Environment Protection and Biodiversity Conservation Act Referral

Corunna Downs Project

179-LAH-EN-REP-0004

Revision 1

Authorisation

Rev	Reason for Issue	Prepared	Checked	Authorised	Date
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Signatures are required for Revision 0 and above

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1. Summary of Proposed Action

1.1 Short Description

The Proposal is to mine iron ore within the Corunna Downs Project (the Project) area, located 241 km south east of Port Hedland. Mining will be via conventional open cut, crushing and screening mining methods above the groundwater table. Associated infrastructure will include open pits, waste rock dumps, mine infrastructure, borefield and accommodation camp.

1.2 Latitude and Longitude

Location Point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
1	21°	17`	22.669”S	119°	40`	43.354”E
2	21°	18`	0.068”S	119°	42`	35.566”E
3	21°	22`	41.226”S	119°	42`	19.813”E
4	21°	23`	47.071”S	119°	43`	8.457”E
5	21°	24`	15.828”S	119°	43`	7.594”E
6	21°	24`	18.307”S	119°	41`	55.091”E
7	21°	28`	43.561”S	119°	40`	32.033”E
8	21°	28`	42.173”S	119°	39`	15.233”E
9	21°	18`	38.005”S	119°	41`	11.211”E
10	21°	17`	56.231”S	119°	39`	46.800”E
11	21°	17`	22.055”S	119°	40`	12.210”E

1.3 Locality and Property Description

The Project is located in the Shire of East Pilbara (SoEP), in the Pilbara Region of Western Australia. The Project is situated 241 km south east of Port Hedland and 33 km south of Marble Bar.

1.4 Size of the Development Footprint or Work Area (hectares)

The Project is located within a Development Envelope of 2263.19 ha, however Atlas has committed to not clearing more than 423.12 ha, as shown in Figure 1.1.

Figure 1.1 – Project Area

1.5 Street Address of the Site

N/A

1.6 Lot Description

The proposed action occurs within the following mining tenure granted under the *Mining Act 1978*:

M45/1257

G45/339

L45/407

L45/408

L45/410

L45/418 (pending)

1.7 Local Government Area and Council Contact

The Project is located in the Shire of East Pilbara (SoEP) and will be subject to local government planning approval.

Atlas has been liaising with the SoEP with regards to the Project and the most relevant contact person within the SoEP is:

Rick Miller

Director Technical and Development Services

Shire of East Pilbara

PMB 22

Newman WA 6753

Phone: 0409 278 667

Email: dtds@eastpilbara.wa.gov.au

1.8 Time Frame

Subject to regulatory approvals, construction of the Project is due to commence in the second quarter of 2017. The predicted life of mine is six years with mining commencing in the last quarter of 2017 and haulage commencing at the end of the first quarter in 2018.

1.9 Alternatives to Proposed Action

Were any feasible alternatives to taking the proposed action (including not taking action) considered which are not proposed?	X	No
		Yes, please also complete section 2.2

1.10 Alternative Time Frames, Locations or Activities

Does the proposed action include alternative timeframes, locations or activities?	X	No
		Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3 and 5 (where relevant).

1.11 Commonwealth, State or Territory Assessment

Is the action subject to other Commonwealth, State or Territory environmental impact assessment?	X	No Atlas believes that the Project can be adequately assessed by a Mining Proposal under the *Mining Act 1978*, due to its size and level of impact. This conclusion is supported by the Memorandum of Understanding between the Department of Mines and Petroleum (DMP) and the Environmental Protection Authority (EPA) and through consultation with the EPA and DMP. The Project will apply for the following State environmental approvals: • Mining Proposal approved by the DMP under the *Mining Act 1978*. • Native Vegetation Clearing Permit under the *Environmental Protection Act 1986.*
		Yes, please also complete section 2.5

1.12 Component of Larger Action

Is the proposed action a component of a larger action?	X	No
		Yes, please also complete section 2.7

1.13 Related Actions/Proposals

Is the proposed action related to other actions or proposals in the region?	X	No
		Yes, provide details:

1.14 Australian Government Funding

Has the person proposing to take the action received any Australian Government grant funding to undertaken the proposed action?	X	No
		Yes, please also complete section 2.8

1.15 Great Barrier Reef Marine Park

Is the proposed action inside the Great Barrier Reef Marine Park?	X	No
		Yes, please also complete section 3.1 (h), 3.2 (e)

2. Detailed Description of Proposed Action

2.1 Description of Proposed Action

2.1.1 Overview

The Corunna Downs Project (the Project) is located 241 km south east of Port Hedland and 33 km south of Marble Bar (Figure 2.1). The Project involves the development of five open pits (Split Rock, Razor Back, Shark Gully, Runway North and Runway South) using conventional drill and blast, load, and haul methods. It is anticipated 23.3 million tonnes (Mt) of iron ore will be mined over approximately 6 years.

Figure 2.1 – Regional Location

2.1.2 Mining

Mining will be undertaken by a reputable mining contractor and managed by Atlas. The proposed mining will incorporate pre-stripping, drilling, blasting, and excavation using excavators and a dump truck fleet.

Pre-stripping will be required to expose the targeted ore. Following pre-stripping, weathered rock will be free-dug (without blasting) where possible. Drill and blasting will be undertaken on the remaining material, using modern blasting techniques and typical pattern sizes for the expected rock conditions. Grade control will be conducted through reverse circulation (RC) drillhole samples prior to drill and blast to establish ore blocks.

As mining will be above the water table, pit dewatering will not be required. However, in-pit sump pumping may be required to remove any incidental rainfall or seepage, which may occur as the pit approaches its final depth.

2.1.3 Ore Processing and Transport

Ore will be crushed and screened onsite using a 4 Mtpa mobile crushing and screening plant, which will provide primary, secondary and tertiary crushing and screening to reduce the product size to less than 10 mm. The product will then be transported using side-tipper, triple or quad-configuration road trains with a total load capacity of approximately 100 tonnes to the Utah Point Bulk Commodities Berth at Port Hedland.

Product transport operations will operate on a continuous basis (24 hours per day, seven days a week) with approximately 96 truck cycles per day (round trip).

2.1.4 Additional Infrastructure and Support Facilities

A number of additional infrastructure and support facilities will be required for the Project, including a mine operation centre and administration area, mining contractors yard and workshop, haulage contractors area, explosives magazine and prill storage, water production bores, potable water treatment and storage, sewage treatment system, fuel storage and refuelling areas, haul roads, access roads and tracks and borrow pits. These are shown in Figure 2.2.

Figure 2.2 – Mine Plan

2.2 Feasible Alternatives to taking the Proposed Action

A constraint for all mineral resource development projects is that they can only occur where a commercially viable resource is identified. The proposed action is the only feasible option for the Project; consequently, the only alternative to the development of this Project is to not develop.

2.3 Alternative Locations, Timeframes or Activities That Form Part of the Referred Action

There are no alternative locations, timeframes or activities that form part of the Project.

2.4 Context, Including Any Relevant Planning Framework and State/Local Government Requirements

The Project is located within the Shire of East Pilbara, which claims to be the largest shire in Australia. In the 2011 census there were 11,950 residing within the Shire. Of couple families, 31.9% had both partners employed full-time, 1.8% had both employed part-time and 18.5% had one employed full-time and the other part-time (ABS, 2016).

Marble Bar is the nearest town to the Project, it has a population of 512. Of couple families, 11.3% had both partners employed full-time, 13.2% had both employed part-time and 9.4% had one employed full-time and the other part-time and 18.9% both not working (ABS, 2016).

Once the Project has been considered to be environmentally acceptable and sanctioned by the Department of the Environment and Energy (DoEE) and the Department of Mines and Petroleum (DMP), additional approvals are also required under various other planning, heritage and environmental legislation, including (but not limited to):

- *Aboriginal Heritage Act 1972*.
- *Agriculture and Related Resources Protection Act 1978.*
- *Australian Heritage Council Act 2003 (*Commonwealth*).*
- *Contaminated Sites Act 2003.*
- *Dangerous Goods Safety Act 2004.*
- *Dangerous Goods Safety (Explosives) Regulations 2007*
- *Dangerous Goods Safety (General) Regulations 2007.*
- *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007.*
- *Environmental Protection Act 1976.*
- *Environmental Protection Regulations 1987.*
- *Environmental Protection (Noise) Regulations 1997.*
- *Health Act 1911.*
- *Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974.*
- *Heritage of Western Australia Act 1990.*
- *Land Administration Act 1997.*

- *Local Government Act 1995.*
- *Main Roads Act 1930.*
- *Mine Safety and Inspection Act 1995.*
- *Mining Amendment Act 2004.*
- *Native Title Act 1993 (*Commonwealth*).*
- *Soil and Land Conservation Act 1976.*
- *Town Planning and Development Act 1928.*
- *Wildlife Conservation Act 1950.*

State Policies and Guidelines

Policies and guidelines relevant to the assessment and management of potential Project impacts include, but are not limited to:

- Department of Conservation and Land Management Policy Statement No. 29: Translocation of threatened flora and fauna, 1995.
- Environmental Protection Authority (EPA) Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems, 2006.
- EPA Environmental Assessment Guidelines, EAG 12: Environmental Assessment Guideline for Consideration of Subterranean Fauna in Environmental Impact Assessment in Western Australia, June 2013.
- EPA Guidance Statement No. 20: Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia, 2009.
- EPA Guidance Statement No. 41: Guidance for the Assessment of Environmental Factors – Assessment of Aboriginal Heritage, 2004.
- EPA Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia, 2004.
- EPA Guidance Statement No. 56: Terrestrial Fauna Surveys for Environmental Impact in Western Australia, 2004.
- EPA Position Statement No. 2: Protection of Native Vegetation in Western Australia, 2000.
- EPA Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection, 2002.
- DMP, Guideline for Mining Proposals in Western Australia, 2016.
- DER, Draft Guideline on Environmental Noise for Prescribed Premises, 2016.
- EPA and DEC Technical Guide: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment, 2010.
- DMP and EPA Guidelines for Preparing Mine Closure Plans, 2016.
- National Uniform Drillers Licensing Committees, Minimum Construction Requirements for Water Bores in Australia, Edition 3, 2012.
- Western Australian Planning Commission, State Planning Policy 5.4 Road and Rail Transport Noise and Freight, 2009.

- Department of Planning and Western Australian Planning Commission, Implementation Guidelines for State Planning Policy 5.4, 2014.

2.5 Environmental Impact Assessments Under Commonwealth, State or Territory Legislation

Commonwealth Legislation

This *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) referral has been prepared and submitted to the DoEE to allow a determination of whether the project is a controlled action under the EPBC Act.

The Project has been referred based on the potential to impact upon matters of national environmental significance.

Western Australian Legislation

Western Australian state environmental impact assessments are conducted under the following legislation:

- *Mining Act 1978 (*Mining Act).
- *Environmental Protection Act 1986* (EP Act).
- *Rights in Water and Irrigation Act 1914* (RIWI Act).

The Mining Act governs mineral exploration and mining in Western Australia. A mining proposal, together with a mine closure plan, will be submitted to the DMP to meet the requirements of this Act. Atlas has been granted the appropriate mining tenure under the Mining Act for all Project components.

The EP Act is the primary legislation that governs environmental impact assessment and protection in Western Australia. Approvals can be required under two parts of the EP Act; Part IV – Environmental Impact Assessment and Part V – Environmental Regulation.

The criteria for referral/assessment under Part IV of the EP Act, as detailed within the Memorandum of Understanding (MoU) established between the DMP and the Environmental Protection Authority (EPA) are not triggered by this Project.

Under Part V – Environmental Regulation, the Project's wastewater treatment plant, crushing and screening plant, and landfill facility are classified as a Prescribed Premises. A Works Approval and Operating Licence for construction and operation will be required. Atlas will submit a Works Approval application to the Department of Environment Regulation (DER) for assessment prior to construction of any prescribed premises.

Native vegetation clearing permits (NVCP) will be required under Part V of the EP Act. As of 2005, the DMP holds responsibility for the assessment and approval of NVCP applications relating to mining activities in Western Australia. Atlas will submit a clearing permit (purpose) application to the DMP for assessment of clearing activities on mining tenure.

Atlas will also submit a clearing permit application to the DER for the proposed upgrade works to the Public Road (Hillside-Marble Bar) as this is not covered by mining tenure.

The RIWI Act, administered by Department of Water (DoW), governs the management and allocation of all terrestrial water resources in WA. In particular, all new groundwater bores require a 26D licence prior to construction of the bore and a 5C licence for water abstraction. A permit to interfere with the bed or banks of a watercourse is also required under the RIWI Act, for Projects within a proclaimed surface water area.

Atlas has obtained a 26D licence to investigate water sources and will obtain a 5C licence for the abstraction of groundwater. The 5C licence will be amended as further water resources are identified to fulfil the construction and operational water requirements. As part of the DoW assessment Atlas will develop and submit a Water Management Plan and Site Operating Strategy for the proposed abstraction and management of groundwater resources on site. A permit to interfere with the bed or banks approval will also be sought where required.

2.6 Public Consultation (Including With indigenous Stakeholders)

Atlas has proactively consulted with government and non-government stakeholders throughout the development, design and planning stages of the Project. Stakeholders consulted includes, but is not limited to:

- Indigenous community groups (Njamal Native Title Claimant Group).
- Neighbouring pastoral lease owners (Hillside/Panorama, Eginbah).
- Government Departments (DMP, EPA, DPaW, DER, DoEE, Department of Aboriginal Affairs (DAA), Main Roads Western Australia).
- Local Government (Shire of East Pilbara).
- Relevant tenement holders (Numerous).
- Local Community Members (Marble Bar)

Atlas is committed to continuing consultation with stakeholders through the approval, construction and operational phases of the Project to ensure stakeholders are regularly informed of Project develops and any concerns raised are addressed efficiently.

Consultation regarding the Project is ongoing and will continue with key stakeholders throughout the life of the Project.

2.7 A Staged Development or Component of a Larger Action

N/A

2.8 Related Actions

N/A

3. Description of Environment & Likely Impacts

3.1 Matters of National Significance

3.1 (a) World Heritage Properties

Description

No World Heritage Property lies within or near the Project.

Nature and Extent of Likely Impact

The Project will have no impact any World Heritage Properties.

3.1 (b) National Heritage Places

Description

No National Heritage Places lie within or near the Project.

Nature and Extent of Likely Impact

The Project will have no impact any National Heritage Places.

3.1 (c) Wetlands of Internal Importance (Declared Ramsar Wetlands)

Description

No Wetlands of Internal Importance lie within or near the Project.

Nature and Extent of Likely Impact

The Project will have no impact any Wetlands of Internal Importance.

3.1 (d) Listed Threatened Species and Ecological Communities

Description

Threatened Ecological Communities

Woodman Environmental Consulting Pty Ltd (Woodman) conducted a Level 2 flora and vegetation survey for the Project over the Study Area (Figure 3.1).

Classification analysis of quadrat floristic data to define Vegetation Types (VTs) was conducted using quadrats from the Study Area.

Figure 3.1 – Flora and Vegetation Study Area

None of the VTs mapped in the Study Area were considered to represent any Threatened Ecological Communities (TECs) listed under the *Environment Conservation and Biodiversity Protection Act 1999* (EPBC Act) or as classified by Department of Parks and Wildlife (DPaW) and endorsed by the Western Australian Minister for Environment (DPaW 2015). None of the VTs mapped in the Study area are considered to represent any DPaW-classified Priority Ecological Community (PECs) (DPaW 2016a). No known locations of any DPaW-classified TECs, TECs listed under the EPBC Act, or DPaW-classified PECs, coincide with the Study area (DoE 2016a; DPaW 2016a).

The full report can be found in Appendix A.

Threatened Species
Atlas engaged MWH Australia Pty Ltd (MWH) to undertake the appropriate field surveys for vertebrate fauna and conduct an impact assessment of the Project which was to be aligned with the relevant sections of the following guidelines:

- EPA (2002), Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection;
- EPA (2004), Guidance Statement No. 56: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia;
- EPA and DEC (2010), Technical Guide: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment;
- DEWHA (2010a) Survey Guidelines for Australia's Threatened Bats;
- DEWHA (2010b), Survey Guidelines for Australia's Threatened Birds;
- DSEWPaC (2011b), Survey Guidelines for Australia's Threatened Mammals;
- DSEWPaC (2011c), Survey Guidelines for Australia's Threatened Reptiles; and
- DoE (2016c), EPBC Act Referral Guidelines for the Endangered Northern Quoll *Dasyurus hallucatus*.

A desktop study was conducted, prior to an initial field survey, comprising of database searches and literature reviews. The objective of the desktop study was to gather background information on the local region, to provide an indication of which fauna species and habitats that were likely to be present, determine the suitable survey methodology, and to provide a regional context to inform the analysis of field survey findings.

Database searches were completed using a central coordinate of 772687 mE and 7627386 mN (GDA94, UTM 50K; Table 3.1). Search buffers differed due to the technical capabilities of individual databases, as well as features surrounding the Study Area relevant to different species groups. The Study Area is shown in Figure 3.2.

Figure 3.2 – Vertebrate Fauna Survey Area

Table 3.1 – Databases Searched

Reference	Custodian	Database	Date obtained	Search area buffer (km)
DPaW (2016b)	Department of Parks and Wildlife	Threatened and Priority Fauna Database	21/10/2016	50
Birdlife Australia (2014)	Birdlife Australia	Birdlife Atlas Database	4/02/2014	75
DPaW (2016a)	Department of Parks and Wildlife	NatureMap	11/10/2016	40
DoEE (2016)	Department of the Environment and Energy (DoEE)	Protected Matters Search Tool	11/10/2016	40

The desktop study identified a total of 325 species of vertebrate fauna, which have previously been recorded and/or have the potential to occur within the Study Area. Of those, 174 (54%) were recorded during the field survey including 28 native mammal, four introduced mammal, 72 bird, 66 reptile and four amphibian species (MWH 2106f). Eight Listed Threatened Species under the EPBC Act were identified to potentially occur in the Study Area (Table 3.2); of these species four were Confirmed within the Study Area, one was assessed as Possible to occur, and three were considered Unlikely to occur. The full report and findings can be found in Appendix B.

Table 3.2 – Conservation Listed Fauna Identified by the Desktop Study

Common name (*Scientific name*)	Conservation status EPBC Act	Likelihood of occurrence*
Curlew Sandpiper *Calidris ferruginea*	Cr, Mi	Unlikely Nearest DPaW (2016) record located ~250 km south of the Study Area, at Ophthalmia Dam and very few inland records of the species. Species only recorded from DoEE Protected Matters database, which is based on estimated species distribution, rather than actual field records.
Northern Quoll *Dasyurus hallucatus*	En	Confirmed Five individuals were trapped from eight capture events during the Phase 2 survey. An additional 19 records were retrieved from motion-sensor cameras and another eleven scat records. All records were collected within Rocky Ridge and Gorge, Drainage Line, Riverine and Rocky Foothill (within the vicinity of Rocky Ridge and Gorge) habitats.
Night Parrot *Pezoporus occidentalis*	En	Unlikely Nearest DPaW (2016a) record located ~135 km south-west from near the Fortescue Marsh (Davis and Metcalf 2008). Species only recorded from DoEE Protected

Common name (*Scientific name*)	Conservation status EPBC Act	Likelihood of occurrence*
		Matters database, which is based on estimated species distribution, rather than actual field records.
Australian Painted Snipe *Rostratula australis*	En	Unlikely Nearest DPaW (2016a) record located ~170 km south of the Study Area, near Fortescue Marsh, but otherwise very few records within the Pilbara region (Knuckey et al. 2013). N Species only recorded from DoEE Protected Matters database, which is based on estimated species distribution, rather than actual field records.
Greater Bilby *Macrotis lagotis*	Vu	Possible Populations of the species are scattered and rare within its distribution (van Dyck and Strahan 2008). Nearest DPaW (2016b) records located ~30 km south-west of the Study Area and ~45 km south-east at McPhee Creek (Outback Ecology 2014). Species requires sandy substrates for burrowing and although such habitat was present in the Study Area (Spinifex Sandplain), this habitat did not contain deep sands suitable for deep burrows. Additionally substantial targeted search effort failed to record evidence of the species, which is relatively easy to identify (Burrows *et al.* 2012).
Ghost Bat *Macroderma gigas*	Vu	Confirmed The species was confirmed from 10 records within the Study Area, including one observation of a roosting individual at cave CO-CA-01 and one individual observed flaying into CO-CA-01 at night. Low level activity was also recorded by SM units from five caves, and scats were found at three locations. All records were within Rocky Ridge and Gorge and Ironstone Ridgetop habitats.
Pilbara Leaf-nosed Bat *Rhinonicteris aurantia*	Vu	Confirmed The species was confirmed from 41 records, including four direct sightings of 10-200 individuals. Two diurnal roosts recorded of the species, in addition to seven Nocturnal Refuges, within Rocky Ridge and Gorge habitat. Rocky Ridge and Gorge habitat, provides suitable foraging habitat for the species.
Pilbara Olive Python *Liasis olivaceus barroni*	Vu	Confirmed The species was confirmed from four records within the Study Area. From three direct sightings and the remains of one skin sloth. The species is likely to reside in the Rocky Ridge and Gorge habitat and utilise Drainage Line and Riverine habitats for foraging and dispersal.

*** Likelihood of Occurrence**

Confirmed – the presence of the species in the Study Area has been recorded unambiguously during the last ten years (i.e. during recent surveys of the Study Area or from recent records obtained via database searches);

Very Likely – the Study Area lies within the known distribution of the species and contains suitable habitat(s), plus the species generally occurs in suitable habitat and has been recorded nearby within the last 20 years;

Likely – the Study Area lies within the known distribution of the species and the species has been recorded nearby within the last 20 years; however, either:

- **the Study Area contains only a small area of suitable habitat, or habitat that is only marginally suitable; or**
- **the species is generally rare and patchily distributed in suitable habitat;**

Possible – there is an outside chance of occurrence, because:

- **the Study Area is just outside the known distribution of the species, but it does contain suitable and sufficient habitat (the species may be common, rare, or patchily distributed); or**
- **the Study Area lies within the known distribution of the species, but the species is very rare and/or patchily distributed; or**
- **the Study Area lies on the edge of, or within, the known distribution and has suitable habitat, but the species has not been recorded in the area for over 20 years; or**

Unlikely – the Study Area lies outside the known distribution of the species, the Study Area does not contain suitable habitat, and the species has not been recorded in the area for over 20 years.

Fauna listed under the EPBC Act and that have been Confirmed to occur within the Study Area are further discussed, fauna that are listed under the EPBC Act but are considered Unlikely or Possible to occur in the Study Area are not considered to be impacted by the proposed action and are therefore not discussed further.

Northern Quoll (Endangered)

The Northern Quoll is listed as endangered under the EPBC Act and Schedule 2 of the *Wildlife Conservation Act 1950* (WC Act). Once widely distributed across northern Australia, the Northern Quoll is now restricted to six isolated populations (DoE 2016b). The Pilbara region was formerly thought likely to remain free of cane toads (the largest threat to the species), and therefore act as a 'stronghold' population for the species (Cramer et al. 2016). However it is now predicted that cane toads will invade the Pilbara (Tingley et al. 2013) and the population is in threat of significant decline.

The Northern Quoll was recorded in all 11 previous surveys conducted within the vicinity of the Study Area and was identified by two databases. Specifically DPaW (2016b) identified 35 records of the species between 1899 and 2014, the nearest (and most recent) located approximately 30 km west at Mt Webber in similar habitat to what occurs within the Study Area (DPaW 2016b, MWH 2015). The large number of previous records within the vicinity of the Study Area suggests that the species is relatively common in the local region. Additionally, the presence of two females (one carrying young) indicates the presence of nearby den sites and confirms that a breeding population occurs within the Study Area (as opposed to rogue, dispersing males only). However, the lack of captures at targeted trapping sites suggests that the population's distribution is confined to specific systems (i.e. gorge and rocky ridge systems) rather than uniform occurrence throughout broad habitat types (MWH 2016f).

The Northern Quoll was recorded on 36 occasions within the Study Area; of which nine were located within the Development Envelope and one within the Disturbance Footprint. Twenty-six records (72%) were recorded from the Rocky Ridge and Gorge habitat, one was recorded from the Drainage Line and Riverine habitats each (MWH 2016f).

The occurrence within these habitat types is consistent with the species known habitat preferences, showing preference for rocky habitats with rock crevices and caves (van Dyck and Strahan 2008, Woinarski et al. 2014), such as ironstone ridges, rocky escarpments, granite boulders and outcrops, and riverine systems (Dunlop et al. 2014).

Ghost Bat (Vulnerable)

The Ghost Bat has an extensive, although disjointed, distribution occurring from the arid Pilbara across to tropical rainforests of Queensland (Armstrong and Anstee 2000, Churchill 2008). Within the Pilbara region the species has a very widespread but patchy distribution (Armstrong and Anstee 2000).

Fifty-nine records were identified by DPaW (2016b) within the surrounding area, many of which originate from two regionally important roosting sites, Klondyke Queen Mine (~25 km north-east) and Comet Mine (~20 km north). Headcounts of the species from both these mines range from 20-366 and 35-100, respectively (DoE 2016a).

Although roost habitat is specific, Ghost Bats will forage over a wide range of habitats (Churchill 2008). This species forages using echolocation during flight, but will also use 'passive sit and wait' hunting techniques visually scanning and ambushing prey from high structures, such as rocky overhangs and trees (Churchill 2008). The species may therefore forage over all habitats within the Study Area, although the Rocky Ridge and Gorge is likely to be of particular importance for both foraging and roosting.

The Ghost Bat was recorded on 10 occasions during the Survey, comprising two sightings, three scat and five echolocation records. Both visual sightings were of one individual at cave CO-CA-01, during Phase 2 this was 10 minutes after civil twilight on the 2nd October 2016. The timing of this record suggests that the individual was roosting within the vicinity of CO-CA-01, potentially within the Study Area. Scat records were located, variously, at caves believed to represent nightly foraging and feeding sites only due to the small amount of scat material present.

Echolocation recordings suggested low levels of activity at these sites and confirmed night-time visitation only (i.e. no evidence of diurnal roosting). Although the lack of echolocation records cannot rule out diurnal roosting within the Study Area as Ghost Bats are capable of hunting and navigating entirely visually (Armstrong and Anstee 2000); it is unlikely that an important roost is located within the Study Area, particularly within areas sampled and searched. Extensive effort was invested in determining presence/absence of the species within all potential cave forming features within the search areas. Studies have shown that Ghost Bats are highly affected by fire (Bullen and McKenzie 2011), and this may explain the complete absence of the species during Phase 1.

Pilbara Leaf-nosed Bat (Vulnerable)

The Pilbara Leaf-nosed Bat is restricted to the Pilbara region and is thought to have been separated from populations of the Orange Leaf-nosed Bat in the Kimberley, Northern Territory and western Queensland for at least 30,000 years (van Dyck and Strahan 2008).

The species is known to occur throughout the region, but is restricted to the Chichester and Hamersley subregion where suitable roosting habitat is available. Five known Permanent Diurnal Roosts are known to occur within 60 km of the Study Area (Mt Webber, Lalla Rookh, Daltons Creek, Glacier Valley, Copper Hills) and a large number of Transitory Diurnal Roosts and/or Non-Permanent Breeding Roosts are also known to occur (i.e. Klondyke Queen, Comet, Abydos and North Star mines; Bat Call 2013, DoE 2016c, MWH 2016a). Additionally, 60 records of the species were identified in the surrounding area by DPaW (2016b).

The species was recorded from 42 records during the Survey, including four direct sightings, 37 echolocation recordings and one night of video-census recording. Of the records obtained, 26 were from Rocky Ridge and Gorge, six from Ironstone Ridgetop, five from Drainage Line, one each in Spinifex Stony Plain, Calcrete, Spinifex Sandplain and Stony Rises habitat and one from outside the Study Area (MWH 2016f).

The most important features identified in the Study Area, and relevant to the species is CO-CA-01, a Permanent Diurnal Roost, and CO-CA-03 potentially a Non-Permanent Breeding Roost (MWH 2016f). The colony occupying CO-CA-01 during the Survey was estimated at 407-600 individuals. The species is heavily reliant on warm (28 to 32°C), humid (85 to 100%) sites for roosting (Armstrong 2001), which enable individuals to reduce water loss and energy expenditure (Baudinette et al. 2000). The distribution of the species is therefore limited by the scarcity of caves that possess the required microclimates (Armstrong 2001, Churchill 1991). Until recently only two roosts of the species were known, both in disused mineshafts (Armstrong 2001); however, the number of known roost sites has increased to over 30 in the past few years (DoE 2016c). Many of these roosts are in unstable disused mine shafts, the occurrence of these two naturally occurring roosts is of high conservation value to the species. These roosts are supported by a large number of foraging resources, both Nocturnal Refuges and water sources, and extensive coverage of preferred foraging habitat. As such, Drainage Line, Riverine and Rocky Ridge and Gorge (particularly gorge systems that contain water sources) habitat types occurring within the Study Area are of significant value to the species.

Pilbara Olive Python (Vulnerable)

The Pilbara Olive Python is Western Australia's largest snake averaging 2.5 m (Bush and Maryan 2011, Cogger 2014). The species has a dull olive-brown upper surface and is pale cream below (Burbidge 2004, Cogger 2014). This subspecies is endemic to the Pilbara region, distributed from Burrup Peninsula, Ord Ranges and Meentheena south to Nanutarra and Newman (Bush and Maryan 2011, Storr et al. 2002).

It is often misconceived that the species is reliant and restricted to areas near permanent water; however the species is attracted to these areas due, only, to the productivity and abundance of suitably-sized prey (Pearson 2003). Within the Study Area, the Rocky Ridge and Gorge habitat is likely to be the primary habitat for the species, containing cracks, crevices and caves for sheltering and also prone to holding water for hunting. Additionally, the Drainage Line and Riverine habitats are likely to represent important regional transit corridors for the species.

The species was recorded during eight of the eleven surveys conducted within the vicinity of the Study Area and from all three relevant databases. Specifically DPaW (2016b) identified two records of the species, one undated from Marble Bar and the other from Mt Webber in 2010.

The species was recorded within the Study Area on four occasions, comprising one direct sighting during the Survey, two direct sightings from site staff outside of the Survey (although confirmed via photographs) and one record of an individual's skin sloth (confirmed via counting midbody scales). Two records were obtained within Rocky Ridge and Gorge habitat and the remaining two were recorded from Ironstone Ridgetop and Drainage Line habitat. The species commonly inhabits moist areas such as gorges, rivers, pools and surrounding hills, but can be found in a range of habitats (Burbidge 2004, DSEWPaC 2011, Pearson 2003).

Nature and Extent of Likely Impact

The terminology, rational and criteria that has been used to determine whether the Project has a 'significant impact' is consistent with the DoE's *Matters of National Environmental Significance, Significant Impact Guidelines 1.1* (2013). In addition the criteria used to determine the significance of impact to the Northern Quoll was taken from the *EPBC Act referral guidelines for the endangered northern quoll Dasyurus hallucatus* (DoE, 2016b) and for the Pilbara Leaf-nosed Bat the significance criteria was taken from *Conservation Advice Rhinonicteris aurantia (Pilbara form) Pilbara leaf-nosed Bat* (2016c).

MWH completed an impact assessment on the Project without the implementation of management measures. Their findings can be found in Appendix C and is summarised in Table 3.3. Table 3.3 also summarises Atlas' assessment of the Projects potential for significant impact with the implementation of management measures.

Table 3.3 – Assessment of Project Impacts on EPBC Act Listed Fauna

EPBC Act Listed Threatened Fauna	Nature of Impact	
	Without Management Measures	With Management Measures
Northern Quoll	Significant	Not Significant
Ghost Bat	Not significant	Not Significant
Pilbara Leaf-nosed Bat	Significant	Not Significant
Pilbara Olive Python	Significant	Not Significant

The detailed information on the assessment of the significance of impacts to EPBC Act fauna is detailed in Table 3.4 to Table 3.7.

Table 3.4 –Northern Quoll Assessment of Significant Impact

<table>
<tr><th>Significant Impact Criteria</th><th>Assessment</th></tr>
<tr><td>• result in the loss of habitat critical to the survival of the Northern Quoll</td><td>Clearing of habitat critical to the survival of the species is likely to pose the largest threat from the Project. Habitat critical to the Northern Quoll comprises rugged, rocky areas, often in close association with permanent water (Molloy et al. 2016, Oakwood 2000), and major drainage lines and treed creek lines (DoE 2016b) – this is consistent with Rocky Ridge and Gorge, Drainage Line and Riverine habitats within the Study Area. The occurrence of the Northern Quoll however, is not uniform throughout these habitats.

The presence of Rocky Ridge and Gorge, Drainage Line and Riverine habitats and their percentages within the Study Area is detailed in the table below:
<table>
<tr><th rowspan="2">Habitat</th><th colspan="3">Total Area (ha)</th></tr>
<tr><th>Study Area</th><th>Development Envelope</th><th>Development Footprint</th></tr>
<tr><td>Rocky Ridge and Gorge</td><td>1,766</td><td>249.26
14.1%</td><td>42.29
2.4%</td></tr>
<tr><td>Drainage Line</td><td>502</td><td>55.72
11%</td><td>2.7
0.5%</td></tr>
<tr><td>Riverine</td><td>167</td><td>37.72
22%</td><td>1.73
1%</td></tr>
</table>
Habitats within the Development Envelope, are connected to similar habitat outside the Development Envelope (north and south within the Study Area), as well as similar habitat outside the Study Area (particularly to the north). In particular, Drainage Line habitat is known to be widespread in the broader landscape (MWH, 2016e) and Riverine habitat is known to occur outside the Study Area to the east.

The proposed Project will reduce the amount and quality of critical, foraging and dispersal habitat on a very minor scale with the proposed percentage of known habitat that will be impacted by the Project being minimal and will not result in a loss of habitat critical to the survival of the Northern Quoll.

The management measures to avoid and reduce impacts to Northern Quoll are detailed in Section 5 and will be implemented as described.</td></tr>
</table>

Significant Impact Criteria	Assessment
	The Project is unlikely to have a significant impact on the species based on this criteria.
• decrease the size of a population important for the long-term survival of the Northern Quoll and therefore interfere with the recovery of the species	The population existing within the Study Area, is considered to be a high density population (under definition by DoEE "numerous camera triggers of multiple individuals across multiple cameras and or traps"), and therefore constitutes a population important to the long-term survival of the species. Northern Quoll abundance within the Study Area was varied. Areas of high densities were located outside the Development Envelope. In such locations the population density was relatively high compared to nearby records in the eastern Pilbara region, such as Mt Webber (MWH 2016g), Nullagine (Bamford Consulting Ecologists 2009) and McPhee Creek (Outback Ecology 2012), although not as high as recorded in other areas such as Abydos (MWH 2016a) and Wodgina (MWH 2016h). Reducing the amount of suitable denning habitat could potentially reduce the long term local population size of the species. Northern Quoll, particularly males, are highly territorial; the number of individuals which occupy a given amount of quality habitat is limited. While individuals may escape direct mortality of mining activity, they are then required to compete with other individuals in the long term. However, the proposed percentage of disturbance on mapped habitats is minimal (as discussed above). In the Pilbara, the species occurs in fragmented populations, mainly in rocky ridgeline and outcrop type habitats (Woinarski et al. 2014), however the genetic connectively, and therefore dispersal capabilities, of the species is thought to be high (Spencer et al. 2013). The Project will implement management measures to avoid and reduce impacts of threatening processes through vehicle hygiene practices, vehicle management, surface water management and clearing of vegetation. These management measures are discussed in detail in Section 5. The Project is unlikely to have a significant impact on the species based on this criteria.
• introduce inappropriate fire regimes or grazing activities (i.e. increasing the risk of late dry season high intensity fires to the area) that substantially degrade habitat critical to the survival of the Northern Quoll or decrease the size of a population important for the long term survival of the species	The proposed Project is unlikely to increase impact caused by grazing in the area, nor is it likely to change the fire regimes. The Project is unlikely to cause significant impact to the species based on this criteria.
• fragment a population	The population existing within the Study Area, is considered to be a high density population (under definition by DoEE "numerous

Significant Impact Criteria	Assessment
important for the long term survival into two or more populations	camera triggers of multiple individuals across multiple cameras and or traps"), and therefore constitutes a population important to the long-term survival of the species. Infrastructure of the proposed Project is unlikely to restrict interaction between individuals, additionally the species is regarded as having good dispersal capabilities and the Development Envelope is surrounded by suitable dispersal (Drainage Line, Riverine) habitat. The Project is unlikely to cause significant impact to the species based on this criteria.
• result in invasive species or increase of them that are harmful to the Northern Quoll becoming established in its habitat, namely cane toads, feral cats, red foxes or exotic grasses which increase fire risk. This includes action which have inadequate quarantine measures in place for movements between the mainland and offshore islands where Northern Quolls occur	Feral cats were recorded in the Study Area and are likely to reside in habitat critical to the Northern Quoll. Atlas has an established feral animal management program and will implement measures to maintain or reduce the number of feral animals with the Project Area. Details of the feral animal management program are provided in Section 5. The Project is unlikely to have a significant impact on the species based on this criteria.

Therefore the Project unlikely have a significant impact on the Northern Quoll. Measures to avoid or reduce the impacts of the Project area discussed in Section 5.

Table 3.5 – Ghost Bat Assessment of Significance of Impact

Significant Impact Criteria	Assessment
• lead to a long-term decrease in the size of an important population of a species	The population of Ghost Bats inhabiting the Study Area, does not comprise an 'important population'. The Project is unlikely to cause significant impact to the species based on this criteria.
• reduce the area of occupancy of an important population	The population of Ghost Bats inhabiting the Study Area, does not comprise an 'important population'. The Project is unlikely to cause significant impact to the species based on this criteria.

Significant Impact Criteria	Assessment
• fragment an existing important population into two or more populations	The population of Ghost Bats inhabiting the Study Area, does not comprise an 'important population'. The Project is unlikely to cause significant impact to the species based on this criteria.
• adversely affect habitat critical to the survival of the species	Clearing of habitat critical to the survival of the Ghost Bat is likely to pose the largest threat from the Project. However, no maternity caves or significant diurnal roosts were identified as occurring within the Development Envelope, despite an extensive amount of Survey effort expended in the area. Habitat within the Study Area does not comprise 'habitat critical to the survival of the species'. The Project is unlikely to cause significant impact to the species based on this criteria.
• disrupt the breeding cycle of an important population	The population of Ghost Bats inhabiting the Study Area, does not comprise an 'important population' and no maternity caves or significant diurnal roosts were identified as occurring within the Development Envelope, despite an extensive amount of Survey effort expended in the area. The Project is unlikely to cause significant impact to the species based on this criteria.
• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The population of Ghost Bats inhibiting the Study Area does not appear to be dependent on the any feature within the Development Envelope and it is therefore unlikely the species will decline in response to development of the Project. The Project is unlikely to cause significant impact to the species based on this criteria.
• result in invasive species that are harmful to a critically species becoming established in the vulnerable species' habitat	The proposed Project is unlikely to cause the introduction of a species harmful to the Ghost Bat. The Project is unlikely to cause significant impact to the species based on this criteria.
• introduce disease that may cause the species to decline	The proposed Project is unlikely to introduce disease into the area. The Project is unlikely to significant impact the species based on this criteria.
• interfere substantially with the recovery of the species	Despite presence of the species, the Study Area does not provide habitat critical to the survival of the species and is therefore unlikely to interfere with the species recovery. The Project is unlikely to significant impact the species based on this criteria.

Therefore the Project is considered to not have a significant impact on the Ghost Bat species.

Table 3.6 – Pilbara Leaf-nosed Bat Assessment of Significance

Significant Impact Criteria	Assessment
• lead to a long-term decrease in the size of the Pilbara Leaf-nosed Bat population	According to DoE (2016c) "The loss of, or unmitigated disturbance to 'Permanent Diurnal Roosts' or 'Non-permanent Breeding Roost' is highly likely to lead to a long-term decrease in the size of the Pilbara Leaf-nosed Bat population". Atlas has committed to a 450 m buffered exclusion zone surrounding the entrance of the Permanent Diurnal Roost. The nearest infrastructure in the Disturbance Footprint is a haul road and then a mining pit, located 450 m and 470 m from the cave entrance, respectively. Both features are located on the opposite side of a deep gully, on a separate ridge. Therefore drilling and blasting activities (which create noise and vibration impacts) associated with the nearby pit are unlikely to travel through the ridge system and impact this diurnal roost. A 500 m buffered exclusion zone has proven adequate at Cattle Gorge and 200 m buffer was adequate at Koodaideri (Biota 2013), a 500 m buffer is recommended by regional bat expert Bob Bullen. Atlas has committed to a 50 m buffered exclusion zone surrounding the entrance of the potentially Non-permanent Breeding Roost (CO-CA-03). It is known the cave is not occupied year round but it has not been confirmed how often the cave is occupied, therefore the cave maybe less important than currently categorised (i.e. it may be temporary diurnal roost).The nearest proposed infrastructure in the Disturbance Footprint is the Razor Back mining pit located 50m from the entrance of the cave. Razor Back pit will be the last pit mined as part of the Project, with mining to commence year four of the five to six year life of mine. Razor Back pit is also planned to be mined on a part-time basis in conjunction with another pit (Split Rock, the largest pit). The likely success of a 50 m buffer on the structural integrity of the cave is unknown and will dependent largely on the rock strata of the system. Atlas is current undertaking further monitoring and survey work to confirm the definition of this cave and assess the structural integrity. Drilling and blasting activities, and ore extraction up to 50 m of cave CO-CA-03 may disturb the roosting individuals within and potentially cause abandonment of the roost. However, the impact is likely to be short-term in nature and a 50 m buffer may be adequate and not cause a long term decline in the local population. Additionally, if the structure is maintained, it is likely that the cave will still be used as a nocturnal refuge for the duration of the mining activity. An additional important Nocturnal Refuge was located outside the Study Area in Glen Herring Gorge, although more are likely to occur (McKenzie and Bullen 2009). Therefore, the Project will not cause a loss or unmitigated disturbance to either the 'Permanent Diurnal Roost' or the 'Non-permanent Breeding Roost' and therefore will not lead to a long-term decrease in the size of the Pilbara Leaf-nosed Bat. The Project is unlikely to have a significant impact on the species based on this criteria.

Significant Impact Criteria	Assessment
• reduce the area of occupancy of the Pilbara Leaf-nosed Bat population	The Project is unlikely to have an adverse impact to the Permanent Diurnal Roost (CO-CA-01), although it may impact upon the Non-permanent Breeding Roost (CO-CA-03). Given that these two roosts are located approximately 5 km from one-another and individuals occurring in each are likely to forage in same area it is unlikely that the Project would reduce the area of occupancy of the species, even if CO-CA-03 was disturbed. The Project is unlikely to have a significant impact on the species based on this criteria.
• adversely affect individuals or habitat critical to the Pilbara Leaf-nosed Bat	Diurnal roost are considered habitat critical to the species. The exclusion zone around CO-CA-01 is likely to mitigate disturbance to this roost, however the 50 m exclusion zone surrounding CO-CA-03 may not be sufficient to mitigate disturbance to this Non-Permanent Breeding Roost. Razor Back will be the last pit mined as part of the Project, with mining to commence year four of the five to six year life of mine. Razor Back pit is also planned to be mined on a part-time basis in conjunction with another pit (Split Rock, the largest pit). Drilling and blasting activities, and ore extraction up to 50 m of cave CO-CA-03 may disturb the roosting individuals within and potentially cause abandonment of the roost. However, the impact is likely to be short-term in nature and a 50 m buffer may be adequate and not cause a long term decline in the local population. Additionally, if the structure is maintained, it is likely that the cave will still be used as a nocturnal refuge for the duration of the mining activity. Additionally foraging habitat within the vicinity of a diurnal roost is likely to constitute habitat critical to the species. Approximately 14.1% Rocky Ridge and Gorge, 11% of Drainage Line and 22% of Riverine habitats mapped in the Study Area, are located within the Development Envelope, with 2.4%, 0.5% and 1% respectively falling within the Development Footprint. Two permanent and two semi-permanent water sources and four nocturnal refuges are located within the Development Envelope and a further four semi-permanent and three permanent water sources and three nocturnal refuges were located outside the Development Envelope but within the Study Area. One permanent water source currently lies within the Disturbance Footprint. The Project is unlikely to have a significant impact on the species based on this criteria
• disrupt the breeding cycle of an important colony	Development-related activities in close proximity to diurnal roosts have the potential to disrupt the breeding cycle of the Pilbara Leaf-nosed Bat if they occur within any part of the breeding period (DoE 2016c). As the Project is anticipated to operate year round, there is potential for the Project to disrupt the species during the breeding season (July-March). The exclusion zone around CO-CA-01 is likely to mitigate majority of disturbance to this roost. Mining activities up to 50 m from CO-CA-03 may disrupt the breeding of individuals in this cave, however cave CO-CA-01 is only located approximately 5km away. The Project unlikely to have a significant impact on the species based on this criteria.

Significant Impact Criteria	Assessment
• modify, destroy, remove or isolate or decrease the availability or quality of Pilbara Leaf-nosed Bat habitat to the extent that the species is likely to decline	Diurnal roost are considered habitat critical to the species. The exclusion zone around CO-CA-01 is likely to mitigate disturbance to this roost and the 50 m exclusion zone surrounding CO-CA-03 may mitigate disturbance to this Non-Permanent Breeding Roost. Foraging habitat within the vicinity of a diurnal roost is likely to constitute habitat critical to the species. Approximately 249.26 ha of Rocky Ridge and Gorge, 55.72 ha of Drainage Line and 37.72 ha of Riverine habitat, are located within the Development Envelope, all which are considered critical habitat for the species. Of these, 42.29 ha, 2.70 ha and 1.73 ha lie within the Disturbance Footprint, respectively, which when compared to the total known area is minimal (as discussed above). Four water sources and four Nocturnal Refuges utilised by the species are located within the Development Envelope, only one permanent water source is located within the current Disturbance Footprint. The Project is unlikely to have a significant impact on the species based on this criteria.
• Result in invasive species that are harmful to the PLNB becoming established in its habitat	In accordance with the conservation advice (2016) invasive species are unlikely to have a significant impact on the Pilbara Leaf-nosed Bat.
• Introduce disease that may cause the PLNB to decline	In accordance with the conservation advice (2016) there are no known diseases that are threatening the Pilbara Leaf-nosed Bat (Threatened Species Scientific Committee, 2016)

Therefore it is considered that the Project is unlikely to have a significant impact on the Pilbara Leaf-nosed Bat. Management measures to avoid or reduce impacts on the Pilbara Leaf-nosed Bat are discussed in Section 5.

Table 3.7 – Pilbara Olive Python Assessment of Significant Impact

Significant Impact Criteria	Assessment
• lead to a long-term decrease in the size of an important population of a species	The population of Pilbara Olive Pythons inhabiting the Study Area is likely to represent a source population (therefore 'important population'), dictated by the high amount of suitable habitat and microhabitat features, and the number of records recorded in the Study Area. There is approximately 249.26 ha of the Rocky Ridge and Gorge habitat, critical habitat for the species, located within the Development Envelope, 42.29 ha of this is in the Disturbance Footprint (2.4% of habitat mapped within the Study Area). Additionally two semi-permanent and two permanent water sources are located within the Development Envelope, one permanent water source is located within the Disturbance Footprint. The removal of such habitat may to lead to a decrease in the size of the population as such habitat cannot be readily replicated post-closure. The species however, is not reliant or restricted to areas near permanent water; they are however attracted to these areas due to the productivity and abundance of suitably-sized prey (Pearson 2003). Additionally, water bodies such as Turkeys Nests and sewage ponds associated with mining or development appear to benefit the species (Pearson 2003). The Project is unlikely to have a significant impact on the species based on this criteria.
• reduce the area of occupancy of an important population	249.26 ha of the Rocky Ridge and Gorge, habitat critical for the species, occurs within the Development Envelope. Six semi-permanent and five permanent water sources were recorded within the Study Area. Of these, two permanent and two semi-permanent water sources are located within the Development Envelope and one permanent water source is located within the Disturbance Footprint. The species commonly inhabits moist areas such as gorges, rivers, pools and surrounding hills, but can be found in a range of habitats (Burbidge 2004, DSEWPaC 2011, Pearson 2003). Habitats within the Development Envelope, are connected to similar habitat outside the Development Envelope (north and south within the Study Area), as well as similar habitat outside the Study Area (particularly to the north). The Project is unlikely to have a significant impact on the species based on this criteria.

Significant Impact Criteria	Assessment
• fragment an existing important population into two or more populations	The species is highly mobile and able to travel extensive distances. Drainage Line and Riverine habitat, used as dispersal habitat is well represented outside the Development Envelope and will provide thoroughfare for the species to disperse through the region. Although the species is patchily distributed, the Pilbara Olive Python is widespread across the Pilbara (DPaW 2016b) and was recorded during eight of the eleven surveys conducted within the vicinity of the Study Area (MWH 2016f). Habitats within the Development Envelope, are connected to similar habitat outside the Development Envelope (within the Study Area), as well as similar habitat outside the Study Area (particularly to the north). The Project is unlikely to have a significant impact on the species based on this criteria.

Significant Impact Criteria	Assessment
• adversely affect habitat critical to the survival of the species	Clearing of habitat critical to the survival of the Pilbara Olive Python is likely to pose the largest threat from the Project. Rocky Ridge and Gorge represents habitat critical to the survival of the Pilbara Olive Python, providing suitable sheltering and hunting microhabitats for the species. Approximately 249.26 ha of the Rocky Ridge and Gorge habitat is located in the Development Envelope, including 42.29 ha in the Disturbance Footprint. Removal of Rocky Ridge and Gorge habitat is likely to reduce resource available to the Pilbara Olive Python within the Study Area and may result in a local population decline. The recovery of the population post-closure is unlikely given the inability to restore microhabitats within such habitats. The Drainage Line and Riverine habitats represent suitable foraging and dispersal habitat of the species. Approximately 55.72 ha and 2.70 ha of Drainage Line habitat, is located within the Development Envelope and Disturbance Footprint, respectively. Approximately 37.72 ha and 1.73 ha of Riverine habitat, is located within the Development Envelope and Disturbance Footprint, respectively. Six semi-permanent and five permanent water sources were recorded within the Study Area. Of these, two permanent and two semi-permanent water sources are located within the Development Envelope and one permanent water source is located within the Disturbance Footprint. Each of these is likely to be of importance to the Pilbara Olive Python. Six significant water sources, important to the Pilbara Olive Python, are located within 1 km of the Development Envelope (in addition to those within the Development Envelope). The species commonly inhabits moist areas such as gorges, rivers, pools and surrounding hills, but can be found in a range of habitats (Burbidge 2004, DSEWPaC 2011, Pearson 2003). The species however, is not reliant or restricted to areas near permanent water; they are however attracted to these areas due to the productivity and abundance of suitably-sized prey (Pearson 2003). Additionally, water bodies such as Turkeys Nests and sewage ponds associated with mining or development appear to benefit the species (Pearson 2003). The Project is unlikely to have a significant impact on the species based on this criteria.
• disrupt the breeding cycle of an important population	Although habitat critical to the species will be loss, after clearing has occurred there is few threatening processes that will have an ongoing adverse impact on the breeding cycle of the population. The Project is unlikely to cause significant impact to the species based on this criteria.

Significant Impact Criteria	Assessment
• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Approximately 249.26 ha of the Rocky Ridge and Gorge habitat is located in the Development Envelope. Additionally two semi-permanent and two permanent water sources are located within the Development Envelope, one which is known to support the species. Ongoing threatening processes such as vehicle collisions in other habitats may cause local decline of the species population. Management measures that will be implemented to address this risk are provided in Section 5. The species commonly inhabits moist areas such as gorges, rivers, pools and surrounding hills, but can be found in a range of habitats (Burbidge 2004, DSEWPaC 2011, Pearson 2003). The species is highly mobile and able to travel extensive distances. Drainage Line and Riverine habitat, used as dispersal habitat is well represented outside the Development Envelope and will provide thoroughfare for the species to disperse through the region. The species however, is not reliant or restricted to areas near permanent water; they are however attracted to these areas due to the productivity and abundance of suitably-sized prey (Pearson 2003). The Project is unlikely to have a significant impact on the species based on this criteria.
• result in invasive species that are harmful to a critically species becoming established in the vulnerable species' habitat	The Red Fox is the largest invasive species threat to the species. The Project is unlikely to cause the introduction of the Red Fox or other species harmful to the Pilbara Olive Python. The Project is unlikely to cause significant impact to the species based on this criteria
• introduce disease that may cause the species to decline	The proposed Project is unlikely to introduce disease into the area. The Project is unlikely to significant impact the species based on this criteria.
• interfere substantially with the recovery of the species	The Project is located on an active pastoral lease. Development of the proposed Project is unlikely to interfere substantially with any conservation recovery initiative for the species. The Project is unlikely to significant impact the species based on this criteria.

Therefore the Project is considered to potentially have a significant impact on the Pilbara Olive Python. Management measures to avoid or reduce the impacts of the Project on the Pilbara Olive Python are discussed in Section 5.

3.1 (e) Listed Migratory Species

Description

MWH completed a desktop study which identified 165 species of bird that potentially occur in the Study Area. Seventy-two (44%) of these species were recorded during the survey, including 59 species from 2,740 records at systematic sampling sites.

The migratory species identified during the desktop assessment as potentially occurring in the Study Area are provide in Table 3.8, together with the likelihood of their occurrence in the Study Area.

Table 3.8 – Conservation Listed Fauna Identified by the Desktop Study

Common name (Scientific name)	Conservation status	Likelihood of occurrence
	EPBC Act	
Curlew Sandpiper *Calidris ferruginea*	Cr, Mi	Unlikely Nearest DPaW (2016a) record located ~250 km south of the Study Area, at Ophthalmia Dam and very few inland records of the species. Species only recorded from DoEE Protected Matters database, which is based on estimated species distribution, rather than actual field records.
Fork-tailed Swift *Apus pacificus*	Mi	Possible Nearest DPaW (2016a) record located ~75 km north-west of the Study Area from 2011. The species was also recorded by How et al. (1991). The species may flyover the Study Area on an irregular basis, but is not dependent on habitats within the Study Area.
Oriental Plover *Charadrius veredus*	Mi	Unlikely Nearest DPaW (2016a) record located ~25 km north-east of the Study Area. Preferred habitat for the species does not occur within the Study Area and the species is generally uncommon in region
Oriental Pratincole *Glareola maldivarum*	Mi	Unlikely Nearest DPaW (2016a) record located ~150 km north-west of the Study Area, from Port Hedland and no inland records of the species. Species only recorded from DoEE Protected Matters database, which is based on estimated species distribution, rather than actual field records.
Sharp-tailed Sandpiper *Calidris acuminata*	Mi	Possible Nearest DPaW (2016a) record located ~25 km north-east of the Study Area, from freshwater pools east of Marble Bar. The species may occur as an irregular visitor to pools within the Riverine and Drainage Line habitats of the Study Area, but is not dependent on habitats within the Study Area.

Common name (Scientific name)	Conservation status EPBC Act	Likelihood of occurrence
Wood Sandpiper *Tringa glareola*	Mi	Possible Nearest DPaW (2016a) record located ~25 km north-east of the Study Area, from freshwater pools east of Marble Bar. The species may occur as an irregular visitor to pools within the Riverine and Drainage Line habitats of the Study Area, but is not dependent on habitats within the Study Area.
Common Sandpiper *Actitis hypoleucos*	Mi	Possible Nearest DPaW (2016a) records located ~25 km north-east of the Study Area at Marble Bar from 2005. The species may occur as an irregular visitor to pools within the Riverine and Drainage Line habitats of the Study Area, but is not dependent on habitats within the Study Area.
Common Greenshank *Tringa nebularia*	Mi	Possible Nearest DPaW (2016a) record located ~25 km north-east of the Study Area, from freshwater pools east of Marble Bar. The species may occur as an irregular visitor to pools within the Riverine and Drainage Line habitats of the Study Area, but is not dependent on habitats within the Study Area.
Glossy Ibis *Plegadis falcinellus*	Mi	Possible Nearest DPaW (2016a) record located ~50 km north of the Study Area, from the Coongan Riverine system. The species may occur as an irregular visitor to pools within the Riverine and Drainage Line habitats of the Study Area, but is not dependent on habitats within the Study Area.
Barn Swallow *Hirundo rustica*	Mi	Unlikely Nearest DPaW (2016a) record located ~150 km north-west of the Study Area, from Port Hedland and no inland records of the species. Species only recorded from DoEE Protected Matters database, which is based on estimated species distribution, rather than actual field records.
Grey Wagtail *Motacilla cinerea*	Mi	Unlikely Nearest DPaW (2016a) record located ~550 km north-west of the Study Area, from Broome. Species only recorded from DoEE Protected Matters database, which is based on estimated species distribution, rather than actual field records.
Yellow Wagtail *Motacilla flava*	Mi	Unlikely No previous surveys in the vicinity of the Study Area have recorded the species and it was reported only by

Common name (Scientific name)	Conservation status	Likelihood of occurrence
	EPBC Act	
		the DoE Protected Matters database, which is based on estimated species distributions rather than actual field records.

*** Likelihood of Occurrence**

Confirmed – the presence of the species in the Study Area has been recorded unambiguously during the last ten years (i.e. during recent surveys of the Study Area or from recent records obtained via database searches);

Very Likely – the Study Area lies within the known distribution of the species and contains suitable habitat(s), plus the species generally occurs in suitable habitat and has been recorded nearby within the last 20 years;

Likely – the Study Area lies within the known distribution of the species and the species has been recorded nearby within the last 20 years; however, either:

- **the Study Area contains only a small area of suitable habitat, or habitat that is only marginally suitable; or**
- **the species is generally rare and patchily distributed in suitable habitat;**

Possible – there is an outside chance of occurrence, because:

- **the Study Area is just outside the known distribution of the species, but it does contain suitable and sufficient habitat (the species may be common, rare, or patchily distributed); or**
- **the Study Area lies within the known distribution of the species, but the species is very rare and/or patchily distributed; or**
- **the Study Area lies on the edge of, or within, the known distribution and has suitable habitat, but the species has not been recorded in the area for over 20 years; or**

Unlikely – the Study Area lies outside the known distribution of the species, the Study Area does not contain suitable habitat, and the species has not been recorded in the area for over 20 years

As all migratory species were found to either be considered Unlikely or Possible to occur in the Study Area, they are not considered to be impacted by the proposed action and are therefore not discussed further.

3.1 (f) Commonwealth Marine Area

Description

No Commonwealth Marine Areas lie within or near the Project.

Nature and Extent of Likely Impact

The Project will not have any impact any Commonwealth Marine Areas.

3.1 (g) Commonwealth Land

Description

No Commonwealth Land lies within or near the Project.

Nature and Extent of Likely Impact

The Project will not have any impact any Commonwealth Land.

3.1 (h) The Great Barrier Reef Marine Park

Description

The Great Barrier Reef Marine Park does not lie within or near the Project.

Nature and Extent of Likely Impact

The Project will not have any impact the Great Barrier Reef Marine Park.

3.1 (i) A Water Resource, in Relation to Coal Seam Gas Development or Large Coal Mining Development

Description

N/A

3.2 Nuclear Actions, Actions Taken by the Commonwealth (or Commonwealth Agency), Actions Taken in a Commonwealth Marine Area, Actions Taken on Commonwealth Land, or Actions Taken in the Great Barrier Reef Marine Park

3.2 (a) Is the Proposed Action a Nuclear Action?

X	No
	Yes, (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b) Is the Proposed Action to be Taken by the Commonwealth or a Commonwealth Agency?

X	No
	Yes, (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c) Is the Proposed Action to be Taken in Commonwealth Marine Area?

X	No
	Yes, (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (d) Is the Proposed Action to be Taken on Commonwealth Land?

X	No
	Yes, (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (e) Is the Proposed Action to be taken in the Great Barrier Reef Marine Park?

X	No
	Yes, (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.3 Description of the Project Area and Affected Area for the Proposed Action

3.3 (a) Flora and Fauna

Flora

Woodman conducted a Level 2 flora and vegetation survey for the Project (Appendix A). A total of 413 discrete vascular flora taxa, one known hybrid and one putative hybrid were recorded within the Study Area. Sixteen taxa recorded in the Study Area are considered to be significant flora taxa. This includes 11 DPaW-classified Priority flora taxa, three potentially undescribed taxa, and two taxa whose records are significantly disjunct from their known distributions. None of the significant taxa are considered to have been comprehensively surveyed for in the Study Area, although some opportunistic searching was undertaken for particular taxa. It is considered likely that further locations of the majority of significant flora taxa would be found in the Study Area if targeted survey was undertaken.

A total of 18 introduced flora taxa were recorded by the survey of the Study Area. Records of such taxa were often associated with drainage features that appear to be preferentially grazed by cattle over other areas. None of the introduced flora recorded in the Study Area are currently listed as Declared Pests in Western Australia (DAF 2016).

Fauna

Atlas commissioned MWH to undertake a baseline terrestrial vertebrate fauna assessment of an 18,845 ha parcel of land associated with the Project (the Study Area). The overall objective of this Survey was to gather background biological information on the terrestrial vertebrate fauna, fauna assemblages and fauna habitats of the Study Area, and to identify presence and importance to conservation significant species.

Eleven broad fauna habitat types were identified and mapped over the Study Area (Figure 3.3). These were consistent with habitat types known to occur elsewhere in the

Chichester subregion. No habitat types identified within the Study Area were considered regionally significant, although four habitat types were considered locally significant; Rocky Ridge and Gorge, Drainage Line, Riverine and Granite Outcrop. These habitat types were identified as locally significant due to a variety of factors, including:

- their importance as refuge habitat for fauna of conservation significance;
- their potential to host permanent and semi-permanent water sources which are important for a diverse range of fauna, and/or
- their ability to support a diverse fauna assemblage.

The remaining seven habitat types; Stony Rises, Rocky Foothills, Spinifex Stony Plain, Ironstone Ridgetop, Granitic Uplands, Calcrete and Spinifex Sandplain, were noted as being widespread and/or being of limited importance to species of conservation significance and/or do not support a diverse fauna assemblage.

Figure 3.3 – Fauna Habitats

Subterranean Fauna

Atlas commissioned MWH to undertake a subterranean fauna assessment of the Study Area. The objectives of this assessment were to investigate the subterranean fauna values of the Project Study Area and to assess if the potential direct impacts associated with the proposed Project will place any species of stygofauna or troglofauna at risk. The scope of the study encompassed a literature review, database searches, assessment of subterranean habitat, a comprehensive Level 2 troglofauna baseline survey, a Level 1 stygofauna pilot survey, and an environmental impact assessment.

No stygofauna specimens were collected from within the Study Area. However troglofauna were recorded from 26 of the 110 holes sampled and 32 of the 141 samples taken (MWH 2016c).

The troglofauna assemblage recorded from the Study Area was found to be distributed along much of the ironstone ridge that hosts the target deposits with distributions appearing to extend to, and possibly throughout the adjoining hills within the associated range system. Of the 13 species recorded, eight (62%) have been found to occur in two or more Project Areas. The remaining five species that were recorded from a single Project Area only were all singletons.

The geological (physical) and genetic (biological) evidence presented clearly indicated that the proposed Runway and Shark Gully pits do not represent isolated habitats.

Only one species (Projapygidae OES2) was considered to be of potential low conservation concern due to proposed groundwater drawdown impacts because its distribution has not been demonstrated to range beyond the modelled 0.5 m drawdown contour associated with the groundwater abstraction from the Bore CRD0071. However, the magnitude (both vertically and laterally) of the proposed groundwater drawdown occurring from the recorded location of Projapygidae OES2 was not considered to translate to any significant change in humidity within the troglofauna habitat overlying the aquifer. In addition, it is likely that the distribution of Projapygidae OES2 does extend well beyond the proposed groundwater drawdown impact zone when taking into consideration the wider extent of the unsaturated alluvial/colluvial habitat associated with the drainage system from which it was recorded. Therefore, the predicted drawdown is considered unlikely to pose a conservation risk to Projapygidae OES2.

Short Range Endemic Invertebrate Species

Atlas commissioned MWH to conduct a terrestrial short-range endemic (SRE) invertebrate fauna assessment

Eleven broad habitats were identified across the Study Area. These habitats were categorised as having a high, medium or low potential to support terrestrial SRE taxa based on the presence of microhabitats, whether the habitat was restricted, isolated, widespread and/or well connected in the landscape. Based on these criteria, two habitats, Rocky Ridge and Gorge and Granite Outcrops, have a high potential to support SRE species, and one habitat, Drainage Lines, has a medium potential (MWH 2016e).

It is unlikely that any SRE taxa recorded during this Survey are likely to be adversely impacted by development of the Project. Habitat clearing poses the largest threat of the Project to SRE and as such, clearing should, where possible, avoid habitats considered of High or Medium likelihood to support SRE taxa.

3.3 (b) Hydrology, Including Water Flows

Surface Water

Light rainfall events will generally produce small volumes of runoff, due to initial soakage rates and evaporation, and are generally of low velocity and minor sediment load. Heavier rainfall events will produce higher velocity flows and increased sediment load.

The incised drainage paths along the ridge and hill areas indicate that high flows do occur after heavy rainfall events with subsequent erosion and sediment transport. The flat areas spreading out from the ridges provide evidence of low gradient sheet flow. In these areas finer materials carried from high velocity areas would settle out as flow velocities decrease.

Rivers in the Pilbara region are typically ephemeral in nature; however, surface water does exist throughout the year in pools along the main rivers and creeks. These pools are most likely surface expressions of locally perched groundwater within the alluvium. During periods of river flow, following significant rainfall events, the groundwater systems are recharged by the presence of surface water in the river beds. As river flows subside and river beds dry, permanent pools remain and are fed by groundwater inflow during the dry periods. Major pools on the main branch of the Coongan River are the Nandingarra, Bookargemoona and Doolena pools (Ruprecht 2000). These pools are located upstream of the Corunna Downs project and will not be impacted by the mining operation.

Surface flow in the region occurs almost exclusively as a direct response to rainfall and is highly skewed to summer events (December to March). Flow in the smaller channels is typically of short duration, and ceases soon after the rainfall event passes. In the larger river channels, which drain the larger catchments, runoff can persist for several weeks and possibly months following major rainfall events such as tropical cyclones. No perennial steams occur in the immediate vicinity of the mine site.

There are two stream flow gauging stations located on the Coongan River (Table 3.9) that can be used to provide an indication of the nature of flows within the catchment.

Table 3.9 – Coongan River Stream Flow Gauges

Number	Location	Latitude	Longitude	Record Period	Area (km2)	Available Data
710006	Marble Bar road crossing	21.912	119.788	13/12/2007 – 02/12/2014		Level only
710204	Marble Bar	21.193	119.715	11/12/1966 – 26/10/2014	3,734	Levels and daily flows

Atlas commissioned MWH to undertake a surface water environmental impact assessment for the Project. MWH found the pits, waste rock dumps and most of the access / haul roads were generally located on higher ground therefore lessening the risk of significant pit inundation.

Regional catchments

The Project area lies within the middle reaches of the Coongan River catchment which sits within the De Grey River Basin (Figure 3.4). The De Grey River Basin covers an area of 56,890 km2 (Ruprecht et al. 2000) with its major tributaries being the Strelley, Shaw, Coongan, Oakover and Nullagine Rivers.

The Coongan River system has a total catchment area of around 7,090 km^2 and lies between the Chichester Ranges in the south and minor ranges on the west and east. The Coongan River has a number of tributaries, including Budjen Creek, Triberlar Creek, Boobina Creek, Emu Creek and Camel Creek. Coongan River joins the De Grey River at Mulyie Pool, about 41 km upstream of the confluence with the Shaw River.

MWH found the Project's percentage of disturbance to the regional Coongan River catchment amounts to 0.04% of the total catchment. This is a very small percentage of the regional catchment which implies any alteration to the surface water regime as a result of project operations will be insignificant within the regional catchment. Alterations to the surface water regime may be noticed locally, but impacts will soon dissipate as flows from larger downstream areas contribute to the natural watercourses (MWH 2016d).

Figure 3.4 – Regional Catchments

Hydrogeology

The hydrogeology of the northern Pilbara is typified by faulted granitoid rocks and associated folded Archaean age greenstone rocks, which has resulted in structurally-induced permeability throughout the region.

In the Project Area thin alluvium overlies fractured, banded iron formation (BIF), shale and metasedimentary rocks which may be variably folded and faulted. Iron enrichment within the BIF typically increases the porosity of the enriched zone. It is expected that the ore zones within the Project Area host aquifers with generally higher permeability than the surrounding materials. Bounding of the local aquifers may occur as a result of thick sub-vertical shale units toward the east. Variable folding and faulting may control the flow of groundwater at a local scale. Potential for compartmentalisation of groundwater is also a possibility.

The expected aquifer is an unconfined fractured system with the primary aquifer hosted in mineralised BIF. The aquifer type within the Project is not definitively known but unconfined to semi-confined systems are typical in mountainous fractured BIF aquifers of the Pilbara such as at McPhee Creek.

The local water table within the ore bodies lies at approximately 58 mbgl. Groundwater flow in the Project Area is strongly controlled by local and regional-scale stratigraphy and topography, and may be enhanced or impeded along faults and discontinuities.

Mine Dewatering

The Proposed Action does not include mining below water table

Other Users

A search of the DoW Water Information Reporting database identified no existing bores or wells within the project area or Atlas tenements. A search of the DoW Water Register website found no non-Atlas water licences within a 30 km radius of the Project Area.

Pastoral bores and wells for stock and domestic supplies are exempt from licensing in unconfined aquifers.

3.3 (c) Soil and Vegetation Characteristics

A regional land survey was undertaken in the Pilbara region between 1995 and 1999, by the, then, Department of Agriculture (now the Department of Agriculture and Food) and the then Department of Land Administration (now Landgate). The objective of the survey was to develop a comprehensive description of biophysical resources and assess the vegetation composition and soil condition within the region. This information was used by van Vreeswyk et al. (2004) to classify and map the land systems of the Pilbara region according to landform, soil, vegetation, geology and geomorphology.

Eight land systems occur within the Study Area (Table 3.10;Figure 3.5). The Rocklea and Capricorn land systems occupy most (81%) of the Study Area, defined broadly by rolling hills and steep rugged ridges, respectively.

Table 3.10 – Land Systems Occurring within the Study Area

Land system	Brief Description	Extent in Study Area	
		Ha	%
Rocklea	Basalt hills, plateaux, lower slopes and minor stony plains supporting hard (and occasionally soft spinifex) grasslands	11,124	59
Capricorn	Hills and ridges of sandstone and dolomite supporting low shrublands or shrubby spinifex grasslands	4,058	21.5
Talga	Hills and ridges of greenstone and chert and stony plains supporting hard and soft spinifex grasslands	2,191	11.6
Boolgeeda	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands	482	2.6
Satirist	Stony plains and low rises supporting hard spinifex grasslands, and gilgai plains supporting tussock grasslands	340	1.8
Granitic	Rugged granitic hills supporting shrubby hard and soft spinifex grasslands	294	1.6
River	Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex	293	1.6
Macroy	Sandy/Stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands	64	0.3
Total		**18,846**	**100**

Figure 3.5 – Land Systems

Vegetation

The Study Area is located in the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) Region, specifically the PIL1 Chichester subregion (Commonwealth of Australia 2012). The Chichester IBRA subregion comprises the northern section of the Pilbara Craton and consists of undulating Archaean granite and basalt plains and ranges. The plains contain a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on the ranges. Drainage occurs to the north via numerous rivers including De Grey, Oakover and Nullagine. The land is primarily used for native pasture grazing (Kendrick & McKenzie 2001).

Beard mapped the vegetation of the Pilbara Region at a scale of 1:1 000 000 (Beard 1975). The Study Area traverses the Abydos Plain and Gorge Ranges physiographic regions within the Pilbara region.

Shepherd et al. (2002) mapped and described vegetation system associations in the Chichester IBRA subregion related to physiognomy, utilising mapping undertaken by Beard (1975). Vegetation system associations were described at a scale of 1:250,000. Six vegetation system associations occur in the Study Area, these being Abydos Plain_93, Abydos Plain – Chichester_93, George Ranges_82, George Ranges_587, George Ranges_171 and George Ranges_619.

Woodman's Level 2 survey of the Study Area mapped 15 VTs within the Study Area, none are considered to represent any Threatened Ecological Communities as classified by DPaW and endorsed by the Western Australian Minister for Environment or as listed under the EPBC Act, or any Priority Ecological Communities as classified by DPaW. Eight VTs are considered to be of local significance, primarily because of their limited extent in the Study Area and also because they form habitat for conservation significant flora. Of these, four VTs are also considered to be potentially regionally significant (Woodman 2016a).

The majority of the vegetation in the Study Area was ranked as being in Excellent condition, with little to no human disturbance and an absence or low levels of introduced flora taxa. However, the majority of larger drainage features, including creeks and flow lines, had lower condition scores as a result of the presence of high densities of aggressive introduced species and high grazing and trampling impacts from cattle. There was also a general trend towards poorer vegetation in drainage features in the south-western corner of the Study Area and also in closer proximity to Marble Bar in the north, with grazing impacts in drainage features appearing higher than in most other parts of the Study Area (Woodman 2016a).

3.3 (d) Outstanding Natural Features

There are no outstanding natural features in the Project area.

3.3 (e) Remnant Native Vegetation

Table 3.11 summarises the vegetation system associations described in Section 3.3 (c) and the current extent in relation to its pre-European extent, and the percentage of the current extent of each vegetation system association currently protected for conservation (in DPaW-managed land) (Government of Western Australia 2015). All six vegetation system associations have been subject to very limited clearing, with less than 1 % of each vegetation system association having been cleared since European settlement. However, very little or none of each vegetation system association is protected for conservation.

Table 3.11 – Extent of Vegetation System Associations within the Study Area (Government of Western Australia 2015)

Vegetation System Association	Description	Current Extent (ha)	Percentage of Pre-European Extent Remaining	Percentage of Current Extent Protected for Conservation
Abydos Plain_93	Hummock grasslands, shrub steppe; kanji over soft spinifex	432,038.31	99.94	0
Abydos Plain-Chichester_93	Hummock grasslands, shrub steppe; kanji over soft spinifex	2,478,504.08	99.86	0.54
George Ranges_82	Hummock grasslands, low tree steppe; snappy gum over Triodia wiseana	316,855.10	99.90	0
George Ranges_171	Hummock grasslands, low tree steppe; snappy gum over soft spinifex & Triodia brizoides	269,728.32	99.52	0
George Ranges_587	Mosaic: Hummock grasslands, open low tree-steppe; snappy gum over Triodia wiseana / Hummock grasslands, shrub-steppe; kanji over Triodia pungens	103,444.39	99.99	0
George Ranges_619	Medium woodland; river gum (Eucalyptus camaldulensis)	4,402.59	100	0

3.3 (f) Gradient (or Depth Range if Action is to be Taken in a Marine Area)

Prevalent landforms around the project area are steep-sided ridges and hills associated with outcrops of Banded Iron Formation, greenstone, chert and minor sandstone, dolomite and basalt. Well-developed drainage lines incised into the ridge areas form ironstone and sandstone gorges and gullies (MWH, 2016d). Away from the ridges the topography changes to gentle undulating slopes in the valleys and in the river floodplains.

Elevation ranges from 460 mAHD at the top of the ridge near Split Rock pit to 190 mAHD at the Marble Bar Road crossing.

3.3 (g) Current State of the Environment

Woodman found a total of 18 introduced flora taxa were recorded during the surveys of the Study Area and were mainly associated with drainage features that appeared to be preferentially grazed by cattle (Woodman, 2016a). There were no Declared Pests under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) (WA) recorded within the Study Area (DAF 2016).

MWH identified nine species of introduced mammal that potentially occur in the Study Area, Four were recorded during the Survey. Of these, the Camel (*Camelus dromedarius*) is listed as a 'Declared Animal' under the BAM Act, which calls for reduction in their numbers when they are running wild or feral. European Cattle (*Bos taurus*) were the most commonly recorded introduced species, however majority of the Study Area is located upon pastoral lease, actively run for farming cattle.

3.3 (h) Commonwealth Heritage Places or Other Places Recognised as Having Heritage Values

There are no Commonwealth heritage places or other places recognised as having heritage values in the Project Area.

3.3 (i) Indigenous Heritage Values

The Project falls within the Njamal native title claimant area. The Njamal people's claim covers approximately 40,980 km^2 of land and sea in the Pilbara region and lies across the Town of Port Hedland and the Shire of East Pilbara.

Atlas is proactive in undertaking consultation with Indigenous Stakeholders with regards to all aspects of projects from exploration through construction, operation and closure. Below is a summary of the surveys that have been undertaken over the Project area to date.

Table 3.12 – Summary of Aboriginal Heritage (ethnographic and archaeological) Surveys

Author / Year	Report Title	Survey Standard	Sites Identified
Haydock, P, 2008	Preliminary advice of a Njamal ethnographic heritage survey of Gondwana Resources Limited's Corunna Downs Project, prepared for Gondwana Resources Limited	Ethnographic Work Program Clearance	Spring 1 Spring 2 Waterhole 1
Corsini, S, 2010	Gondwana Resources Ltd proposed exploration drilling program Corunna Downs iron project tenement E45/2585	Archaeological and Ethnographic Work Area Clearance	No sites were identified
Reynen, W and Gollan, K, 2013	Work program and work area heritage assessment, nominated areas within Atlas Iron Limited's Corunna Downs project, Pilbara, Western Australia	Archaeological and Ethnographic Site Avoidance	CD01-12A CD02-12A
Harris, D 2013	Work program heritage assessment (site avoidance level), tenement E45/2585-1, Atlas Iron Limited's Corunna Downs Exploration Project, East Pilbara, Western Australia	Archaeological Work Program Clearance and Site Avoidance	CD01-12A CD02-12A
Harris, D, Dinkler, L, and Harris, A 2013	Work area and work program heritage assessment, Corunna Downs exploration drilling program, tenements E45/3320, E45/3321, E45/3579, and E45/2585, Atlas Iron Ltd's Corunna Downs Project, East Pilbara, Western Australia	Ethnographic Work Program Clearance and Archaeological Site Avoidance	Corunna Downs 03-13A Corunna Downs 04-13A

Author / Year	Report Title	Survey Standard	Sites Identified
			Corunna Downs 05-13A Corunna Downs 06-13A Corunna Downs 07-13A
De Gand, 2014	Report on an Aboriginal heritage assessment – ethnographic site identification – of the Corunna Downs Project areas (AI – 115) Located near Marble Bar in the Eastern Pilbara, Western Australia	Ethnographic Work Area Clearance	No sites were identified
Walshe, D 2014	Report of an Aboriginal archaeological survey of the Corunna Downs exploration CD32 survey area, Pilbara, Western Australia	Archaeological Site Avoidance	No sites were identified
Walshe, D 2014	Report of an Aboriginal archaeological survey of the Corunna Downs access track survey area, Pilbara, Western Australia	Archaeological Site Avoidance	CRD08-14
Walshe, D 2014	Report of an Aboriginal archaeological survey of the Corunna Downs exploration – Shark Gully South and CD12 survey area, Pilbara, Western Australia	Archaeological Site Avoidance	CRD09-14
Walshe, D and Maling, J 2014	Report of an Aboriginal archaeological and ethnographic survey of the Corunna Downs exploration CD32 EIS survey area, Njamal native title claim, Pilbara, Western Australia	Archaeological and Ethnographic Site Avoidance	CRD10-14 CRD11-14 CRD12-14 CRD13-14
Howard, C, McDonald, G, and Chisholm, S 2016	Preliminary advice for the archaeological and ethnographic site avoidance heritage assessment of the central portion of the Corunna Downs project area, conducted by the Njamal Traditional Owners and Terra Rosa Consulting and prepared for Atlas Iron Limited	Archaeological and ethnographic site avoidance	Corunna Downs – Central Portion
Golden, A, McDonald, G, and Chisholm S 2016	Preliminary advice for Trip 2 of the archaeological and ethnographic site avoidance and site identification heritage assessment of the central, southern and northern portion of the Corunna Downs project area, conducted by the Njamal Traditional Owners and Terra Rosa	Archaeological and ethnographic site avoidance and site identification	Corunna Downs – Central Portion

Author / Year	Report Title	Survey Standard	Sites Identified
	Consulting and prepared for Atlas Iron Limited		
Golden, A, McDonald, G, and Chisholm, S 2016	Preliminary advice for Trip 3 of the archaeological and ethnographic site avoidance heritage assessment of the central, southern and northern portion of the Corunna Downs project area, conducted by the Njamal Traditional Owners and Terra Rosa Consulting and prepared for Atlas Iron Limited	Archaeological and ethnographic site avoidance	Corunna Downs – Central Portion
Golden, A, and Chisholm, S 2016	Preliminary advice for Trip 4 of the archaeological and ethnographic site avoidance heritage assessment of the central, southern and northern portion of the Corunna Downs project area, conducted by the Njamal Traditional Owners and Terra Rose Consulting and prepared for by Atlas Iron Limited	Archaeological and ethnographic site avoidance	Corunna Downs – Central Portion
Anderson-Bonavia, K, Coutant, D. and Golden, A. 2016	Report on an archaeological and ethnographic site avoidance and site identification heritage survey of the Corunna Downs Project area, conducted by the Njamal Traditional Owners and Terra Rose Consulting and prepared for by Atlas Iron Limited	Archaeological and ethnographic site avoidance and site identification	CRD14-16 to CRD65-16

Where impacts to sensitive Aboriginal sites are unavoidable approval to disturb the site will be sought under Section 18 of the *Aboriginal Heritage Act 1972*.

3.3 (j) Other Important or Unique Values of the Environment

There are no national parks, conservation reserves or wetlands of national significance within the application area or within close proximity.

The Chichester subregion has 6.6% of its land surface reserved under some form of conservation tenure, including the Abydos-Woodstock reserve (60 km west of the Study Area), Millstream-Chichester National Park (190 km west), Mungaroona Range Nature Reserve (116k m south-west) and Meentheena ex-pastoral lease (54 km east) (Kendrick and McKenzie 2001).

3.3 (k) Tenure of the Action Area (e.g. freehold, leasehold)

The Project is located within the Panorama and Eginbah Pastoral Stations as well as Unallocated Crown Land. Atlas has the following approved mining tenure over the Project area (Table 3.13).

Table 3.13 – Tenement Details

Tenement	Tenement Holder		
M45/1257	Atlas Iron Limited		
G45/339	Atlas Iron Limited		
L45/407	Atlas Iron Limited		
L45/408	Atlas Iron Limited		
L45/410	Atlas Iron Limited		

3.3 (l) Existing Uses of Area of Proposed Action

The majority of the Study Area lies within the Panorama and Eginbah Pastoral Stations and the remaining comprises unallocated crown land (Figure 3.6). Evidence of pastoral activity is widespread in the Study Area particularly around water holes and drainage lines, with cattle, pasture grasses such as Buffel Grass (*Cenchrus ciliaris*) and land degradation frequently observed in such areas.

The first mining exploration in the Pilbara commenced in the early 1800s, and currently this area provides the majority of Western Australia's petroleum, gas and iron ore exports (RDA 2013). Historically, mining activity has been highly active in the vicinity of the Study Area, and in the western portion of the Study Area which possess a legacy of tracks, clearings, small mining camps and abandoned shafts.

3.3 (m) Any Proposed Uses of Area of Proposed Action

There are no other proposed uses of the Project Area.

Figure 3.6 – Land Use

4. Environmental Outcomes

Atlas will protect the Northern Quoll, Ghost Bat, Pilbara Leaf-nosed Bat and Pilbara Olive Python populations from significant impact through the implementation of the Significant Species Management Plan (SSMP) for the Corunna Downs Project (Appendix E).

The Project design has recognised the importance of Cave CO-CA-01 within the Study Area and has applied a 450m buffer to the cave to ensure all direct impacts are avoided and indirect impacts associated with the Project are minimised as far as practicable. A 50m buffer has also been applied to Cave CO-CA-03 to avoid direct impacts from the Project clearing. Indirect impacts of the Project on CO-CA-03 will be mitigated as far as practicable to prevent the degradation of the cave and maintain its function for the Pilbara Leaf-nosed Bat.

Atlas is currently undertaking further detailed monitoring of caves CO-CA-01 and CO-CA-03 to further clarify cave CO-CA-03's classification and collect additional baseline information. In addition these two caves will be surveyed so future monitoring can be compared to their original state.

The monitoring program for the Pilbara Leaf-nosed Bat, detailed in the SSMP also ensures the management measures implemented to mitigate the indirect impacts are effective. If however, the monitoring determines the populations are being affected then further investigation will be undertaken and an adaptive management approach will be implemented.

A main threat identified for both the Northern Quoll and the Pilbara Olive Python is the abundance of feral animals, namely cats through their predation on Northern Quoll and juvenile Pilbara Olive Pythons as well as on the Pilbara Olive Python's prey items. The implementation of a feral animal control program will assist in reducing the abundance of feral cats and their impact on these species within the Project area and potentially within the wider region.

Another significant threat to the EPBC Act listed fauna is clearing of critical habitat. The Project is proposing to clear no more than 423.19ha within a Development Envelope of 2,263.19ha. Of the habitat areas that have been identifies as significant for species listed under the EPBC Act 14.1% of Rocky Ridge and Gorge, 11% of Drainage Line and 22% of Riverine habitats occurs within the Development Envelope and 2.4%, 0.5% and 1% respectively occurs within the Disturbance Footprint.

Atlas has been proactive in undertaking detailed baseline surveys for the Corunna Downs Project and commenced surveys in the early design phase (2014). The baseline surveys cover an area of more than 26,000 ha. A list of the baselines investigations that have been undertaken to date are provided in Table 4.1.

Table 4.1 – Baseline Studies

Factor	Specialist
Flora and Vegetation	Woodman Environmental Consulting
Vertebrate Fauna	MWH Australia Pty Ltd
Subterranean Fauna	MWH Australia Pty Ltd
Short Range Endemic Invertebrate Fauna	MWH Australia Pty Ltd
Noise	Talis Consultants Pty Ltd
Dust	Pacific Environmental Ltd
Soil and Waste Characterisation	MWH Australia Pty Ltd
Surface Water	MWH Australia Pty Ltd

Atlas is also undertaking further investigations into the local groundwater aquifer conditions in the Project area. There is currently a programme of exploration drilling, testing and monitoring being undertaken so modelling of the groundwater aquifers can be conducted. The modelling will provide detailed information on the potential groundwater supply for the project and any associated drawdown from the abstraction of the groundwater for the Project. All drawdown will be managed appropriately to ensure any impacts on critical habitat for the Northern Quoll, Ghost Bat, Pilbara Leaf-nosed Bat or the Pilbara Olive Python are minimised as far as practicable.

In addition a Water Management Plan and Operating Strategy will be developed for the Project for DoW to demonstrate how the water abstraction will be managed and the management measures to be implemented. These will be reviewed, assessed and approved by the DoW prior to the water being abstracted. Furthermore, mining is above the groundwater table and no dewatering will be required.

Atlas has commissioned Pacific Environment Limited to undertake a Dust Impact Assessment of the Project, which will assess the key sensitive locations and relevant assessment criteria for particulates (as $PM_{10,}$ $PM_{2.5}$ and TSP) referencing:

- National Environmental Protection (Ambient Air Quality) Measure 1998 (as amended)
- Air Quality Modelling Guidance Notes (Department of Environment, 2006)
- Environmental Protection Act 1986 (as amended) and associated Regulations

Rehabilitation to restore the Project area to a sustainable ecosystem once the Project has been completed will be undertaken in accordance with the Mine Closure Plan which will be submitted to the DMP for assessment and approval prior to the commencement of the Project. The Mine Closure Plan will be reviewed and updated throughout the life of the mine in accordance with the DMP's Guidelines for Preparing Mine Closure Plans (2015).

5. Measures to Avoid or Reduce Impacts

Atlas believes the potential impacts on EPBC Act listed species confirmed as present in the Study Area can be managed to an acceptable level through the implementation of management measures and commitments which are contained in this section and described in the Significant Species Management Plan (SSMP) for Corunna Downs.

The draft SSMP (Appendix E) has been developed in consideration of existing SSMPs in place for Atlas' other projects, which have been developed in consultation with the DPaW and DoEE, the most recent guidelines and improvements to monitoring techniques.

Standard management measures from the SSMP, which have been developed to control and mitigate impacts to all conservation significant species, are provided below:

- During the design and planning phase of the Project, the infrastructure footprints will be aligned as much as practicable to avoid habitats that are known to, or have been identified as likely to support conservation significant fauna species (e.g. Rocky Ridges and Gorge Drainage Line and Riverine habitats).
- Clearing in/of sensitive habitats including caves, cliff lines, waterholes, gorges, ridges, outcrops, drainage lines, scree slopes and crevices will be kept to the minimum necessary for safe construction and operation of the Project.
- Night-time vehicle movements will be restricted where possible to minimise the potential for vehicle strikes.
- Signage identifying the presence of conservation significant fauna will be installed along the roads, where they intersect suitable habitat.
- Borrow pits will be designed and constructed to permit egress of fauna.
- Turkey's nests will be constructed to ensure a point of ingress/egress.
- The landfill will be operated and managed in accordance with the *Environmental Protection (Rural Landfill) Regulations 2002. This will* include fencing to reduce the potential for attracting fauna.
- The Site Environmental Advisor will maintain a site database and maps detailing, the location of:
  - Conservation significant species and habitat.
  - Impact exclusion zones.
  - Cleared areas.
  - Rehabilitated areas.
- Vehicle speed limits will be imposed and enforced on Project roads.
- Off-road driving will be prohibited unless otherwise authorised by Senior Management.
- Noise, dust and light emissions will be controlled where possible to avoid excessive disturbance to native fauna, including directing lights to working areas, shielding lights to reduce glow, and using conventional dust suppression techniques (i.e. water trucks).
- All bins storing putrescible waste will have tightly secured lids to avoid fauna attraction and entry.

- Awareness training will identify conservation significant fauna and habitat and discuss relevant management measures, personnel/contractor responsibilities, and incident reporting requirements (i.e. reporting of fauna observations and/or incidents).
- All fauna mortalities and injuries will be reported to the Site Environmental Advisor within 24 hours and recorded within Atlas's incident reporting system.
- All sightings of non-indigenous fauna and conservation significant fauna will be reported to the Site Environmental Advisor.
- The Site Environmental Advisor will report all conservation significant fauna injuries and mortalities to DPaW within one week.
- Where required, fauna will be handled and transported in accordance with the procedures outlined in the DPaW Standard Operating Procedure No 11.1, *Transport and Temporary Holding of Wildlife*.
- Interactions with fauna (e.g. feeding, harassment, capture, killing) are not permitted unless specifically authorised by the Senior Environmental Advisor.
- Domestic pets are prohibited on site.
- A feral fauna control program will be implemented and a database of all feral animals captured will be maintained as a complement to the database of sightings.
- A targeted feral animal control program will be implemented where sightings are regular and/or if nuisance or dangerous individuals are seen.
- No more than 423.12 ha of vegetation within the 2263.19 ha Development Envelope will be cleared/disturbed.
- Clearing and disturbance of vegetation will be kept to the minimum necessary for safe construction and operation of the Project.
- Clearing will occur in accordance with Atlas' Ground Disturbance Permit Procedure. No clearing will occur without prior authorisation from Atlas.
- Weed hygiene procedures will be implemented at all times for plant and equipment entering and departing the Project area.
- A weed monitoring and management programme will be developed, to ensure that any existing and new weed infestations within areas of Project disturbance (including areas of rehabilitation) are identified and controlled or eradicated.
- Minimise and manage impacts to natural surface hydrology to ensure the Drainage Line and Riverine habitats are maintained.
- Disturbed areas will be progressively rehabilitated as soon as practicable.

In addition to the Standard Management Measures listed above Atlas will also implement species-specific management measures for conservation significant fauna, confirmed as present in the Project area and are likely to be impacted by the Project.

5.1 Northern Quoll

- A Northern Quoll monitoring program will be implemented at Corunna Downs. Monitoring will be undertaken using techniques consistent with DoEE and DPaW requirements and existing Northern Quoll monitoring programs at other Atlas sites. The Northern Quoll monitoring program is detailed in the SSMP (Appendix E).
- Mine site inductions will provide information about the Northern Quoll, including identification and employee and contractor responsibilities.

- Large rocky material and microhabitat features suitable for Northern Quoll habitation will be taken into consideration when creating waste rock landforms and during rehabilitation post closure.
- Northern Quoll sightings, injuries and mortalities will be reported to the Site Environmental Advisor in accordance with Atlas' HSE Incident Management Procedure.

5.2 Pilbara Leaf-nosed Bat and Ghost Bat

- Pilbara Leaf-nosed Bats and Ghost Bats at Corunna Downs will be monitored annually. Monitoring will be undertaken using techniques consistent with DoEE and DPaW requirements. The Pilbara Leaf-nosed Bat and Ghost Bat Monitoring Program is detailed in the SSMP (Appendix E).
- Bat roosts will be recorded in a site database and mapped on all mine plans. The database will be accessible to all Atlas departments.
- A 450m buffer will be maintained around Cave CO-CA-01.
- A 50m buffer will be maintained around Cave CO-CA-03.
- Access to caves known to be occupied by the Pilbara Leaf-nosed Bat and/or Ghost Bat will be restricted.
- Atlas will not install barbed-wire fences or other fences that could cause bat entanglements.
- Blasting techniques will be implemented to lower vibration levels in the vicinity of sensitive areas. This is likely to include:
  - Minimising the number of holes being detonated at any one time within each blast;
  - Increasing initiation delays between holes;
  - Lowering hole charge weights; and
  - Firing to free faces or into broken material where practicable.
- No trapping of bats is to be undertaken.
- Mine site inductions will provide information about Pilbara Leaf-nosed Bats and Ghost Bats and employee and contractor responsibilities.

5.3 Pilbara Olive Python

- An appropriate monitoring program to assess the distribution and abundance and monitor the impact of the Project on the Pilbara Olive Python population will be implemented. Additionally the monitoring program will monitor water sources within the Study Area, to determine if water use and interruption associated with the Project affects important water sources for the species.
- Pilbara Olive Pythons will be captured and relocated to suitable habitat by trained personnel should they be encountered during ground disturbance or operational activities.
- Mine site inductions will provide information about the Pilbara Olive Python and employee and contractor responsibilities.
- Pilbara Olive Python sightings, injuries and mortalities will be reported to the Site Environmental Advisor in accordance with Atlas' HSE Incident Management Procedure.
- Targeted feral animal control program will be undertaken in locally significant habitats.

5.4 Rehabilitation and Closure

Atlas will develop a Mine Closure Plan (MCP) to be submitted to the DMP for assessment as part of the Mining Proposal application for the Project to be assessed. The MCP will also address the requirements of the following guidelines:

- *Strategic Framework for Mine Closure;* Australia and New Zealand Minerals and Energy Council and the Minerals Council of Australia (ANZMEC/MCA 2000);
- *Mine Closure, Leading Practice Sustainable Development Program for the Mining Industry;* Department of Industry, Innovation and Science (DIIS, 2016);
- *Mine Rehabilitation, Leading Practice Sustainable Development Program for the Mining Industry*; Department of Industry, Innovation and Science (DIIS 2016); and
- *Planning for Integrated Mine Closure*: Toolkit; *International Council on Mining and Metals (ICMM 2008).*

The DMP's principle closure objective is for a mine to be (physically) safe to humans and animal, (geo-technically) stable, (geo-chemically) non-polluting/non-contaminating, and capable of sustaining an agreed post-mining land use (DMP, 2015). MCPs are required to be developed and approved prior to commencing a project. They are "live" documents which are revised periodically to reflect changes to the Project, the status of progressive rehabilitation and advances in knowledge.

The MCP is based on a suite of closure objectives and tasks that support the minimising of impacts to the environment overall, including matters of National Environmental Significance. Closure tasks will include:

- Deconstructing equipment for removal offsite.
- Breaking up and appropriately disposing of concrete
- Remediation contamination (if present)
- Re-profiling and contouring landforms to achieve surface water management
- Ripping and scarifying compacted surfaces
- Applying rehabilitation material such as fill, growth medium/topsoil and provenance seed

6. Conclusion on the Likelihood of Significant Impacts

6.1 Do you THINK your proposed action is a controlled action?

X	No, complete section 6.2
	Yes, complete section 6.3

6.2 Proposed action IS NOT a controlled action.

Atlas has nominated this proposed action as NOT a controlled action given the impact assessment provided in Section 3.1 and considers that potential impacts on EPBC listed species can be managed to an acceptable level through the implementation of existing management commitments (which include annual monitoring programs and significant species buffer/exclusion zones) described in the SSMP.

6.3 Proposed action IS a controlled action.

	Matters likely to be significantly impacted	
	World Heritage values (sections 12 and 15A)	
	National Heritage places (sections 15B and 15C)	
	Wetlands of international importance (sections 16 and 17B)	
	Listed threatened species and communities (sections 18 and 18A)	
	Listed migratory species (sections 20 and 20A)	
	Protection of the environment from nuclear actions (sections 21 and 22A)	
	Commonwealth marine environment (sections 23 and 24A)	
	Great Barrier Reef Marine Park (sections 24B and 24C)	
	A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)	
	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)	
	Protection of the environment from Commonwealth actions (section 28)	
	Commonwealth Heritage places overseas (sections 27B and 27C)	

7. Environmental Record of the Person Proposing to Take the Action

		Yes	No
7.1	**Does the party taking the action have a satisfactory record of responsible environmental management?**	X	
	Provide details Atlas Iron has an extensive portfolio of projects covering an area of over 15,000km² in the northeast Pilbara of Western Australia. These include the established operations at Wodgina, Abydos and Mt Webber. Atlas has engaged with indigenous groups, government departments, nongovernment organisations, landholders, and key stakeholders to ensure all aspects of its activities address environmental and social obligations, and are undertaken in a meaningful and sustainable manner. Atlas has demonstrated it is committed to minimising the impact on the environment. A recent example of this is the Mt Dove Project (EPBC reference number 2011/5848) which reduced the size of the open pit to avoid direct impact to a cave where the Pilbara Leaf-nose Bat had been recorded, the relocation of Northern Quolls to artificially constructed Northern Quoll habitat, as well as the establishment of associated monitoring programs for these species. Through the Commonwealth approval process for the Wodgina Project (EPBC reference number 2009/5167 and 2011/5975), Atlas has also committed significant funding towards research into the Pilbara population of Northern Quoll. Atlas has embarked upon a number of incentive programs to promote indigenous business enterprise and partnering throughout both the mining and exploration activities. Atlas is committed to its Environmental and Social Policy, and mitigating impacts as far as practicable.		
7.2	**Provide details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:** **(a) the person proposing to take the action, or** **(b) if a permit has been applied for in relation to the action - the person making the application.**		X
	If yes, provide details		
7.3	**If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework and if and how the framework applies to the action.**	X	

			Yes	No
	The corporate charter and policies that govern Atlas' operations and conduct are listed on the company website: http://www.atlasiron.com.au/irm/content/corporate-governance.aspx?RID=181 Atlas identifies community support and environmental management as essential to our future. Atlas Iron is committed to excellence in the management of environmental matters. Atlas Iron accepts that our employees, suppliers, customers and the communities, in which we operate, have a right to expect prudent, responsible and environmentally sustainable performance from us. To meet this expectation, Atlas Iron will: • Comply with all legal and regulatory requirements as a minimum operating condition; • Implement programs to conserve resources, reduce waste, promote recycling, and avoid causing environmental harm, in conjunction with the community. • Ensure that all employees and contractors understand their role in achieving environmental performance targets. • Review, evaluate and be accountable for the environmental performance of company operations and actively seek opportunities for improvement. • Provide adequate resources and training to maintain and improve environmental performance and community outreach. • Communicate openly with all community and business stakeholders and share environmental expertise with others to help improve industry performance. Excellence in community and environmental performance is essential to our business success, and our continued relationship with the community. Atlas has an established integrated environmental management system (EMS), as well as a series of existing performance standards, environmental management plans (EMPs), standard operating procedures (SOPs) and staff induction programs. Atlas' Health, Safety and Environment Policy can be found on the company website: http://www.atlasiron.com.au/irm/content/health-and-safety.aspx?RID=295			
7.4	**Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?**		**X**	

			Yes	No
	Provide name of proposal and EPBC reference number (if known) Pardoo DSO Project (EPBC reference number 2007/3539). Wodgina DSO Project (EPBC reference number 2009/5167). Wodgina DSO Project (EPBC reference number 2011/5975 Mt Dove DSO Project (EPBC reference number 2011/5848 Abydos DSO Project (EPBC reference number 2012/6345). Boodarie Link Project (EPBC reference number 2012/6506). Mt Webber DSO Project (EPBC reference number 2012/6611) Abydos DSO Project Stage 2 (EPBC reference number 2013/6985).			

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8.2 Reliability and Date of Information

The sources of the information for Section 3 are cited in that section and referenced in Section 8.1. Relevant assessments are included in the Appendices, as listed in Section 8.3 Attachments.

All environmental assessments have been undertaken to a standard that meets or exceeds that recommended by the relevant guidance and/or position statements and environmental legislation, as listed in Section 2.4.

8.3 Attachments

		Attached	Title of Attachments
You must attach	figures, maps or aerial photographs showing the locality of the proposed action (section 1)	X	Figures - Complete
	GIS file delineating the boundary of the referral area (section 1)	X	EPBC_Referral_Shape_21O6222
	figures, maps or aerial photographs showing the location of the proposed action in respect to any matters of national environmental significance or important features of the environments (section 3)	X	Figures - Complete
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)		
	copies of any flora and fauna investigations and surveys (section 3)	X	Appendix A – Flora and Vegetation Assessment Report Appendix B – Vertebrate Fauna Survey
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3) conclusions in the referral (section 3 and 4)	X	Appendix C – Vertebrate Fauna Impact Assessment Appendix D – Significant Species Management Plan
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

9. Contact, Signatures and Declarations

Proposed Action Title:	Corunna Downs Project

9.1 Person proposing to take action

Name and Title:	Brendan Bow, Manager Land Access, Heritage and Approvals
Organisation:	Atlas Iron Limited
Trust Deed:	☐ attached; or ☒ not applicable
ACN / ABN:	63110396168
Postal Address:	PO Box 7071, Cloisters Square PO WA 6850
Telephone:	+61 (0) 8 6228 8276
Email:	Brendan.bow@atlasiron.com.au

COMPLETE THIS SECTION ONLY IF YOU QUALIFY FOR EXEMPTION FROM THE FEE(S) THAT WOULD OTHERWISE BE PAYABLE

I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

☐an individual; OR

☐a small business entity – aggregated turnover is less than $2million for the previous income year (as prescribed within section 328-110 (other than subsection 328-119 (4)) of the Income Tax Assessment Act 1997); OR

☐a small business entity – aggregated turnover for the current financial year is likely to be less than $2million (note that aggregated turnover for one of the previous two income years must also be less than $2million) (as prescribed within section 328-110 (other than subsection 328-119 (4)) of the Income Tax Assessment Act 1997) (Cth)).

☒ not applicable.

If you are small business entity you must provide the Date/Income Year that you became a small business entity

COMPLETE THIS SECTION ONLY IF YOU WOULD LIKE TO APPLY FOR A WAIVER

I would like to apply for a waiver of full or partial fees under regulation 5.21A of the EPBC Regulations. Under regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made:	☒not applicable
Declaration:	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.
Signature:	 **Date:** 17/01/2017

9.2 Designated proponent

Name of proposed proponent:	
ACN / ABN:	
Postal address:	
Telephone:	
Email:	
Declaration by the person proposing to take the action:	I ....., the person proposing to take the action, consent to the proposed designation of ..... as proponent for the purposes of the action described in this referral.
Signature:	**Date:** .

9.3 Person preparing the referral information (if different from Section 9.1)

Name:	Melissa Finlay
Title:	Approvals Advisor
Organisation:	Atlas Iron Limited
ACN / ABN:	63110396168
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Declaration:	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence.
Signature:	**Date:** 16/01/2017

10. Referral Checklist

HAVE YOU:

- ☒ Completed all required sections of the referral form?
- ☒ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ☒ Provided a map showing the location and approximate boundaries of the project area for the proposed action?
- ☒ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ☒ Provided a digital file (preferably ArcGIS shapefile, refer to guidelines at Attachment A) delineating the boundaries of the referral area?
- ☒ Provided complete contact details and signed the form?
- ☒ Provided copies of any documents referenced in the referral form?
- ☒ Ensured that all attachments are less than three megabytes (3mb)?
- ☒ Sent the referral to the Department (electronic and hard copy preferred)

Appendix A Corunna Downs Project, Level 2 Flora and Vegetation Assessment

Appendix B Corunna Downs Project: Terrestrial Vertebrate Fauna Survey

Appendix C Corunna Downs Project: Vertebrate Fauna Impact Assessment

Appendix D Significant Species Management Plan, Corunna Downs

Appendix E Significant Species Management Plan