

POONDANO IRON ORE PROJECT

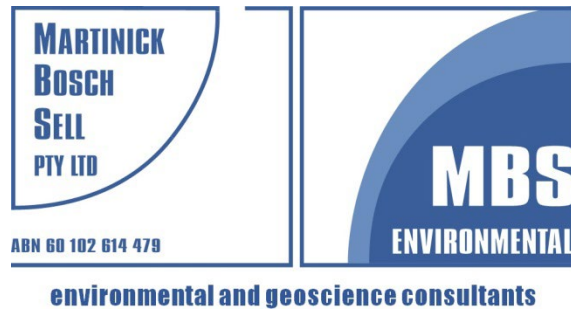
ENVIRONMENTAL LICENCE APPLICATION ATTACHMENT 7 — SITING AND LOCATION

PREPARED FOR:

HEDLAND MINING PTY LTD



AUGUST 2024



POONDANO IRON ORE PROJECT ATTACHMENT 7 - SITING AND LOCATION

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1. SITING AND LOCATION

Hedland Mining (for Poondano Mining Company Pty Ltd) has developed the Poondano Iron Ore Project (Poondano, the Project) which is located within the Town of Port Hedland (ToPH), approximately 30 km southeast of Port Hedland and 10 km south of the Great Northern Highway in the Pilbara region of Western Australia (Figure 1, Attachment 2). Access to the Project is from the Great Northern Highway.

The project tenure package comprises one mining lease (M45/1189) and four miscellaneous Licences (L45/219, L45/247, L45/356 and L45/357) with M45/1189 being the only tenement applicable to the Prescribed Premises Boundary (PPB) for this Environmental Licence Application, (Figure 2, Attachment 2). Project tenure is overlaid by General lease GE J245076, which has been granted under the *Land Administration Act 1997* for 'grazing purposes only'. As such, the Project Area has been used for pastoral purposes for more than 100 years. The Pippingarra Station homestead is located approximately 4 km northwest of M45/1189 (Figure 8, Attachment 2). A Gravel Reserve (29266) exists within M45/1189 and is vested with the Commissioner of Main Roads Western Australia (MRWA) (Figure 8, Attachment 2).

The Prescribed Premise Boundary (PPB) has been defined in Schedule 1 of W6856/2023/1 (Figure 3, Attachment 2). This boundary was designed to reutilise disturbed ground from previous mining operations in order to minimise impacts to environmental values of the region by avoiding (where possible) sensitive receptors.

The project tenure is completely covered by the Ngarla and Ngarla Native Title Determination Area (WCD 2007/003) and the Kariyarra Native Title Determination Area (WC1999/003) (Figure 7, Attachment 2). Hedland Mining has engaged with the registered Native Title holders, the Yamatji Marlpa Aboriginal Corporation and have negotiated the terms for the Project. Polaris Minerals International (PMI) has a Deed of Native Title Agreement (NTA), which addresses heritage and related issues within M45/1189.

2. ENVIRONMENTALLY SENSITIVE RECEPTORS

The environmentally sensitive receptors identified for the Project are summarised in the sections below.

2.1 ECOLOGICAL COMMUNITIES, FLORA AND FAUNA

2.1.1 Flora and Vegetation

Three flora and vegetation surveys have been conducted over the Project Area in 2008 and 2022 which cover the extent of the PPB. Astron Environmental conducted a Desktop Scoping Study in April 2008 (Astron 2009b) and a Level 2 Flora and Vegetation Survey in May 2008 (Astron 2009a). Rapallo Environmental completed a flora site assessment in 2022 (Rapallo 2023) to ground-truth previous vegetation mapping and undertake targeted searches for conservation significant flora.

Forty-one broad vegetation communities were identified during the 2008 survey, of which 31 were also identified in the 2022 survey. Across the two surveys the 31 vegetation communities were found to have consistent dominant flora taxa (Rapallo 2023). The 2022 survey identified 32 flora taxa from the Project, which had not been recorded previously recorded in 2008 (Rapallo 2023).

The majority of the Project Area is considered to be in Good to Excellent condition, with the vegetation dominated by native flora with a few signs of disturbance and low proportion of weed species (Astron 2009a).

A total of 263 vascular flora species from 45 families were recorded in the project area. The dominant families were Poaceae; Papilionaceae; Mimosaceae; Malvaceae and Convolvulaceae (Astron 2009b):

Across the two surveys, three Priority 3 flora taxa as listed by the Department of Biodiversity, Conservation and Attractions (DBCA) have been recorded within the PPB, these include:

- *Euploca mutica*.
- *Triodia chichesterensis*.
- *Gymnanthera cunninghamii*.

Euploca mutica and *Triodia chichesterensis* were identified in the areas surveyed in 2022. *Gymnanthera cunninghamii* was recorded at a single location in the 2008 survey, however, it was not identified in the 2022 survey despite the area where the species was recorded being revisited (Rapallo 2023). None of the Priority Flora survey records were located within the PPB. The closest record is 6.4 m east of the PPB. Significant Flora records are shown in Figure 4 of Attachment 2.

2.1.2 Threatened and Priority Ecological Communities

No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) pursuant to the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) Act or the *Biodiversity Conservation Act 2016* (BC Act) are present within the PPB or its immediate surrounds.

2.1.3 Fauna and Habitat

Two fauna and habitat assessments have been conducted across M45/1189 in 2008 (Outback Ecology) and 2022 (Stantec) and recorded four species of significance, including:

- Northern quoll (*Dasyurus hallucatus*) — listed as Endangered under the EPBC Act and BC Act.
- Pilbara leaf-nosed cat (*Rhinionictis aurantia*) — listed as Vulnerable under the EPBC Act and BC Act.
- Western pebble-mound mouse (*Pseudomys chapmani*) — listed as a Priority 4 species by DBCA.

- Ghost bat (*Macroderma gigas*) — listed as Vulnerable under the EPBC Act and BC Act.

Habitat of the PPB is considered suitable for greater bilby (*Macrotis lagotis*); listed as Vulnerable under the EPBC Act and BC Act, however no occurrence of this species has been recorded to date (Stantec 2023).

Most records of significant fauna occurred within the Poondano East Mining Area of the PPB. The closest record of significant fauna found within the PPB was the western pebble-mound mouse found 480 m away from operational activities .

The 2022 survey identified seven broad fauna habitat types, of which six represented primary habitats for the identified significant fauna species. Due to the occurrence of significant bat species within the Project Area, further assessments were undertaken and identified the mesas in the Poondano Central Mining Area contain caves and granite outcrops that are considered critical habitat for bat species (Outback Ecology 2009, Stantec 2023).

A short-range endemic (SRE) habitat assessment that included a targeted land snail search was undertaken in 2009. The assessment determined a very low potential for SRE habitat at Poondano West and limited potential at Poondano Central. One terrestrial snail species (genus *Rhagada*) was found in association with *Ficus* sp. trees at six sites on the most westerly mesa (adjacent to Petermarer Creek) at Poondano Central Mining Area. The species was also located outside of the M45/1189 on a granite hill. Identifications conducted by the Western Australian Museum concluded that the species is not a SRE (Outback Ecology 2009).

Three introduced species were recorded during the surveys, including cow (*Bos taurus*), European fox (*Vulpes vulpes*), domestic dog (*Canis lupus*) and European rabbit (*Oryctolagus cuniculus*).

Priority Fauna habitat and recorded occurrence is shown in Figure 5 of Attachment 2.

2.2 PUBLIC WATER SOURCES AND WATER BODIES

There are no public drinking water source areas (PDWSAs) within the PPB. The closest PDWSAs are the De Grey and Yule PDWSAs located 44 km east and 36 km west of the PPB respectively (Figure 9, Attachment 2).

Poondano is situated in the Port Hedland catchment, between two major regional river systems, the De Grey River and the Turner River which are approximately 57 km to the east and to 25 km to the west of the PPB. Petermarer Creek, Beebingarra Creek (Figure 7, Attachment 2) and Petermarer Pool are locally significant watercourses within and surrounding the PPB.

There are no RAMSAR wetlands, wetlands of National Importance or Conservation Category wetlands within the PPB.

2.3 NATIVE TITLE AND HERITAGE

2.3.1 Native Title

The project tenure is completely covered by the Ngarla and Ngarla Native Title Determination Area (WCD 2007/003) and the Kariyarra Native Title Determination Area (WC1999/003), (Figure 7, Attachment 2).

2.3.2 Aboriginal Heritage

A search of the Aboriginal Cultural Heritage Inquiry System (ACHIS) identified several Aboriginal Heritage Sites surrounding the PPB but none within (DPLH 2023). The two closest Aboriginal Heritage Sites to the PPB include:

- 12 Mile (Lodged Site 27412) 12 Mile — a burial; ritual / ceremonial site located 2.3 km west of the PPB.
- Strelley Site (Registered Site 9909) — an artefacts / Scatter; Quarry located 10.6 km east of the PPB.

These Aboriginal Heritage Sites are shown in Figure 8, Attachment 2.

In 2009 an ethnographic survey (Big Island 2009) and archaeological survey (GIS 2009) were undertaken across the project tenements, both which involved participation from the Ngarla Traditional Owners.

No ethnographic cultural heritage of sufficient significance was identified within PPB (M45/1189). However, a soak area on Petermarer Creek within M45/1189 (Figure 8, Attachment 2) was identified as an area of local significance and the Ngarla Traditional Owners recommended a 50-m radius buffer be placed around this soak as a protective boundary (Big Island 2009).

The archaeological survey identified two sites of local significance consisting of grinding patches on rocky outcrops (GIS 2009) which included Poondano Grinding 1 (2 grinding patches) and Poondano Grinding 2 (at least 20 grinding patches).

Grinding Patch 1 exists within the PPB, approximately 8.2 km and 9.9 km from the processing plant and landfill area, respectively. Grinding Patch 2 exists approximately 0.8 km southeast of the PPB (Figure 8, Attachment 2).

2.3.3 European Heritage

No European Heritage sites were located that were associated with the PPB.

2.4 ENVIRONMENTALLY SENSITIVE AREAS

The PPB is not associated with any conservation lands and is not located within a DBCA managed Conservation Reserve. The closest conservation reserve is the Millstream Chester National Park, approximately 160 km southwest of the PPB.

The PPB or surrounding area does not contain any Environmentally Sensitive Areas (ESA) listed under the *Environmental Protection Act 1986* (EP Act).

2.5 OTHER ENVIRONMENTAL RECEPTORS

Other environmentally sensitive receptors that have the potential to be impacted by the proposed activities include nearby land use such as:

- The township of Port Hedland located 19 km northwest of the PPB. Port Hedland is a main hub in the region and has a population of approximately 15,700 (ABS 2021).
- Pippingarra Station homestead located approximately 4 km northwest of the PPB.
- Main Roads Western Australia (MRWA) who utilise the gravel pit within M45/1189.
- Commuters and community members who access and utilise the Great Northern Highway, located approximately 10 km to the north of the PPB.

Nearby land uses are shown in Figure 8, Attachment 2.

3. ENVIRONMENTAL SITING CONTEXT

3.1 CLIMATE

The Project area experiences a semi-arid to semi-tropical climate, influenced by summer sub-tropical high rainfall events and a prolonged winter dry season. Most rainfall occurs during the wet season between December and June with occasional major deluge events occurring from cyclonic activity during this period. Potential evapotranspiration is very high, approximately 3400 mm/year.

Monthly maximum and minimum temperatures are shown in Chart 1. Maximum temperatures are generally between 30 and 36°C, with minimum temperatures rarely dropping below 12°C (BoM 2023).

The closest Bureau of Meteorology (BOM) site recording long term rainfall is Port Hedland Aerodrome (BOM Station No 4032) operating since 1942. The station is located approximately 17 km to the west-northwest of the Project area (BoM 2023).

Monthly rainfall statistics for the Port Hedland area from 1942–2023 are shown in Table 1 and Chart 1, with annual rainfall figures based on rainfall year from January to December. Mean annual rainfall is 318.5 mm, however, is highly variable with a lowest annual rainfall of 44.5 mm and highest of 713.2 mm. Median annual rainfall is 310.6 mm. Very low or no rainfall may occur in some months.

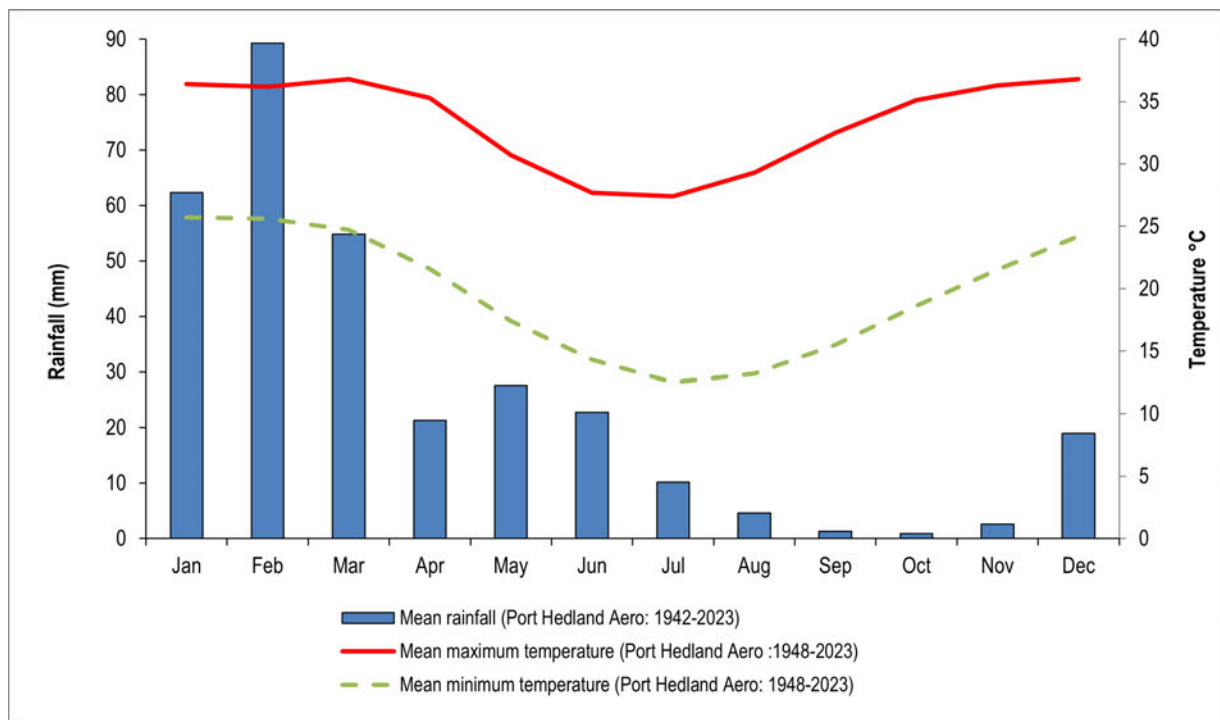


Chart 1: Climate Data, Port Hedland Aero (1942–2023) (BoM 2023)

Table 1: Rainfall Statistics for Port Hedland Aero

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	62.3	89.3	54.8	21.3	27.6	22.8	10.2	4.6	1.3	0.9	2.6	19.0	318.5
Highest	453.5	360.0	427.2	352.1	169.9	261.8	80.5	58.6	27.4	8.6	66.8	219.0	713.2
Median	25.6	71.2	16.8	2.0	8.2	6.4	1.8	0.6	0.4	0.2	0.0	0.6	310.6
Lowest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.5

3.2 BIOREGION AND TOPOGRAPHY

The Project lies within the Roebourne subregion (PIL4) of the Pilbara region. The Roebourne region is typified by quaternary alluvial and older colluvial coastal and sub coastal plains with a grass savanna of mixed bunch and hummock grasses and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* spp. and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite (Astron 2009).

The Poondano southwest area is dominated by hummock grassland on a sand plain that gently slopes towards a tributary of the Beebingarra Creek. The plain is sandy (red-orange sandy loams) with occasional patches of ironstone pebbles. *Triodia wiseana* forms a dominant understorey with occasional *Acacia* and *Hakea* species emerging in the mid-storey. At low points, shrubs comprised of *Melaleuca*, *Acacia* and *Hakea* species form small thickets with emergent *Eucalyptus hamersleyana* up to 4 m in height. Unlike Poondano Central, no major rocky features are present in this area. The sand plain, in conjunction with a lack of rocky features, has resulted in a relatively uniform habitat.

The Poondano West area comprises of three main landform features: flat-topped rocky hills, gently sloping plains and drainage systems. The sand processing area will be located on the gently sloping plains in a Main Roads WA gravel pit area that has been greatly disturbed by previous and current mining activities. The gently sloping plains consist of ironstone scree pebbles on red-orange loamy sands. The scree plain stretches west towards Poondano Southwest along the centre axis of the Poondano West area. In other areas of the plain, red-orange sandy loams form the dominant soil type. The vegetation on the plains is similar to Poondano Southwest, with a dominant understorey of *Triodia wiseana* and occasional *Acacia* and *Hakea* species. The Main Roads WA gravel pit area is greatly disturbed with large barren areas of pit floor and patchy regrowth.

Poondano Central comprises of nine mesas that stretch for 3 km from east to west. The Poondano Central resource, the iron ore mineralisation zone is confined to the top 3 to 8 m of the mesas, overlying a 12–21-m granitic rock formation. The iron bearing mineralisation zone represents approximately 10% of the outcropping formation. Mining will extract the iron capping layer and leave the granitic rock formation untouched.

3.3 HYDROLOGY AND HYDROGEOLOGY

3.3.1 Hydrology

The PPB is situated in the Port Hedland catchment between two major regional river systems, the De Grey and Turner Rivers. These systems are approximately 57 km east and 25 km west of the Project respectively (Figure 6, Attachment 2).

Several smaller drainage lines are present throughout the project area. All creeks are ephemeral in nature, only flowing briefly immediately following significant rainfall events.

Petermarer Creek is a locally significant watercourse passing directly through tenement M45/1189. Due to its local significance with the Ngarla People, Hedland Mining recognises the need to protect and maintain Petermarer Pool,

located on Petermarer Creek (Figure 8, Attachment 2). Beebingarra Creek (approximately 3 km to the east of the PPB) is another locally significant watercourse.

The Poondano Southwest area is dominated by a sandy plain that gently slopes towards Beebingarra Creek. Surface waters from incidental rainfall are likely to initially percolate but then commence overland flow as the pindan clays seal with larger rainfall volumes. Surface and subsurface water will flow towards Beebingarra Creek. Surface and subsurface hydrology in Poondano West and Poondano Central will flow towards Petermarer Creek.

3.3.2 Hydrogeology

Groundwater in the region is generally unconfined, with recharge occurring mostly from river flow. The most important areas for groundwater resources are in the vicinity of major surface water courses. Mining is the largest user of water in the Pilbara, with 52% of water used being mine water dewater released to the environment, followed by water used in mine operations (26%).

Groundwater has been encountered in the western extension of Poondano Southwest, on average at a vertical depth of 11–13 m. At Poondano Central, the narrow mesas stand at least 30–40 m above the surrounding plain.

3.4 GEOLOGY AND SOILS

Poondano covers a series of remnant Cretaceous or Tertiary Channel Iron Deposits (CID) extending discontinuously over approximately 11 km in an east-west orientation. Within the PPB (Poondano Central and Poondano West) there are some well-defined CIDs. The central sector of the paleochannel, the CID remnants, are mesas elevated up to 40 m above plain level (Poondano Central), which 80% of Poondano Central has been previously mined. In the west the CID has expression as a low hill 10–15 m above surrounding sand plain level (Poondano West). In the southwest the CID has no exposure above ground as it is underlying 6–14 m of later-deposited laterites and kaolin clays; a flat topography with no noticeable expression can be identified covering this area of the deposit (Poondano Southwest). The underlying rocks comprise Archaean granitic rocks, biotite adamellite and muscovite pegmatites that are common in this district.

Five soil and land systems occur within the Project Area (Figure 9, Attachment 2) of which four are present within the PPB (Table 2). These four soil and land systems have extensive areas occurring within the Pilbara.

The majority of the PPB is associated with the Robe and Uaroo and Land System. The rocky mesas (Poondano Central and West) of the Robe Land System have little defined soil structure due to massive outcropping. Where present, soils are stony with shallow gravels. Extensive colluvial material is deposited on each side of the mesa and consists of iron ore scree particles mixed with silty and sandy fines. These soils are red shallow loams with minor calcareous shallow loams.

The sandy plains of the Uaroo Land System are characterised by depositional surfaces with red sandy earths, red deep sands and red loamy earths. Soils may range from level sandy plains of 10 km or more in extent with scattered drainage; pebbly surface plains and plains with calcrete at shallow depth; broad mostly unchanneled tracts receiving more concentrated sheet flow and minor low stony hills and rises.

Table 2: Soil and Land Systems

Land System	Description	Area in M45/1189 (ha)	Area in Pilbara (ha)	% of Pilbara
Robe (281 Ro)	Low limonite mesas and buttes supporting soft spinifex (and occasionally hard spinifex) grasslands.	387	86,500	0.5
Uaroo (281 Ua)	Broad sandy plains supporting shrubby hard and soft spinifex grasslands.	512	768,100	4.2
Macroy (281 Mc)	Stony plains and occasional tor fields based on granite supporting hard and soft spinifex grasslands.	96	1,309,500	7.2
River (281 Ri)	Active flood plains and major rivers supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex grasslands.	33	408,800	2.3

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