily relying on electrification of diesel-powered plant and equipment. Benchmarking against other gold mining operations indicates the proposal's emissions intensity is consistent with best practice for such facilities. **Regulation under Safeguard Mechanism:** The proponent has identified that the proposal will be a 'designated large facility' under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act). Proposals regulated under the Safeguard Mechanism are required to take actions to reduce emissions to achieve Australian emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050. As a new facility the proposal will be subject to the stringent 'best practice emission intensity' for 'run-of-mine metal ore'. Based on the anticipated production rates and Safeguard baselines, the proponent will be required under the Safeguard Mechanism to significantly reduce net scope 1 emissions over the life of the proposal. In the first full year of operations (2028) the proponent has forecast that the Safeguard Baseline will be 11% of the covered scope 1 emissions for the proposal. Scope 1 emissions not covered under the Safeguard Mechanism are primarily associated with vegetation clearing and are estimated to be well below 100,000 t CO_2-e (max 26,236 t CO_2-e in 2028). **Scope 2 emissions:** The scope 2 emissions arise from sourcing all electrical power for the proposal from the North West Interconnected System (NWIS) grid. Emissions abatement through electrification is expected to result in an increased electrical demand from the NWIS over the life of the proposal. The proponent has predicted that significant reductions in electricity emissions intensity will be achieved in the Pilbara, based on projections in the Sectoral Emissions Reduction Strategy (SERS) for WA, published in 2023 (Government of Western Australia 2023a). These projections include 30% renewable energy in 2030, 85% in 2040, and 95% in 2050. Based on these projections, the proponent estimates that scope 2 emissions for the proposal will achieve a linear reduction in emissions between commencement in 2027 and net zero in 2050. The proponent intends to enter a power purchase agreement (PPA) for the construction of high-efficiency reciprocating gas engines at the Port Hedland Power Station (as approved under

	Ministerial Statement (MS) 1236), and a 43 megawatt expansion of the Port Hedland Solar Farm currently under construction. Through the PPA the proponent is taking reasonably practicable measures to reduce scope 2 emissions over the life of the proposal. It is also recognised that scope 2 emissions for the proposal associated with electricity production at the Port Hedland Power Station are scope 1 emissions for the purposes of that proposal which is subject to implementation conditions under MS 1236. **Scope 3 emissions:** Scope 3 emissions associated with downstream processing of gold are relatively small compared to processing of other metallic ores, such as iron ore. Approximately 80% of scope 3 emissions are related to purchased good and services upstream of the proposal, with 70% of this being for explosives, and the remaining 30% as processing reagents. Notwithstanding, the EPA notes that scope 3 emissions form a large proportion (46%) of total GHG emissions over the life of the proposal. The EPA considers that the proponent has taken all practicable measures currently available to reduce scope 3 emissions and that further opportunities to reduce emissions are expected to arise through detailed project design and confirmation of supply chains. The EPA notes that the proponent has advised that energy efficiency and emissions reduction are key criteria in process and equipment selection and expect mitigation opportunities to be identified as the detailed design of the proposal progresses. The EPA encourages the proponent to take all measures it can reasonably take to reduce scope 3 emissions. **Offsets** The proponent forecasts that approximately 90% of Safeguard covered scope 1 emissions will be required to be offset per year through Australia carbon credit units (ACCUs) to reduce the facilities' net emissions below the respective baseline. An estimated 1,635,591 ACCUs will be required over the life of the proposal. The proponent has undertaken due diligence investigations and has advised that sufficient offsets are likely to be available over the timeframe of the proposal. Offsets through ACCUs are expected be of sufficient integrity. The EPA advises that carbon offsets required should demonstrate they meet offset integrity principles, and be based on clear, enforceable and accountable methods. The EPA is of the view that emissions reductions required under the Safeguard Mechanism represent an as far as practicable reduction of the proposal's scope 1 GHG emissions, and therefore the likely environmental effects of the proposal can be mitigated to achieve consistency with the environmental factor objective for GHG emissions. The EPA has recommended a condition that requires the proponent to notify the State of a substantial change to its obligations under the Safeguard Mechanism.

	Subject to the recommended conditions, and other statutory decision-making processes, the environmental outcome for greenhouse gas emissions is likely to be consistent with the EPA's objective for this factor.

Environmental Factor: Social surroundings	
Residual impact on key value	**Assessment finding/environmental outcome**
Potential removal or disturbance of Aboriginal heritage sites. Reduction in visual amenity. Loss of access to country. Impacts to cultural values associated with the Yule and Turner Rivers.	The proponent intends to avoid direct disturbance to Aboriginal heritage, where possible. Notwithstanding, there are potential residual impacts to Aboriginal heritage, including through indirect disturbance. The landscape in which the proposal is located is relatively flat, and as such, any permanent landforms are likely to reduce visual amenity, as well as limit existing access to country. Potential impacts to water-based values, such as the Yule River and Turner River, have been considered through the inland waters factor. Subject to the recommended conditions for inland waters, water-based social and cultural values are likely to be protected. To provide for the protection of Aboriginal cultural heritage values, and to minimise the impacts on visual amenity, the EPA has recommended the inclusion of conditions. Subject to the recommended conditions, the environmental outcome for social surroundings is likely to be consistent with the EPA's objective for the factor.

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
- residual impacts, emissions and effects in relation to the key environmental factors, separately and holistically (this has included considering cumulative impacts of inland waters, flora and vegetation, terrestrial fauna, subterranean fauna, social surroundings, and GHG emissions)
- likely environmental outcomes (and taking into account the EPA's recommended conditions), and the consistency of these outcomes with the EPA objectives for the key environmental factors
- the 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.

1 Proposal

The Hemi Gold Project proposal involves the excavation of open pits, mine dewatering, surplus water management including reinjection and controlled discharge. Associated supporting infrastructure includes an integrated waste landform tailings storage facility, waste rock landforms, low-grade stockpiles, airstrip, accommodation village, sealed access and haulage roads, power and pipeline corridors, wastewater treatment plant, and landfills. The proposal is located 85 kilometres south of Port Hedland, in the Pilbara region of Western Australia. (see Figure 1).

The disturbance footprint for the proposal is 5,830 ha within a development envelope of 22,194 ha (Figure 2). The proposal will have a maximum 15-year life, followed by mine closure.

The proponent for the proposal is De Grey Mining Ltd (De Grey Mining). The proponent referred the proposal to the Environmental Protection Authority (EPA) on 8 June 2023. The proposal is set out in section 2 of the proponent's revised referral supporting document (De Grey 2025g), which is available on the EPA website.

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

Table 1: Proposal content document (De Grey 2023)

Proposal element	Location	Maximum extent or range
Physical elements		
Mine elements including: • Open Pits • Waste Rock Landforms • Low-grade Stockpiles • Haul Roads • Topsoil Stockpiles.	Figure 2-1 of Referral Supporting Document.	Up to 5,830 ha of disturbance inside a Development Envelope of 22,194 ha.
Mine dewatering infrastructure including: • Abstraction and reinjection borefields • In pit sumps • Pipelines • Water management ponds • An outfall in the Turner River.		
Processing Elements including: • Run of mine pad and ore stockpiles • Processing plant • Tailings storage facility • Tailings and return water pipelines • Process water ponds • Secondary crushing station and conveyors.		
Support infrastructure including: • Airstrip • Accommodation village • Access and haulage roads • Power and pipeline corridors • Offices • Workshops • Laydown areas • Explosives magazines and compounds • Wastewater treatment plant • Surface water management infrastructure • Borrow pits • Landfills • Other ancillary infrastructure.		
Operational elements		
Mine dewatering	Figure 2-1 of Referral	Up to 30 GL/year
Aquifer reinjection		Up to 100% of water abstracted

Proposal element	Location	Maximum extent or range
Surplus water discharge	Supporting Document.	Up to 10GL/year for the first three years Up to 4 GL/year in years 4 -6 Up to 2 GL/year thereafter
Mineral processing		~ 10 million tonnes per annum
Tailings deposition		~ 130 million tonnes of dry tailings
Greenhouse gas emissions – based on low carbon scenario		
Maximum Annual Average (Arises in Financial Year 2027)		
Scope 1	Plant and Equipment; processing: Approximately 240,734 tCO_2-e	
Scope 2	Electricity Use: Approximately 256,217 tCO_2-e	
Annual average over life of mine (Total emissions divided by 13)		
Scope 1	Plant and Equipment; processing: Approximately 156,316 tCO_2-e	
Scope 2	Plant and Equipment: Approximately 116,472 tCO_2-e	
Total Emissions (based on annual average scope 1 and scope 2)		
Approximately 3,819,035 tCO_2-e		
Commissioning		
Commissioning of the processing facility to be undertaken subject to operational limits above		
Rehabilitation and closure		
The Project has considered mine closure in its design. Progressive rehabilitation will be undertaken over the life of mine and landforms will be constructed to conform to the existing landscape and be safe, stable and non-polluting. Stakeholder consultation over mine closure and acceptable post-mining land uses will be ongoing during operations. At the cessation of mining and processing, infrastructure will be decommissioned and removed (unless otherwise agreed with relevant stakeholders), closure earthworks completed, and native vegetation re-established. Abandonment bunds will restrict access to post-closure pit lakes. A conceptual mine closure plan has been included with the referral. This will form the basis of an operational mine closure plan to be prepared and submitted to the Department of Mines, Industry Regulation and Safety prior to construction.		
Other elements which affect extent of effects on the environment		
Proposal time: Proposed commencement in 2024	Maximum project life: ~15 years.	Limited by the capacity of the TSF, currently anticipated to be 13 years, preceded by two years of dewatering and followed by mine closure activities.

Units and abbreviations
ha – hectare
GL/year – gigalitres per year
tCO_2-e – tonnes carbon dioxide equivalent
TSF – tailings storage facility

Proposal context and alternatives

The proposal is situated between two river systems, with the Yule River to the west and Turner River to the east. The Yule River Water Reserve, located approximately 500 m west of the development envelope (Figure 2), is a Priority 1 water reserve that supports the drinking water supply for the Town of Port Hedland.

In designing the proposal, the proponent considered discharging to the Yule River, but rejected this option in favour of discharging to the Turner River. This determination was based on the comparatively higher environmental values associated with the Yule River, including a greater presence of permanent groundwater-fed pools, higher aquatic ecological value, and the importance of the Yule River Water Reserve. The proponent also advised that representatives for the Traditional Owners, the Kariyarra People, advised that discharge to the Turner River was the preferred option.

Consultation

The EPA published the proponent's referral information on its website for seven days public comment from 5 July 2023 to 12 July 2023. Three public comments were received this public consultation period. On 12 October 2023, the EPA decided to assess the proposal at the level Referral Information with addition information required (4-week public review). The EPA also published the additional information on its website for public review for 4 weeks (from 25 November 2024 to 23 December 2024).

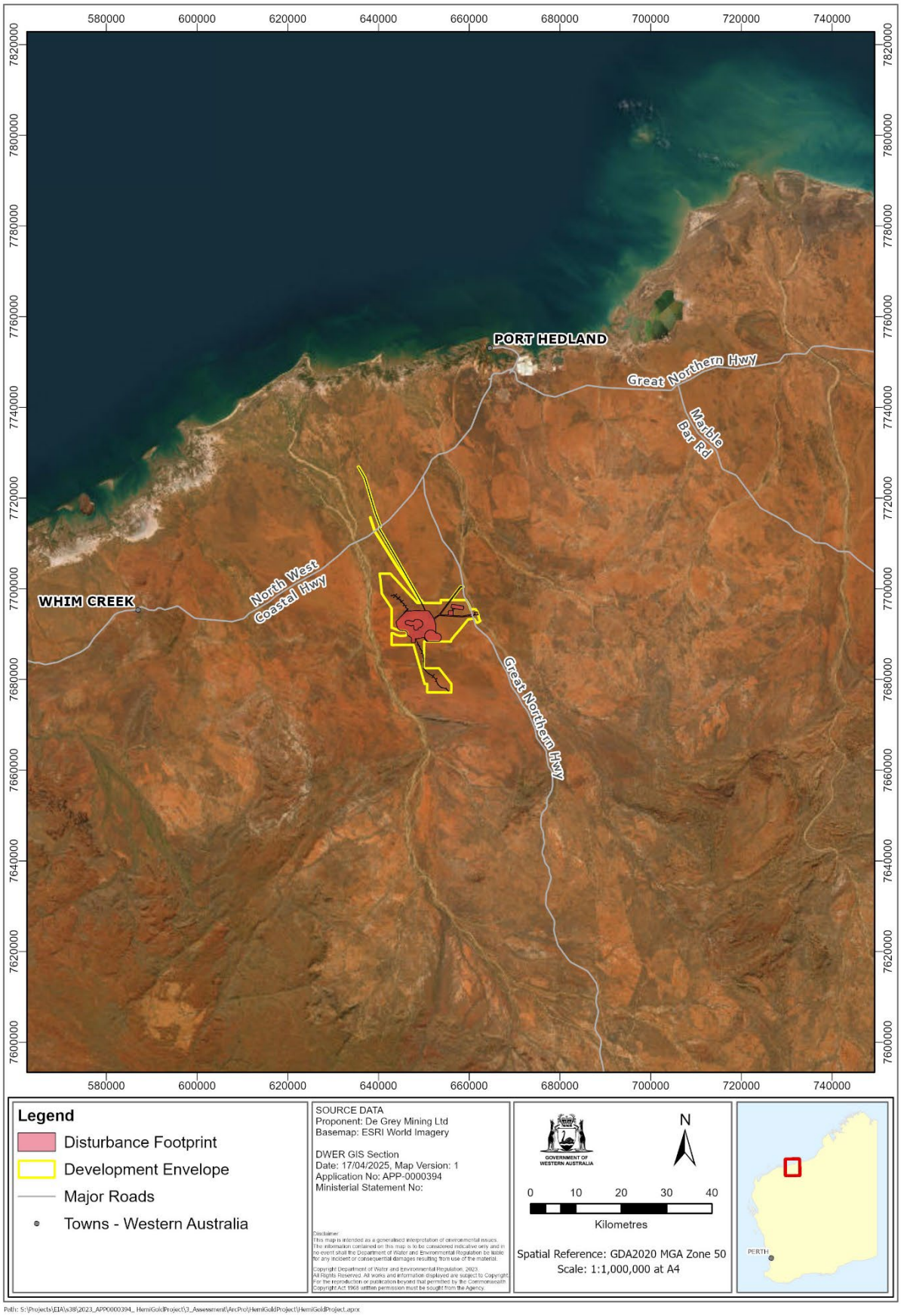

Figure 1 Hemi Gold Project location and development envelope

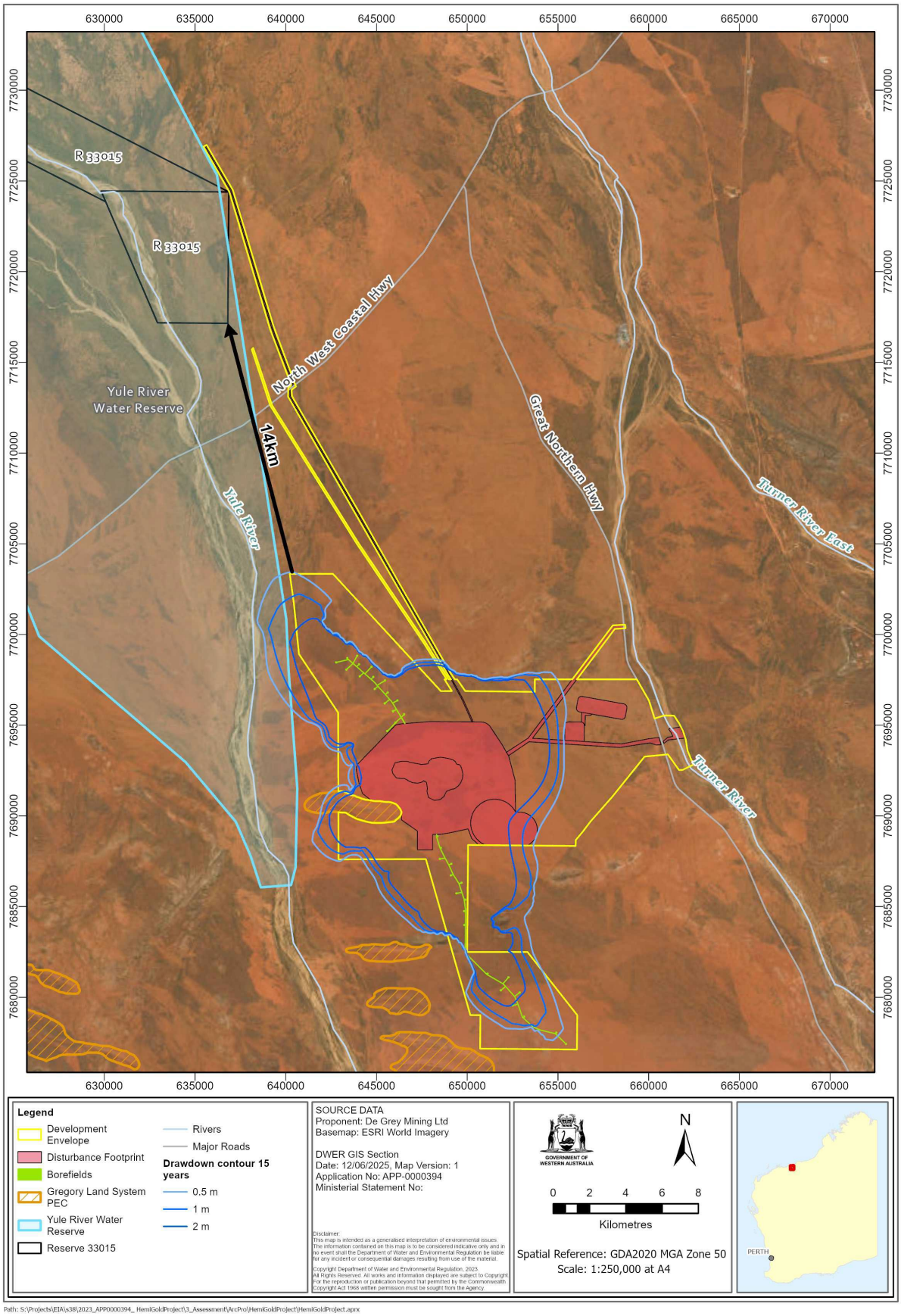

Figure 2 Hemi Gold Project development envelope, indicative disturbance footprint and groundwater drawdown extents at end of operation life

2 Assessment of key environmental factors

This section details the outcome of the EPA's assessment of the key environmental factors against its environmental objectives, and its recommendations on conditions the proposal should be subject to if it is implemented. The EPA has also considered the principles of the *Environmental Protection Act 1986 (*EP Act) in assessing whether the residual impacts will be consistent with its environmental factor objective (Appendix D). The EPA evaluated the impacts of the proposal on other environmental factors and concluded these were not key factors for the assessment (Appendix E).

2.1 Inland waters

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).

The proponent submitted the following investigations, surveys and peer reviews for assessment:

- Baseline aquatic ecology study of the Turner and Yule Rivers (Stantec, 2022)
- Baseline aquatic ecology survey of the Turner and Yule Rivers, flood study memorandum (Stantec, 2023)
- Conceptual long-term drawdown at 200 years (De Grey, 2025a).
- Definitive feasibility study – Conceptual and numerical groundwater modelling (Geowater Consulting, 2023).
- Hemi pit lake model (De Grey, 2025e).
- Results of ecotoxicity testing on Hemi dewater discharge water (MBS Environmental, 2024b).
- Short term reinjection trial (De Grey, 2025h).
- Sub-surface materials characterisation (SRK Consulting, 2022).
- Tailings storage facility design report (CMS Geosciences, 2022).
- Technical review - Definitive feasibility study - Conceptual and numerical groundwater modelling (Jurassic Groundwater, 2023).
- Turner River and site closure flood modelling (SWS, 2022).
- Turner River dewater discharge tier 2 environmental risk assessment (MBS Environmental, 2024a).

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

The EPA sought advice from the Department of Water and Environmental Regulation (DWER) in relation to the surface and groundwater modelling that was considered as part of this assessment.

Table 2: Assessment for inland waters

Key environmental values and context	
The development envelope is situated between the Yule and Turner Rivers, predominately within the Turner River surface water catchment. There are more surface water pools present within the Yule River compared to the Turner River, and a higher proportion of permanent pools that are likely to be groundwater dependent. Permanent pools in the Pilbara are typically of high value, as they provide a year-round source of water, provide habitat for fauna, and often have associated social or cultural values. The proponent has identified the Jelliabidina and Mardagubbidina pools within the Yule River as examples of such pools. Groundwater is relatively shallow across the development envelope, typically between 4 and 10 metres below ground level (mbgl) (see Figure 3), and flows south-east to north-west. The upper alluvium aquifer is laterally extensive with low permeability, with a thickness of up to 15 m. The lower alluvium paleochannel has high permeability and generally 1-2 kms wide, and depth to approximately 40 m. Beneath this, igneous intrusions within the saprock zone have resulted in fractures that provide low to moderate permeability, decreasing up to a depth of between 120 to 150 m, after which fresh bedrock is likely impermeable. Groundwater quality within the alluvium and saprock zone is generally fresh to brackish (800 – 1,100 mg/L TDS) with a pH between 7.5 and 8.5. Naturally higher concentrations of arsenic, chromium, uranium, and vanadium were recorded in groundwater samples taken from within the target ore deposits. The Yule River Public Drinking Water Source Area (PDWSA) is located 500 m west of the development envelope. The borefield within the PDWSA, in Reserve 33015, is operated by the Water Corporation to service the Port Hedland region and is approximately 15 km north-west of the development envelope.	
Impacts from the proposal	**Assessment finding, environmental outcome and recommended conditions**
Potential impacts Potential impacts to inland waters from: • permanent alteration of the local hydrological regime, include surface water drainage and groundwater availability • reduced surface water quality, and a wetting front of up to 50 km downstream, from the discharge of excess water to the Turner River • reduced groundwater availability and yield for other users, the Yule River PDWSA, and pools within the Yule River that are reliant on groundwater from the abstraction of groundwater • reduced groundwater quality from reinjecting excess water that contains elevated levels of arsenic, chromium, uranium, and vanadium • formation of pit lakes post-closure.	**Assessment finding and environmental outcomes** <u>Discharge of excess water</u> The proponent has proposed limits on the amount of water discharged to the Turner River, which reduce in stages over the life of the proposal. The EPA considers that these limits are reasonable and has included them in recommended condition A1-1. The proponent has modelled a wetting front down the Turner River from the proposed discharge rates over the life of the proposal, which has a maximum extent of approximately 45 kms from the proposed discharge location (SWS 2022). This maximum extent was modelled to be reached at month eight and maintained for 14 months, after which the wetting front reduces dramatically with no observable impact at or beyond the Great Northern Highway (approximately 40 kms downstream) (Chart 8-2 of De Grey 2025g). The EPA considers that this modelled wetting front is reasonable and has included the maximum extent in recommended condition A1-1.

Avoidance and minimisation measures (including regulation by other DMAs)
• groundwater abstraction of no more than:
  ○ 30 GL/a for the first four years,
  ○ 15 GL/a between years 5 and 7, and,
  ○ 10 GL/a from years 8 onwards.
• no groundwater drawdown within 15 km of the Yule River PDWSA borefield
• reinject no more than 15 GL/a.
• water quality limits on disposal of excess water via reinjection and discharge to the Turner River
• discharge to the Turner River of no more than:
  ○ 10 GL/a for the first three years,
  ○ 4 GL/a between years 4 and 6, and
  ○ 2 GL/a from year 7 onwards.
• maximum extent of wetting front in the Turner River
• implementation of the Environmental Management Plan (EMP) and Mine Closure Plan (MCP)
• impacts associated with the discharge of excess water can be reduced through a works approval and license under Part V of the EP Act
• impacts associated with the abstraction of groundwater can be reduced through a 5C application under the *Rights in Water Irrigation Act 1914* (RiWI Act)
• impacts associated with the leakage of contaminants from the integrated waste landform (IWL) tailings storage facility can be adequately addressed through works approval and license under Part V of the EP Act.
Consultation
The key matters raised during the consultation period include:
• lack of clarity on the potential impacts associated with groundwater drawdown, including post-closure impacts and cumulative impacts to neighbouring third party users
	The proponent has identified 7 intermittent and semi-permanent pools within this modelled wetting front. One of these pools, the Moorambine Pool, is located approximately 42 km downstream of the discharge location and has an undetermined permanency of standing water. The Moorambine Pool is related to site 7833, registered under the *Aboriginal Heritage Act 1972*, and is noted as being of cultural significance (De Grey 2024b). This pool does not appear to have been visited during cultural surveys, and therefore it is unclear as to what values are associated with this pool. The EPA has recommended condition B1-2(2) to minimise adverse impacts to the Moorambine Pool, and to consult with the Kariyarra Traditional Owners on the achievement of this condition through recommended condition B6-3.
	The EPA notes the proponent's commitment that only water with <24 µg/L of dissolved As will be discharged to the Turner River. Water with a higher As concentration (>24 µg/L) will only be reinjection into the proposal's southern borefield, and based on the proponent particle tracking modelling the water will report to the mine pits for re-abstraction and use in the processing plant, prioritised for use in the processing plant once operational. The EPA considers that the water discharged to the Turner River should not adversely impact the water quality in the Turner River and has recommended condition B1-1(4) to ensure that water quality meets reasonable water quality standards, which are to be determined in an environmental license under Part V of the EP Act.
	The Turner River contains vegetation which provides habitat for priority flora, conservation significant fauna, and short-range endemic (SRE) fauna species. In addition to the discharge limits in recommended condition A1-1, the EPA considers that the proponent should seek to minimise impacts to riparian vegetation and fauna habitat from the discharge of excess water through an objective-based condition, recommended condition B1-2(1). Noting the recommended conditions, and the consideration of water quality limits under Part V of the EP Act, there is unlikely to be significant residual impacts associated with the discharge of excess water to the Turner River.
	<u>Groundwater drawdown</u>
	The proponent has modelled the expected groundwater abstraction rates in stages over the life of the proposal. The EPA considers that the staged reduction is reasonable and has included abstraction limits in recommended condition A1-1.
	The proponent has proposed a groundwater drawdown limit, namely, no groundwater drawdown within 14 km of the Yule River PDWSA borefield. The EPA acknowledges the importance of this borefield in providing drinking water to

• groundwater modelling and particle tracking should be improved • the proposed monitoring of groundwater drawdown and discharge of surplus water are insufficient to effectively manage the potential impacts to values of the Yule River, and Turner River, respectively.	the Town of Port Hedland and has included this commitment in recommended condition B1-1(2). The EPA also acknowledge the importance of maintaining the PDWSA that supports the borefield and is directly west of the proposal development envelope (Figure 2). In addition, the Yule River contains permanent surface water pools, contains riparian vegetation, groundwater-dependent vegetation, provides habitat for priority flora species and conservation significant fauna, and contains Aboriginal cultural heritage values such as those associated with the Jelliabidina and Mardagubbidina pools. The EPA considers that impacts to the Yule River should be avoided, where possible, and that additional measures should be included to ensure the protection of the values associated with the river system. The EPA notes that reinjected water (with naturally elevated As concentrations) will be contained within the proposal's southern borefield to be re-abstracted from the mine pit for use in the for use in the processing plant once operational. Further, the proponent's particle tracking modelling indicates that post closure the proposal is unlikely to result in groundwater contamination as all particles from the southern borefield and tailings storage facility return to the mine pits, reinforcing the role of the pit lakes as long-term hydraulic sinks. The EPA has recommended condition B1-1(1) to ensure there is no detectable decrease to the water level or quality of pools in the Yule River, recommended condition B1-1(3) to ensure groundwater drawdown does not exceed the predicted drawdown extent, and recommended condition B1-1(5) to ensure water quality reinjected to the borefield closest to the Yule River is of reasonable quality. It is noted that the proponent has committed to deepening and/or replacing bores in consultation with third parties, such as the Indee Pastoral Station, if affected. The EPA advises that the potential impacts to the Yule River, Turner River, and groundwater aquifer can be regulated through reasonable conditions and through other statutory decision-making processes. Subject to the recommended conditions, the environmental outcome is likely to be consistent with the EPA objective for inland waters. **Cumulative impacts** The EPA has assessed cumulative impacts on the groundwater aquifer and surface water systems by considering existing and reasonably foreseeable projects and activities in the surrounding area. This includes the Indee Pastoral Station, the Mt Dove Iron Ore Mine, and the potential Vysarn Asset Management (VAM) abstraction project.

	The Mt Dove Iron Ore Mine is currently in care and maintenance with limited borefield use, however, the proponent has advised that they have considered full-capacity operation in groundwater drawdown modelling. The EPA notes that there is limited publicly available information regarding the potential VAM abstraction project, including the proposed location of abstraction. It is noted that an assessment under the RiWI Act has the potential to set conditions in the 5C license for a reduced abstraction limit when considering other existing licenses that target the same aquifer resource. The EPA considers that the impacts of the proposal, in the context of the significance of the environmental values at risk, can be appropriately managed to provide for an environmental outcome that is consistent with the EPA's objective for inland waters. **Recommended conditions to ensure consistency of environmental outcome with EPA objective** Condition A1 • limits on extent of proposal Condition B1 • limits on maximum groundwater drawdown extent • limits on quality and quantity of water discharged to the Turner River • limits on quality and quantity of water reinjected to groundwater • no impacts to the surface water pools in the Yule River • minimise impacts to riparian vegetation and fauna habitat from the discharge of excess water Condition B4 • revise and implement the EMP Condition B5 • rehabilitation of landforms • revise and implement the MCP

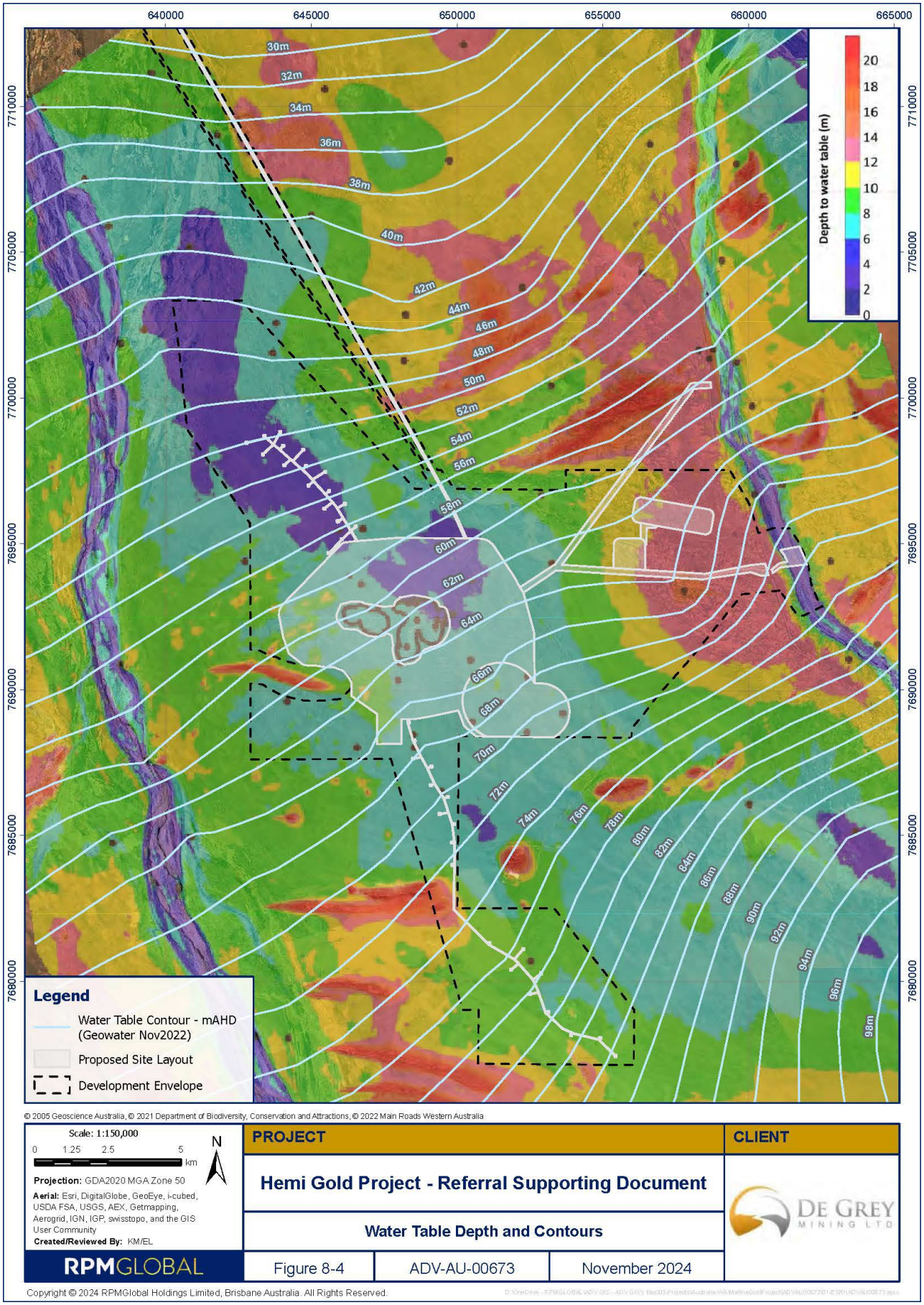

Figure 3 Water table depth and contours (De Grey 2025g)

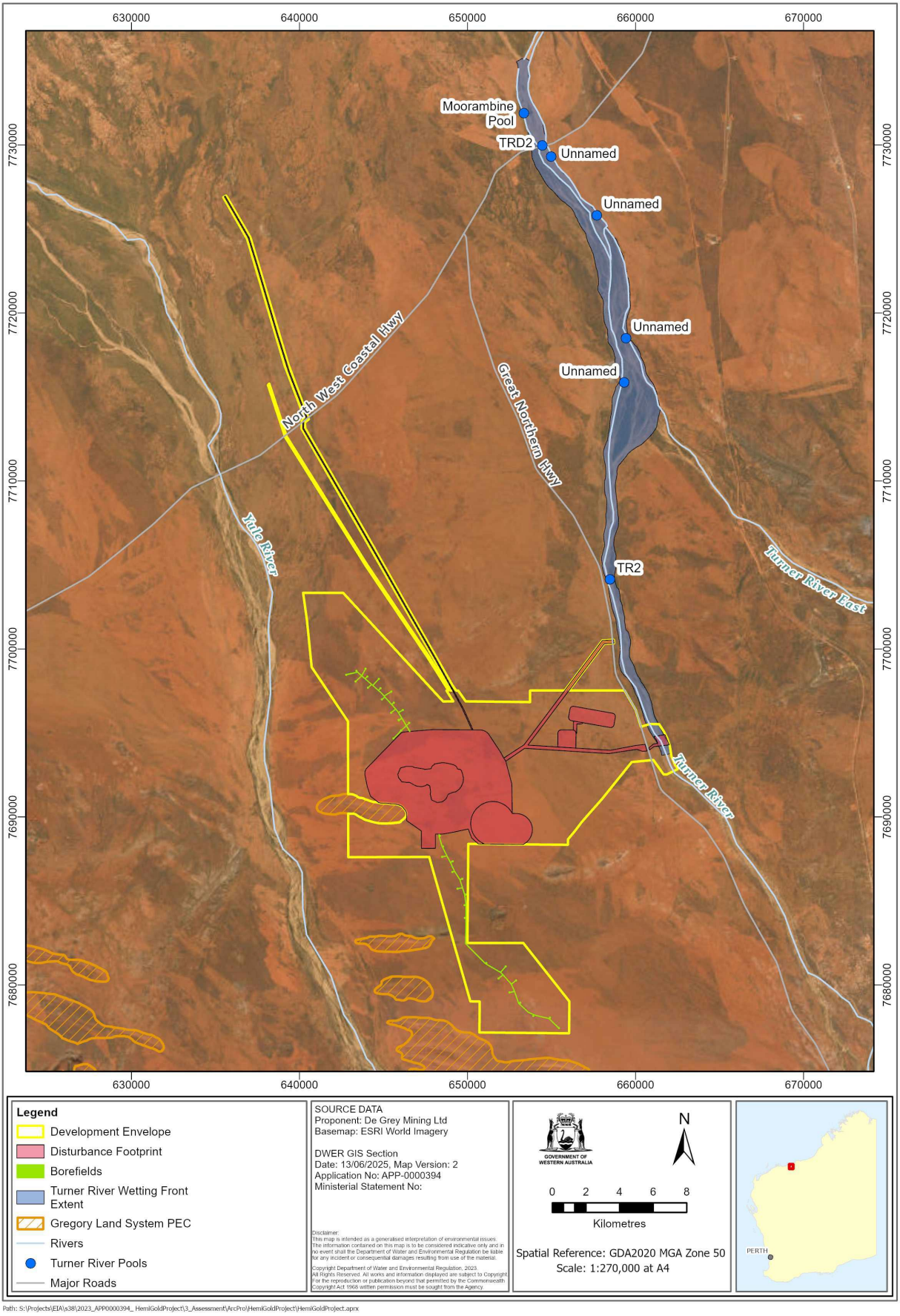

Figure 4 Hemi Gold Project maximum wetting front extent

2.2 Flora and Vegetation

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).

The proponent submitted the following investigations and surveys for assessment:

- Baseline aquatic ecology study of the Turner and Yule Rivers (Stantec, 2022)
- Baseline aquatic ecology survey of the Turner and Yule Rivers, flood study memorandum (Stantec, 2023)
- Baseline flora and vegetation assessment (Umwelt, 2024b)
- Definitive feasibility study - Conceptual and numerical groundwater modelling (Geowater Consulting, 2023)
- Desktop assessment of the proposed 300 m buffer around the Gregory Land System Priority Ecological Community at Hemi (Umwelt, 2024a)
- Status of *Seringia exastia* at Hemi (Umwelt, 2022)
- Technical review - definitive feasibility study - Conceptual and numerical groundwater modelling (Jurassic Groundwater, 2023)
- Turner River flora and vegetation assessment (Umwelt, 2024c).

The flora and vegetation surveys were largely consistent with the *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016d). The EPA considered that the relevant studies are appropriate to inform the assessment of the potential impacts to the above environmental factor.

The EPA sought advice from DWER and the Department of Biodiversity, Conservation and Attractions (DBCA) in relation to the flora and vegetation surveys that were considered as part of this assessment.

Table 3: Assessment for flora and vegetation

Key environmental values and context	
The proposal is located within the Chichester and Roebourne subregions within the Pilbara IBRA bioregion. Most of the vegetation within the survey area was considered to be in 'Excellent' or 'Very Good' condition. Areas mapped as 'Very Good' displayed signs of impacts associated with cattle, including trampling, some grazing, and/or presence of weeds. Only small, isolated areas were of lower condition, including small historically cleared areas and trough sites at wells. Areas with existing clearing for exploration drilling were marked as 'not assessed.' No Threatened Ecological Communities listed under the *Biodiversity Conservation Act 2016* (BC Act) or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were identified within the survey area. One Priority Ecological Community was recorded in the survey area, the Gregory Land Systems Priority 1 Priority Ecological Community (Gregory Land Systems PEC). The Gregory Land System PEC is described as linear dunes and restricted sandplains supporting shrubby spinifex (and occasionally soft spinifex) grasslands (DBCA 2023). A single dune approximately 4 km long and 0.5 km wide is present directly adjacent to the development envelope. No threatened flora listed under the BC Act were recorded. One threatened flora listed under the EPBC Act was recorded, *Seringia exastia* (Critically endangered), however, this is likely to be removed from the EPBC Act as it is now considered widespread. Five priority species listed under the BC Act were recorded, and one unconfirmed species. 17 vegetation types were mapped within the survey area. All vegetation types recorded are relatively common across the Pilbara, aside from VT 17 (the Gregory Land System PEC). All vegetation types within the development envelope were considered to be at least partially reliant on surface water flows, with five representing riparian vegetation (VT 2, 3, 4, 15, and 16). VT 16 is associated with the Turner and Yule river channels and is also considered to represent groundwater-dependent vegetation due to the present of obligate and potentially facultative phreatophytes (such as *Melaleuca argentea* and *Eucalyptus camaldulensis* subsp. *refulgens*).	
Impacts from the proposal	**Assessment finding, environmental outcome and recommended conditions**

Potential direct impacts
Potential impacts to flora and vegetation from:
• Clearing of up to the following within the development envelope:
  ○ 5,830 ha of 'Good' to 'Excellent' condition native vegetation
  ○ 18.4% of *Abutilon* sp. *pritzelianum* (P3)
  ○ 33.7% of *Euploca mutica* (P3)
  ○ 30.2% of *Gymnanthera cunninghamii* (P3)
  ○ 32.4% of *Rothia indica* subsp. *Australis* (P3)
  ○ 6.3% of *Triodia chichesterensis* (P3)
  ○ 13.7% of *Polymeria* sp. *nov* (unconfirmed, but likely a P3).
	Assessment finding and environmental outcomes
	<u>Vegetation</u>
	The EPA has assessed the potential impacts on clearing of up to 5,830 ha of native vegetation in 'Good' to 'Excellent' condition. The proponent has proposed to offset the residual impacts to native vegetation through financial contributions to the Pilbara Environmental Offsets Fund (PEOF), which is reflected in recommended condition B8.
	The proponent has designed the proposal to avoid direct impacts to VT17, the Gregory Land Systems P3 PEC. However, some indirect impacts may still occur such as from dust generation, introduction or spread of weeds, or spills and leaks. The EPA considers that these impacts can be adequately addressed through an outcome-based condition, recommended condition B2-2(2), and the regulatory process under Part V of the EP Act.
	The remaining vegetation types are relatively widespread across the Pilbara region. While VT 16 is relatively common, it is likely to contain considerable value in regard to

Potential indirect impacts • changes to groundwater depth from dewatering or reinjection • changes to the water quality and water level in Turner River from the discharge of excess water • fragmentation of native vegetation • dust generation • introduction or spread of weeds • spills or leaks from contaminants of concern. **Avoidance and minimisation measures (including regulation by other DMAs)** • designed the development envelope to avoid direct disturbance to the Gregory Land System PEC • alter the disturbance footprint to reduce the extent of priority flora species impacted • implement standard dust and weed management measures • implement the EMP and MCP • impacts associated with discharge and reinjection of excess water can be minimised through a works approval and license under Part V of the EP Act • impacts associated with spills and leaks of contaminants can be adequately addressed through a works approval and license under Part V of the EP Act. **Consultation** The key matters raised during the consultation period include: • potential indirect impacts to the Gregory Land System PEC • clearing of a large proportion the local and regional records of priority flora species and vegetation type 16 (VT 16)	flora and vegetation, as well as other key factors such as terrestrial fauna and social surroundings. It is acknowledged that the proponent reduced the proposed maximum extent of clearing to VT 16 to 10 ha in response to comments received during the public review period. The EPA considers that clearing of up to 10 ha of VT 16 is unlikely to represent a significant residual impact. A clearing limit of 10 ha has been included under the terrestrial fauna factor, in recommended condition B3-1(1)(b). The EPA expects that the proponent will undertake progressive rehabilitation during operations and that the Department of Mining, Petroleum and Exploration (DMPE) would regulate mine closure under the *Mining Act 1978* (Mining Act). Subject to the proposed limits and extents in recommended condition A1, and the environment outcomes in recommended condition B1 (limits on reduction in water level or quality in the Yule River, limits on reduction in water quality in the Turner River, and minimise impacts to riparian vegetation) and B2 (no indirect impacts to the Gregory Land Systems PEC), B3 (limit on clearing of VT 16), B5 (rehabilitation), and B8 (contributions to PEOF), the residual impacts to vegetation are likely to be consistent with the EPA's objective for flora and vegetation. <u>Flora</u> Six priority flora species were recorded within the development envelope, with five recorded as priority 3 species and one unconfirmed (likely to be a P3 species as advised by DBCA). The EPA acknowledges that the proponent revised its disturbance footprint during the public review stage to reduce the direct impacts on priority flora species and proposed stricter clearing limits on these species, which are reflected in recommended condition B2-1. The EPA considers that the revised disturbance limits are not likely to significantly impact the local extent, regional extent, or conservation status of these priority flora species. Subject to the proposed limits and extents in recommended condition A1, and recommended conditions B1 (limits on reduction in water level and quality and minimise impacts to riparian vegetation), B2 (limits on disturbance to priority flora and no impacts to the Gregory land Systems PEC), B5 (rehabilitation), and B8 (contributions to PEOF), the residual impacts to flora species is likely to be consistent with the EPA's objective for flora and vegetation. **Cumulative impacts** The proponent has assessed the cumulative impacts of the proposal and other projects (applications under both Part IV and Part V of the EP Act) on values of flora and vegetation. This assessment considered a local impact area of 100 km of the development envelope, and a regional impact area that matched the Pilbara IBRA

• lack of management measures for priority flora species and VT 16.	region. The EPA has considered the existing and reasonably foreseeable cumulative impacts associated with the proposal and nearby proposals. None of the four Soil Landscape Systems found within the development envelope were considered threatened in the EPA's report on cumulative environmental impacts in the Pilbara (EPA 2014). The maximum cumulative impact for a Soil Landscape System in the local area was 11.2% of the mapped area (increased by 3.4%), out of a total of 529,177 ha. Cumulative disturbance to pre-European vegetation associations across the regional impact area add up to no more than 3.5% of the total extent of each vegetation association. The largest cumulative impact was to the Abydos Plain Shrub-steppe (at 3.5% of total area), for which the proposal contributed 0.5%. Across the local impact area, the largest cumulative disturbance was also to the Abydos Shrub-steppe, with the proposal contributing an additional 0.8% disturbance (up to 11.2% of the total area). The vegetation associations, particularly the Abydos Plan Shrub-steppe, are common in and around the development envelope and the extent to be impacted is relatively small in comparison to the remaining native vegetation. Noting the exclusion of the Gregory Land System PEC from the development envelope, and the recommended condition B2-1(2) for no indirect disturbance, there are not expected to be any cumulative impacts to priority ecological communities. It is considered that the cumulative effects to the Soil Landscape Systems, the Gregory Land System PEC, and vegetation in a 'Good' to 'Excellent' condition are not at a level that would warrant a decision to allow no further clearing Significant impacts to flora and vegetation that may affect biological diversity and ecological integrity are not anticipated when considered individually or cumulatively. **Recommended conditions to ensure consistency of environmental outcome with EPA objective** Condition A1 • limits and extents on the proposal Condition B2 • disturbance limits on priority flora • no impacts to the Gregory Land System PEC • disturb no more than 10 ha of VT 16 (conditioned under the terrestrial fauna factor) Condition B4 • revise and implement the EMP

	Condition B5 • rehabilitation of flora and vegetation values • revise and implement the MCP Condition B8 • contribute funds to PEOF to counterbalance the significant residual impacts to 'Good' to 'Excellent' condition native vegetation and riparian vegetation.

2.3 Terrestrial fauna

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

The proponent submitted the following investigations and surveys for assessment:

- Baseline aquatic ecology study of the Turner and Yule Rivers (Stantec, 2022)
- Baseline aquatic ecology survey of the Turner and Yule Rivers, flood study memorandum (Stantec, 2023)
- Short range endemic fauna survey report (Bennelongia, 2023b)
- Detailed vertebrate fauna survey 2021-2024 (Western Wildlife, 2024).

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

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

The EPA also considered relevant fauna recovery plans and conservation advice where applicable.

Table 4: Assessment for terrestrial fauna

<table>
<tr><th colspan="2">Key environmental values and context</th></tr>
<tr><td colspan="2">Four vertebrate fauna habitat types were recorded within the development envelope, namely spinifex sandplain (15,809.8 ha), sandplain drainage (6,029.4 ha), stony hills (172.9 ha), and major river (181.2 ha). The major river habitat coincidences with the Yule and Turner River, and vegetation type 16 as discussed against the flora and vegetation factor. Two additional habitat types, the sand dune and rocky outcrop habitats, were recorded in surveys but were not present within the development envelope.
31 conservation significant species were predicted to potentially occur in the study area. Of these, eight species have been recorded within the development envelope, and a further five species have a possible or likely occurrence. The threatened and priority fauna species recorded within the development envelope and their respective habitat types were:
• greater bilby (VU) – spinifex sandplain, sandplain drainage
• grey falcon (VU) – major river
• northern quoll (EN) – major river
• Pilbara olive python (VU) – major river
• Pilbara leaf-nosed bat (VU) – all habitat types
• northern coastal free-tailed bat (P1) – major river
• brushtailed mulgara (P4) – spinifex sandplain, sandplain drainage
• western pebble-mound mouse (P4) – stony hills
The threatened and priority fauna species with a possible or likely occurrence and their respective habitat types:
• night parrot (CE) – spinifex sandplain, sandplain drainage
• ghost bat (VU) – all habitat types
• pin-striped finesnout Ctenotus (P1) – poorly known, potentially all habitat types
• Gane’s blind snake (P1) – poorly known, potentially spinifex sandplain
• spectacled hare-wallaby (P4) – spinifex sandplain, sandplain drainage.
Seven potentially SRE fauna species were identified as having potentially restricted distributions. These species were located within five SRE habitats: sandplain, sandy/stony plain, ironstone outcrop, sand dunes, and major drainage line.</td></tr>
<tr><th>Impacts from the proposal</th><th>Assessment finding, environmental outcome and recommended conditions</th></tr>
<tr><td>Potential direct impacts
Potential impacts to terrestrial fauna from:
• clearing of up to:
  ○ 5,100 ha of spinifex sandplain</td><td>Assessment finding and environmental outcomes
<u>Critical habitat</u>
The spinifex sandplain, sandplain drainage, and major river habitat types are critical habitat for conservation significant fauna, however, the EPA notes</td></tr>
</table>

○ 800 ha of sandplain drainage ○ 33.3 ha of stony hills ○ 10 ha of major river • clearing of up to 41 ha of northern quoll dispersal and foraging habitat • clearing of hollow-forming trees • fauna strikes from vehicle movements • fragmentation and loss of ecological connectivity. **Potential indirect impacts** • increased noise, dust, vibration, and light emissions during construction and operation • increased feral fauna activity • changes to the water quality and water level in the Yule River or Turner River • reduction in quality of habitat from introduction or spread of weeds • spills or leaks from contaminants of concern. **Avoidance and minimisation measures (including regulation by other DMAs)** • exclusion of fauna habitat from the development envelope where possible, including the sand dune and rocky outcrop habitat types, and habitat associated with the Yule River • access to IWL will be restricted by the construction of bunds and gates as required • pre-clearance surveys for the greater bilby • implement standard dust and weed management measures • implement the EMP and MCP • impacts associated with discharge of excess water can be minimised through a works approval and license under Part V of the EP Act • impacts associated with spills and leaks of contaminants can be adequately addressed through a works approval and license under Part V of the EP Ac	that these habitat types are widespread across the local area and Pilbara region. The major river habitat is critical habitat for several fauna species and supporting habitat for several more. This habitat, and particularly the surface water pools present within it, are likely to function as an ecological linkage and a refuge for fauna species in dry conditions. It is noted that major river habitat extends beyond the development envelope for both the Yule River (~250km long) and Turner River (~220km long). The 10 ha clearing extent proposed within the Turner River is unlikely to represent a significant impact to this ecological linkage or to the viability of Turner River to support threatened and priority fauna. To minimise the potential impacts to critical habitat, including from habitat fragmentation, the EPA has recommended condition B3-2. <u>Threatened and priority fauna</u> The EPA notes that while the Pilbara leaf-nosed bat and ghost bat are likely to visit the development envelope to forage, critical habitat (in the form of diurnal roosts) was not present. All habitat types were considered suitable foraging habitat, however, there are no known roosts near the development envelope and therefore visitation is likely to be limited. There is unlikely to be any significant residual impacts to either bat species. The proponent has committed to pre-clearance surveys for greater bilby presence within the sandplain habitat types, and this has been included in recommended condition B3-3(1). While the spinifex sandplain and sandplain drainage habitat represent potential roosting/breeding habitat for the night parrot and spectacled hare-wallaby, both species prefer long unburnt, ring-forming spinifex. The EPA notes that due to recent fires, some of which were started by the pastoralist, mature spinifex habitat is likely to be limited across the development envelope. The sandplain habitat types are considered widespread in the local area and across the Pilbara region. While highly unlikely to be found, due to the conservation status of the night parrot, the EPA recommends condition B3-3(1) to ensure pre-clearance surveys are undertaken to account for the potential presence at least 7 days prior to clearing. Similarly, major river habitat has been identified as critical habitat for the northern quoll, Pilbara olive python, and grey falcon. All habitat within 1 km of major river is also considered to be critical foraging and dispersal habitat for the northern quoll. Hollow forming trees within major river habitat may be

• the outcomes of the Commonwealth's assessment process (administered under the EPBC Act) and the statutory requirements under s. 40 of the BC Act, may further manage and mitigate impacts to the conservation significant fauna species. **Consultation** Key matters raised during the consultation period include: • management measures for conservation significant fauna and SRE species should be developed further • pre-clearance surveys should be conducted for the northern quoll and bilby within and near important habitat • suitability of bund construction to avoid trapping vertebrate fauna.	utilised by grey falcon for breeding, or by the northern coastal free-tailed bat for roosting. The EPA has recommended condition B3-3(2) and B3-3(3) to ensure pre-clearance surveys are undertaken for the northern quoll and Pilbara olive python, and condition B3-1(4) to avoid the clearing of hollow-forming trees. Noting the potential presence of conservation significant fauna within the development envelope, the proposed 24-hour operation schedule, and the nocturnal nature of the greater bilby and night parrot, there is a potential for vehicles to strike fauna species. The EPA has recommended speed limits within the development envelope, including a reduced speed limit at night, in condition B3-4. Subject to the recommended conditions, the environmental outcome for terrestrial fauna is likely to be consistent with the EPA's objective for this factor. **Cumulative impacts** Four of the seven conservation significant fauna (northern quoll, greater bilby, Pilbara olive python, and grey falcon) identified within the development envelope have been assessed for their cumulative impact from the proposed proposal and from other nearby proposed/approved projects within a 70 km radius. The proponent considered five approved projects within the local impact area (100 km of the development envelope), but notes the cumulative impact assessment did not include an assessment of: • the night parrot as no individuals have been recorded in the development area; or, • the ghost bats or Pilbara leaf-nosed bat as there is no critical habitat within the Proposed Impact Area. The implementation of the proposal is expected to contribute to cumulative impacts to the four remaining conservation significant fauna through the clearing of critical habitat, however, the EPA advises that proposals contribution is relatively low. The proposal would result in the clearing of between 0.01% and 1.0% of the total mapped extent within the local impact area. At least 89.8% of mapped critical habitat within the local impact area will remain for all species, and at least 89.4% across the Pilbara IBRA region. For the northern quoll, Pilbara olive python and grey falcon, the proposed disturbance to critical habitat is primarily in relation to the major river habitat

	type. The EPA notes that the Yule River is, and will remain, relatively undisturbed after the implementation of this proposal. The Yule River represents high quality critical habitat for both species outside of the development envelope. It is possible that clearing within the Turner River, in combination with other disturbance such as the sand mining operation downstream of the proposed discharge location, may result in fragmentation for the species that rely on this river. However, the clearing proposed is relatively small (10 ha), the Turner River is wide (approximately 1 km across), and the proposed disturbance being relatively non-invasive (upgrades to existing tracks, the discharge outfall, and associated pipeline infrastructure are unlikely to result in significant additional impacts from noise, dust, vibration, or lighting). It is noted that almost the entirety of the local impact area is critical habitat for the greater bilby, as all habitat is considered critical, and therefore extensive critical habitat will remain outside the development envelope. In addition, the EPA's recommended condition B3-1(4) to ensure no additional clearing of hollow-forming trees and condition B3-2 to avoid impacts to critical habitat, where possible, will further minimise potential cumulative impacts on conservation significant species. The EPA considers that the cumulative impact to conservation significant fauna habitat is not at a level that would warrant a decision to allow no further clearing. **Recommended conditions to ensure consistency of environmental outcome with EPA objective** Condition A1 • limits and extents on proposal Condition B1 • no decrease to water level or quality of pools in Yule River • limits on quality and quantity of water discharged to the Turner River Condition B3 • disturbance limits on habitat types • no increase in feral animal presence • no clearing of hollow forming trees in major river habitat • minimise indirect impacts to critical fauna habitat

	• preclearance surveys for presence of night parrots, greater bilby, northern quoll, Pilbara olive python, and hollow forming trees • speed limits Condition B4 • revise and implement the EMP Condition B5 • rehabilitation of terrestrial fauna habitat • revise and implement the MCP Condition B8 • contribute funds to PEOF to counterbalance the significant residual impacts to critical habitat for conservation significant fauna.

2.4 Subterranean fauna

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

The proponent submitted the following investigation and surveys for assessment:

- Definitive feasibility study - Conceptual and numerical groundwater modelling (Geowater Consulting, 2023)
- Technical review - Definitive feasibility study - Conceptual and numerical groundwater modelling (Jurassic Groundwater, 2023)
- Subterranean fauna survey report (Bennelongia, 2023a)
- Targeted stygofauna survey (Bennelongia, 2024)
- Subterranean fauna habitat assessment (De Grey, 2024b).

The EPA notes that the subterranean fauna surveys were largely consistent with the EPA's *Technical guidance – Subterranean fauna surveys for environmental impact assessment* (EPA 2021e). The EPA considered that the relevant studies are appropriate to inform the assessment of the potential impacts to the above environmental factor.

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

Table 5: Assessment for subterranean fauna

Key environmental values and context	
The development envelope is situated between the Yule and Turner Rivers, with groundwater relatively shallow typically ranging between 4 and 10 mbgl. Five different subterranean fauna habitat types were identified across the study area, with stygofauna occurring below the water table and troglofauna occurring above (De Grey 2024b): • Upper Aeolian, Colluvium and Alluvium (Type 1) – A laterally extensive facies consisting of unconsolidated clay, mud, silt and lesser sand. This domain of the groundwater aquifer is considered to have low to high permeability (clay/mud content dependent) and is largely saturated; and, • Saturated Lower Colluvium and Alluvium (Type 2) – A similar system to the upper alluvium, but which notably is defined as the palaeochannel facies and contains unconsolidated sands and gravels and lesser silt. This is the main host to the groundwater aquifer system and has high permeability and storage values. • Saprolite and Saprock (Type 3) – A compact clay dominant domain with lesser silt, sand and clasts of highly weathered rock. This domain contains minor volumes voids or fractures that occur in association with shear zones and faults but also part of the natural development of the profile during a deep tropical weathering event. • Joint Weathered Bedrock Basement (Type 4) – A weathered fractured bedrock (incipiently weathered rock) domain with minor clays/oxides on the joint surfaces. The joints increase in spacing as a result of the incipient weathering. Fresh Bedrock Basement (Type 5) was also identified, but lacked sufficient fractures, cavities, and voids to be a productive habitat for either stygofauna or troglofauna. The proponent's subterranean fauna surveys collected 3,967 stygofauna specimens representing at least 52 species, of which 27 species were collected from the impact area (i.e. within the groundwater drawdown area). Five species were only identified from within the impact area, with the remaining species either being considered widespread or occurring beyond the impact area (i.e. occurring beyond the 1 m drawdown contour) (Bennelongia 2023a; De Grey 2024b). The five species recorded only from within the impact area, and the respective habitat they were collected from, were: • *Parastenocaris* 'BHA392' – Type 1 and Type 3 • *Brevisomabathynella* `BSY226' – Type 1 • *Paramelitidae* `BAM210` – Type 1 and Type 3 • *Microcerberidae* `BIS464' – Type 1 and Type 2 • *Microcerberidae* `BIS544' – Type 1, Type 2 and Type 3. A single species of troglofauna, *Parajapygidae* `BDP208` was collected from within the impact area (i.e. within the proposed mine pits), and only two specimens of this species were collected. The species was recorded from the same hole, above the water table within Type 1 habitat, and had not been recorded prior to sampling.	
Impacts from the proposal	**Assessment finding, environmental outcome and recommended conditions**
Potential impacts	**Assessment finding and environmental outcomes**

• loss of five potentially restricted stygofauna taxa and one potentially restricted troglofauna taxa • loss of stygofauna habitat (up to 30% of Type 1 and 30% of Type 2 within the development envelope) from groundwater abstraction • loss of troglofauna habitat from groundwater reinjection. **Potential indirect impacts** • changes to surface inputs of flow/volume of water, nutrients and oxygen • changes to structure and presence of underground voids • desiccation of subterranean habitat • contamination from spills, leaching and incidents. **Avoidance and minimisation measures (including regulation by other DMAs)** • groundwater abstraction limits for the proposal (see Section 2.1) • water quality limits on disposal of excess water via reinjection (see Section 2.1) • implementation of the EMP and MCP • impacts associated with the abstraction of groundwater can be adequately addressed through a 5C application under the RiWI Act • impacts associated with the leakage of contaminants from the IWL can be adequately addressed through a works approval and license under Part V of the EP Act. **Consultation** The key matters raised during the consultation period include: • the EMP should be revised to address impacts to include stygofauna species • potential impacts to stygofauna from groundwater contamination, such as from elevated concentrations of arsenic, have not been addressed • sampling for subterranean fauna is limited and does not provide certainty on the scale of potential impacts.	<u>Stygofauna</u> Habitat types 1 and 2 were considered to be core habitat for stygofauna, while types 3 and 4 were considered to have some limited ability to support stygofauna. While five species may be considered potentially restricted, the proponent has undertaken detailed modelling to map the extent of stygofauna habitat outside of the impact area. 3D modelling to demonstrate physical connectivity of habitat was performed using LeapFrog (De Grey 2024b), as consistent with EPA technical guidance (EPA 2021e). The geology and hydrogeology of all habitat types were relatively consistent within and outside the development envelope, and the habitat was found to be extensive and well connected. Approximately 69%, 84%, and 93% of the extent of stygofauna habitat types 1, 2, and 3 across the study area would remain at the cessation of mining. Across all four habitat types, approximately 82% would remain. Based on the availability of widespread and interconnected habitat outside the impact area, the five potentially restricted stygofauna species listed above are reasonably likely to not be restricted to the impact area and are likely to persist beyond the 1 m drawdown contour. However, as there is some uncertainty regarding whether or not these species are spatially restricted, the EPA has recommended condition B1-1(6) to limit the extent of disturbance to stygofauna habitat. Subject to the recommended conditions, the environmental outcome for subterranean fauna is likely to be consistent with the EPA's objective for this factor. <u>Troglofauna</u> The availability of viable habitat for troglofauna is limited by the depth to groundwater across the development envelope, which on average is 6.5 mbgl. This shallow groundwater level results in an estimated 98% of troglofauna habitat being classed as Type 1, which was found to be extensive and well connected outside the impact area. Approximately 99% of the above water table Type 1 habitat will remaining post implementation of the proposal. Sampling results for troglofauna strongly indicate that the troglofauna community within the survey area is depauperate and that in such circumstances any troglofauna species present will be wide ranging rather than endemic. The overall low yield of troglofauna species from surveying is

	likely attributed to lack of available habitat associated with the shallow water table (Bennelongia 2023a; De Grey 2024b). As mentioned above, the only species recorded in sampling, the *Parajapygidae* `BDP208`, was found within Type 1 habitat and this habitat type is well connected and extensive. It is likely that this species is present outside the impact area. Noting that the EPA has recommended limits and extents and conditions for inland waters that will minimise the potential impacts to troglofauna, the EPA did not consider that a condition specifically for troglofauna was necessary or important to maintain consistency with the EPA objective for subterranean fauna. Subject to the recommended conditions for inland waters (see Section 2.1), the limits and extents in recommended condition A1-1, and other statutory processes, the environmental outcome for subterranean fauna is likely to be consistent with the EPA's objective for this factor. **Cumulative impacts** Cumulative impacts for subterranean fauna is primarily in relation to groundwater drawdown reducing the connectivity of stygofauna habitat for potentially restricted species. As noted in section 2.1, there is a potential cumulative impact from third-parties also abstracting groundwater in the area. The proponent has considered the current and reasonably foreseeable activities in its assessment of impacts to groundwater, and therefore, the availability of suitable stygofauna habitat. It is noted that all suitable habitat types for stygofauna are widespread and well-connected, and the implementation of existing or reasonably foreseeable projects is unlikely to change this conclusion. The EPA considers that the impacts of the proposal, in the context of the significance of the environmental values at risk, can be approximately managed to provide for an environmental outcomes that is consistent with the EPA's objectives for inland waters. **Recommended conditions to ensure consistency of environmental outcome with EPA objective** Condition A1 • limits and extents on proposal Condition B1 • limits on maximum groundwater drawdown extent

	• limits on disturbance to volume of stygofauna habitat.

2.5 Greenhouse gas emissions

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

The proponent submitted the following reports, management plans, and peer reviews for assessment:

- Emissions estimates, peer benchmarking and scope 3 review, summary report (Energetics 2022)
- Greenhouse gas environmental management plan (De Grey 2024a)
- Greenhouse gas environmental management plan – Independent peer review (Worley 2024).

The EPA recognises that the proponent prepared its information relating to this factor in accordance with the 2023 version of the Environmental Factor Guideline – Greenhouse Gas Emissions (EFG GHG; EPA 2023a). The EPA considers it has adequate information to have due regard to its recently updated EPA (2024b) EFG GHG in its assessment of the proposal's GHG emissions.

Table 6: Assessment for greenhouse gas emissions

Key environmental values and context	
GHG emissions from a cumulative range of sources have an impact on Western Australia's environment, even if the specific impact of a particular proposal's emissions may not be known with certainty. This is because there is an established link between GHG emissions and the risk of climate change. The EPA recognises that climate change will have an impact on Western Australia's environment and environmental values. For example, climate change has already caused a significant drying of the state's south-west, which in turn places significant additional pressures on water resources, flora and fauna, marine environmental quality, and social surroundings. The EPA therefore considers GHG emissions to be a key environmental factor in the assessment of the proposal. There is also an established correlation between global temperature rise and greenhouse gas emissions. The EPA advises that for every 1,000 billion tonnes [i.e. 1 gigatonne (1 Gt)] of carbon dioxide emitted by human activity, global surface temperature rises by 0.45°C, as a best estimate, with a likely range from 0.27°C to 0.63°C (IPCC 2023). The EFG GHG (EPA 2024b) provides that GHG emissions from a proposal will be considered where they are reasonably likely to exceed 100,000 tonnes (t) of carbon dioxide equivalents (CO_2-e) of scope 1 or scope 2 emissions in any year. This is the same as the (scope 1) threshold criteria for designation of a large facility under the Australian Government's Commonwealth Safeguard Mechanism. The scope 1 and 2 emissions provided by the proponent for this proposal exceed this threshold. Scope 3 emissions for the proposal are also expected to exceed 100,000 t CO_2-e per annum.	
Impacts from the proposal	**Assessment finding, environmental outcome and recommended conditions**
GHG emissions estimates	
GHG emissions during construction Scope 1 GHG emissions resulting from construction activities relate to diesel consumption and vegetation clearing. Overall scope 1 emissions during the early construction years of 2025 and 2026 are estimated to be 10,000 t CO_2-e and 48,000 t CO_2-e respectively. Approximately 80% of these emissions are attributable to diesel consumption from mobile and stationary plant and equipment. Vegetation clearing for construction of the proposal is estimated to result in a total of 71,000 t CO_2-e GHG emissions over the life of the proposal. The majority of these emissions (58,000 t CO_2-e; 81%) will occur in the early years of construction, being 2026 to 2029 inclusive. There are no scope 2 GHG emissions associated with construction activities. Scope 3 GHG emissions associated with construction include those generated from purchased goods and services. Total scope 3 emissions during the main construction years of 2025 and 2026 are estimated to be 19,000 t CO_2-e and 50,000 t CO_2-e respectively. The	The proponent's Greenhouse Gas Environmental Management Plan (GHGEMP) and emissions estimates report (Energetics 2022) describe the various methodologies that were used to calculate quantities of proposal GHG emissions. Scope 1 GHG emissions from construction and operations were calculated using the National Greenhouse and Energy Reporting (Measurement) Determination 2008 and National Greenhouse Accounts (NGA) Factors emissions factors (DCCEEW, 2023a) and were based on predicted vehicle fleet, movements, operating times, and typical fuel efficiencies. Direct processing emissions associated with carbonates within the ore and the addition of limestone for neutralisation were calculated based on the chemical characterisation of the orebody and the chemical process. Scope 1 GHG emissions from vegetation clearing were calculated using the Full Carbon Accounting Model and a conversion factor of 12.1 t carbon per hectare, based on the proposal location and rainfall data. Scope 2 emissions are based on the expected electrical demand from the North West Interconnected System (NWIS) grid. The initial scope 2

higher emissions in 2026 reflect the incorporation of operational scope 3 emissions during this period. **GHG emissions during operations** The proponent has provided estimates of operational (2027 – 2038) annual average unmitigated GHG emissions under a 'base case scenario': • Scope 1 – 197,230 t CO_2-e (max 262,000 t CO_2-e in 2032) • Scope 2 – 140,846 t CO_2-e (max 231,000 t CO_2-e in 2027) • Scope 3 – 290,500 t CO_2-e (max 419,000 t CO_2-e in 2033). **Cumulative effects** WA's yearly scope 1 emissions based on 2022 levels were 82.5 million tonnes (Mt) CO_2-e (DCCEEW 2024b) and national emissions for 2022 were 432.9 Mt CO_2-e (DCCEEW 2023a). The annual estimated scope 1 GHG emissions (without mitigation, i.e. the 'base case scenario') from the proposal at commencement of full operations (2028 estimates) would constitute approximately 0.28% of WA's total emissions and 0.05% of Australia's total reported GHG emissions.	emissions were calculated based on the published average electricity emissions intensity of 0.58 tCO_2-e per megawatt hour (MWh) for all generators on the NWIS for the 2022/2023 reporting period. The proponent predicted that scope 2 emissions over the life of the proposal will reduce proportionally to the projected incorporation of renewable energy production into the NWIS as set out in the SERS (Government of Western Australia 2023a). The proponent's scope 2 emissions estimates were based on the assumption that the emissions intensity of the NWIS would reduce as follows: • 0.49 tCO_2-e/MWh in 2027 • 0.41 tCO_2-e/MWh in 2030 based on forecast 30% renewables • 0.09 tCO_2-e/MWh in 2040 based on forecast 85% renewables • 0.03 tCO_2-e/MWh in 2050 based on forecast 95% renewables. Scope 3 emissions were calculated based on proposal information prior to the definitive feasibility study, and the proponent acknowledges that scope 3 emissions estimates are likely to be refined as the proposal becomes better defined. Approximately 80% of scope 3 emissions are related to purchased good and services upstream of the proposal, with 70% of this being for explosives, and the remaining 30% as processing reagents The EPA considers that the proponent's estimated GHG emissions quantities are a reasonable basis for the assessment. However, the EPA recognises that the proponent's estimates for scope 2 emissions are highly reliant on the forecasted rapid incorporation of renewable energy sources into the NWIS.
Baseline emissions avoidance and minimisation, including best practise review and benchmarking	
The proponent has identified the following measures to minimise scope 1 GHG emissions in the GHGEMP: • use of electric non-mining vehicles, including 100% use of electric buses at commencement and 25% of all vehicles at the commencement of full operations in 2028 • use of electric dewatering and borefield pumps, 25% in 2028 • use of energy efficient high-pressure grinding and rolling to achieve particle size reduction • adoption of the energy efficient pressure oxidation hydrometallurgical process that does not require heating inputs.	The proposal has adopted emissions efficient processing methods suitable for the semi-refractory ore to be mined. The pressure oxidation hydrometallurgical process is considered best practice and is less emission-intensive than alternative semi-refractory ore processing methods, such as roasting. The proponent has committed to progressive electrification of mining operations in order to reduce scope 1 emissions. The EPA notes that the expected increase in the proportion of renewable energy production in the NWIS will contribute to overall proposal emissions reductions as electrification of mining operations occurs.

A technical review of the proponent's GHGEMP was undertaken by Worley (2024) that focussed on evaluating whether: • best practice technological measures have been adopted to avoid or reduce the proposal's scope 1 GHG emissions • offsets that satisfy integrity principles are likely to be reasonably practicable and available at the time of proposed future surrender • the proposal is consistent with, or outperforming, relevant sector pathways and milestones.	The EPA notes that the proponent has incorporated electrification of mining equipment at the commencement of operations, with the intention to increase electrification as technological options become more readily available. Alternative fuels, such as biodiesel and green hydrogen have not been proposed as they were not considered suitably available at scale in the Pilbara region at commencement of the proposal. The peer review of the GHGEMP (Worley 2024) concluded that the proponent had demonstrated that the proposal is consistent with best practice for GHG emissions reductions technologies. A benchmarking analysis commissioned by the proponent (Wood 2023) indicates that the proposal's scope 1 and scope 2 emissions intensity is similar to the benchmark intensities of other Western Australian and Australian gold mining operations. The EPA acknowledges that the carbonate content of the ore provides inherent neutralising capacity, but increases the emissions intensity of the proposal relative to other operations where non carbonate neutralising agents are utilised (such as quicklime). The EPA considers that the proponent has adopted upfront avoidance and mitigation measures to reduce GHG emissions from the commencement of operations. Based on the proponent's benchmarking and the findings of the Worley (2024) peer review, the proposal is likely to be consistent with best practice for gold mining and processing operations. Therefore, the proposal is likely to be consistent with the EPA's environmental factor objective to reduce greenhouse gas emissions as far as practicable.
Emissions trajectory to 2050	
The proponent's GHGEMP was prepared in accordance with the 2023 version of the EFG GHG (EPA 2023a) and consequently includes five yearly emissions targets along a linear trajectory to net zero by 2050. The proponent has forecast that the emissions targets would be met under the 'low carbon scenario' without any need for offsets.	The EPA notes that the proponent's emissions trajectory for scope 1 emissions will mitigate approximately 219,000 t CO_2-e over the life of the proposal, compared to the 'base case scenario'. It is noted that under the 'low carbon scenario' the proponent's five yearly emissions targets will be exceeded (i.e. emissions will be less than the targets), resulting in mitigation of approximately 499,000 t CO_2-e over the life of the proposal compared to the 'base case scenario'.
Scope 2 GHG emissions	
The scope 2 emissions arise from sourcing electrical power for the proposal from the NWIS. As noted above, based on the projected incorporation of renewable electricity generation into the NWIS, the proponent estimates that scope 2 emissions for the proposal will	The EPA recognises that scope 2 emissions are influenced by increased electrical demand over the life of the proposal due to the electrification of mining plant and equipment associated with implementation of measures to reduce scope 1 emissions.

achieve a linear reduction in emissions between commencement in 2027 and net zero in 2050. The proponent intends to enter a power purchase agreement (PPA) for the construction of high-efficiency reciprocating gas engines at the Port Hedland Power Station (as approved under Ministerial Statement (MS) 1236), and a 43 MW expansion of the Port Hedland Solar Farm currently under construction.	The base case emissions scenario represents best practice design for the processing plant, building and accommodation camp. Further design improvements are expected to be identified during the detailed design phase. The proponent estimates that a further 20% improvement in scope 2 emissions may be realised through the design of the accommodation village and other buildings. Through the PPA, the EPA considers that the proponent is taking reasonably practicable measures to reduce scope 2 emissions over the life of the proposal. The PPA also enables the proponent to increase the contribution of renewable energy to the proposal over time as renewable energy projects (such as third-party wind projects) in the region become operational. The EPA recognises that the PPA supports the broader incorporation of renewable energy into the NWIS that will service electrical demand beyond the proposal and support regional emissions reductions into the future, including beyond the life of the proposal. It is further noted that the proponent retains the option, through the proposal description and proposed disturbance extent, to develop an onsite solar farm to supplement power supply. The proponent has advised that implementation of the solar farm will be further considered during detailed project design as power requirements are better defined. The EPA recognises that scope 2 emissions for the proposal associated with electricity production at the Port Hedland Power Station are scope 1 emissions for the purposes of that proposal which is subject to implementation conditions under Ministerial Statement 1236. Condition B2 of MS 1236 sets limits on net emissions consistent with the EPA's expectations for emissions reductions, including a linear trajectory to net zero by 2050. In taking the above into account, the EPA is satisfied that scope 2 emissions associated with the proposal are reasonably expected to substantially reduce over the life of the proposal consistent with the EPA's objectives.
Scope 3 GHG emissions	
Annual average scope 3 GHG emissions during operations (2027 to 2038) under a 'base case scenario' are estimated to be 290,500 t CO_2-e, with a maximum of 419,000 t CO_2-e in 2033. Approximately 80% of scope 3 emissions are related to purchased goods and services upstream of the proposal, with approximately 70% of this being for	Scope 3 emissions associated with downstream processing of gold are relatively small compared to processing of other metallic ores, such as iron ore. Notwithstanding, the EPA notes that scope 3 emissions form a large proportion (46%) of total GHG emissions over the life of the proposal and are estimated to exceed 100,000 t CO_2-e per annum.

explosives and the remainder associated with reagents required for ore processing.	The EPA notes that the proponent has taken all practicable measures currently available to reduce scope 3 emissions and that further opportunities to reduce emissions are expected to arise through detailed project design and confirmation of supply chains. The EPA notes that the proponent has advised that energy efficiency and emissions reduction are key criteria in process and equipment selection and expect mitigation opportunities to be identified as the detailed design of the proposal progresses. The EPA encourages the proponent to take all measures it can reasonably take to reduce scope 3 emissions.
Offsets	
The proponent forecasted that emissions offsets will be required to meet the Safeguard Mechanism facility baseline. The proponent intends to acquire and surrender Australia carbon credit units (ACCUs) to reduce the facilities' net emissions below the respective baseline. An estimated 1,635,591 ACCUs will be required over the life of the proposal.	The proponent has undertaken due diligence investigations and has concluded that sufficient offsets are likely to be available over the timeframe of the proposal. The EPA notes that a substantial amount of offsets are proposed to be utilised by the proponent to ensure that net emissions comply with the Safeguard baseline. The proponent forecasted that during operational years, approximately 90% of Safeguard covered scope 1 emissions will be required to be offset. The EPA considers that offsets through ACCUs are expected to be of sufficient integrity. The EPA acknowledges that the proponent has advised that it will consider offset integrity information published by the Emissions Reduction Assurance Committee to inform is selection of ACCUs.
Other decision-making processes, including the Commonwealth Safeguard Mechanism	
Commonwealth Safeguard Mechanism The proponent has identified that the proposal will be a 'designated large facility' under the Commonwealth *National Greenhouse and Energy Reporting Act 2007* (NGER Act). Proposals regulated under the Safeguard Mechanism are required to take actions to reduce emissions to achieve Australian emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050. As a new facility the proposal will be subject to the 'best practice emission intensity' for 'run-of-mine metal ore', which is currently set at 0.00247 t CO_2-e per tonne of ore. Applying the Safeguard Mechanism 4.9% annual decline rate, the proponent expects to be subject to a baseline in the 2028 reporting period (first full year of nameplate	The EPA notes that the proponent expects that covered scope 1 emissions for the proposal will be required to be reduced to achieve national emission reduction targets. The proponent has forecast that the Safeguard Baseline for the proposal will require substantial reductions to the facility's net emissions during operations that greatly exceed the proponent's 'low carbon scenario'. The EPA notes that annual residual scope 1 emissions not covered under the Safeguard Mechanism are well below 100,000 t CO_2-e (max 26,236 t CO_2-e in 2028). The EPA is of the view that emissions reductions required under the Safeguard Mechanism represent an as far as practicable reduction of the proposal's scope 1 GHG emissions, and therefore the likely environmental

capacity production) calculated from an emissions intensity of 0.00192 t CO2-e per tonne of ore. Based on the anticipated production rates and Safeguard baselines, the proponent will be required under the Safeguard Mechanism to significantly reduce scope 1 emissions over the life of the proposal. In 2028 the proponent has forecast that the Safeguard Baseline will be 11% of the covered scope 1 emissions for the proposal and will therefore be required to substantially reduce the facility's net emissions at the commencement of operations. Scope 1 emissions not covered under the Safeguard Mechanism are primarily associated with vegetation clearing and are no more than 12% of the low carbon scenario estimate for 2028 and well below 10% for years 2028 to 2038.	effects of the proposal can be mitigated to achieve consistency with the environmental factor objective for GHG emissions. The EPA has recommended a condition that requires the proponent to notify the State of a substantial change to its obligations under the Safeguard Mechanism (recommended condition B7). The EPA recognises that the Safeguard Baseline is significantly lower (11 % in 2028) than the covered scope 1 emissions for the proposal. Following reforms to the Safeguard Mechanism in 2023, the facility baseline is based on the best practice emissions intensity for 'run-of-mine metal ore'. The best practice emissions intensity was derived based on the based on the top 10% of the Australian industry performance for a broad range of metal ore projects, not limited to gold. The EPA acknowledges that the emissions intensity of mining projects is highly dependent on variables that are often beyond the control or influence of the proponent, such as the location, depth, and geochemical nature of the orebody. The adopted best practice emissions intensity benchmark for 'run-of-mine metal ore' may be a reflection of the unique operating conditions of 10% of Australian mining operations. The EPA notes that the best practice emissions intensity for 'run-of-mine metal ore' is approximately 25% of the default emissions intensity, which is relatively low compared to other mining activities specified in the Safeguard Mechanism, such as lithium ore (69%) iron ore (39%) and manganese ore (94%). In addition to the above, the Hemi gold proposal is comparatively scope 1 emissions intensive in the context of other Australian metal ore mining operations because: • the proposal includes the full feasible lifecycle of gold mining and processing, through to production of raw gold bars onsite • the ore is semi-refractory and requires more intensive means of processing to extract the gold • the ore contains natural carbonates that release carbon dioxide during processing. Whilst the proposal is considered consistent with best practice for gold mining internationally and within the Australian context, the EPA recognises that there are limited opportunities and technological constraints for increased emissions reductions above what has been proposed. As the applicable best practice emissions intensity is relatively low, the corresponding Safeguard facility baseline for the proposal is significantly

	lower than the forecast covered scope 1 emissions, even under the low carbon scenario. The EPA acknowledges that a substantial quantity of offsets are expected to be required for the proposal to meet the emissions reductions required under the Safeguard Mechanism. The EPA advises that carbon offsets required should demonstrate they meet offset integrity principles, and be based on clear, enforceable and accountable methods.

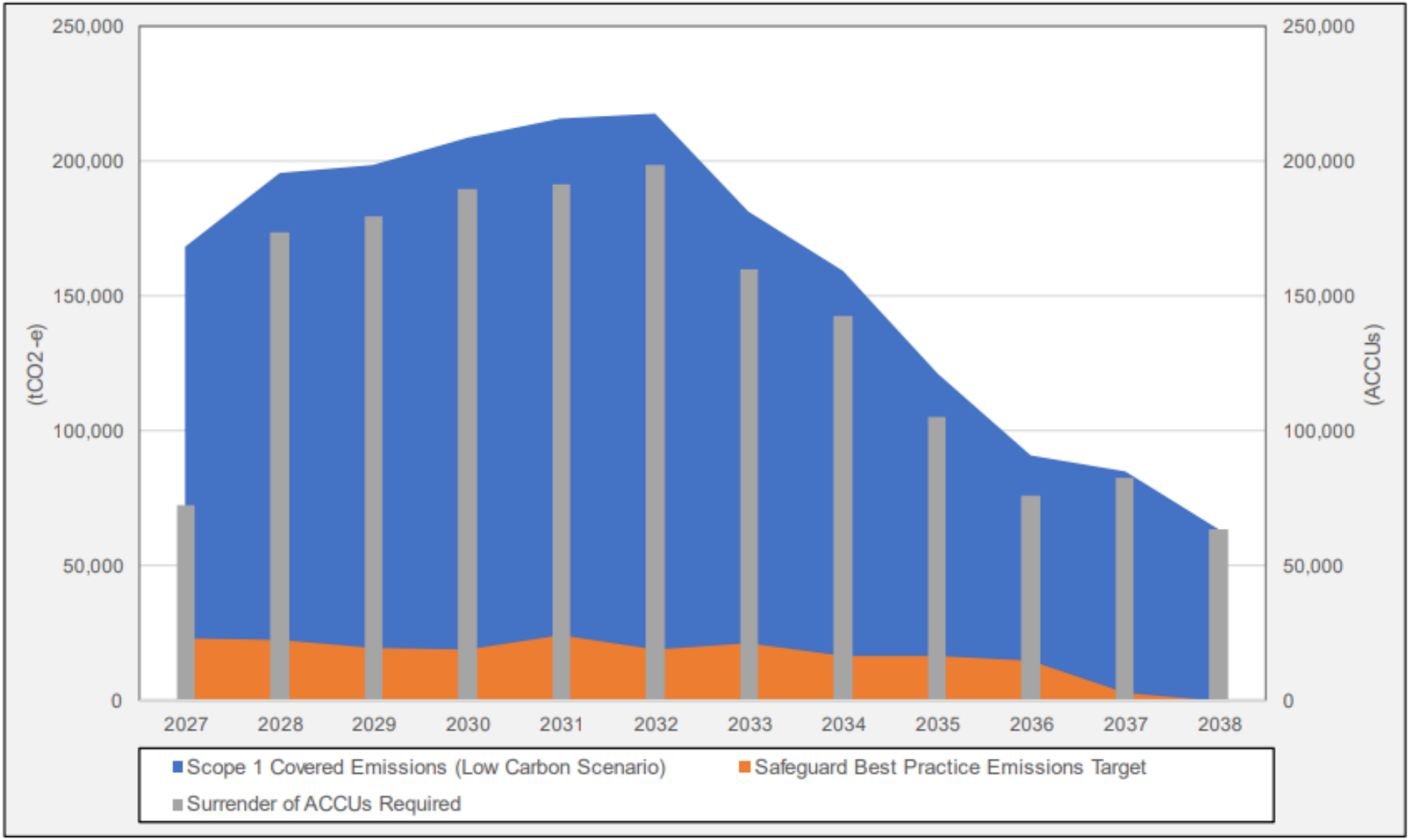

Figure 5 Scope 1 emissions and Safeguard baseline (De Grey 2024a)

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

The EPA recognises that the significantly strengthened Commonwealth Safeguard Mechanism requires the proponent to take actions to reduce GHG emissions, including imposing annual baseline decline rates to ensure Australian emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050 are achieved. The EPA is of the view that emissions reductions required under the Safeguard Mechanism, in conjunction with best practise measures represents as far as practicable for the reduction of greenhouse gas emissions from the proposal. . The EPA notes that the large difference between the Safeguard facility baseline for the proposal and the forecast covered scope 1 emissions will provide an ongoing incentive for the proponent to implement further emissions reductions as new technologies become available. The EPA has recommended a condition that requires the proponent to notify the State of a substantial change to its obligations under the Safeguard Mechanism (recommended condition B7).

The EPA notes that scope 2 emissions of 140,846 t CO_2-e per annum (average) exceeds the 100,000 t CO_2-e per annum threshold in the EFG GHG (EPA 2024b). These emissions are associated with the consumption of purchased electricity sourced from the NWIS. The EPA notes the proponent's commitment to mitigate scope 2 emissions through a power purchase agreement that will contribute to reducing emissions of the NWIS through construction of high-efficiency reciprocating gas engines at the Port Hedland Power Station and expansion of the Port Hedland Solar Farm. The EPA also acknowledges the decarbonisation of the NWIS through State government's commitment to net zero GHG emissions by 2050 and SERS for Western Australia (Government of Western Australia 2023a) which provides pathways for this transition to net zero emissions and decarbonisation. The EPA acknowledges the proponent's proposed commitments to mitigate scope 2 emissions and emissions reduction targets and the EPA is satisfied that scope 2 emissions associated with the proposal are reasonably expected to substantially reduce over the life of the proposal consistent with the EPA's objectives. The EPA has therefore not recommended conditions relating to scope 2 emissions for the proposal. The EPA supports the mitigation measures proposed and the continued reduction of scope 2 emissions to ensure the environmental outcome is consistent with the EPA objective for GHG emissions.

Scope 3 emissions form a large proportion (46%) of total GHG emissions over the life of the proposal and are estimated to exceed 100,000 t CO2-e per annum. The EPA notes that the proponent has taken all practicable measures currently available to reduce scope 3 emissions, and encourages the proponent to take further reasonable opportunities to reduce emissions as they arise through the life of the project to reduce scope 3 emissions.

2.6 Social surroundings

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

The proponent submitted the following investigations and surveys for assessment:

- Air quality assessment (ETA 2022)
- Confidential Aboriginal heritage sites (De Grey 2025c)
- Definitive feasibility study - Conceptual and numerical groundwater modelling (Geowater Consulting, 2023)
- Environmental noise assessment (HAS 2022)
- Stakeholder consultation register (De Grey 2024c)
- Technical review - Definitive feasibility study - Conceptual and numerical groundwater modelling (Jurassic Groundwater, 2023).

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

The EPA sought advice from the Department of Health in relation to the dust emissions modelling that were considered as part of this assessment.

Table 7: Assessment for social surroundings

Key environmental values and context	
The proposal is located entirely within with Kariyarra Native Title Determination (WCD2018/01), and consultation with the Traditional Owners has been facilitated by the Kariyarra Aboriginal Corporation (KAC). The proponent has advised that they have engaged in consultation with representatives for the Kariyarra People, including workshops with apical ancestor family groups from January 2021, and archaeological and ethnographic surveys from 2018. A Native Title Mining Agreement has been reached between the proponent and the KAC, executed on the 15 December 2022. The proponent has provided a confidential report summarising the findings of the archaeological and ethnographic surveys that have been conducted. 21 sites were recorded within and adjacent to the development envelope, with 15 determined to be artifact scatters, three determined to be ethnographic sites, two water sources (the Yule and Turner Rivers), and one stone cairn. The Kariyarra people have stressed the social and cultural significance of the Yule and Turner Rivers and importance of maintaining the health of these river systems. The Yule River (Site 06655) and Turner River (Site 06653) were both deregistered by DPLH in 2001, however, the KAC have advised that they intend to register both sites. The proposal is predominately located within the Indee Pastoral Station boundary, with a small portion of the northern infrastructure corridors intersecting the Mundabullangana Pastoral Station. The landscape in which the proposal is located is relatively flat, and as such, any permanent landforms are likely to reduce visual amenity, as well as limit existing access to country. One European heritage site is located approximately 13 km east of the Hemi deposits and is the site of the Indee Station plane crash, registered on 28 November 2007.	
Impacts from the proposal	**Assessment finding, environmental outcome and recommended conditions**
Potential impacts • removal or disturbance of registered Aboriginal heritage sites • impacts to social and cultural values associated with changes to surface and groundwater quality and regimes • reduction in amenity and landscape values due to the formation of pit lakes and permanent landforms post-closure • loss of access to country • impacts to amenity from noise, dust, and light emissions • impacts to cultural values associated with the Yule River from groundwater drawdown • impacts to cultural values associated with the Turner River from the discharge of excess water. **Avoidance and minimisation measures (including regulation by other DMAs)**	**Assessment finding and environmental outcomes** <u>Aboriginal cultural heritage</u> The EPA acknowledges that the proponent has taken reasonable steps to consult with the KAC about the impacts associated with implementation of the proposal, and the EPA has used this information to inform its assessment. The EPA considers that direct impacts to Aboriginal heritage sites can be adequately addressed through the regulatory process under the AH Act and has recommended standard condition B6-1(1) to reflect this. The potential indirect impacts to values of Aboriginal cultural heritage can be minimised through reasonable conditions as recommended under other environmental factors. For example, recommended condition B1-1(1) for no detectable decrease to the water level or quality of pools in the Yule River.

• avoid direct impacts to ethnographic sites, such as the sand dune and ridgeline • commitment to minimise adverse impacts to Aboriginal cultural heritage • ensure ongoing access to the sand dune • lighting with be designed and shielded to minimise light spilling • minimise dust emissions through standard suppression techniques such as speed limits and water trucks • rehabilitation will be undertaken in consultation with the Traditional Owners • implementation of the EMP and MCP • direct impacts to Aboriginal cultural heritage sites can be adequately addressed under the *Aboriginal Heritage Act 1972* (AH Act) • impacts associated with emissions and discharges (including noise and dust emissions, and leaks and spill) can be adequately addressed through works approval and license under Part V of the EP Act. • impacts associated with the discharge of excess water can be reduced through a works approval and license under Part V of the EP Act • impacts associated with the abstraction of groundwater can be minimised through a 5C application under the RiWI Act. **Consultation** The key matters raised during the consultation period include; • lack of clarity on the potential impacts associated with groundwater drawdown, including post-closure impacts and cumulative impacts to neighbouring third party users • the proposed monitoring of groundwater drawdown and discharge of surplus water are insufficient to effectively manage the potential impacts to values of the Yule River, and Turner River, respectively • the proponent has not adequately considered direct and indirect impacts to values of Aboriginal cultural heritage	The proponent proposed the inclusion of an objective to minimise adverse impacts to Aboriginal cultural heritage within and surrounding the development envelope, which is reflected in recommended condition B6-2. <u>Amenity</u> The EPA considers that the potential impacts associated with noise, dust, and light emissions are unlikely to represent significant residual impacts on amenity values due to the distance between sites and mining infrastructure. The EPA has assessed the potential impacts on visual amenity and landscape values from the inclusion of permanent landforms in a relatively flat landscape. The proponent has committed to consulting with the Traditional Owners about the rehabilitation and closure of the proposal, with is reflected in recommended condition B6-4. Subject to this condition, and the rehabilitation outcomes and measures in recommended condition B5, the inclusion of permanent landforms is unlikely to represent a significant residual impact on visual amenity. <u>Other social surroundings values</u> No impacts to European heritage sites are expected, due to the distance between the development envelope and the sites. The proposal is likely to reduce groundwater availability in third-party bores, however, the proponent has committed to ensuring these bores are deepened or replaced, as discussed in Section 2.1 above. **Cumulative impacts** The proponent has conducted an assessment of the cumulative impacts across the Kariyarra Native Title determination area. Approximately 10% of the determination area is already subject to approved disturbance, and the proposal would add an addition 2.3%. Subject to ongoing consultation with the Traditional Owners, the overall cumulative impact to values of Aboriginal cultural heritage is not expected to be inconsistent with the EPA's objective for social surroundings. **Recommended conditions to ensure consistency of environmental outcome with EPA objective** Condition A1 • limits and extents on proposal Condition B1 • limits on maximum groundwater drawdown extent

• stakeholders have not been adequately consulted.	• limits on quality and quantity of water discharged to the Turner River • limits on quality and quantity of water reinjected to groundwater • no impacts to the surface water pools in the Yule River Condition B4 • revise and implement the EMP Condition B5 • rehabilitation of landforms • revise and implement the MCP Condition B6 • no disturbance to Aboriginal cultural heritage sites unless consent is granted under the AH Act • no loss of access to country • minimise adverse impacts to Aboriginal cultural heritage • consult with the Traditional Owners about the achievement of conditions and design of permanent landforms.

3 Holistic assessment

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

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

There is a high-level of connectivity between flora and vegetation, terrestrial fauna, inland waters, and subterranean fauna. Flora and vegetation, terrestrial fauna, and subterranean fauna have an integral reliance on inland waters to sustain and maintain growth. The surface water catchments and groundwater aquifers support groundwater-dependent ecosystems such as vegetation and fauna habitat. Surface water pools and the river systems provide a source of water for flora and vegetation and terrestrial fauna species and supports habitat for conservation significant and short-range endemic species. Minimising impacts to values of inland waters will also minimise impacts to conservation significant flora and fauna species, vegetation, subterranean fauna, and fauna habitat. It is noted that the key values associated with the Yule River and Turner River are primarily located along the length of the river, rather than between the two river systems.

Conservation significant flora and vegetation provides shelter, dispersal, foraging, breeding, and/or roosting habitat for significant fauna, such as the greater bilby, northern quoll, and grey falcon. Minimising impacts to flora and vegetation will minimise impacts to terrestrial fauna.

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

Greenhouse Gas Emissions

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

The EPA considers that the Safeguard Mechanism and the proposed conditions relating to GHG emissions will ensure that the impacts to other factors and values of the environmental are likely to be consistent with the EPA environmental factor objectives.

Social surroundings

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

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

Conclusion

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

4 Offsets

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

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

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

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

In the case of this proposal, likely (and potential) significant impacts are:
- loss of flora and vegetation values
- loss of significant fauna habitat values.

In applying the residual impact significance model (Government of Western Australia 2014), the EPA considers the proposal would result in significant residual impacts to:
- 'Good' to 'Excellent' condition native vegetation
- riparian vegetation, including groundwater-dependent vegetation
- critical habitat for the greater bilby, grey falcon, night parrot, northern quoll, and Pilbara olive python.

The EPA has concluded that the clearing of habitat is a significant residual impact on its own, in the context of the proposal, and in the context of the biological diversity and ecological integrity in the local area, as it provides habitat for threatened fauna species. Due to the remaining quantity and quality of habitat types in the local area and region, the EPA considers that some of the significant residual impacts could be counterbalanced through a contribution to the PEOF. The EPA considers future PEOF projects are expected to be able to collectively counterbalance the significant impacts from the clearing of native vegetation and critical fauna habitat of the proposal. The EPA notes the PEOF Governance Framework (DWER 2019) states

that projects will aim to counterbalance the significant residual impacts that have been identified in Ministerial Statements with projects that are designed to deliver enduring and long-term strategic conservation outcomes in the Pilbara. The PEOF Implementation Plans identify the significant residual impacts for which contributions to the Fund have been made and how they will be addressed.

The EPA recommends condition B8 be imposed on the proponent to provide an offset in the form of a contribution to the PEOF, to counterbalance most of the significant residual impacts of the proposal. PEOF has been consulted regarding this proposal and has been informed of the environmental values requiring offset through the program. PEOF has confirmed that the environmental values anticipated to be impacted by this proposal are consistent with those addressed by other offset projects currently being implemented or developed under the program.

The EPA recommends that the following offset rates (calculated on the 2023-2024 financial year, subject to annual indexation) should apply in the form of a contribution to the PEOF (condition B8) for landscape-scale actions to protect biodiversity in the Pilbara:

- $932 AUD (excluding GST) per hectare of **'Good' to 'Excellent' condition native vegetation** cleared as a result of the proposal within the Chichester **IBRA** subregion;
- $986 AUD (excluding GST) per hectare of **'Good' to 'Excellent' condition native vegetation** cleared as a result of the proposal within the Roebourne **IBRA** subregion;
- $1,864 AUD (excluding GST) per hectare of the following values cleared within the Chichester **IBRA** subregion as a result of the proposal:
    - greater bilby (*Macrotis lagotis*) **critical habitat**;
    - grey falcon (*Falco hypoleucos*) **critical habitat**;
    - night parrot (*Pezoporus occidentalis*) **critical habitat**;
    - northern quoll (*Dasyurus hallucatus*) **critical habitat**; and
    - Pilbara olive python (*Liasis olivaceus barroni*) **critical habitat**.
- $1,972 AUD (excluding GST) per hectare of the following values cleared within the Roebourne **IBRA** subregion as a result of the proposal:
    - greater bilby (*Macrotis lagotis*) **critical habitat**; and
    - night parrot (*Pezoporus occidentalis*) **critical habitat**.

5 Recommendations

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

- environmental values which may be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- likely environmental outcomes which can be achieved with the imposition of conditions
- consistency of environmental outcomes with the EPA's objectives for the key environmental factors
- the 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, and
- principles of the EP Act.

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

6 Other advice

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

Scope 2 greenhouse gas emissions

The EPA notes that the proponent's scope 2 GHG emissions estimates, and associated reduction in emissions over the life of the proposal, are reliant on the forecasted rate of incorporation of renewable energy into the NWIS as set out in the SERS (Government of Western Australia 2023a). Consistent with the State government's commitment to net zero GHG emissions by 2050, the SERS forecasts that up to 85% of the NWIS will be generated from renewable energy sources. Consistent with the EFG GHG, the EPA expects that proponents undertake reasonably practicable measures and explore alternatives to avoid or reduce scope 2 emissions at commencement and consider options to mitigate scope 2 emissions throughout the life of the proposal. The EPA acknowledges that in most instances there are limited opportunities available to proponents to materially avoid or reduce scope 2 emissions where grid connection is the only reasonable option.

The EPA therefore strongly encourages the continued WA Government support of decarbonisation of the State's interconnected electricity grids, including through strategic policy initiatives supported by public reporting of progress against adopted targets.

Cumulative pressure on water resources

Due to the increasing pressures on water resources, improved resolution on potential impact sources is critical to the cumulative impact assessment on water resources. While regulation of water resources can occur through both Part IV of the EP Act and the RiWi Act, the EPA notes that users seeking to access water resources are not guaranteed an entitlement under the RiWi Act to the level the EPA has considered is consistent with its objectives. Any entitlement issued under RiWi Act incorporates its own risk assessment process as a key part of its licensing and approval processes for water use and related activities, and this separate regulatory process may determine a lesser entitlement is warranted.

The EPA recognises the separate but potentially competing users accessing or seeking to access water resources in the vicinity of the Hemi Gold proposal area. The EPA encourages relevant users to work together to maximise beneficial uses and ultimately minimise pressure on water resources. Further, following recent legislative amendments to the EP Act and policy changes with respect to parallel processing and parallel approvals, the EPA recommends proponents engage early across relevant regulatory pathways and leverage new parallel assessment/approval processes to avoid potential misalignment between EP Act and RiWi Act regulatory outcomes.

7 Proponent's application of the Interim Guidance - Environmental outcomes and outcomes-based conditions (2021)

During the assessment, the proponent advised the EPA of how incorporating clear environmental outcomes in project planning played a key role in improving the efficiency of environmental impact assessment and proponent decision making.

The EPA supports the proponent's approach to identifying relevant environmental outcomes and then designing its proposal to meet those pre-determined outcomes. The EPA encourages all proponents to consider environmental outcomes as early as possible in the development of their proposal. De Grey Mining advised the EPA that this process allowed for the elimination of certain activities early in project planning, such as the discharge of excess water to the Yule River.

The following paragraphs were provided by the proponent to describe its approach to setting environmental outcomes:

> *"The De Grey Environment Team identified the environmental values of the Hemi Gold Project early in the development and discovery phase. Once the environmental values associated with the project were identified, a series of workshops were held to discuss Key Environmental Factors, outlining the EPA objectives associated with each factor, interactions with other factors and significance to external stakeholders including Traditional Owners and Pastoralists. The Executive Leadership, De Grey management and the environment teams, then identified how each value may be impacted by the project and the opportunities that existed to protect these values.*
>
> *During these workshops, environmental outcomes were presented that would allow for the avoidance or mitigation of impacts to significant features. For example, the cultural and ecological values of the Yule River were identified, and it was agreed that the project would avoid impacts to the environmental and cultural values of the Yule River. An outcome was then workshopped to guide decision-making in all aspects of project design and development, which meant that where a proposed activity was identified to impact these values, it was immediately discarded in favour of options that ensured their protection. This process ensured that senior leadership was involved in the decision making and it was a companywide commitment. The risks and opportunities of each environmental outcome were presented and circulated as a decisions note, and signed off by relevant executives to ensure this decision could be carried forward throughout the project design. It was anticipated that conditions could be easily adapted from the proposed environmental outcomes and that this would allow for a streamlined approval process."*

Where relevant to potentially significant environmental impacts, the EPA has translated the proponent's outcomes as recommended outcome-based conditions in Appendix 1.

Appendix A: Recommended conditions

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

Recommended Environmental Conditions

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

HEMI GOLD PROJECT

Proposal: This Proposal is for the construction and operation of the Hemi Gold Project, located 85 km south of Port Hedland. The Proposal includes excavation of open pits; mine dewatering; surplus water management including reinjection and controlled discharge; construction of waste rock landforms and low-grade stockpiles; and construction and operation of on-site processing facilities, an integrated waste landform tailings storage facility and other supporting infrastructure.

Proponent: De Grey Mining Limited
Australian Business Number 65 094 206 292

Proponent address: 2 Kings Park Road
WEST PERTH WA 6005

Assessment number: 2380

Report of the Environmental Protection Authority: 1785

Introduction: Pursuant to section 45 of the *Environmental Protection Act 1986,* it has been agreed that the proposal entitled Hemi Gold Project described in the 'Proposal Content Document' attachment of the referral of 20 June 2023, 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		
Development envelope	Figure 1	No more than 22,194 **ha**.
Disturbance footprint	Within the **development envelope** shown in Figure 1	No more than 5,830 **ha** within a 22,194 **ha development envelope**.
Direct **disturbance** of native vegetation	Within the **development envelope** shown in Figure 1	Clearing of no more than 5,830 **ha** of **'Good' to 'Excellent' condition native vegetation** within a 22,194 **ha development envelope**.
Gregory Land Systems PEC	Figure 2	No direct **disturbance**, aside from **low impact activities** to support environmental monitoring and management.
Operational elements		
Groundwater abstraction	N/A	Up to: • 30 **GL/a** for the first three years, • 15 **GL/a** for years 4 to 8, and • 10 **GL/a** for the remainder of the mine life.
Management of surplus water	N/A	Allowable disposal methods of surplus water: • use on site, • aquifer reinjection, • provision to other users, and • controlled discharge into the Turner River.
Aquifer reinjection	N/A	No groundwater mounding within 2 **m** of the surface.

Controlled discharge to the Turner River	N/A	Up to: • 10 **GL/a** for the first 3 years, • 4 **GL/a** for years 4 to 6, and • 2 **GL/a** for the remainder of the mine life.
Wetting front	Figure 2	Wetting front not to exceed **predicted wetting front extent** from the point of discharge under natural no-flow conditions.
Tailings deposition	N/A	Up to 130 **Mt** of wet tailings.
Timing elements		
Mine life	N/A	Up to 15 years from the date of **ground disturbing activities** (closure not included).

PART B – ENVIRONMENTAL OUTCOMES, PRESCRIPTIONS AND OBJECTIVES

B1 Inland waters and subterranean fauna

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

(1) no **detectable** decrease to the water level and water quality of any semi-permanent or permanent pools in the Yule River, compared to **baseline**;

(2) no **detectable** decrease in groundwater quality within 14 **km** of Reserve 33015, as shown in Figure 3, compared to **baseline**;

(3) groundwater drawdown does not exceed the **predicted drawdown extent**;

(4) water quality discharged to the Turner River does not exceed **water quality standards and criteria**;

(5) water quality reinjected to the **reinjection borefields** do not exceed **water quality standards and criteria**; and

(6) **disturb** no more than 18% of the total volume of all **stygofauna habitat** within the **3D habitat modelling area** and **disturb** no more than 31% of the volume of any **stygofauna habitat** type within the **3D habitat modelling area**.

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

(1) avoid, where practicable, or otherwise minimise impacts to **riparian vegetation** and fauna habitat from:

(a) water discharged to the Turner River; and

(b) groundwater drawdown within the **Yule River Water Reserve**.

(2) minimise **adverse impacts** to **Moorambine Pool.**

B2 Flora and vegetation

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

(1) **disturb** no more than the following within the **development envelope**:

(a) 18.4% of *Abutilon* sp. *Pritzelianum (S. van Leeuwen 5095)* (P3);

(b) 33.7% of *Euploca mutica* (P3);

(c) 30.2% of *Gymnanthera cunninghamii* (P3);

(d) 32.4% of *Rothia indica* subsp. *australis* (P3);

(e) 6.3% of *Triodia chichesterensis* (P3); and

(f) 13.7% of *Polymeria* sp. nov (undetermined).

(2) no indirect **disturbance** to the **Gregory Land System PEC**, including from dust deposition or the introduction or spread of **environmental weeds**, compared to **baseline**.

B3 Terrestrial fauna

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

(1) **disturb** no more than:

(a) 5,786.7 **ha** of **sandplain habitat types**;

(b) 10.0 **ha** of **major river** habitat; and

(c) 33.3 **ha** of **stony hills** habitat.

(2) **disturb** no more than 41.0 **ha** of **dispersal and foraging habitat** for the northern quoll (*Dasyurus hallucatus)*;

(3) no **detectable** increase in feral animal abundance in the **development envelope** from **baseline** levels during the life of the proposal relative to suitable reference sites; and

(4) no **clearing** of **hollow forming trees** within **major river** habitat.

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

(1) avoid, where practicable, or otherwise minimise impacts to **critical habitat**, including from dust emissions, spread or introduction of **environmental weeds**, fire, altered hydrological regimes, habitat fragmentation and **contamination**.

B3-3 Prior to **ground disturbing activities**, the proponent must undertake the following actions:

(1) within seven (7) days prior to **clearing sandplain habitat types**, using a licensed **fauna spotter**, undertake **pre-clearance surveys** of the areas to be cleared to detect presence of greater bilby (*Macrotis lagotis*) and night parrot (*Pezoporus occidentalis*);

(2) within seven (7) days prior to **clearing major river** habitat or **dispersal and foraging habitat**, using a license **fauna spotter**, undertake **pre-**

clearance surveys of the areas to be cleared to detect presence of northern quoll (*Dasyurus hallucatus*);

(3) within seven (7) days prior to **clearing major river** habitat, using a licensed **fauna spotter**, undertake **pre-clearance surveys** of the areas to be cleared to detect presence of Pilbara olive python (*Liasis olivaceous barroni*) and **hollow forming trees**;

(4) where greater bilby (*Macrotis lagotis*), night parrot (*Pezoporus occidentalis*), northern quoll (*Dasyurus hallucatus*), or Pilbara olive python (*Liasis olivaceous barroni*) are identified, **ground disturbing activities** shall not commence in that location until:

(a) the finding has been notified to the **CEO** and **DBCA**; and

(b) either:

(i) the individual (with the exception of the night parrot (*Pezoporus occidentalis*)) has been relocated by a licensed **fauna handler** to **critical habitat**; or

(ii) the individual has been observed by the **fauna spotter** to have moved on from the area to adjoining **critical habitat**; or

(iii) the **fauna spotter** considers that the individual no longer occurs in the area to be cleared.

B3-4 During **construction activities** and **operations**, vehicle and machinery speed limits within the **development envelope**, excluding the Great Northern Highway, **active mining areas** and **emergency response vehicles**, shall not exceed:

(1) 60 **km/hr**; and

(2) 40 **km/hr** on unsealed roads during **night-time** hours.

B4 Environmental Management Plan

B4-1 The proponent must review and update the *Environmental Management Plan (Revision 2, 25 March 2025)* that satisfies the requirements of condition C4 and C5 and demonstrates how achievement of the **outcomes** in condition B1-1(1), condition B1-1(2), condition B1-1(3), B1-1(6), condition B2-1, and condition B3-1(3), the **objectives** in condition B1-2 and condition B3-2, and the prescriptive requirements in condition B3-3 will be monitored and substantiated and submit it to the **CEO**.

B4-2 The environmental management plan as required by condition B4-1 must contain adaptive management measures for the night parrot (*Pezoporus*

occidentalis), in the event they are identified in the **pre-clearance surveys** as required under condition B3-3(1).

B5 Rehabilitation

B5-1 The proponent must ensure the implementation of the proposal achieves the following environmental **outcomes**:

(1) rehabilitated vegetation and fauna habitat are **self-sustaining**;

(2) rehabilitated areas are consistent with the species diversity and abundance of native vegetation within comparative analogue or reference sites; and

(3) rehabilitated landforms are stable and do not cause **pollution** or **environmental harm**.

B5-2 The proponent must ensure:

(1) rehabilitation includes the use of native seeds and propagated material collected from native vegetation within the proposal disturbance footprint; and

(2) 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.

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

B6 Aboriginal cultural heritage

B6-1 The proponent must ensure the implementation of the proposal achieves the following environmental **outcomes**:

(1) no **disturbance** to **Aboriginal cultural heritage sites** in the proposal disturbance footprint, unless consent is granted to disturb that site under the *Aboriginal Heritage Act 1972* and has involved reasonable steps to consult with the **relevant Traditional Owners**; and

(2) subject to reasonable health and safety requirements, no interruption of ongoing access to land utilised for traditional use or custom by the **relevant Traditional Owners**.

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

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

B6-3 The proponent must take reasonable steps to consult with the **relevant Traditional Owners** about the achievement of the **outcomes** in condition B1-1(1), condition B1-1(4), condition B5-1, and condition B6-1(2) and the **objectives** in condition B1-2 and condition B6-2 for the life of the proposal.

B6-4 The proponent must take reasonable steps to consult with the **relevant Traditional Owners** about:

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

B7 Greenhouse gas emissions

B7-1 The proponent must notify the **CEO** in writing within one month of it becoming aware that implementation of the proposal will not be or is not expected to be regulated under the **Safeguard Legislation** as a designated large facility (the notifiable event) and such notice must briefly describe the reasons for and expected duration of the notifiable event.

B7-2 The proponent must, if requested in writing by the **CEO**, provide the **CEO** with a report on the implications for the proposal of any amendment or proposed amendment to the **Safeguard Legislation**, or a decision or proposed decision made under the **Safeguard Legislation** that is specified in the **CEO's** request.

B7-3 The report required by condition B7-2 must:

(1) be submitted to the **CEO** within three months of the date of the **CEO's** request or such longer period as the **CEO** agrees to in writing; and

(2) explain the implications that the specified amendment or decision has had or is expected to have on:

(a) the obligation to reduce net **Scope 1 greenhouse gas emissions** from implementation of the proposal under the **Safeguard Legislation**; and

(b) the quantity of actual and net **Scope 1 greenhouse gas emissions** likely to result from the future implementation of the proposal.

B8 Pilbara Environmental Offsets Fund

B8-1 The proponent must contribute funds to the **Pilbara Environmental Offsets Fund** calculated pursuant to condition B8-2, to achieve the **objective** of counterbalancing the significant residual impacts to:

(1) '**Good' to 'Excellent' condition native vegetation**;

(2) **riparian vegetation**; and

(3) **critical habitat** for the greater bilby (*Macrotis lagotis*), grey falcon (*Falco hypoleucos*), night parrot (*Pezoporus occidentalis*), northern quoll (*Dasyurus hallucatus*), and Pilbara olive python (*Liasis olivaceus barroni*) subject to any reduction approved by the **CEO** under condition B8-9.

B8-2 The proponent's contribution to the **Pilbara Environmental Offsets Fund** must be paid biennially, with the amount to be contributed calculated based on the clearing undertaken in each year of the biennial reporting period in accordance with the rates in condition B8-3. The first biennial reporting period must commence from **ground disturbing activities** of the **environmental values** identified in condition B8-3.

B8-3 Calculated on the 2023-2024 financial year, the contribution rates are:

(1) $932 AUD (excluding GST) per hectare of **'Good' to 'Excellent' condition native vegetation** cleared as a result of the proposal within the Chichester **IBRA** subregion;

(2) $986 AUD (excluding GST) per hectare of **'Good' to 'Excellent' condition native vegetation** cleared as a result of the proposal within the Roebourne **IBRA** subregion;

(3) $1,864 AUD (excluding GST) per hectare of the following values cleared within the Chichester **IBRA** subregion as a result of the proposal:

(a) greater bilby (*Macrotis lagotis*) **critical habitat**;

(b) grey falcon (*Falco hypoleucos*) **critical habitat**;

(c) night parrot (*Pezoporus occidentalis*) **critical habitat**;

(d) northern quoll (*Dasyurus hallucatus*) **critical habitat**; and

(e) Pilbara olive python (*Liasis olivaceus barroni*) **critical habitat**.

(4) $1,972 AUD (excluding GST) per hectare of the following values cleared within the Roebourne **IBRA** subregion as a result of the proposal:

(a) greater bilby (*Macrotis lagotis*) **critical habitat**; and

(b) night parrot (*Pezoporus occidentalis*) **critical habitat**.

B8-4 The rates in condition B8-3 change annually each subsequent financial year in accordance with the percentage change in the **CPI** applicable to that financial year.

B8-5 To achieve the **objective** in condition B8-1 the proponent must revise the *Impact Reconciliation Procedure - Hemi Gold Project, De Grey Mining, 25 March 2025*, and submit to the **CEO** for approval. This procedure must:

(1) spatially define the **environmental values** identified in condition B8-1;

(2) spatially define the areas where offsets required by condition B8-1 are to be exempt;

(3) include a methodology to calculate the amount of **clearing** undertaken during each year of the biennial reporting period for each of the **environmental values** identified in condition B8-3;

(4) state that clearing calculation for the first biennial reporting period will commence from **ground disturbing activities** in accordance with condition B8-2 and end on the second 30 June following commencement of **ground disturbing activities**;

(5) state that clearing calculations for each subsequent biennial reporting period will commence on 1 July of the required reporting period, unless otherwise agreed by the **CEO**; and

(6) be prepared in accordance with *Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports* (March 2024) (or any subsequent revisions).

B8-6 The proponent must submit an Impact Reconciliation Report in accordance with the **confirmed** Impact Reconciliation Procedure in condition B8-5.

B8-7 The Impact Reconciliation Report required pursuant to condition B8-6 must:

(1) provide the location and spatial extent of the **clearing** undertaken as a result of the proposal during each year of each biennial reporting period; and

(2) include evidence that **clearing** undertaken in any area was necessary for the commencement of proposal-related activities or **operations** in that cleared area within six (6) months of the **clearing** having occurred.

B8-8 The proponent may apply in writing and seek the written approval of the **CEO** to reduce all or part of the contribution payable under condition B8-2 where:

(1) a payment has been made to satisfy a condition of an approval under the *Environment Protection and Biodiversity Conservation Act 1999* in relation to the proposal; and

(2) the payment is made for the purpose of counterbalancing impacts of the proposal on matters of national environmental significance.

B8-9 The **CEO** may grant approval to discount the amount payable under condition B8-1(3) if the **CEO** is satisfied that the payment will offset the significant residual impacts of the proposal.

B8-10 Condition C2 applies to the **confirmed** Impact Reconciliation Procedure required by condition B8-5 as if it were an environmental management plan.

B8-11 Failure to implement a **confirmed** Impact Reconciliation Procedure or submit an Impact Reconciliation Report as required by condition B8-6 represents a non-compliance with these conditions.

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:

(1) **ground disturbing activities** until the **CEO**, on advice of **DBCA**, has confirmed in writing that the environmental management plan required by condition B4-1 meets the requirements of that condition, condition B4-2, condition C4 and condition C5; and

(2) **ground disturbing activities** until the **CEO** has confirmed in writing that the Impact Reconciliation Procedure required by condition B8-5 meets the requirements of that condition.

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

(1) **threshold criteria** that provide a limit beyond which the environmental **outcomes** are not achieved;

(2) **trigger criteria** that will provide an early warning that the environmental **outcomes** are not likely to be met;

(3) monitoring parameters, sites, control/reference sites, methodology, timing and frequencies which will be used to measure **threshold criteria** and **trigger criteria**. Include methodology for determining alternate monitoring sites as a contingency if proposed sites are not suitable in the future;

(4) **baseline** data;

(5) data collection and analysis methodologies;

(6) adaptive management methodology;

(7) **contingency measures** which will be implemented if **threshold criteria** or **trigger criteria** are not met; and

(8) reporting requirements.

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

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

C5-1 The environmental management plans required under condition B4-1 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
3D habitat modelling area	The spatial area as defined by the modelling boundaries in the *Subterranean fauna habitat assessment - Hemi Gold Project, De Grey Mining Ltd, 24 October 2024*, namely, the coordinates (627551, 7731751), (676251, 7731751), (627551, 7661251) and (676251, 7661251).
Aboriginal cultural heritage	Means the tangible and intangible elements that are important to the Aboriginal people of the State, and are recognised through social, spiritual, historical, scientific or aesthetic values, as part of Aboriginal tradition to the extent they directly affect or are affected by physical or biological surroundings.
Aboriginal cultural heritage site(s)	Means an Aboriginal site as defined in section 5 of the *Aboriginal Heritage Act 1972*.
Active mining areas	Active operational areas within the **development envelope**, limited to open pits, waste rock landforms, the integrated waste landform, the processing plant, and haul roads between these physical elements. Does not include infrastructure corridors or access roads.
Adverse impact(s)	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. 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. In relation to terrestrial fauna, includes but is not limited to, habitat fragmentation, vehicle strike, collision with fencing, artificial light and vibration, noise emissions, and predation. In relation to **Moorambine Pool** this includes but is not limited to, changes to water quality and hydrological changes resulting from water discharged to the Turner River. In relation to **Aboriginal cultural heritage**, includes but is not limited to, hydrological change, structural damage, introduction or spread of non-indigenous flora and/or fauna, alteration of fauna behaviour, dust, light, and noise emissions.

Baseline	Initial conditions measured before **disturbance** associated with the proposal, as captured in the environmental management plan required by condition B4-1, which is used for comparison with data collected during and after **disturbance** to identify and measure changes in conditions.
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986*, or the **CEO's** delegate.
Clearing	Has the same meaning as in section 51A of the *Environmental Protection Act 1986*.
CO_2-e	Carbon dioxide equivalent.
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. 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.
Conservation significant fauna	Threatened fauna listed under the *Biodiversity Conservation Act 2016* and Priority fauna listed by **DBCA**.
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.
Contamination	Having a substance present at above background concentrations that presents, or has the potential to present, a risk or harm to human health, the environment or any **environmental value**.
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.
CPI	The All Groups Consumer Price Index numbers for Perth compiled and published by the Australian Bureau of Statistics.

Critical habitat	The fauna habitat types described in the *Hemi Gold Project - Vertebrate fauna surveys 2021 – 2024, Western Wildlife, July 2024*. For the greater bilby (*Macrotis lagotis*), this includes **spinifex sandplain** and **sandplain drainage**. For the grey falcon (*Falco hypoleucos*) and Pilbara olive python (*Liasis olivaceus barroni*), this includes **major river**. For the night parrot (*Pezoporus occidentalis*), this includes mature spinifex within **spinifex sandplain** and **sandplain drainage**. For the northern quoll (*Dasyurus hallucatus*), this includes **major river** and any **foraging and dispersal habitat**.
DBCA	The Department of Biodiversity, Conservation and Attractions.
DMPE	The Department of Mines, Petroleum and Exploration.
Detecting/ Detectable	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 envelope	The spatial area as depicted in Figure 1 and defined by geographic coordinates in Schedule 1.
Dispersal and foraging habitat	Comprises of **sandplain drainage**, **sandplain spinifex** and **stony hills** habitat within 1 **km** of **major river** habitat, considered **critical habitat** for the northern quoll (*Dasyurus hallucatus*).
Disturb / disturbance	Means directly has or materially contributes to the disturbance effect on health, diversity or abundance of the receptor/s being impacted or on an **environmental value**. In relation to inland waters, includes to have the effect of altering hydrological regimes or water quality to the detriment of the **environmental values** supported by or dependent on surface water and/or groundwater. In relation to flora, vegetation or fauna habitat, includes to result in the death, destruction, removal, severing or doing substantial damage. In relation to fauna, includes to have the effect of altering the natural behaviour of fauna to its detriment. In relation to subterranean fauna means the loss of habitat through groundwater drawdown and the direct removal of habitat as a result of mining activity. In relation to **Aboriginal cultural heritage**, includes direct physical or biological effects on the tangible and intangible elements that are important to Aboriginal people, and are recognised through social, spiritual, historical, scientific or aesthetic values, as part of Aboriginal tradition.
Emergency response vehicles	Vehicles responding to an emergency, as defined by section 5 of the *Emergency Management Act 2005*.

Environmental harm	Has the meaning provided by section 3A(2) of the *Environmental Protection Act 1986*.
Environmental value(s)	A beneficial use, or ecosystem health condition.
Environmental weeds	Any plant declared under section 22(2) of the *Biosecurity and Agriculture Management Act 2007,* any plant listed on the Weeds of National Significance List and any weeds listed on **DBCA's** Pilbara Impact and Invasiveness Ratings list, as amended or replaced from time to time.
Fauna handler	A person who is qualified and has attained the appropriate licence/s and authorisation/s under section 40 of the *Biodiversity Conservation Act 2016* and the Biodiversity Conservation Regulations 2018.
Fauna spotter	A person who is suitably trained in species identification, who does not perform any handling of animals where a licence to do so is required.
Greenhouse gas emissions	Greenhouse gas emissions expressed in tonnes of **CO_2-e** as calculated in accordance with the definition of 'carbon dioxide equivalence' in Section 7 of the *National Greenhouse and Energy Reporting Act 2007* (Cth), or, if that definition is amended or repealed, the meaning set out in an Act, regulation or instrument concerning greenhouse gases as specified by the Minister.
Greenhouse gas	Has the meaning given by Section 7A of the *National Greenhouse and Energy Reporting Act 2007* (Cth) or, if that definition is amended or repealed, the meaning set out in an Act, regulation or instrument concerning greenhouse gases as specified by the Minister.
GL/a	Gigalitre(s) per annum.
'Good' to 'Excellent' condition native vegetation	Means the condition of native vegetation rated in accordance with the *Technical guidance – Flora and vegetation surveys for environmental impact assessment, Environmental Protection Authority, December 2016* including any revision to this technical guidance.
Gregory Land System PEC	The priority ecological community for flora and vegetation, referred to as 'Gregory Land System' in the *Priority ecological communities for Western Australia version 35, Department of Biodiversity, Conservation and Attractions, 19 June 2023*.
Ground disturbing activities	Any activity or activities undertaken in the implementation of the proposal, including any **clearing**, civil works or construction.
Groundwater abstraction	The process of taking water from a ground source.
ha(s)	Hectare(s).

Hollow forming trees	Trees within **major river** habitat that could be used for roosting or denning by **conservation significant fauna** species such as the northern quoll (*Dasyurus hallucatus*), grey falcon (*Falco hypoleucos*), and Northern Coastal Free-tailed Bat (*Ozimops cobourgianus*), as determined by a **fauna spotter**.
IBRA	Interim Biogeographic Regionalisation for Australia.
km	Kilometre(s).
km/hr	Kilometre(s) per hour.
Low impact activities	Means activities involving minimal **disturbance** of ground or vegetation. Activities may include monitoring of fauna, vegetation or water, or management activities associated with feral fauna control or weed control.
m	Metre(s).
Major river	The habitat type as described in the *Hemi Gold Project - Vertebrate fauna surveys 2021 – 2024, Western Wildlife, July 2024*.
Management action(s)	The identified actions implemented with the intent of achieving the environmental **objective**.
Management target(s)	A type of indicator to evaluate whether an environmental **objective** is being achieved.
Moorambine Pool	The surface water pool as depicted in Figure 2 and defined by the geographic coordinates in Schedule 1.
Mt	Million tonne(s).
Objective(s)	An objective is the proposal-specific desired state for an environmental factor/s to be achieved from the implementation of **management actions**.
Operations	Operation of the plant infrastructure for the proposal and includes pre-commissioning, commissioning, start-up and operation of the plant infrastructure for the proposal.
Outcome(s)	A proposal-specific result to be achieved when implementing the proposal.
Pilbara Environmental Offsets Fund	A special purpose account created pursuant to section 16(1)(d) of the *Financial Management Act 2006* by the Department of Water and Environmental Regulation.
Pollution	Has the meaning provided by section 3A(1) of the *Environmental Protection Act 1986*.
Pre-clearance survey(s)	Surveys designed to identify the presence or evidence of threatened fauna listed under the *Biodiversity Conservation Act 2016* prior to **ground disturbing activities**.

Predicted drawdown extent	The modelled groundwater drawdown extent as depicted in Figure 3 and defined by the geographic coordinates in Schedule 1.
Predicted wetting front extent	The modelled wetting front extent as depicted in Figure 2 and defined by the geographic coordinates in Schedule 1.
Progressive manner	In relation to rehabilitation, the stage treatment of **disturbed** areas during exploration, **construction**, development, and **operations** as soon as these areas become available.
Reinjection borefields	The reinjection borefields as depicted in Figure 2 and defined by geographic coordinates in Schedule 1.
Relevant Traditional Owner(s)	In relation to the land subject to the proposal, means one or more of the following: - a registered native title body corporate for the land; or - a registered native title claimant for the land; or - a group of persons with Aboriginal traditional and cultural associations with the land; or - a body prescribed in the Aboriginal Heritage Regulations 1974.
Riparian vegetation	Vegetation types 2, 3, 4, 15, and 16 that were considered to be dependent on surface water flows and/or groundwater, as described in the *Hemi Gold Deposit baseline flora and vegetation assessment - Mallina Gold Project, Umwelt (Australia Pty Limited, 11 October 2024*.
Safeguard Legislation	The Commonwealth *National Greenhouse and Energy Reporting Act 2007* and associated *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015*.
Sandplain drainage	The habitat type as described in the *Hemi Gold Project - Vertebrate fauna surveys 2021 – 2024, Western Wildlife, July 2024*.
Sandplain habitat types	The **spinifex sandplain** and **sandplain drainage** habitat types.
Scope 1	Scope 1 emissions of **greenhouse gas**, in relation to a facility, means the release of **greenhouse gas** into the atmosphere as a direct result of one or more activities, which are part of the proposal, that generate **greenhouse gas emissions**.
Self-sustaining	Refers to vegetation that can survive (continue indefinitely) without on-going management actions such as watering, weed control or in-fill planting.
Spinifex sandplain	The habitat type as described in the *Hemi Gold Project - Vertebrate fauna surveys 2021 – 2024, Western Wildlife, July 2024*.
Stygofauna habitat	The potential stygofauna habitat types: • Saturated Upper Aeolian, Colluvium and Alluvium domain (Type 1);

	• Saturated Lower Colluvium and Alluvium (Type 2); • Saprolite and Saprock (Type 3); and, • Joint Weathered Bedrock Basement (Type 4), as defined and recorded in the *Subterranean fauna habitat assessment - Hemi Gold Project, De Grey Mining Ltd, 24 October 2024*.
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.
Water quality standards and criteria	Water quality standards and criteria as required under a works approval or license issued under Part V of the *Environmental Protection Act 1986*.
Yule River Water Reserve	The Priority 1 Public Drinking Water Source Area, referred to as the 'Yule River Water Reserve' in the *Yule River Water Reserve drinking water source protection review, Department of Water and Environmental Regulation, March 2019*, and as shown in Figure 2.

Figures (attached)

Figure 1 Hemi Gold Project location and development envelope (This figure is a representation of the co-ordinates referenced in Schedule 1)

Figure 2 Hemi Gold Project development envelope, indicative disturbance footprint and maximum wetting front extent (This figure is a representation of the co-ordinates referenced in Schedule 1)

Figure 3 Predicted groundwater drawdown extents at end of operational life (This figure is a representation of the co-ordinates referenced in Schedule 1)

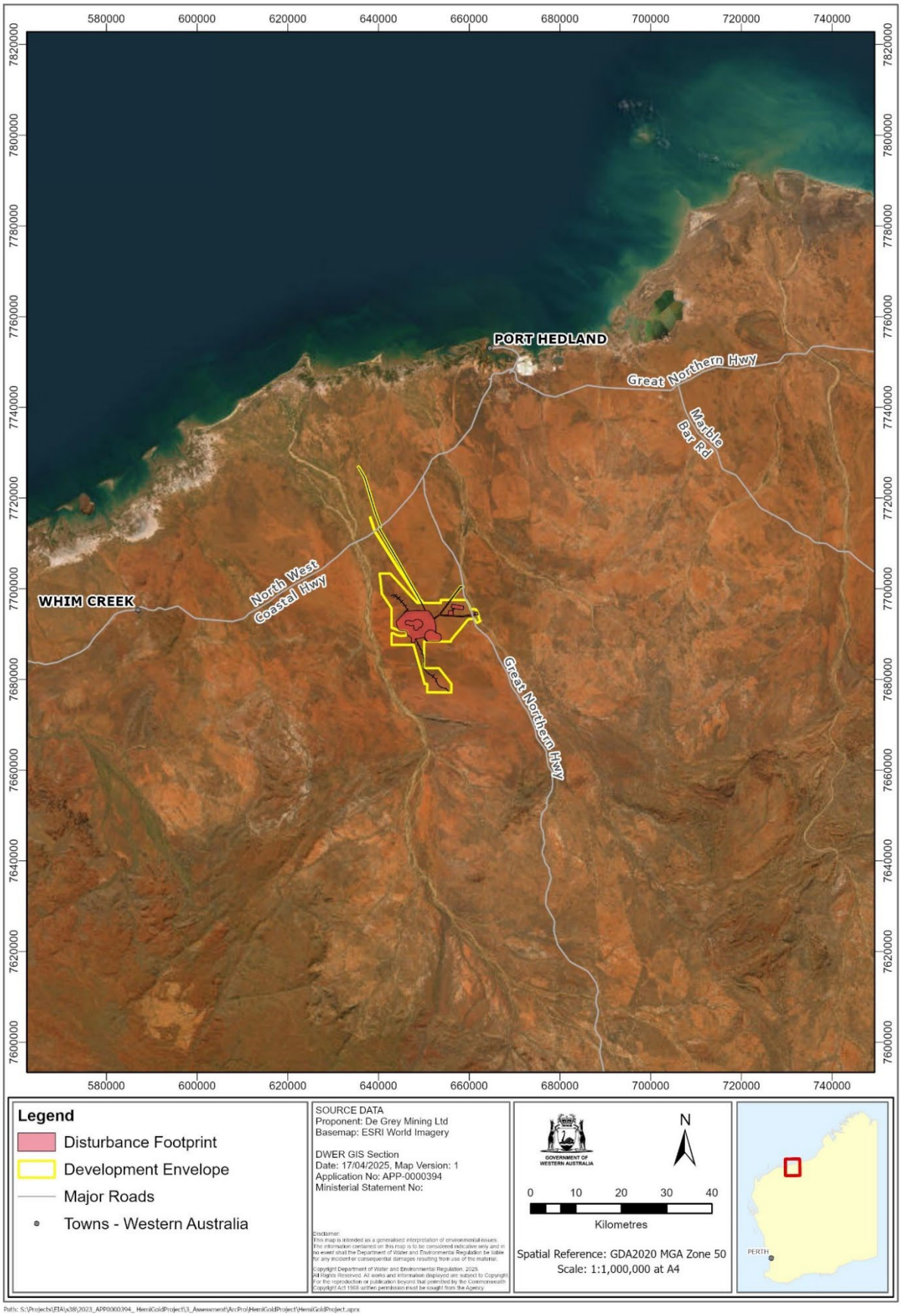

Figure 1 Hemi Gold Project location and development envelope

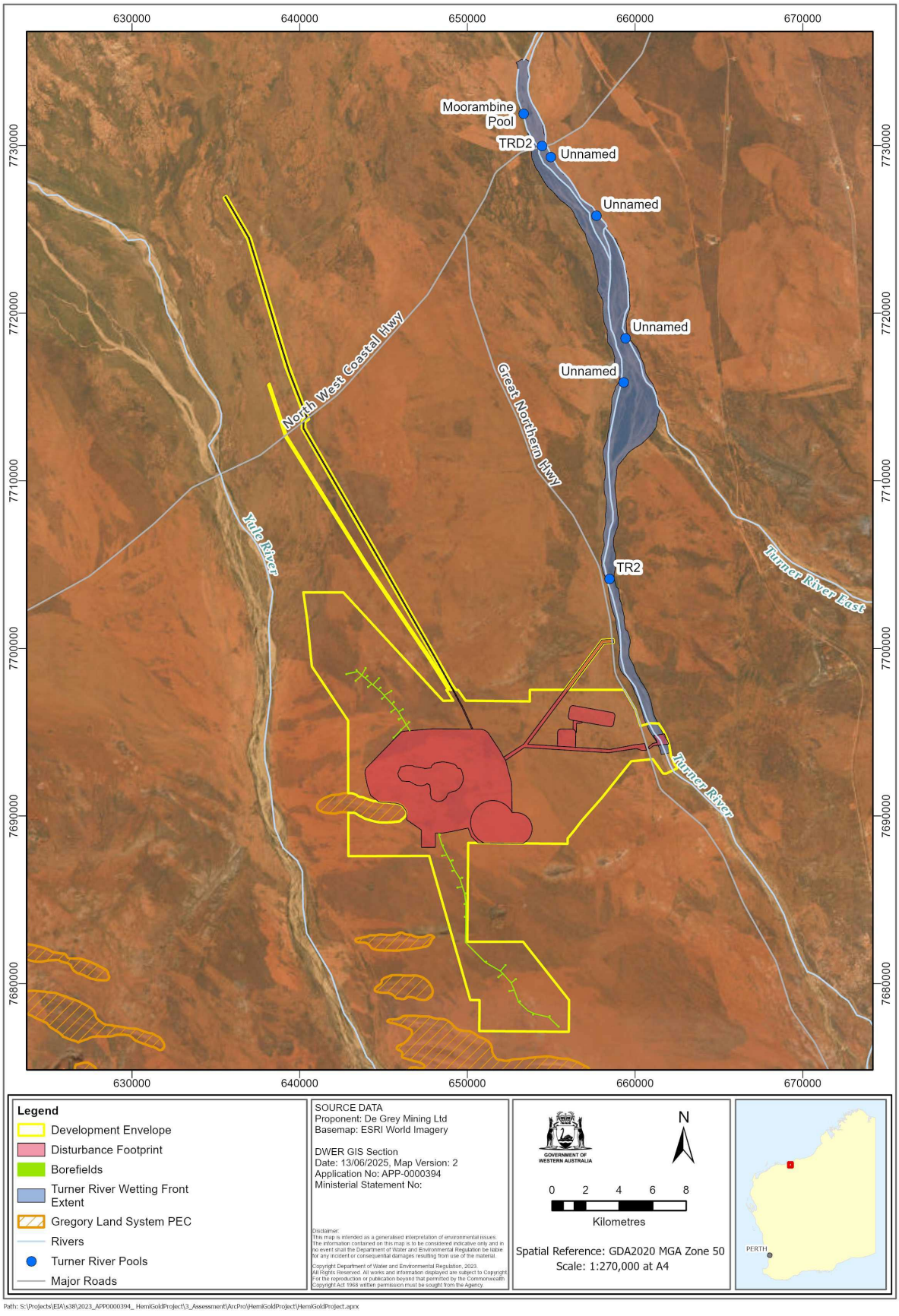

Figure 2 Hemi Gold Project development envelope, indicative disturbance footprint and maximum wetting front extent

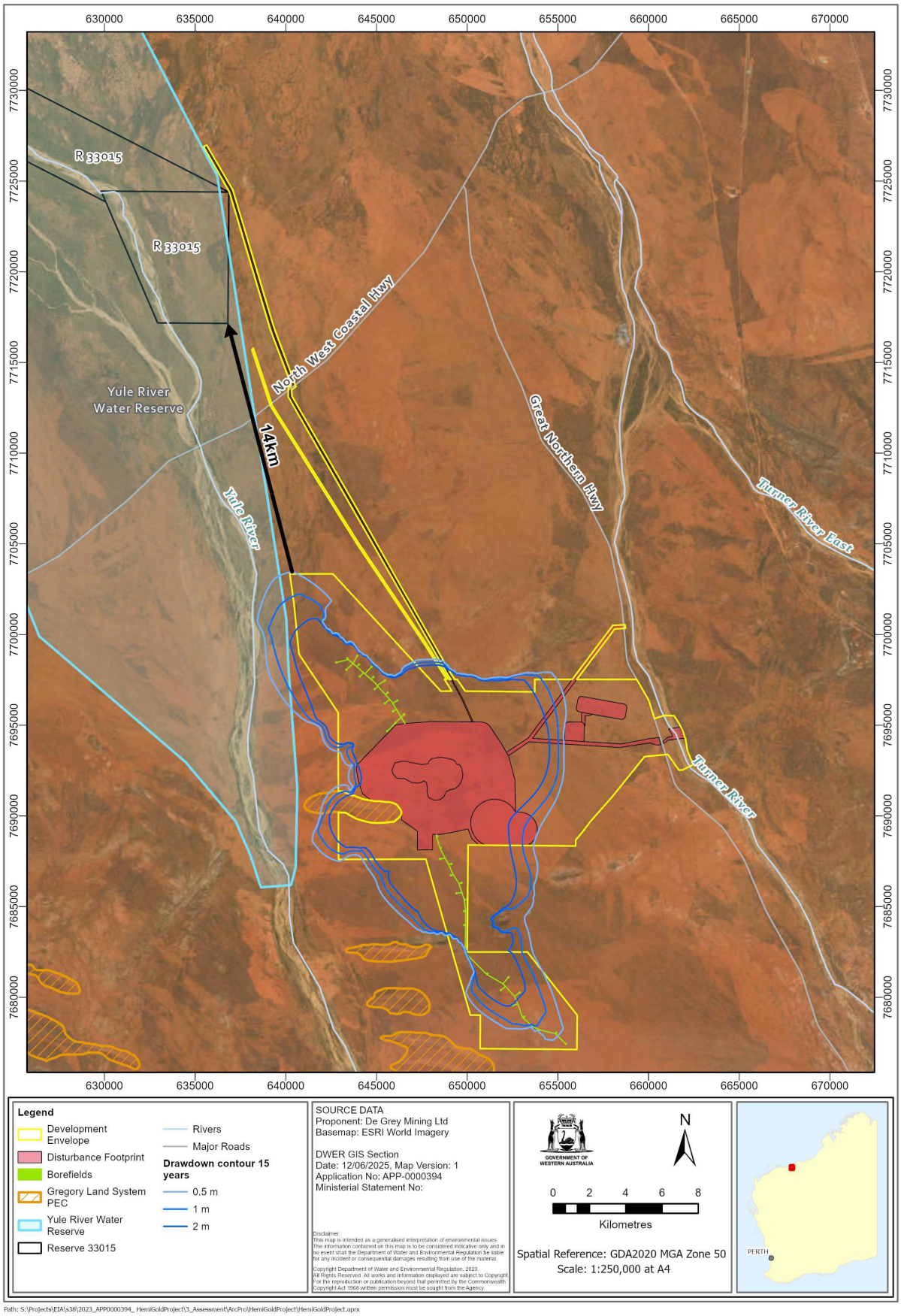

Figure 3 Predicted groundwater drawdown extents at end of operational life

Schedule 1

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

Spatial data depicting the figures are held by the Department of Water and Environmental regulation. Record no. DWER-801164602-418022.

Appendix B: Decision-making authorities

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

Decision-Making Authority	Legislation (and approval)
1. Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972* – section 18 consent to impact a registered Aboriginal heritage site
2. Minister for Environment	*Biodiversity Conservation Act 2016* – section 40 authority to take or disturb threatened species
3. Minister for Mines and Petroleum	*Mining Act 1978* – granting of a new mining lease
4. Minister for Water	*Rights in Water and Irrigation Act 1914* – permit to interfere with beds and banks – permit to take water – groundwater abstraction licence – licence to construct bores – dewatering licence
5. Chief Executive Officer, Department of Biodiversity, Conservation and Attractions	*Biodiversity Conservation Act 2016* – authority to take flora and fauna (other than threatened species)
6. Chief Health Officer, Department of Health	*Health Act 1911* Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974
7. Chief Dangerous Goods Officer Department of Mines, Industry Regulation and Safety	*Dangerous Goods Safety Act 2004* – storage and handling of dangerous goods
8. Executive Director Resource and Environmental Compliance, Department of Mines, Industry Regulation and Safety	*Mining Act 1978* – mining proposal
9. Department of Mines, Industry Regulation and Safety	*Mining Act 1978* – miscellaneous license
10. State Mining Engineer, Department of Mines, Industry Regulation and Safety	*Mines Safety and Inspection Act 1994* – mine safety – approval to commence mining operations
11. Chief Executive Officer, Department of Water and Environmental Regulation	*Environmental Protection Act 1986* – part V works approval and licence – part V clearing permit – part IV compliance (Ministerial statements)

Decision-Making Authority	Legislation (and approval)
12. Chief Executive Officer Town of Port Hedland	*Local Government Act 1995* – development approval and scheme amendment *Health Act 1911* – permit for treatment of sewage *Health Act 1911* and Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974 *Building Act 2011* – permit for worker accommodation

Appendix C: Regulation under other statutory processes

Table C1: Regulation under other statutory processes

Statutory decision-making process	Environmental outcome
Aboriginal Heritage Act 1972	No disturbance to Aboriginal cultural heritage, unless consent is granted to disturb that site under the *Aboriginal Heritage Act 1972* and has involved reasonable steps to consult with relevant Traditional Owners.
Biodiversity Conservation Act 2016	The taking of threatened flora, fauna and ecological communities does not result in any species or community being listed under a higher conservation status.
Environmental Protection Act 1986 Part V works approval and license Environmental Protection (Noise) Regulations 1997	Regulate emissions and discharges from construction and operations to achieve the following outcomes: • no adverse impacts to soil, surface water and groundwater quality • maintain air quality and minimise emissions so that environmental values are protected • protect sensitive receptors from dust and noise.
Mining Act 1978	Mining activities and associated closure and rehabilitation to be managed via a Mining Proposal and Mine Closure Plan under the Mining Act and achieve the following outcomes: • rehabilitated landforms are stable and do not cause pollution or environmental harm • rehabilitated vegetation is self-sustaining • rehabilitated areas are consistent with the species diversity and abundance of native vegetation within comparative analogue or reference sites • rehabilitation includes the use of native seeds collected from native vegetation within the proposal • rehabilitated drainage lines are stable, not prone to erosion, and support ecological processes • closure planning and rehabilitation are undertaken in a progressive manner consistent with achievement of the above outcomes during operations, where practicable.

Rights in Water and Irrigation Act 1914	No adverse impacts to groundwater or surface water.
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)	The EPA has recommended conditions in relation to impacts on listed threatened species and communities protected by the EPBC Act. The Department of Climate Change, Energy, the Environment and Water may impose additional conditions under the EPBC Act.
National Greenhouse and Energy Reporting Act 2007 (Commonwealth)	The reduction of scope 1 GHG emissions to meet Australian emission targets of 43% below 2005 levels by 2030 and net zero by 2050. The potential environmental effects of the proposal associated with the emissions of scope 1 GHG emissions are likely to be mitigated to achieve consistency with the environmental factor objective for GHG emissions through the obligations required under the *National Greenhouse and Energy Reporting Act 2007* and the Commonwealth Safeguard Mechanism.

Appendix D: Environmental Protection Act principles

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

EP Act principle	Consideration
1. The precautionary principle *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.* *In application of this precautionary principle, decisions should be guided by –* *(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* *(b) an assessment of the risk-weighted consequences of various options.*	The EPA has considered the precautionary principle in its assessment and has had particular regard to this principle in its assessment of inland waters, flora and vegetation, terrestrial fauna, subterranean fauna, social surroundings and greenhouse gas emissions. The proponent has undertaken appropriate studies and investigations to provide scientific information to identify environmental values and understand the potential risks on the environment and human health. The EPA notes that the proponent has considered alternatives in designing the proposal to avoid, where practicable, impacts on the environment. This includes: • excluding the Gregory Land System PEC and rocky outcrop habitat from the development envelope • reinjecting some excess water, rather than discharging all to surface water environments • discharging excess water to the Turner River rather than the Yule River. The proponent also proposed limits and clear outcomes as a mitigation measure to reduce impacts on the environment, such as clearing limits for critical habitat types. Where there is uncertainty to prevent or avoid impacts from occurring, the EPA has recommended conditions. Subject to the implementation of these recommended conditions, the proposal is unlikely to result in serious or irreversible harm. <u>Greenhouse gas emissions</u> The EPA notes that climate change as a result of cumulative GHG emissions has the potential to cause serious damage to WA's environment. The specific impacts of any single proposal's GHG emissions are not able to be known with certainty at this time. However, the EPA has not used this as a reason for postponing assessment of the proposal's contribution to the State's GHG emissions or recommending practicable conditions to reduce emissions in order to minimise the risk of environmental harm associated with climate change. The EPA notes that as a result of proposal implementation residual scope 1 and 2 emissions will be emitted prior to the proponent reaching net zero. The EPA

EP Act principle	Consideration
	considers the Commonwealth's Safeguard Mechanism represents an as far as practicable reduction of the proposal's GHG emissions. The EPA has recommended condition B7 that requires the proponent to notify the State of a substantial change to its obligations under the Safeguard Mechanism.
2. The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.*	The EPA has considered the principle of intergenerational equity in its assessment and has had particular regard to this principle in its assessment of inland waters, flora and vegetation, terrestrial fauna, social surroundings, and greenhouse gas emissions. The EPA notes that the proponent has considered this principle by: • preparing a GHG management plan, including a decarbonisation plan to reduce emissions over the life of the proposal • consulting with the Traditional Owners of the potential impacts to the social and cultural values and to ensure values and traditional knowledge of the land is not compromised • commitments to rehabilitate in a progressive manner and at the cessation of mining to a state suitable for future land use, as identified by the pastoral, traditional, or other land users. The EPA considers consistency with this principle could be achieved with the implementation of its recommended conditions, which require the proponent to: • maintain levels of ecological protection within the terrestrial environment such as limits on the extent of disturbance to flora and vegetation, and terrestrial fauna habitat • ensure ongoing access to land used for traditional use or custom by the Traditional Owners • consult with the Traditional Owners on the design of the waste rock landforms (WRLs) and IWL • rehabilitate landforms, vegetation, and fauna habitat to an appropriate state, including consideration of species diversity and abundance. The EPA has concluded that the environmental values will be protected, and the health, diversity and productivity of the environment will be maintained for the benefit of future generations. <u>Greenhouse gas emissions</u>

EP Act principle	Consideration
	The EPA has noted that GHG emissions pose a risk to future generations, however, also notes that the proponent's obligations under the Commonwealth's Safeguard Mechanism to net zero emissions by 2050 consistent with the Paris Agreement and IPCC 1.5 report, and to use offsets should these targets not be met by continuous improvement. The EPA has recommended condition B7 which requires the proponent to report to the CEO of DWER if obligations change under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) and Safeguard Mechanism.
3. The principles of the conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*	The EPA has considered the principle of conservation of biological diversity and ecological integrity in its assessment and has had particular regard to this principle in its assessment of flora and vegetation, terrestrial fauna and subterranean fauna. The EPA notes that the proponent has designed the proposal to avoid areas of critical habitat, such as the Gregory Land System PEC and the Yule River, and has proposed a disturbance limit to the Turner River of 10 ha. To ensure biodiversity and ecological integrity of environmental values within the development envelope, the EPA has recommended conditions including disturbance limits for terrestrial fauna habitat and priority flora species and ensuring vegetation and fauna habitat are appropriately considered in rehabilitation planning. The EPA has also set limits on the maximum disturbance of stygofauna habitat types to ensure species are able to persist beyond the boundaries of the development envelope. The EPA has concluded that the actions to avoid and minimise impacts to environmental values, which are also recommended as conditions, would likely ensure that environmental outcomes are achieved. The application of limits on disturbance and any associated conditions are to ensure there is no significant residual impact on the biodiversity diversity and ecological integrity of these values.
4. Principles relating to improved valuation, pricing and incentive mechanisms • *Environmental factors should be included in the valuation of assets and services.* • *The polluter pays principle — those who generate pollution and waste should bear the cost of containment, avoidance or abatement.*	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, terrestrial fauna, subterranean fauna, social surroundings, and greenhouse gas emissions. The EPA notes that the proponent has pursued these principles by:

EP Act principle	Consideration
• *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.* • *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.*	• undertaking surveys to identify and confirm environmental values within the development envelope • incorporating costs of environmental management in project planning • minimising clearing to the extent required • progressively rehabilitating to restore natural ecosystems throughout the life of the proposal. <u>Greenhouse gas emissions</u> The proponent will be responsible for bearing the costs of implementing measures to reduce and offset GHG emissions, including the costs of adopting advances in process management and other measures in the future to further reduce and offset GHG emissions to achieve net zero along a linear trajectory to net zero by 2050.
5. The principle of waste minimisation *All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*	The EPA has considered the principle of waste minimisation in its assessment and has had particular regard to this principle in its assessment of inland waters, flora and vegetation, terrestrial fauna, social surroundings, and greenhouse gas emissions. The proponent has considered the principle of waste minimisation in designing the proposal, such as: • utilising existing roads and pastoral tracks • process tailings will be contained in an integrated waste landform • utilising excess dewater in mineral processing, dust suppression, and domestic water use prior to reinjecting to groundwater and discharging to the Turner River. The EPA notes that the disposal of excess water which will also be limited by recommended condition A1-1.

Appendix E: Other environmental factors

Table D1: 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			
Landforms	Reduced landform diversity and visual amenity from permanent alteration of landscape.	Public comments • None received. Agency comments • None received.	Landforms was not identified as a preliminary key environmental factor when the EPA decided to assess the proposal. Having regard to: • the siting of the development envelope to avoid direct disturbance to the Gregory Land System PEC • limited height and scale of temporary infrastructure, such as the processing plant • the distance of permanent landforms from sensitive receptors • waste structures including the WRLs and IWL will be designed to ensure they will be physically safe, geotechnically stable, and geochemically non-polluting and non-contaminating, consistent with the Guideline for preparing Mine Closure Plans (DEMIRS 2025) • recommended condition B5 to progressively rehabilitate and to ensure rehabilitated landforms are stable and do not cause pollution or environmental harm • recommended condition B6 for the proponent to consult with representatives for the Kariyarra People on the design of WRLs and the IWL the EPA considers that it is unlikely that the proposal would have a significant impact on landforms. Accordingly, the EPA did not consider landforms to be a key environmental factor at the conclusion of its assessment.
Terrestrial environmental quality	Reduction in soil quality from seepage from the WRL and/or IWL, or spills and leaks along pipelines.	Public comments • Concern for the potential impacts associated with seepage of tailings	Terrestrial environmental quality was not identified as a preliminary key environmental factor when the EPA decided to assess the proposal. Having regard to: • the low potential for tailings to be acid-forming

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
		and overtopping of the TSF. Agency comments • Technical advice was provided on the ability of the Mining Act to consider waste characterisation and the proposed management measures.	• emissions from prescribed premises can be adequately assessed, managed, and regulated under Part V of the EP Act • waste structures including the WRLs and IWL will be designed to ensure they will be physically safe, geotechnically stable, and geochemically non-polluting and non-contaminating, consistent with the Guideline for preparing Mine Closure Plans (DEMIRS 2025) • recommended condition B5 to progressively rehabilitate and to ensure rehabilitated landforms are stable and do not cause pollution or environmental harm the EPA considers that it is unlikely that the proposal would have a significant impact on terrestrial environmental quality. Accordingly, the EPA did not consider terrestrial environmental quality to be a key environmental factor at the conclusion of its assessment.
Air			
Air quality	Reduction in air quality from dust emissions air emissions from processing.	Public comments • None received. Agency comments • None received.	Air quality was identified as preliminary key environmental factor when the EPA decided to assess the proposal. Having regard to: • the separation distance between the proposal and nearest sensitive receptors, being Mt Dove accommodation village (4 kms) and Aboriginal heritage sites (6 kms) • management measures proposed by the proponent to manage dust emissions • emissions from prescribed premises can be adequately assessed, managed, and regulated under Part V of the EP Act the EPA considers that it is unlikely that the proposal would have a significant impact on air quality. Accordingly, the EPA did not consider air quality to be a key environmental factor at the conclusion of its assessment.
People			
Human health	Air emissions produced by the proposal have the potential to impact on human health.	Public comments • None received. Agency comments	Human health was not identified as a preliminary key environmental factor when the EPA decided to assess the proposal. Having regard to: • the proposed dust suppression measures

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
		• Concern for impacts to human health from dust generation. • Concern for potential presence of asbestiform minerals and impact on human health.	• impacts to human health from arsenic and asbestiform material can be adequately assessed, managed, and regulated under the Mining Act and the *Work Health and Safety Act 2020* the EPA considers that it is unlikely that the proposal would have a significant impact on human health. Accordingly, the EPA did not consider human health to be a key environmental factor at the conclusion of its assessment.

Appendix F: List of submitters

7-day comment on referral

Organisations and public

- Three (3) submissions were received from the public during the 7-day public comment period.

Government agencies

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

Public review of proponent information

Organisations and public

- Three (3) submissions were received from the public during the 4-week public comment period.

Government agencies

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

Appendix G: Assessment timeline

Date	Progress stages	Time (weeks)
12 October 2023	EPA decided to assess – level of assessment set	
14 November 2023	EPA requested additional information	4
8 November 2024	EPA received additional information	52
19 November 2024	EPA accepted additional information	1
25 November 2024	EPA released additional information for public review	1
23 December 2024	Public review period for additional information closed	4
4 April 2025	EPA accepted proponent's Response to Submissions	10
15 May 2025	EPA completed its assessment	6
24 June 2025	EPA provided report to the Minister for Environment	6
30 June 2025	EPA report published	3 days
21 July 2025	Appeals period closed	3

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

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

Appendix H: Relevant policy, guidance, procedures and references

Bennelongia Environmental Consultants (Bennelongia) 2023a, *Hemi Gold Project subterranean fauna survey report*, 13 December 2023. [Appendix 22 of De Grey 2025g].

Bennelongia 2023b, *Mallina Gold Project short range endemic fauna survey report (Hemi Mining Area)*, 5 December 2023. [Appendix 21 of De Grey 2025g].

Bennelongia 2024, *Hemi Gold Project targeted stygofauna survey*, 13 August 2024. [Appendix 23 of De Grey 2025g].

CMS Geosciences 2022, *Tailings storage facility (TSF) design report*, 5 September 2022. [Appendix 4 of De Grey 2025g].

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023a, *Australian national greenhouse accounts factors workbook 2023*, Department of Climate Change, Energy, the Environment and Water.

DCCEEW 2023b, *Recovery plan for the greater bilby (*Macrotis lagotis*)*, Department of Climate Change, Energy, the Environment and Water.

DCCEEW 2024a, *Safeguard Mechanism: Prescribed production variables and default emissions intensities*, Department of Climate Change, Energy, the Environment and Water, Canberra, ACT.

DCCEEW 2024b, *State and territory greenhouse gas inventories: annual emissions*. Department of Climate Change, Energy, the Environment and Water, Canberra, ACT.

De Grey Mining Ltd (De Grey) 2023, *Proposal Content Document*, 20 June 2023.

De Grey 2024a, *Greenhouse gas environmental management plan – Hemi Gold Project*, 14 October 2024. [Appendix 27 of De Grey 2025g].

De Grey 2024b, *Subterranean fauna habitat assessment – Hemi Gold Project*, 24 October 2024. [Appendix 24 of De Grey 2025g].

De Grey 2025a, *Conceptual long-term drawdown at 200 years*, 21 March 2025. [Appendix 11 of De Grey 2025g].

De Grey 2025b, *Conceptual mine closure plan – Hemi Gold Project*, 1 August 2024. [Appendix 7 of De Grey 2025g].

De Grey 2025c, *Confidential Aboriginal heritage sites – Hemi Gold Project*, 21 March 2025. [Appendix 30 of De Grey 2025g] [Confidential].

De Grey 2025d, *Environmental management plan - Hemi Gold Project*, 21 March 2025. [Appendix 1 of De Grey 2025g].

De Grey 2025e, *Hemi pit lake model*, 26 February 2025. [Appendix 10 of De Grey 2025g].

De Grey 2025f, *Impact reconciliation procedure – Hemi Gold Project*, dated 25

March 2025. [Appendix 31 of De Grey 2025g].

De Grey 2025g, *Section 38 referral supporting document – Hemi Gold Project*, 25 March 2025.

De Grey 2025h, *Short term reinjection trial*, 10 March 2025. [Appendix 9 of De Grey 2025g].

De Grey 2025i, *Stakeholder consultation register*. [Appendix 8 of De Grey 2025g].

Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) 2025*, Guideline for preparing mine closure plans*, Department of Energy, Mines, Industry Regulation and Safety, Perth, WA.

Department of the Environment, Water, Heritage and the Arts 2008, *Approved Conservation advice for* Liasis olivaceus barroni *(olive python - Pilbara subspecies)*, Department of the Environment, Water, Heritage and the Arts, Canberra, ACT.

Department of Water (DoW) 2011, *Lower Turner groundwater allocation limit report*, Department of Water, Perth, WA.

DWER 2019, *Pilbara Environmental Offsets Fund governance framework 2019*, Department of Water and Environmental Regulation.

DWER 2020, *Policy: Use of mine dewatering surplus*, Department of Water and Environmental Regulation, Perth WA.

Energetics 2022, *Hemi Gold Project - Emissions estimates, peer benchmarking and scope 3 review*, 11 July 2022. [Appendix 26 of De Grey 2025g].

Environmental Technologies and Analytics (ETA) 2024, Hemi Gold Project – Air quality assessment, 5 November 2024. [Appendix 29 of De Grey 2025g].

EPA 2014, *Strategic Advice – Cumulative environmental impacts of development in the Pilbara region*, Environmental Protection Authority, Perth, WA.

EPA 2016a, *Environmental factor guideline – Flora and vegetation*, Environmental Protection Authority, Perth, WA.

EPA 2016b, *Environmental factor guideline – Subterranean fauna*, Environmental Protection Authority, Perth, WA.

EPA 2016c, *Environmental factor guideline – Terrestrial fauna*, Environmental Protection Authority, Perth, WA.

EPA 2016d, *Technical guidance – Flora and vegetation surveys for environmental impact assessment*, Environmental Protection Authority, Perth, WA.

EPA 2016e, *Technical guidance – Sampling of short-range endemic invertebrate fauna*, Environmental Protection Authority, Perth, WA.

EPA 2018, *Environmental factor guideline – Inland waters*, Environmental Protection Authority, Perth, WA.

EPA 2020a, *Environmental factor guideline – Air quality*, Environmental Protection Authority, Perth, WA.

EPA 2020b, *Technical guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment,* Environmental Protection Authority, Perth, WA.

EPA 2021c, *Interim Guidance – Environmental outcomes and outcomes-based conditions*, Environmental Protection Authority, Perth WA.

EPA 2021d, *Interim Guidance – Taking decision making processes into account in EIA*, Environmental Protection Authority, Perth WA.

EPA 2021e, *Technical guidance – Subterranean fauna surveys for environmental impact assessment*, Environmental Protection Authority, Perth, WA.

EPA 2023a, *Environmental factor guideline – Greenhouse gas emissions*, Environmental Protection Authority, Perth, WA [Superseded].

EPA 2023b, *Environmental factor guideline – Social surroundings*, Environmental Protection Authority, Perth, WA.

EPA 2023c, *Statement of environmental principles, factors, objectives and aims of EIA*, Environmental Protection Authority, Perth, WA.

EPA 2023d, *Technical guidance – Environmental impact assessment of social surroundings - Aboriginal cultural heritage,* Environmental Protection Authority, Perth, WA.

EPA 2024a, *Environmental impact assessment (Part IV Divisions 1 and 2) procedures manual*, Environmental Protection Authority, Perth, WA.

EPA 2024b, *Environmental factor guideline – Greenhouse gas emissions*, Environmental Protection Authority, Perth, WA.

EPA 2024c, *Public Advice: Considering environmental offsets at a regional scale*, Environmental Protection Authority, Perth, WA.

Geowater Consulting 2023, *Hemi Gold Project – Definitive feasibility study – Conceptual and numerical groundwater modelling – Operational phase*, 18 September 2023. [Appendix 2 of De Grey 2025g].

Government of Western Australia 2011, *WA Environmental offsets policy*, Government of Western Australia, Perth, WA.

Government of Western Australia 2014, *WA Environmental offsets guidelines*, Government of Western Australia, Perth, WA.

Government of Western Australia 2023a, *Sectoral emissions reduction strategy for Western Australia – Pathways and priority actions for the state's transition to net zero emissions*, Department of Water and Environmental Regulation, Perth, WA.

Government of Western Australia 2023b, *Summary of knowledge for six faunal species that are Matters of National Environmental Significance in the Pilbara*, Western Australia, Department of Biodiversity, Conservation and Attractions, Perth, WA.

Herring Storer Acoustics (HSA) 2022, *De Grey Mining Hemi Gold Project – Environmental noise assessment*, 12 October 2022. [Appendix 25 of De Grey 2025g].

Hill, B.M. & S.J. Ward 2010, *National Recovery Plan for the Northern Quoll* Dasyurus hallucatus, Department of Natural Resources, Environment, The Arts and Sport, Darwin, NT.

Jurassic Groundwater 2023, *Technical review - Definitive feasibility study - Conceptual and numerical groundwater modelling - Hemi Gold Project - De Grey Mining Limited*, 9 September 2023. [Appendix 3 of De Grey 2025g].

MBS Environmental 2024a, *Hemi Gold Project – Turner River dewater discharge tier 2 environmental risk assessment*, 13 August 2024. [Appendix 12 of De Grey 2025g].

MBS Environmental 2024b, *Results of ecotoxicity testing on Hemi dewater discharge water*, 4 October 2024. [Appendix 13 of De Grey 2025g].

SRK Consulting 2022, *Hemi deposits – Sub-surface materials characterisation, Hemi Gold Project pre-feasibility study*, September 2022. [Appendix 5 of De Grey 2025g].

Stantec 2022, *Mallina Gold Project – Baseline aquatic ecology study of the Turner and Yule Rivers*, 21 October 2022. [Appendix 14 of De Grey 2025g].

Stantec 2023, Mallina Gold Project – *Baseline aquatic ecology study of the Turner and Yule Rivers, flood study memorandum*, 24 January 2023. [Appendix 15 of De Grey 2025g].

State of Western Australia 2024, *Western Australia Government Gazette, No. 153*, *environmental impact assessment (Part IV Divisions 1 and 2) administrative procedures 2024*.

Surface Water Solutions (SWS) 2022, *Hemi Gold Project – Turner River and site closure flood modelling*, 10 November 2022. [Appendix 6 of De Grey 2025g].

Threatened Species Scientific Committee 2016, *Conservation advice* Pezoporus occidentalis *night parrot*, Department of the Environment, Canberra, ACT.

Threatened Species Scientific Committee 2020, *Conservation advice* Falco hypoleucos *grey falcon*, Department of the Environment, Canberra, ACT.

Umwelt 2022, *Status of* Seringia exastia *at Hemi*, 29 November 2022. [Appendix 17 of De Grey 2025g].

Umwelt 2024a, *Desktop assessment of the proposed 300 m buffer around the Gregory Land System Priority Ecological Community at Hemi*, 3 October 2024. [Appendix 18 of De Grey 2025g].

Umwelt 2024b, *Hemi Gold Deposit baseline flora and vegetation assessment*, 11 October 2024. [Appendix 16 of De Grey 2025g].

Umwelt 2024c, *Hemi Gold Deposit Turner River flora and vegetation assessment*, 5 November 2024. [Appendix 19 of De Grey 2025g].

Western Wildlife 2024, *Hemi Gold Project – Vertebrate fauna surveys 2021 – 2024*, July 2024. [Appendix 20 of De Grey 2025g].

Worley 2024, *Greenhouse gas environmental management plan – Independent peer review*, 18 October 2024. [Appendix 28 of De Grey 2025g].