Pilbara Green Link: Preliminary Investigation Activities

Supporting Document: NVCP 1 Clearing Application

Horizon Power

5 February 2025

→ The Power of Commitment

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1. Introduction

1.1 Proposal background

Horizon Power (HP) is a Western Australian (WA) Government Trading Enterprise (GTE) and the state's regional and remote energy utility. Horizon power operates under the *Electricity Corporations Act 2005* and is governed by a Board of Directors accountable to the Minister for Energy. Horizon Power is an experienced asset manager undertaking active management of vast electricity networks and generation assets across regional WA, utilising mature and robust operational, health and safety, and environmental management systems.

HP anticipates significant transmission developments in the Pilbara as industry prepares to further electrify and decarbonise its operations. The electricity requirements for committed and planned projects are substantial, and the need for all parties to transition to renewable energy solutions provides unique challenges for the State of Western Australia. The Australian Renewable Energy Hub (AREH) renewable project is one of many private developments that the State can support to transition the Pilbara region to a low-carbon energy future.

Working with the AREH Project, HP is proposing to construct a 330 kV transmission line as part of the Pilbara Green Link (PGL) Project. The PGL Project will interconnect with HP's existing network at Port Hedland and extends approximately 275 km east towards the AREH site (Figure 1).

As part of Project feasibility stage, PGL requires preliminary geotechnical and groundwater investigations (Investigation Activities) to be undertaken to assist in determining the alignment of the proposed transmission line, substations and access road infrastructure which ultimately will assist in informing detailed design.

Horizon Power commissioned GHD Pty Ltd (GHD) to complete a Native Vegetation Clearing Permit (NVCP) application for the Investigation Activities. The clearing is for a specific purpose and is on land that is not owned by Horizon Power (which Horizon Power will have legal access to conduct these investigations) and as such a purpose permit is considered appropriate.

The Investigation Activities are proposed to occur between the 07/05/2025 – 07/05/2027 as outlined in the NVCP application document. As an 'energy operator', Horizon Power has certain rights under Sections 46 and 49 of the *Energy Operators (Powers) Act 1979* which allow it to access and use land for the purpose of constructing, maintaining and operating electricity infrastructure. Horizon Power will utilise these access powers for the Project. A Notice of Entry as required under the Act, will be issued to all relevant land-owners or occupiers.

1.1.1 Stakeholder engagement

Ecological surveys of the proposed Sites associated with the Investigation Activities (see below) has involved engagement with Pastoral station owners and Native title holders. Engagement with these, and other stakeholders, will continue through the development of the Investigation Activities.

1.1.2 PGL Alignment Area and the Development Envelope

The PGL Alignment Area extends from Port Hedland and runs approximately 275 km east towards the AREH site. The early investigative stage of the PGL Project associated with this NVCP will consist of up to:

– 10 groundwater bores and
– 37 test pits and 17 bores for geotechnical investigations

Where required, access tracks to each Site will be developed to enable the investigation program.

For the purpose of this assessment, the following areas are defined in the table below (Table 1):

Table 1 Project definitions

Project definition	Purpose	Area (hectares (ha))
Investigation Activities	The preliminary geotechnical and groundwater investigations to be undertaken to assist in determining the alignment of the proposed transmission line,	Described in the rows below

Project definition	Purpose	Area (hectares (ha))
	substations and access road infrastructure which ultimately will assist in informing detailed design	
PGL Alignment Area	This is an area along the 275 km proposed route, approximately 2 km in width, which has previously been surveyed to inform the ecological constraints.	**50,119.40 ha**
Development Envelope (DE)	The maximum extent, consisting of access track corridors and Investigation Pads (45 total), within which, limited clearing will occur to enable to Investigation Activities. The pads consist of the following combinations of Investigation Activities: A full outline of Investigation Pads and the associated Investigation Activities is found in Table 23.	**84.22 ha** Consisting of: – 45.00 ha of Investigation Pads – 39.22 ha of Access track corridors
Investigation Pad	The pads consist of the following combinations of Investigation Activities: – 35 pads for geotechnical investigations only – 5 pads for groundwater investigations only – 5 pads for co-located groundwater and geotechnical investigations Each pad allocated a maximum area of 100m x 100m to allow flexibility in micro-siting to account for local constraints and minimise the impacts of clearing	
Access track corridor	– 12 access tracks corridors Corridors were allocated a buffer width of 25m to allow flexibility in micro-siting to account for local constraints and minimise the impacts of clearing	
Indicative Impact Area:	The maximum extent of impact to vegetation within the DE. Consisting of Investigation Activity Sites and access tracks. – The total number of Investigation Pads is considered a maximum that may be required for the Investigation Activities. There is not a guaranteed need for all Sites with contingency Sites included in case successful boreholes cannot be established – Where a geotechnical Investigation Site is co-located with a groundwater Investigation Site, the clearing required within the Investigation Pad will be 70 m by 70 m to account for all Investigation Activities. – Clearing totals for Investigation Activities below are based on whether they are co-located, as described above.	**23.88 ha** Consisting of: – 0.76 ha of geotechnical test pits – 1.18 ha of geotechnical boreholes – 4.90 ha of groundwater boreholes – 17.04 ha of access tracks
Geotechnical test pit	37 test pits – 20 Geotechnical test pit only sites – 12 co-located with only geotechnical boreholes – 3 co-located with only groundwater boreholes – 2 co-located with groundwater boreholes and geotechnical test pits – Approximately 15 m by 15 m clearing within an Investigation Pad This allows for the movement of excavator equipment, placement of any stripped vegetation and topsoil, spoil heap and appropriate area to operate this investigation in a safe manner – 5% clearing contingency is applied	
Geotechnical boreholes	17 geotechnical boreholes – 3 geotechnical borehole only sites – 12 co-located with only geotechnical test-pits	

Project definition	Purpose	Area (hectares (ha))
	– 2 co-located with both groundwater boreholes and geotechnical test-pits – Approximately 30 m by 25 m clearing within an Investigation Pad. This is required to accommodate the drilling of a borehole using a truck mounted auger, a laydown area for equipment, and drill spoil – 5% clearing contingency is applied	
Groundwater boreholes	10 groundwater boreholes – 5 co-located with geotechnical investigations activities – Approximately 70 m by 70 m clearing within an Investigation Pad to accommodate the placement of stripped vegetation and topsoil, drilling of a borehole using a truck mounted auger, a laydown area for equipment, sump for water, and drill spoil – This total includes contingency sites. Total clearing is expected to be lower if not all sites are required	
Access tracks	– Approximately 16.23 km – A maximum width of 10 m has been allocated to access tracks. This is an upper limit value and is unlikely to be needed for most of the proposed access track required. This area has been allocated for access tracks, based on desktop assessment, of clearing that may be required at different locations along existing tracks (for occasional turning areas or bends in the road etc), or in the development of new, short-distance access tracks. – 5% clearing contingency is applied	

The Investigation Activities that form this NVCP proposes to clear up to 23.88 ha of native vegetation, within the DE of 84.22 ha for the purposes of geotechnical and groundwater investigations (Figure 2).

1.2 Purpose of this report

The purpose of this document is to support the NVCP application by describing the ten clearing principles assessment and outcome for the Investigation Activities, assess the potential impacts that may result from the proposed Investigation Activities, together with broad management measures to avoid and minimise potential impacts.

This document has been prepared in support of an application for a NVCP (purpose) under Section 51E of Part V of the *Environmental Protection Act 1986* (WA) (EP Act).

This document includes:

– An overview of works required and description of clearing activities to be undertaken (Section 2)
– An overview of existing environment (Section 3)
– An assessment of potential impacts identified (Section 4)
– An assessment against the Ten Clearing Principles, as defined in Schedule 5 of the EP Act (Section 5)
– Environmental management measures to be implemented to minimise clearing impacts (Section 6)
– Identification of other environmental and heritage approvals applicable to the proposed works (Section 7)
– Offsets applicable to the proposed works (Section 8)

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at Scale: 1:700,000

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Kilometres

Horizontal Datum: GDA2020
Grid: GDA2020

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GHD

Pilbara Green Link

Investigation Area - Permit Activities

PGL Alignment Area

Project No. **12657458**
Revision No. **A**
Date **3/02/2025**

FIGURE 1

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2. Description of clearing activities

The proposed geotechnical test pit and borehole locations and the groundwater borehole locations shown in Figure 2. Investigation Sites were informed by the requirements of geotechnical and groundwater studies as described below, and the environmental constraints identified through the desktop and field survey assessments. Positioning of the Investigation Sites followed the PGL Preliminary Design Principles and DWER's clearance principles around avoidance and minimisation of significant flora, fauna and water courses, where possible including:

– Apply the native vegetation disturbance hierarchy throughout the design process, specifically avoid and minimise disturbance
– Avoid placements of pads 50m either side of defined waterways
– Investigation pads were located adjacent to, or near, existing tracks where practicable
– Avoid disturbance to isolated rock or boulder outcrops / boulder fields and breakaways; caves and their immediate (200m radius) surrounds, and gorges and deep gullies
– Avoid disturbance within 300m radius, and preferably 500m radius of identified Bilby burrows
– Avoid disturbance to known Aboriginal sites.

The proposed locations are subject to change if there is an unforeseen constraining factor (such as previously unidentified Aboriginal heritage) to allow flexibility in the placement of geotechnical and groundwater investigations. The larger PGL Alignment Area identifies the area within which access tracks will be constrained. A summary of the clearing required for each Investigation Activity is described in Table 1 above. The full breakdown of Investigation Pads, Investigation Activities and the clearing required can be found in Appendix A.

The type of clearing and actions for the cleared Indicative Impact Area following the completion of Investigation Activities is summarised in Table 2 below. Where geotechnical investigations are occurring alongside groundwater bores rehabilitation will occur after the groundwater bore is established. Any clearing not expected to be within the wider PGL footprint in 2 years from clearing will have a rehabilitation plan developed.

2.1 Access tracks

To conduct the investigative works, some native vegetation is proposed to be cleared along existing and new access tracks within the DE. A truck mounted drill rig and light vehicles will manoeuvre to and from investigation test locations targeting identified locations that will inform the placement of critical infrastructure along the PGL Alignment Area. The clearing required is either to increase the accessibility of pre-existing tracks by removing regrowth or to form new tracks. Where feasible, track development will avoid clearing vegetation by using a blade; rather low vegetation may be driven over.

Although new access tracks would typically be 3 to 4m wide, a maximum width of 10 m has been allowed for to enable larger groundwater drilling rigs to turn around intersections. This is within a larger 25m wide DE, which enables contractors to avoid constraints when accessing each Investigation Pad. An approach which avoids and minimises environmental impact will apply during the investigation program meaning the final clearing is expected to be less than the total outlined below. For the Indicative Impact Area of each access track, a 5% clearing contingency is applied to allow for flexibility when undertaking the works while also accounting for typical GPS inaccuracies. With a maximum width requirement of 10m and 5% contingency applied, access tracks account for 17.04 ha (72%) of the maximum 23.88 ha of clearing proposed with a total length of 16.23 km.

Following the completion of Investigation Activities any clearing associated with existing tracks will be retained. New access tracks developed to sites involving groundwater bores will remain cleared. Where access to a pad is no longer required, and the track was established specifically to access the pad, the track will be rehabilitated.

2.2 Geotechnical Investigations

For the geotechnical investigations, an indicative test spacing of approximately 20 km between boreholes and approximately 10 km between test pits along the proposed PGL Alignment Area was used as a starting point.

Proposed test locations were then reviewed in terms of accessibility, aerial imagery, topography, and underlying geology to capture relevant geotechnical information along the PGL Alignment Area.

Up to 37 geotechnical test pits and 17 boreholes are proposed within the PGL Alignment Area (Figure 2). For the geotechnical boreholes a clearing area of approximately 30 m by 25 m is required while for test pits, a clearing area of approximately 15 m by 15 m is required. For each geotechnical Investigation Activity, a 5% clearing contingency is applied to allow for flexibility when undertaking the works while also accounting for typical GPS inaccuracies. Of the 23.88 ha of clearing proposed, 1.94 ha (7.18%) is for geotechnical boreholes and test pits (inclusive of maximum clearing for the activity and a 5% contingency).

Where feasible and safe to do so, the location of boreholes and test pits will minimise clearing vegetation by traversing over low vegetation rather than using a blade.

2.3 Groundwater Investigations

Groundwater drilling sites were selected after an extensive assessment of the known hydrogeological resources present within or adjacent to the Alignment Area. Estimated yield, hydraulic conductivity, water quality, aquifer homogeneity and isotropy, local prospectivity (topography and hydrology) were the technical aspects assessed, along with existing access and optimising any existing bore locations. Spatial distribution of target sites along the PGL Alignment Area was determined by estimated Project water demands at specific locations, with a view to co-locate target sites with geotechnical sites where practicable to minimise disturbance.

Up to 10 groundwater boreholes are proposed within the PGL Alignment Area (Figure 2) as part of this NVCP. For the groundwater boreholes an area of 70 m by 70 m is required to accommodate the placement of stripped vegetation and topsoil, drilling of a borehole using a truck mounted auger, a laydown area for equipment, and drill spoil. Of the 23.88 ha of clearing proposed, 4.90 ha (20.70%) is for groundwater boreholes.

Table 2 Clearing type for each Investigation Activity

Investigation Activity	Clearing type	Action following completion of Investigation Activity
Access track – Geotechnical	Temporary	– Tracks only cleared for the Investigation Activity will be rehabilitated – Clearing associated with existing tracks will be retained
Geotechnical test pits and boreholes	Temporary	– Sites will be left to be revegetated through active rehabilitation. – Sites will be restored and reprofiled to natural levels and contours – Sites co-located with groundwater borehole will be rehabilitated after the groundwater bore is established
Access track - Groundwater	Permanent	– New access tracks developed and existing tracks involving groundwater bores will remain cleared
Groundwater boreholes	Permanent	– Sites will be established as operational areas during construction phase of the PGL Project with clearing maintained. – Post-construction it is likely groundwater bore ownership will be passed on to an interested party (i.e. pastoralist).
*Groundwater borehole – unsuccessful establishment	Temporary	– If a groundwater bore is not successful in locating water, the bore will be capped and the Investigation Pad area rehabilitated – If a new access track was developed to the site, it will be rehabilitated

2.4 Environmental Management Plan (EMP)

Prior to the commencement of the Investigation Activities, the Contractor for each investigation type will, as a minimum, be required to prepare an Environmental Management Plan (EMP) incorporating the requirements of this NVCP and any associated consent conditions. The avoidance and mitigation measures outlined in Section 6.2 demonstrate the minimum requirements (commitments) expected to be included in each Contractor developed EMP.

PORT HEDLAND

Great Northern Hwy

Northern Hwy

St Wilson

South West Creek

Shelley River

Shelley River West

Pardoo TP1

Pardoo TP2

Pardoo BH1

Pardoo TP3

Pardoo TP4

DS_03

DS_03b

DS_01

DS_02a

DS_02b (gt)

TP1.2

GHT TP1

BH1.2

BH1.1

TP1.1

TP02

TP03

BH02

BH03

TP05

TP06

TP07

BH04

TP08

BH05

TP09

TP10

TP11

BH06

TP12

TP14

TP15

BH08

TP16

0 0.5 1 km

0 250 500 m

Legend

- PGL Alignment Area
- Development Envelope
- Roads & Tracks
- Main River (DWER-031)

Investigation site

- Geotech Borehole
- Geotech Test Pit
- Groundwater Borehole

Paper Size ISO A3
at Scale: 1:200,000

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Kilometres

Horizontal Datum: GDA2020
Grid: GDA2020

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GHD

Pilbara Green Link

Investigation Area – Permit Activities

Investigation Site Locations

Project No. **12657458**
Revision No. **A**
Date **3/02/2025**

FIGURE 2.1

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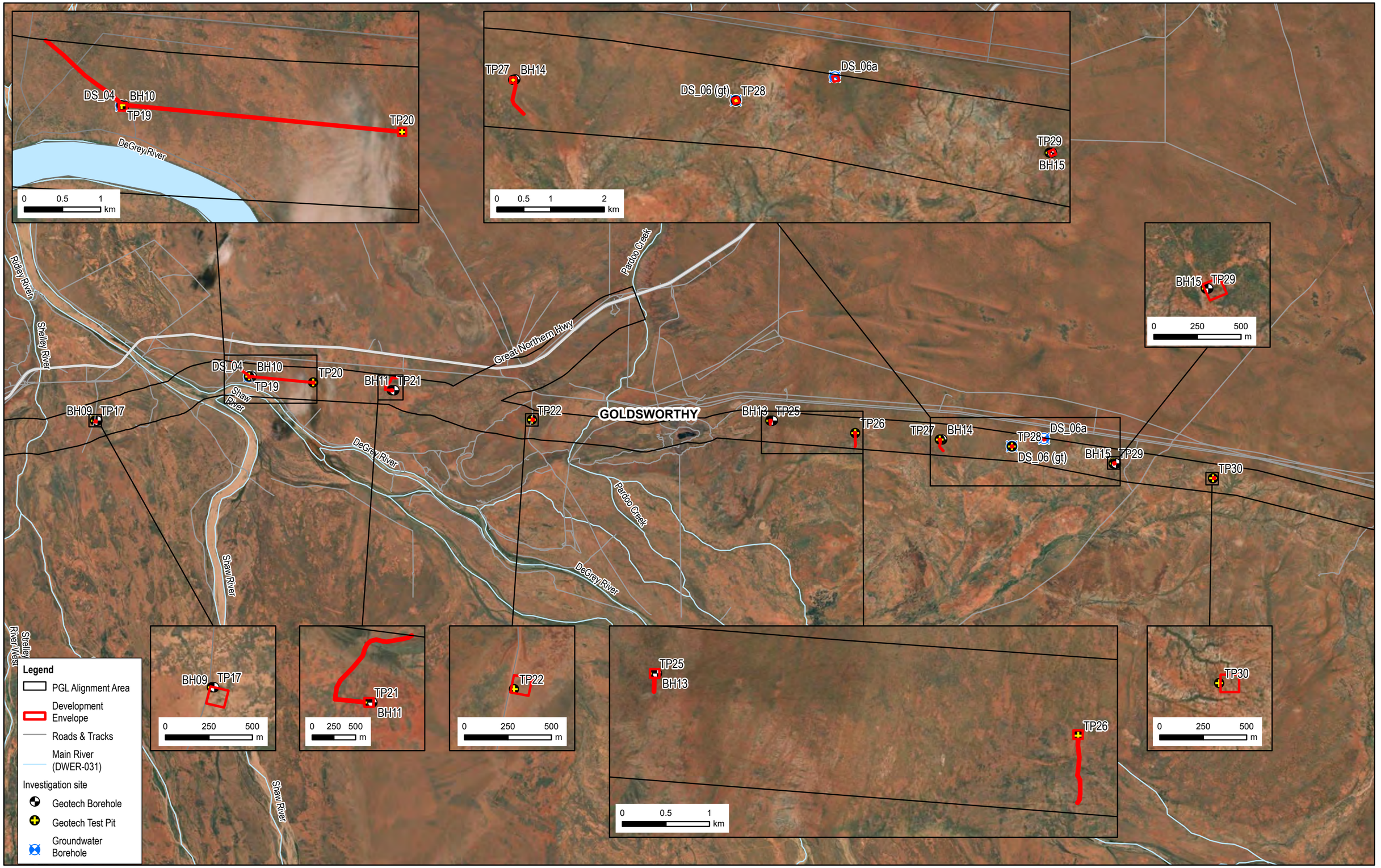

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Horizontal Datum: GDA2020
Grid: GDA2020

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GHD

Pilbara Green Link

Pilbara Green Link - Permit Activities

Investigation Site Locations

Project No. **12657458**
Revision No. **A**
Date **3/02/2025**

FIGURE 2.2

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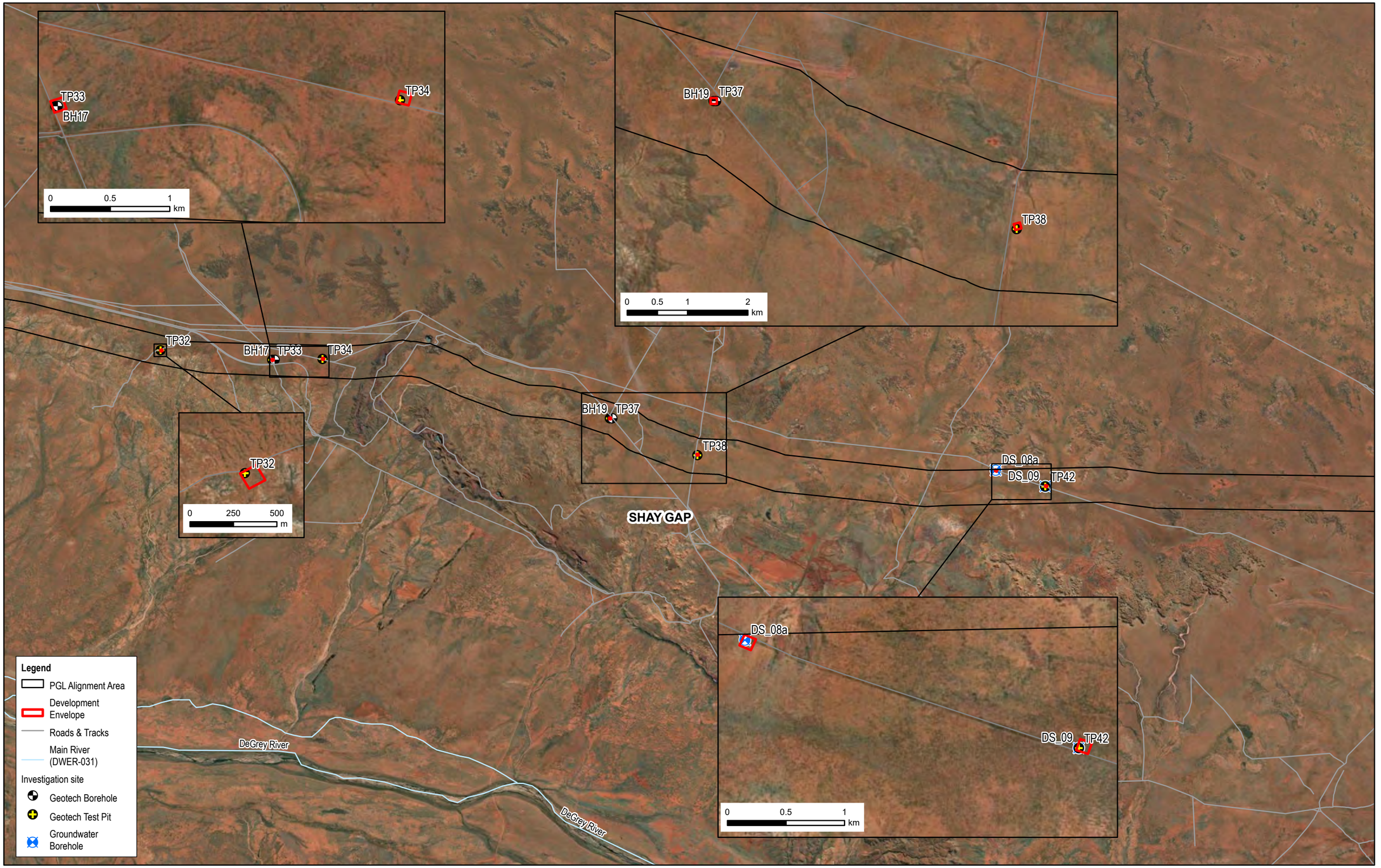

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Pilbara Green Link

Investigation Area – Permit Activities

Investigation Site Locations

Project No. **12657458**
Revision No. **A**
Date **3/02/2025**

FIGURE 2.3

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3. Existing environment

3.1 Climate

The Pilbara region that the Project is located within has a climate of very hot summers, mild winters, and generally low rainfall year-round. The climate is characteristic of hot grassland in the north-west part of the region, where the Project is located.

The western portion of the PGL Alignment Area is near Port Hedland and the eastern portion extends towards Mandora Station, hence the typical weather across the PGL Alignment Area is represented by the weather at these locations.

At the Port Hedland Airport weather station (site number: 004032, BoM, Figure 3) the mean maximum temperature is 36.8℃, occurring in the months of March and December. The mean minimum temperature is in July at 12.5℃. February receives the highest mean rainfall of 88.3 mm, and October the lowest of 0.9 mm. The mean annual rainfall is 314.1 mm.

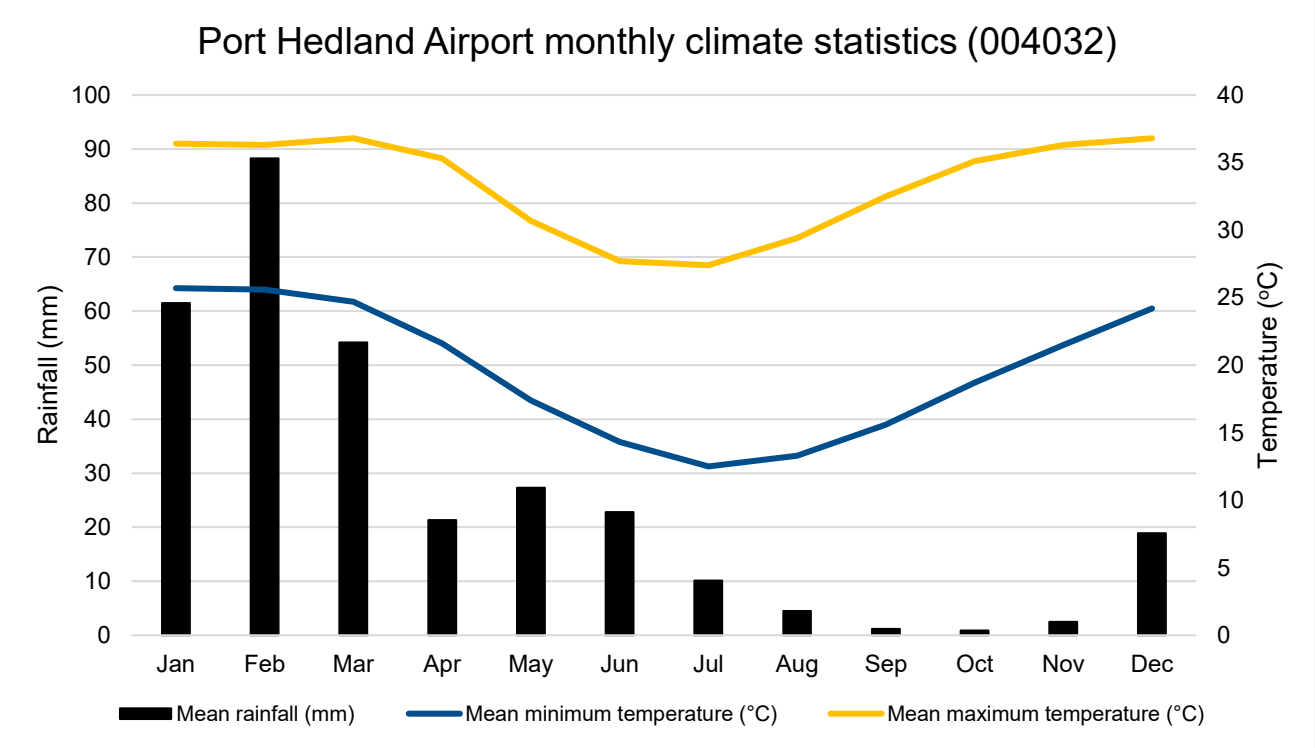


Figure 3 Port Hedland Airport monthly climate statistics (BoM weather station: 004032)

At the Mandora weather station (site number: 004019, BoM, Figure 4) the mean maximum temperature is 37.0℃, occurring in March. The mean minimum temperature is in July at 12.5℃. February receives the highest mean rainfall of 100.9 mm, and September the lowest of 1.0 mm. The mean annual rainfall is 375.0 mm.

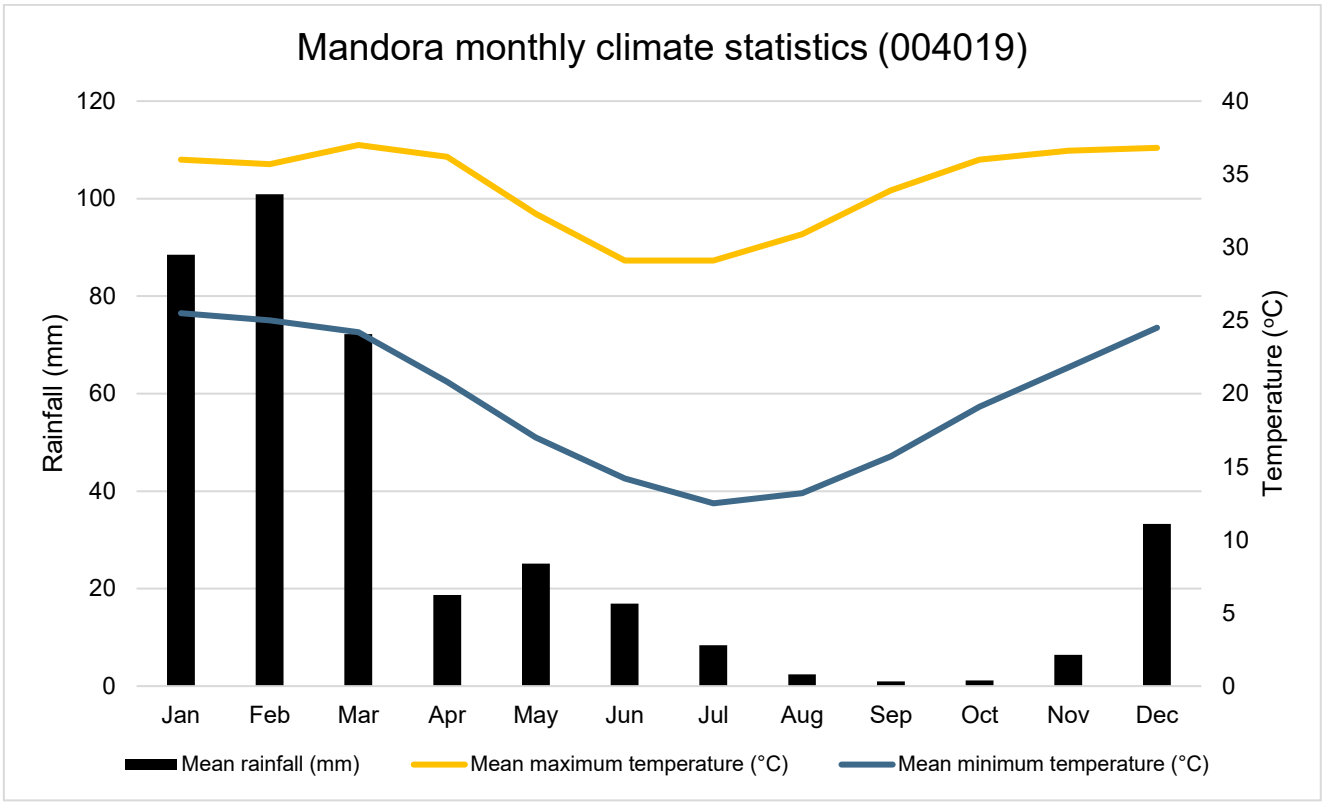


Figure 4 Mandora monthly climate statistics (BoM weather station: 004019)

3.2 Flora and vegetation

In May 2024, Biota conducted reconnaissance and targeted level field surveys of the PGL Alignment Area to inform the design of the PGL Project. These activities were completed in line with the following policy documents and technical guidance:

- Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a)
- Technical Guidance – Sampling of Short-range Endemic Invertebrate Fauna (EPA 2016b)
- Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020)
- Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act (DSEWPaC 2011a)
- Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (DEWHA 2010a)
- Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act (DSEWPaC 2011b)
- Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act (DEWHA 2010b)
- A review of ghost bat ecology, threats and survey requirements (Bat Call WA 2021a)
- A review of Pilbara leaf-nosed bat ecology, threats and survey requirements (Bat Call WA 2021b).

In line with the EPA technical guidance (EPA 2016a, 2020) potential limitations of the surveys identified by Biota (2024). The following limitations were identified:

- Rainfall: Conditions were drier than expected. This resulted in the collection of poor material for some species, hindering identification, and some annual and cryptic perennial taxa are unlikely to have been present, particularly in the clay plains habitats. This would include some Priority flora taxa but no Threatened flora taxa likely for the survey area.
- Fire: Considered a limitation for the flora survey, but one that is typically encountered in the Pilbara region and unlikely to have affected overall survey adequacy.

3.2.1 Regional biogeography

The PGL Alignment Area lies within the McLarty, Chichester and Roebourne subregions of the Great Sandy Desert and Pilbara bioregions (Department of Conservation and Land Management (DCLM) 2002).

- The McLarty subregion (GSD1) is described as “mainly tree steppe grading to shrub steppe in south, comprising open hummock grassland of *Triodia pungens* and *Triodia schinzii* with scattered trees of *Owenia reticulata* and Bloodwoods, and shrubs of *Acacia spp*, *Grevillea wickhamii* and *G. refracta*, on Quaternary red longitudinal sand dune fields overlying Jurassic and Cretaceous sandstones of the Canning and Armadeus Basins. *Casuarina decaisneana* (Desert Oak) occurs in the far east of the region. Gently undulating lateritised uplands support shrub steppe such as *Acacia pachycarpa* shrublands over *Triodia pungens* hummock grass. Calcrete and evaporite surfaces are associated with occluded palaeo-drainage systems that traverse the desert; these include extensive salt-lake chains with samphire low shrublands, and *Melaleuca glomerata* - *M. lasiandra* shrublands. It includes the Mandora Paleoriver System. Red-brown dunefields with finer texture than further south. Includes gravely surfaces of Anketell Ridge along its northern margin. The subregion is arid tropical with summer rain and is influenced by monsoonal activity. Morning fogs are recorded during the dry season. The total subregional area is 13,173, 266 ha.” (DCLM 2002)
- The Chichester subregion (PIL1) comprises of the northern section of the Pilbara Craton. Undulating Archaean granite and basalt plains include significant areas of basaltic ranges. Plains support a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* (formerly *Triodia pungens*) hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on ranges. The climate is Semi-desert-tropical and receives 300 mm of rainfall annually. Drainage occurs to the north via numerous rivers (e.g. De Grey, Oakover, Nullagine, Shaw, Yule, Sherlock). Subregional area is 9,044,560 ha” (DCLM 2002).
- The Roebourne subregion (PIL4) comprises of quaternary alluvial and older colluvial coastal and sub-coastal plains with a grass savannah 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 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. Islands are either Quaternary sand accumulations, or composed of basalt or limestone, or combinations of any of these three. Climate is arid (semi-desert) tropical with highly variable rainfall, falling mainly in summer. Cyclonic activity is significant, with several systems affecting the coast and hinterland annually. Subregional area is 2,008,983 ha” (DCLM 2002).

3.2.2 Land Systems

The PGL Alignment Area intersects with four unique soil landscape zones described in the table below (Table 3)(DPIRD 2022a).

Table 3 Landscape Zones intersecting the PGL Alignment Area

Zone	Description
Zone 112 (Great Sandy Desert Zone)	Sandplains and dunes on sedimentary rocks of the Canning Basin with red deep sands and red sandy earths with some red loamy earths and shallow gravels.
Zone 117 (Nita Sandplain Zone)	Sandplains and dunes on cretaceous canning basin sedimentary rocks with red deep sands and some red sandy earths.
Zone 280 (Nullagine Hills Zone)	Hills and ranges (with some stony plains) on volcanic and sedimentary rocks of the Pilbara craton (including the Hamersley Basin) with stony soils and red shallow loams and sands.
Zone 281 (De Grey-Roebourne Lowlands Zone)	Alluvial plains and sandplains on alluvial and marine deposits over the northern Pilbara craton with red deep sandy duplexes, red loamy earths, red/brown non-cracking clays, cracking clays, red sandy earths and red deep loamy duplexes.

The landscape zones describe above have been further classified into soil-landscape systems (DPIRD 2022b). The PGL Alignment Area intersects with 16 soil-landscape systems described below (Table 4):

Table 4 Soil-Landscape Systems intersecting the PGL Alignment Area

System	Description
Billygoat System	Dissected plains and gravelly slopes supporting hard spinifex grasslands.
Boolaloo System (281Bo)	Granite hills, domes, tor fields and sandy plains supporting spinifex grasslands with scattered shrubs.
Boolgeeda System (281Bg)	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.
Callawa System (117Cl)	Highly dissected low hills, mesas and gravelly plains on sandstone and conglomerate supporting soft and hard spinifex grasslands.
Capricorn System (281Cp)	Rugged sandstone hills, ridges, stony foot slopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs.
Gregory System (281Gr)	Linear dunes and restricted sandplains supporting shrubby hard spinifex (and occasionally soft spinifex) grasslands.
Horseflat System (281Hf)	Gilgaied clay plains supporting Roebourne Plains grass grasslands and minor grassy snakewood shrublands.
Little Sandy System (112Ls)	Sandplains with linear and reticulate dunes supporting shrubby hard and soft spinifex grasslands.
Macroy System (281Mc)	Stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands.
Mallina System (281Ma)	Sandy surfaced alluvial plains supporting soft spinifex grasslands and minor hard spinifex and tussock grasslands.
Nita System (117Nt)	Sandplains supporting shrubby spinifex grasslands with occasional trees.
Paradise System (281Pd)	Alluvial plains supporting soft spinifex grasslands and tussock grasslands.
River System (281Ri)	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
Robe System (281Ro)	Low plateaux, mesas and buttes of limonite supporting soft spinifex and occasionally hard spinifex grasslands.
Ruth System (281Rt)	Hills and ridges of volcanic and other rocks supporting shrubby hard spinifex and occasionally soft spinifex grasslands.
Uaroo System (281Ua)	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.

3.2.3 Broad vegetation mapping and extents

Broad-scale (1:250,000) pre-European vegetation mapping identified seven Vegetation Associations present in the PGL Alignment Area (Department of Primary Industries and Regional Development (DPIRD) 2019). These are shown in Table 5 below.

Table 5 Mapped pre-European vegetation associations

Pre-European vegetation association	Area within PGL Alignment Area (ha)
93: Hummock grasslands, shrub steppe; kanji over soft spinifex	15,489.14
101: Hummock grasslands, shrub steppe; *Acacia pachycarpa* over soft spinifex	5,424.30
117: Hummock grasslands, grass steppe; soft spinifex	18,462.36
171: Hummock grasslands, low tree steppe; snappy gum over soft spinifex & *Triodia briziodes*	536.60
589: Mosaic: Short bunch grassland – savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex	7,816.38
619: Medium woodland; river gum (*Eucalyptus camaldulensis*)	724.31

Pre-European vegetation association	Area within PGL Alignment Area (ha)
647: Hummock grasslands, dwarf-shrub steppe; *Acacia translucens* over soft spinifex	1,666.34

All Vegetation Associations are well represented across State, Interim Biogeographic Regionalisation for Australia (IBRA) Region, IBRA Subregion, and Local Government Area (LGA) extents. The majority of pre-European vegetation associations within the PGL Alignment Area have 99% or more of their pre-European extent remaining (Table 6). Veg Assoc No. 117, described as “hummock grasslands, grass steppe; soft spinifex”, has historically been subject to the highest proportional amount of clearing, seen at a subregional scale (Pindanland). Retention of pre-European vegetation at this scale is approximately 76%. However, a relatively high proportion of this remaining vegetation now exists in Department of Biodiversity, Conservation and Attraction (DBCA) reserves where it is protected from future clearing.

Table 6 Representation of Pre-European Vegetation Associations within the DE.

Pre-European Vegetation Association	Scale		Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA Reserves
Veg Assoc No. 93	Statewide WA		3,044,310	3,040,641	99.88	1.96
	IBRA Bioregion	Pilbara	3,041,114	3,038,472	99.88	1.96
		Great Sandy Desert	1,107	1,096	98.97	0
	IBRA Sub-region	Roebourne	46,361	46,334	99.94	0
		Chichester	2,940,348	2,936,732	99.88	2.02
		McLarty	1,107	1,096	98.97	0
	Local Government Authority	Town of Port Hedland	1,015,339	1,014,600	99.93	0
		Shire of East Pilbara	1,709,522	1,706,781	99.84	2.70
Veg Assoc No. 101	Statewide WA		1,191,084	1,191,038	100.00	1.67
	IBRA Bioregion	Pilbara	341	341	100.00	0
		Great Sandy Desert	961,170	961,124	100.00	2.07
	IBRA Sub-region	Roebourne	56	56	100.00	0
		Chichester	285	285	100.00	0
		McLarty	625,007	624,961	99.99	3.18
	Local Government Authority	Town of Port Hedland	6,958	6,928	99.57	0
		Shire of East Pilbara	612,920	612,904	100.00	3.25
Veg Assoc No. 117	Statewide WA		919,517	886,006	96.36	15.47
	IBRA Bioregion	Pilbara	82,706	78,097	94.43	21.69
		Great Sandy Desert	467,579	467,122	99.90	0.19
		Dampierland	28,895	22,074	76.39	30.54
	IBRA Sub-region	Roebourne	50,963	46,902	92.03	35.19
		Chichester	31,743	31,195	98.27	0
		Pindanland	28,895	22,074	76.39	30.54
		McLarty	247,331	246,923	99.84	0
	Local Government Authority	Town of Port Hedland	26,426	22,987	86.99	0
		Shire of East Pilbara	655,721	654,571	99.82	16.04
	Statewide WA		331,952	330,643	99.61	10.87

Pre-European Vegetation Association	Scale		Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA Reserves
Veg Assoc No. 171	IBRA Bioregion	Pilbara	331,307	330,026	99.61	10.89
		Great Sandy Desert	644	617	95.74	0
	IBRA Sub-region	Chichester	331,307	330,026	99.61	10.89
		McLarty	644	617	95.74	0
	Local Government Authority	Shire of East Pilbara	331,952	330,643	99.61	10.87
Veg Assoc No. 589	Statewide WA		807,699	802,713	99.38	1.9
	IBRA Bioregion	Pilbara	728,768	724,696	99.44	2.10
		Great Sandy Desert	26	26	100	0
		Dampierland	90	90	100	0
	IBRA Sub-region	Roebourne	675,392	671,327	99.4	2.13
		Chichester	53,376	53,368	99.98	1.78
		McLarty	26	26	100	0
		Pindanland	90	90	100	0
	Local Government Authority	Town of Port Hedland	338,269	335,921	99.31	0
		Shire of East Pilbara	64,182	64,112	99.89	0.07
Veg Assoc No. 619	Statewide WA		119,374	118,205	99.02	0.2
	IBRA Bioregion Pilbara		118,920	118,117	99.32	0.2
	IBRA Sub-region	Roebourne	33,377	32,596	97.66	0
		Chichester	85,543	85,521	99.97	0.28
	Local Government Authority	Town of Port Hedland	63,651	62,598	98.35	0
		Shire of East Pilbara	52,765	52,764	100	0
Veg Assoc No. 647	Statewide WA		195,861	191,711	97.88	0
	IBRA Bioregion Pilbara		195,860	191,711	97.88	0
	IBRA Sub-region	Roebourne	188,901	184,775	97.82	0
		Chichester	6,959	6,936	99.68	0
	Local Government Authority	Town of Port Hedland	180,908	176,759	97.71	0

3.2.4 Vegetation types and condition

3.2.4.1 Vegetation types

Biota (2024) completed a reconnaissance and targeted level field survey of the PGL Alignment Area. Twenty-four vegetation types were identified from the PGL Alignment Area (50,119.4 ha), associated with the following six broad landforms, with the remaining 602.7 ha consists of cleared areas:

- Drainage Areas (D) - 1,008.7 ha
- Clay Plains (C) - 4,284.8 ha
- Sand Dunes (S) - 20.9 ha
- Plains (P) - 33,893.2 ha
- Low Stony Rises (H) - 5,906.4 ha

– Rocky Outcrops and Breakaways (R) - 4,403 ha

The Plains broad landform represented the majority of the PGL Alignment Area, covering 33,893.2 ha or 68%. Low Stony Rises made up the second most representative broad landform mapped with 5,906.4 ha or 12% of the PGL Alignment Area. All other broad landforms mapped cumulatively represented less than 21% of the PGL Alignment Area, with no single broad landform representing more than 9% of the PGL Alignment Area.

Each vegetation type is coded based on the broad landform to which it belongs. Vegetation types within each broad landform are shown in Figure 5 and Table 8. The following two vegetation types dominate the PGL Alignment Area, both belonging to the Plains broad landform (Biota 2024):

– P3: *Corymbia zygophylla* scattered low trees to low open woodland over *Grevillea refracta* subsp. *refracta*, *Acacia tumida, Acacia ancistrocarpa, Acacia eriopoda, Acacia monticola* tall open shrubland over *Jacksonia aculeata, Croton aridus* low open shrubland – 15,425.1.0 ha (30.8% of the PGL Alignment Area)
– P1: *Acacia inaequilatera* scattered tall shrubs over *Acacia ancistrocarpa* scattered shrubs over *Acacia stellaticeps* scattered to low open shrubland over *Triodia epactia* scattered tussocks to open hummock grassland - 13,224.1 ha (26.4% of the PGL Alignment Area)

The third most abundant vegetation type, H2: *Acacia robeorum* scattered tall shrubs over *Acacia stellaticeps* low open shrubland over *Triodia angusta* (*Triodia wiseana, T. epactia*) hummock grassland to very open hummock grassland, represents comparatively less vegetation within the PGL Alignment Area, with 3,786.4 ha (7.6% of the PGL Alignment Area).

3.2.4.2 Condition

Biota (2024) mapped vegetation condition over the PGL Alignment Area using the condition categories from EPA (2016). The vegetation condition is presented in Table 7 and Figure 6. The mapping indicates that the PGL Alignment Area is predominantly in Excellent and Very Good to Excellent condition, with each condition representing 34.3% and 37.7% respectively.

Areas completely devoid of native vegetation were mapped as Cleared ('NA') and were not assigned a condition rating. In total, 1.2% of the PGL Alignment Area has been completely cleared of vegetation (e.g. roads, rails, mining area).

As observed by Biota (2024), the main disturbance factors in the PGL Alignment Area comprised weed invasion and cattle grazing and/or trampling. The areas in the worst condition were associated with drainage lines and floodplains, and usually supported high densities of weed species. Areas rated as Excellent, Excellent to Very Good and Very Good were often associated with hills or stony plains vegetation.

Table 7 Vegetation condition categories in the DE

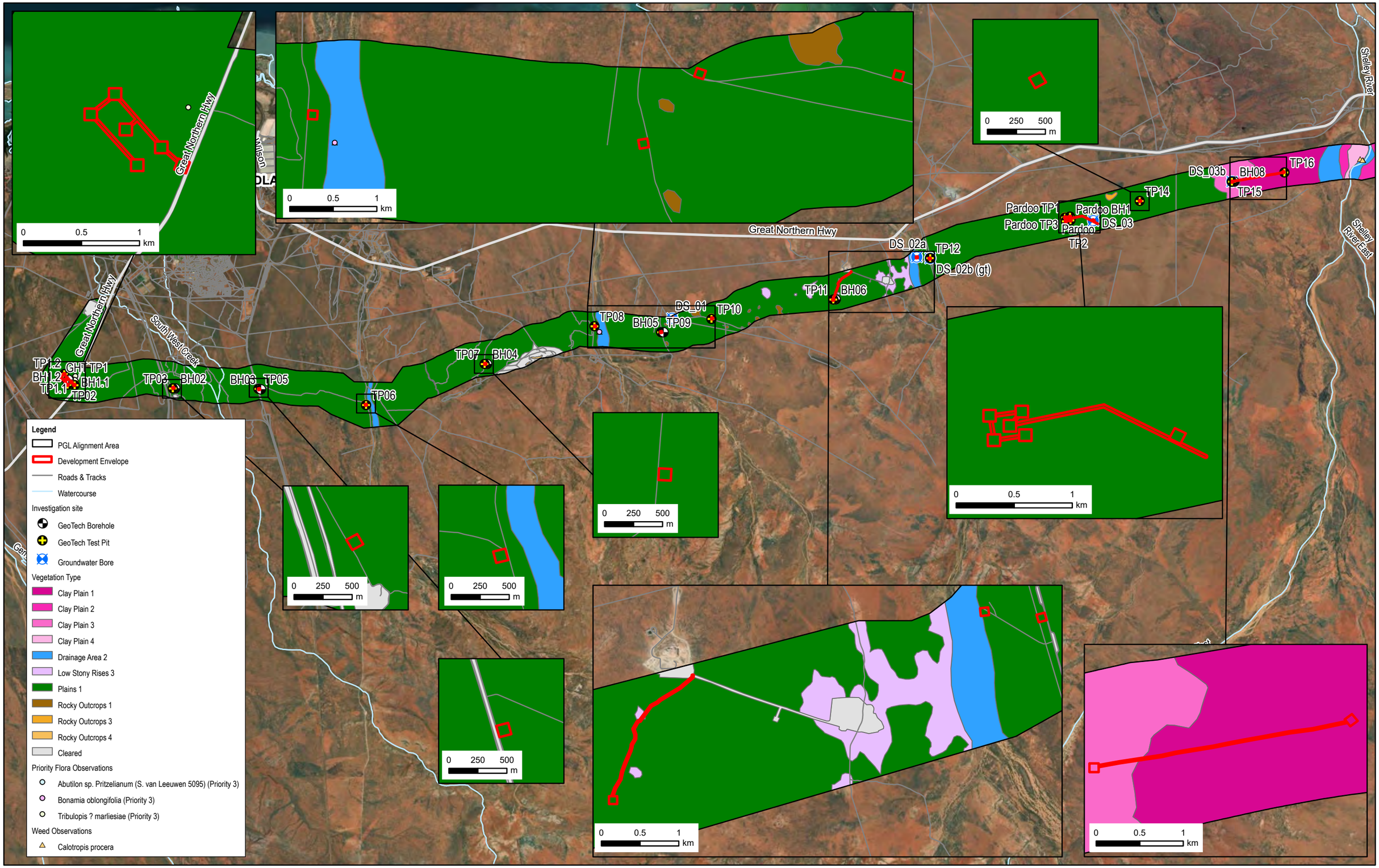
Condition Rating	Area (ha)	Proportion of PGL Alignment Area (%)
Excellent	17,176.9	34.3
Very Good to Excellent	18,874.9	37.7
Very Good	3,805.0	7.6
Good to Very Good	3,628.1	7.2
Good	3,790.2	7.6
Poor to Good	2,241.7	4.5
Cleared/NA	602.6	1.2

Table 8 Vegetation types recorded in the DE

Landform	Vegetation type	Description	Extent (ha)	% of PGL Alignment Area
Drainage Areas	D1	*Melaleuca argentea, Eucalyptus camaldulensis* subsp. *refulgens* open forest over *Ficus aculeata* var. *indecora* scattered low trees over **Calotropis procera* tall open scrub over *Indigofera oblongifolia* tall shrubland over **Cenchrus setiger*, **Cynodon dactylon* open tussock grassland over **Argemone ochroleuca* subsp. *ochroleuca* scattered herbs.	343	1
	D2	*Eucalyptus camaldulensis* subsp. *refulgens* and/or *Eucalyptus victrix* open to low open woodland over *Melaleuca argentea* tall open scrub to open woodland over *Acacia trachycarpa, Acacia colei* tall shrubland over *Corchorus incanus* subsp. *incanus* scattered low shrubs over *Triodia epactia* open to very open hummock grassland over **Cenchrus* spp. scattered to very open tussock grassland.	578	1
	D3	*Corymbia flavescens* low open woodland over *Acacia tumida* var. *pilbarensis* over *Triodia epactia* scattered to very open hummock grassland over mixed native tussock grasses.	65	<1
	D4	*Eucalyptus victrix* low woodland over *Lysiphyllum cunninghamii* low open woodland over *Acacia trachycarpa*, *Acacia colei* var. *colei*, *Acacia ancistrocarpa, Atalaya hemiglauca* tall shrubland over *Carissa lanceolata* open shrubland over *Chrysopogon fallax* open tussock grassland.	22	<1
		Total	1009	2
Clay Plains	C1	*Eriachne* spp. open to closed tussock grassland.	1,333	3
	C2	*Acacia* spp., *Indigofera* spp., *Senna* spp. scattered low shrubs over *Triodia epactia* very open to hummock grassland.	1,256	3
	C3	*Triodia epactia* open hummock to hummock grassland.	1,576	3
	C4	*Eucalyptus victrix, Lysiphyllum cunninghamii* low open woodland over *Acacia tumida* var. *pilbarensis* scattered tall shrubs over *Atalaya hemiglauca*, *Acacia stellaticeps* low open shrubland over *Corchorus incanus* subsp. *incanus, Bonamia alatisemina* scattered low shrubs over *Triodia epactia* open hummock grassland.	121	<1
		Total	4285	9
Sand Dunes	S1	*Corymbia flavescens* low open woodland over *Acacia tumida* var. *pilbarensis, Acacia ancistrocarpa* tall shrubland over *Grevillea refracta* subsp. *refracta, Petalostylis labicheoides* open shrubland over *Acacia adoxa* var. *adoxa, Acacia hilliana* low shrubland over *Triodia epactia* open hummock grassland over *Grevillea wickhamii*, *Bonamia erecta* low shrubland.	11	<1
	S2	*Corymbia zygophylla* scattered low trees over *Acacia* spp. scattered tall shrubs over *Dicrastylis doranii* low open shrubland over *Triodia schinzii* very open hummock grassland over *Aristida holathera* var. *holathera* scattered tussock grasses.	10	<1
		Total	21	<1
Plains	P1	*Acacia inaequilatera* scattered tall shrubs over *Acacia ancistrocarpa* scattered shrubs over *Acacia stellaticeps* scattered to low open shrubland over *Triodia epactia* scattered tussocks to open hummock grassland.	13,224	26
		Eucalyptus victrix low woodland over *Corymbia hamersleyana* scattered low trees over *Acacia colei* var. *colei* tall open shrubland over *Triodia epactia* open hummock grassland.		
	P2	*Lysiphyllum cunninghamii* scattered low trees over *Acacia inaequilatera* tall shrubland over *Triodia longiceps* very open hummock grassland.	1,174	2

Landform	Vegetation type	Description	Extent (ha)	% of PGL Alignment Area
	P3	*Corymbia zygophylla* scattered low trees to low open woodland over *Grevillea refracta subsp. refracta*, *Acacia tumida, Acacia ancistrocarpa, Acacia eriopoda, Acacia monticola* tall open shrubland over *Jacksonia aculeata*, *Croton aridus* low open shrubland over *Triodia schinzii (T. epactia*) open to very open hummock grassland	15,425	31
	P4	*Acacia inaequilatera, Acacia ancistrocarpa, Grevillea wickhamii* tall open shrubland over *Acacia stellaticeps* low open shrubland over *Triodia epactia (T. wiseana, T. angusta*) open to very open hummock grassland.	2,491	5
	P5	*Corymbia hamersleyana* scattered low trees over *Acacia stellaticeps, Acacia adoxa* var. *adoxa* low open shrubland over *Triodia epactia* hummock grassland.	1,579	3
		Total	33893	68
Low Stony Rises	H1a	*Grevillea wickhamii* scattered tall shrubs *Acacia hilliana, Acacia stellaticeps* low open shrubland over *Triodia scintillans* hummock grassland to open hummock grassland.	1,909	4
	H1b	*Corymbia hamersleyana* scattered low trees over *Grevillea wickhamii, Acacia* spp. scattered tall shrubs over *Acacia hilliana, Acacia stellaticeps* scattered low shrubs over *Triodia epactia* open to very open hummock grassland.		
	H1c	*Acacia bivenosa, Carissa lanceolata* scattered shrubs over *Acacia adoxa* var. *adoxa* scattered low shrubs over *Triodia wiseana* very open hummock grassland over scattered native tussock grasses.		
	H1d	*Corymbia flavescens* scattered low trees to low open woodland over *Acacia elachantha, Acacia ancistrocarpa, Acacia colei* tall open shrubland over *Triodia epactia* open to very open hummock grassland.		
	H2a	*Acacia robeorum* scattered tall shrubs over *Acacia stellaticeps* low open shrubland over *Triodia angusta* (*Triodia wiseana, T. epactia*) hummock grassland to very open hummock grassland.	3,786	8
	H2b	*Corymbia hamersleyana* scattered low trees over *Acacia stellaticeps, Acacia bivenosa* low shrubland to open shrubland over *Triodia epactia* open to very open hummock grassland.		
	H2c	*Gyrocarpus americanus* subsp. *pachyphyllus* scattered low trees over *Carissa lanceolatum, Flueggea virosa* subsp. *melanthesoides* scattered tall shrubs over **Cenchrus ciliaris* very open tussock grassland and *Triodia epactia* scattered hummock grasses.		
	H2d	*Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana (T. epactia)* open hummock grassland.		
	H2e	*Corymbia flavescens* scattered low trees over *Acacia colei* var. *colei* scattered tall shrubs over *Acacia stellaticeps* low open shrubland over *Triodia epactia* open hummock grassland over **Cenchrus ciliaris* scattered tussock grasses.		
	H3	*Acacia inaequilatera* scattered shrubs over *Triodia epactia* scattered to open hummock grassland.	211	<1
		Total	5906	12
Rocky Outcrops and Breakaways	R1	*Atalaya hemiglauca* scattered low trees over *Acacia colei* scattered shrubs over *Triodia epactia* very open hummock grassland.	52	<1
	R2a	*Corymbia hamersleyana* low open woodland over *Acacia tumida var. pilbarensis, Acacia acradenia* tall open scrub over *Triodia epactia* (*T. wiseana*) open to very open hummock grassland *over* **Cenchrus ciliaris* scattered tussock grasses.	3,006	6

Landform	Vegetation type	Description	Extent (ha)	% of PGL Alignment Area
	R2b	*Triodia epactia* hummock grassland.		
	R2c	*Terminalia circumalata* scattered tall shrubs to tall shrubland over *Triodia epactia* hummock grassland to very open hummock grassland over mixed scattered tussock grasses.		
	R2d	*Acacia inaequilatera, Grevillea* spp. scattered tall shrubs over *Triodia epactia* open hummock grassland.		
	R3	*Acacia orthocarpa* open shrubland over *Triodia epactia* very open hummock grassland over *Eriachne mucronata* (Typical Form) scattered tussock grasses over *Goodenia scaevolina* scattered herbs.	17	<1
	R4	*Acacia colei* scattered to tall open shrubland over *Triodia epactia* very open hummock grassland.	7	<1
	R5a	*Acacia inaequilatera* scattered tall shrubs over *Triodia epactia* open to very open hummock grassland.	352	1
	R5b	*Corymbia hamersleyana* scattered low trees over *Acacia tumida var. pilbarensis* tall shrubland over *Triodia epactia* open hummock grassland.		
	R6	*Acacia ancistrocarpa, Acacia colei* tall open shrubland over *Acacia adoxa* var. *adoxa* low open shrubland over *Triodia epactia* open hummock grassland.	969	2
		Total	4403	9
Cleared/ N/A	NA	Cleared vegetation for roads, mining, rails and existing tracks.	603	1



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Pilbara Green Link

Investigation Area - Permit Activities

Environmental Constraints Vegetation Type

Project No. **12657458**
Revision No. **A**
Date **3/02/2025**

FIGURE 5.1

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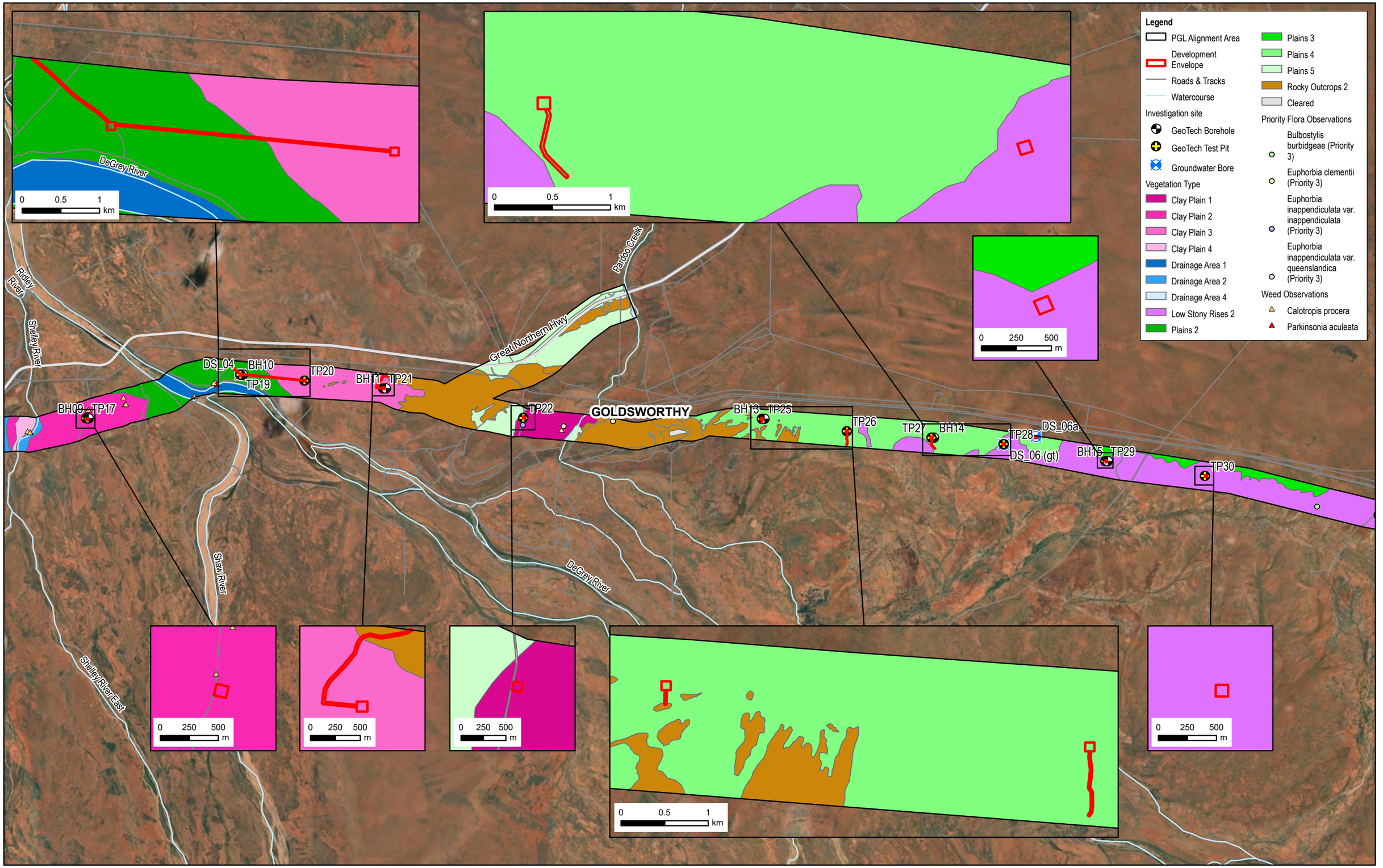

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Pilbara Green Link

Investigation Area - Permit Activities

Environmental Constraints Vegetation Types

Project No. **12657458**
Revision No. **A**
Date **3/02/2025**

FIGURE 5.2

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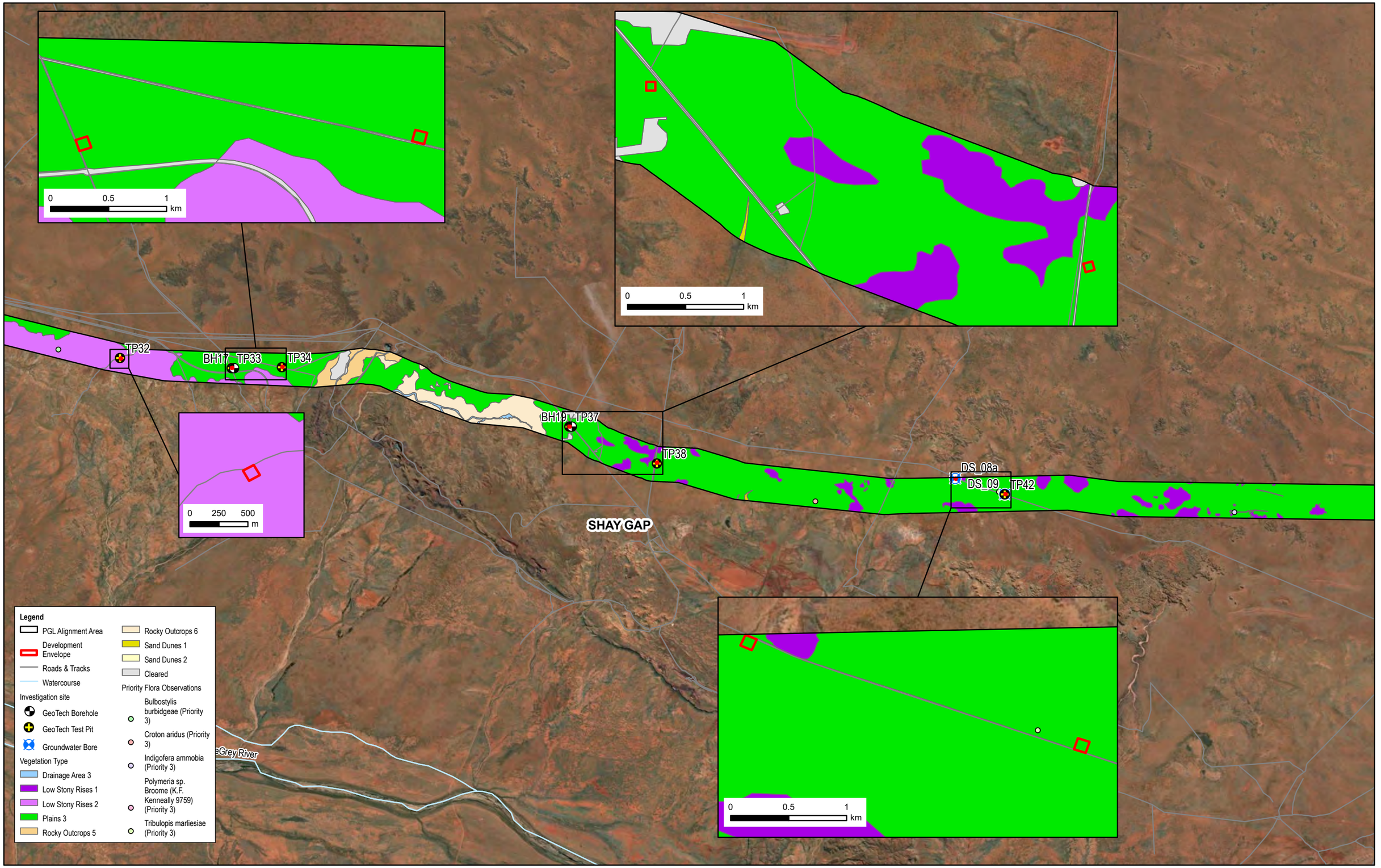

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Pilbara Green Link

Investigation Area - Permit Activities

Environmental Constraints Vegetation Type

Project No. **12657458**
Revision No. **A**
Date **3/02/2025**

FIGURE 5.3

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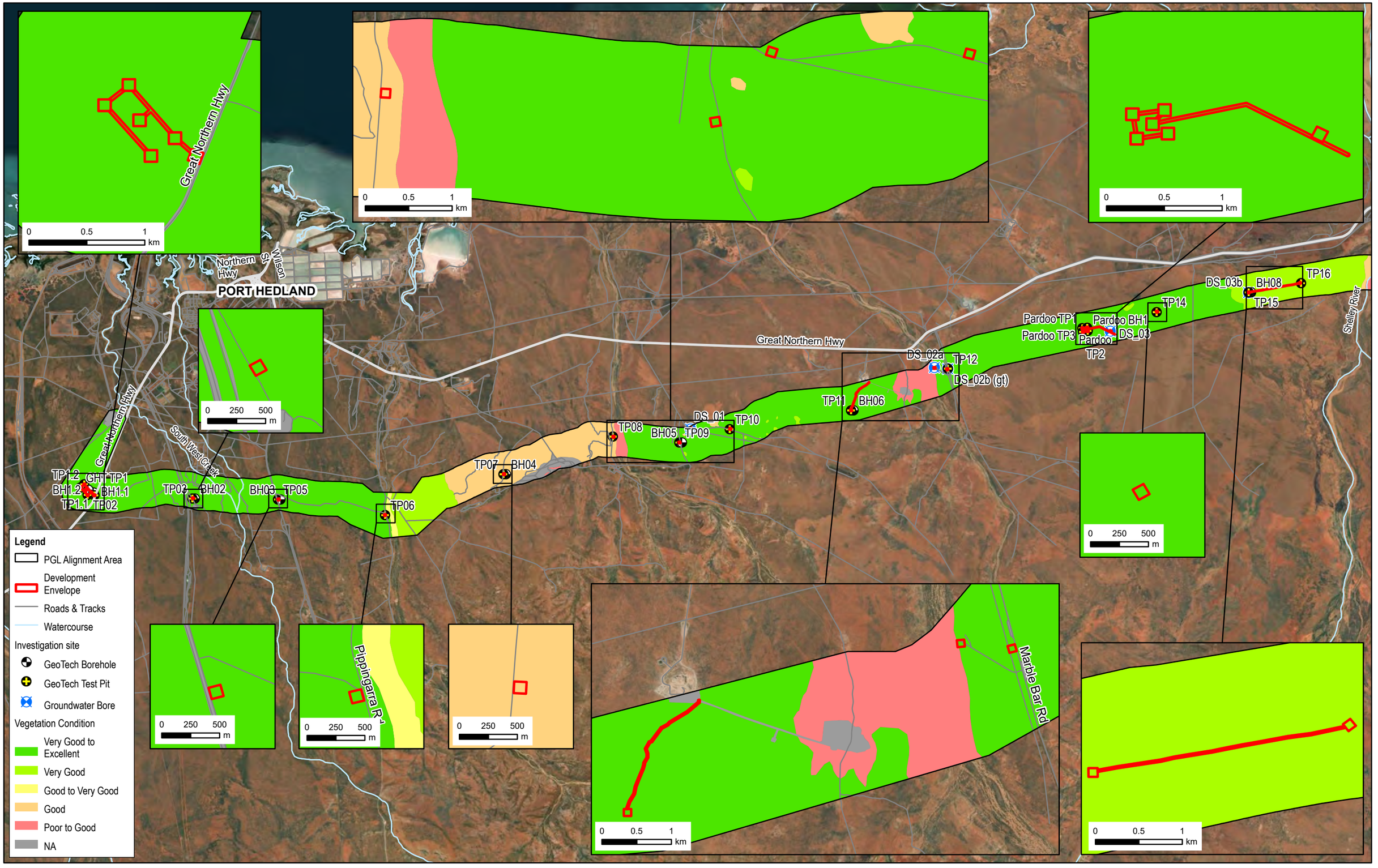

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Pilbara Green Link

Investigation Area - Permit Activities

Environmental Constraints Vegetation Condition

Project No. **12657458**
Revision No. **A**
Date **06/01/2025**

FIGURE 6.1

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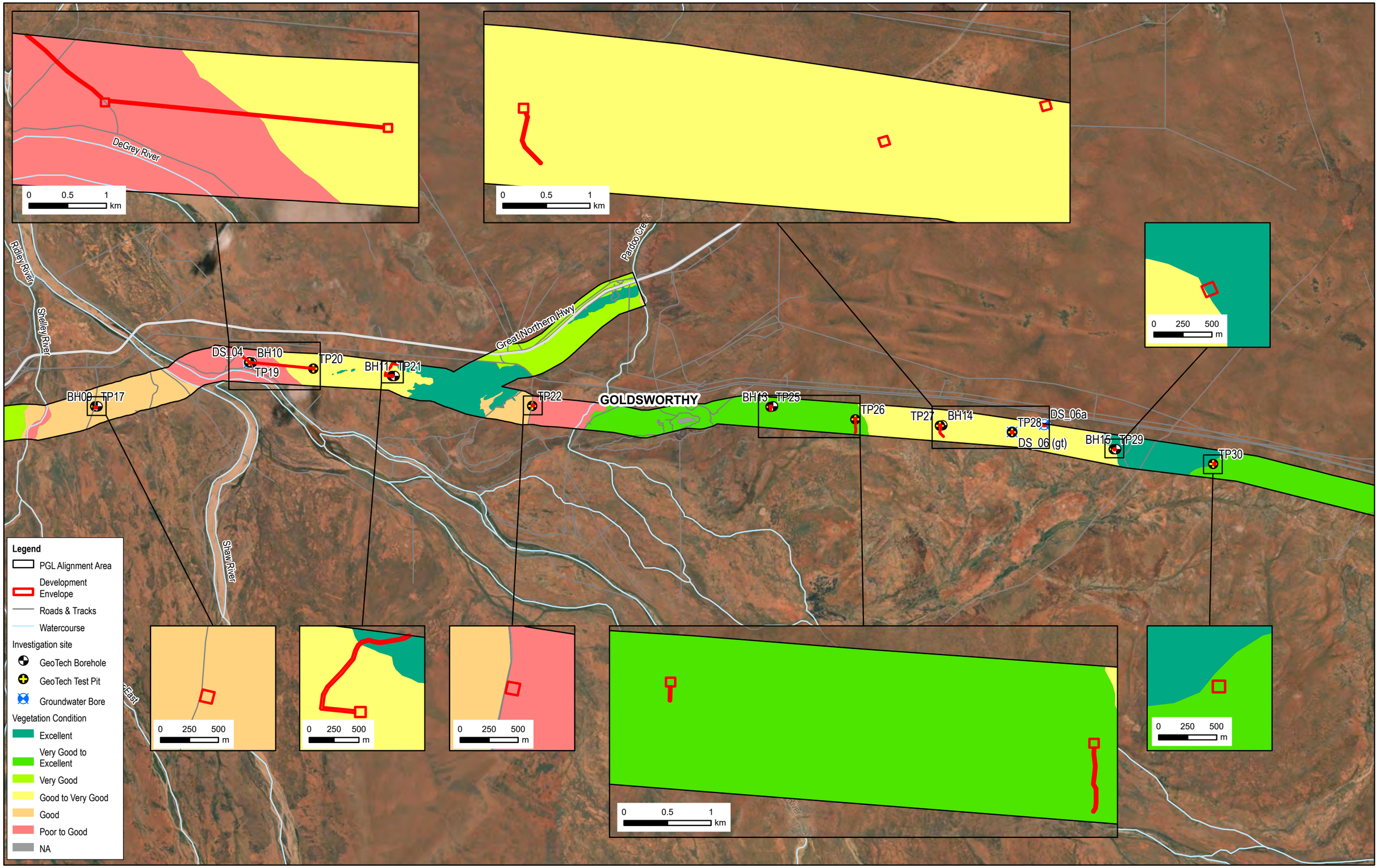

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Pilbara Green Link

Investigation Area - Permit Activities

Environmental Constraints Vegetation Condition

Project No. **12657458**
Revision No. **A**
Date **06/01/2025**

FIGURE 6.2

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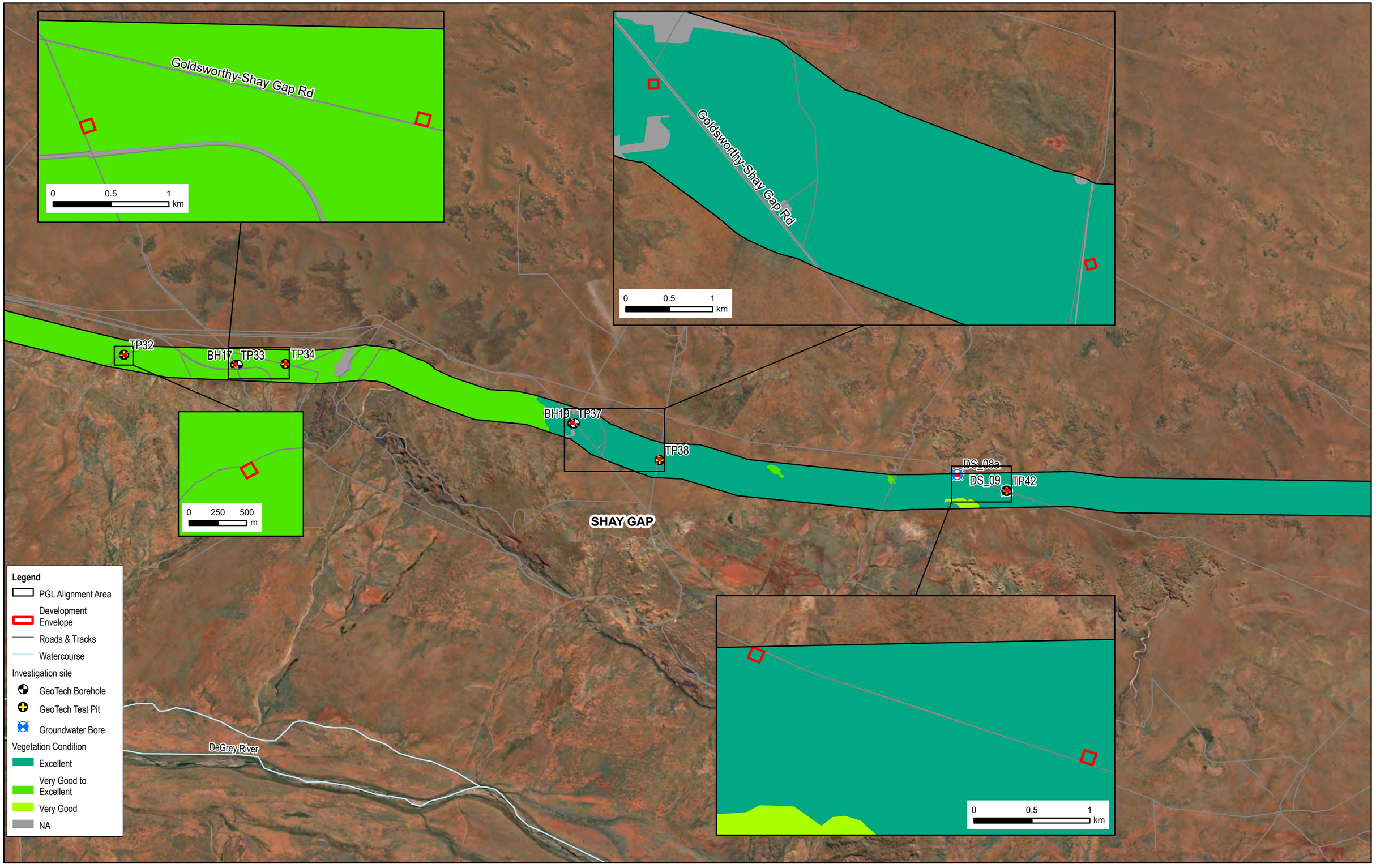

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Date **3/02/2025**

FIGURE 6.3

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3.2.5 Significant ecological communities

The PMST search did not identify any Threatened Ecological Communities (TECs) previously recorded within the PGL Alignment Area. The database search indicated one Priority Ecological Community (PEC) intersecting the PGL Alignment Area, the Gregory Land System (DBCA 2022). DBCA has listed this PEC as Priority 3.

Results of the Biota (2024) survey indicated no vegetation types representative of TECs or PECs were recorded. Post-field survey, the Gregory Land System classification was identified as a misclassification by DBCA. The area is instead classified as a non-listed Granitic Land System, therefore the PGL Alignment Area does not intersect a significant ecological community.

The riparian vegetation types D1 and D2 (the De Grey River and its tributaries) are considered as having a high potential to be Groundwater Dependent Ecosystems (GDEs) or Groundwater Dependent Vegetation (GDV) due to the phreatophytic species *Eucalyptus camaldulensis, Eucalyptus victrix* and *Melaleuca argentea* being dominant taxa. In total, vegetation types D1 and D2 represent 919 ha of the PGL Alignment Area (1.8% of the PGL Alignment Area).

3.2.6 Flora diversity

The Dandjoo search identified 871 vascular flora species previously recorded within the PGL Alignment Area (Appendix C). During the field survey, Biota (2024) recorded a total of 420 native flora species from 148 genera and 51 families. Fabaceae and Poaceae represented the two most dominant native families. These families and genera recorded within, are typical of species lists from the region.

3.2.7 Conservation significant flora

The Biota (2024) field survey identified eleven Priority species, comprising of one P2 species, nine P3 species, and one P4 species across the PGL Alignment Area (Table 9 and Figure 5). No threatened species were recorded during the Biota (2024) survey. Records of all Priority species represented new populations of the species. For two of the recorded Priority species, these new populations are considered significant range extensions:

– *Bonamia oblongifolia* (P3)
– *Euphorbia inappendiculata* var. *queenslandica* (P3)

Biota (2024) concluded an additional seven Priority species, which were not detected during the field survey, as likely to occur and an additional eight species as may occur in the PGL Alignment Area (Table 9). The guidelines applied to determine the flora likelihood of occurrence assessment are detailed in Table 10.

Table 9 Conservation significant flora - Likelihood of occurrence assessment (Biota 2024)

Species	EP Act/DBCA Status
Known	
Goodenia hartiana	P2
Abutilon sp. Pritzelianum (S. van Leeuwen 5095)	P3
Bonamia oblongifolia	P3
Bulbostylis burbidgeae	P3
Croton aridus	P3
Euphorbia clementii	P3
Euphorbia inappendiculata var. *inappendiculata*	P3
Euphorbia inappendiculata var. *queenslandica*	P3
Indigofera ammobia	P3
Polymeria sp. Broome (K.F. Kenneally 9759)	P3
Tribulopis marliesiae	P3
Likely	

Species	EP Act/DBCA Status
Triodia degreyensis	P1
Euploca mutica	P3
Hibiscus aff. krichauffianus	P3
Nicotiana umbratica	P3
Phyllanthus sp. aff. *herbecarpus*	P3
Rothia indica subsp. *australis*	P3
Terminalia kumpaja	P3
May	
Acacia cyperophylla var. omearana	P1
Euploca parviantrum	P1
Tephrosia rosea var. Port Hedland	P1
Gomphrena leptophylla	P3
Gymnanthera cunninghamii	P3
Heliotropium murinum	P3
Triodia chichesterensis	P3
Ptilotus mollis	P4

Table 10 Flora likelihood of occurrence assessment guidelines (Biota 2024)

Rank/ Likelihood	Criteria
Recorded	1. The species has been recorded in the PGL Alignment Area
Likely to occur/ High	1. There are existing records of the species in proximity to the PGL Alignment Area; and • The species is strongly linked to a specific habitat, which is present in the PGL Alignment Area; or • The species has more general habitat preferences, and suitable habitat is present.
May occur / Moderate	1. There are existing records of the species from the locality, however • The species is strongly linked to a specific habitat, of which only a small amount is present in the PGL Alignment Area; or • The species has more general habitat preferences, but only some suitable habitat is present 2. There is suitable habitat in the PGL Alignment Area, but the species is recorded infrequently in the locality.
Unlikely to occur/ Low	1. The species is linked to a specific habitat, which is absent from the PGL Alignment Area; or 2. Suitable habitat is present, however there are no existing records of the species from the locality despite reasonable previous search effort in suitable habitat; or 3. There is some suitable habitat in the PGL Alignment Area, however the species is very infrequently recorded in the locality, or the only records are historical (>40 years old).
Would not occur/ Negligible	1. The species is strongly linked to a specific habitat, which is absent from the PGL Alignment Area; or 2. The species' range is very restricted and does not include the PGL Alignment Area; or 3. The species is not considered extant in the locality

3.2.8 Weeds

Biota (2024) recorded the presence of 15 introduced species within the PGL Alignment Area (Figure 5). Two of these weed species represented Declared Pests; **Calotropis procera* and **Parkinsonia aculeata*. The latter species is also considered a weed of national significance (Department of Agriculture and Water Resources 2017).

The PGL Alignment Area with the highest number of introduced species with 11 different introduced taxa recorded, was near a major drainage line. This presence of water allows for optimal conditions for the growth and dispersal of weeds, as well as routine cattle activity acting to further disperse these species.

3.3 Fauna

3.3.1 Vertebrate fauna habitat

From the field survey (Biota 2024), ten fauna habitats were identified within PGL Alignment Area (Figure 7):

- Acacia shrubland on spinifex sandplain – 32,679 ha
- Granite boulders – 3,836.2 ha
- Gorges and gullies – 3,000.6 ha
- Claypan – 2,902.3 ha
- Minor/moderate drainage lines – 2,630.6 ha
- Low stony rises - 2,474.2 ha
- Rocky outcrops - 993.5 ha
- Major drainage lines – 919.0 ha
- Sand dunes – 20.9ha
- Cleared areas – 601.3 ha

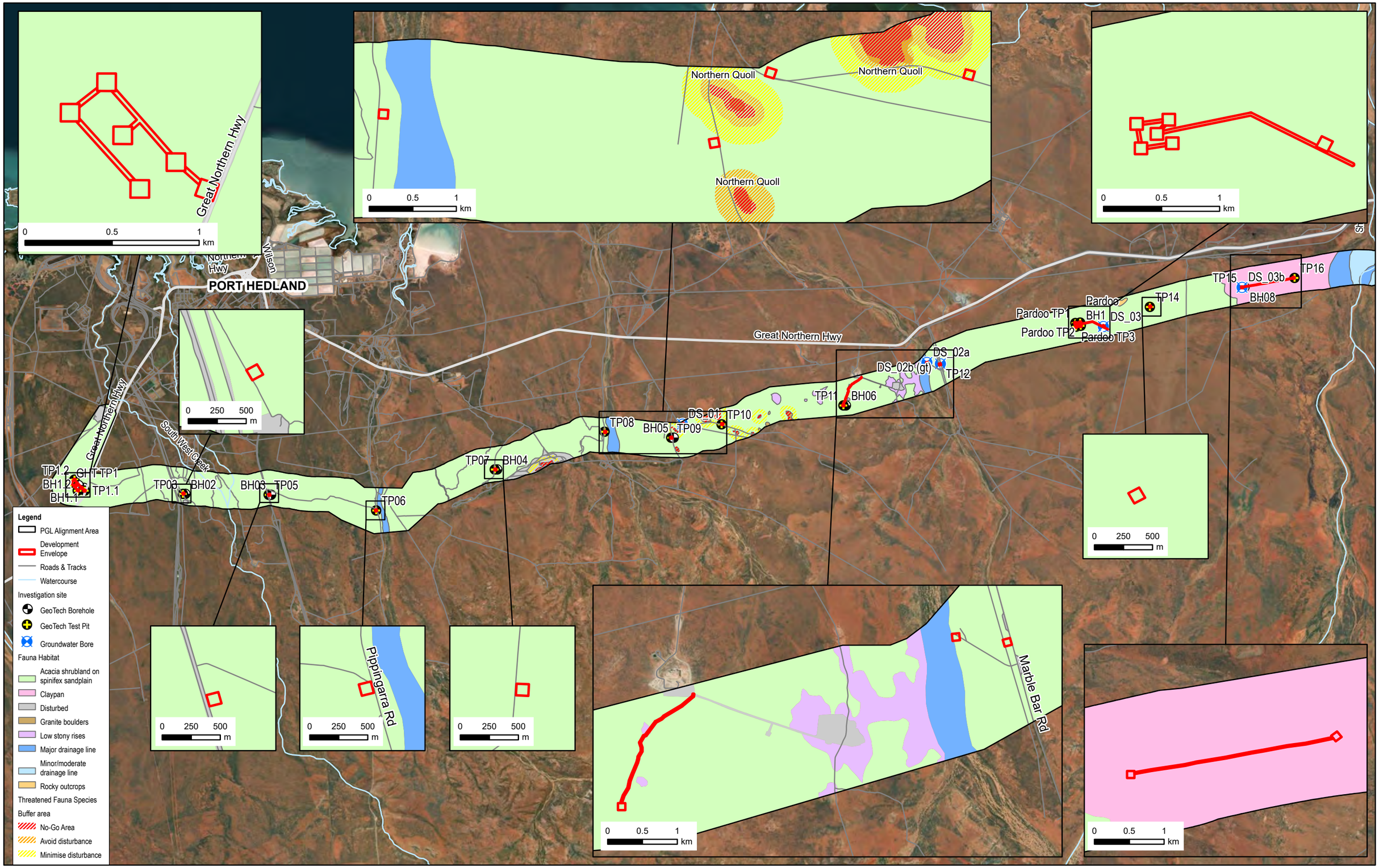
Acacia shrubland on spinifex sandplain was the dominant habitat type within the PGL Alignment Area, representing 65.3%. The other nine habitat types represent between 7.7% and 0.1% of the PGL Alignment Area. These habitats are described in further detail below in Table 11 and shown Figure 7.

Significant fauna species likely to inhabit each habitat have been identified by the Biota (2024) and listed in Table 11. Migratory species were not included in the table as most habitat types were deemed as suitable and/or the habitats were not breeding dependent (Biota 2024). These species will be reviewed in the assessment against the 10 clearing principles.

Table 11 Fauna Habitats within the PGL Alignment Area

Fauna Habitat	Habitat description	Area (ha)	Proportion of PGL Alignment Area (%)	Fauna species likely to inhabit
Acacia shrubland on spinifex sandplain	Open Acacia shrubland with some denser patches and scattered Corymbia and Eucalyptus victrix, including A. stellaticeps, A. ancistrocarpa, A. monticola, over hummock grasslands of spinifex (Triodia spp.) on sandplain	32,679	65.3	– Bilby – Brush-tailed Mulgara – Northern Quoll – Spectacled Hare-wallaby – Western Pebble-mound Mouse – Pilbara Leaf-nosed Bat – Grey Falcon
Granite boulders	Granite boulders with scattered Corymbia spp. and Acacia spp. over open Triodia hummock grassland.	3,836.2	7.7	– Northern Quoll – Ghost Bat – Pilbara Leaf-nosed Bat – Grey Falcon – Black-footed Rock-wallaby
Gorges and gullies	Gorges, gullies, large breakaways and associated foot slopes. Corymbia hamersleyana low open woodland over Acacia spp., over Triodia grassland.	3,000.6	5.9	– Northern Quoll – Western Pebble-mound Mouse – Pilbara Olive Python – Ghost Bat – Pilbara Leaf-nosed Bat – Grey Falcon – Black-footed Rock-wallaby
Claypan	Triodia hummock and tussock grasslands on clay.	2,902.3	5.8	– Short-tailed Mouse
Minor/ moderate drainage line	Minor to moderate drainage lines and floodplains fringed with low eucalypts (Eucalyptus victrix, Corymbia flavescens) and Lysiphyllum cunninghamii over sparse shrubland and tussock grassland	2,630.6	5.3	– Brush-tailed Mulgara – Ghost Bat – Northern Quoll – Pilbara Olive Python – Pilbara Leaf-nosed Bat – Grey Falcon
Low stony rises	Rocky undulating plains, rises and slopes with small outcrops. Mixed Acacia tall shrubland with some scattered Corymbia; Grevillea wickhamii, Triodia epactia, and open tussock grasses.	2,474	4.9	– Northern Quoll – Western-Pebble-mound Mouse
Rocky outcrops	Breakaways and large complex rocky outcropping and, vegetated with Corymbia spp., mixed Acacia spp., Triodia epactia and scattered tussock grasses.	993.5	1.8	– Western Pebble-mound Mouse – Northern Quoll – Ghost Bat – Pilbara Leaf-nosed Bat

				– Black-footed Rock-wallaby
Major drainage lines	Major drainage lines fringed by eucalypts (Eucalyptus camaldulensis, E. victrix), Melaleuca argentea over tall shrubland and open Triodia grassland.	919.0	1.8	– Northern Quoll – Ghost Bat – Pilbara Leaf-nosed Bat – Pilbara Olive Pythons – Brush-tailed Mulgara – Short-tailed Mouse – Grey Falcon
Sand dunes	Corymbia low open woodland over Acacia tall shrubland and open grassland on sand dunes.	20.9	0.01	– Bilby – Brush-tailed Mulgara – Dampierland Plain Slider
Cleared areas		1,086.3	1.2	



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Pilbara Green Link

Investigation Area - Permit Activities

Environmental Constraints Fauna Habitat

Project No. **12657458**
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FIGURE 7.1

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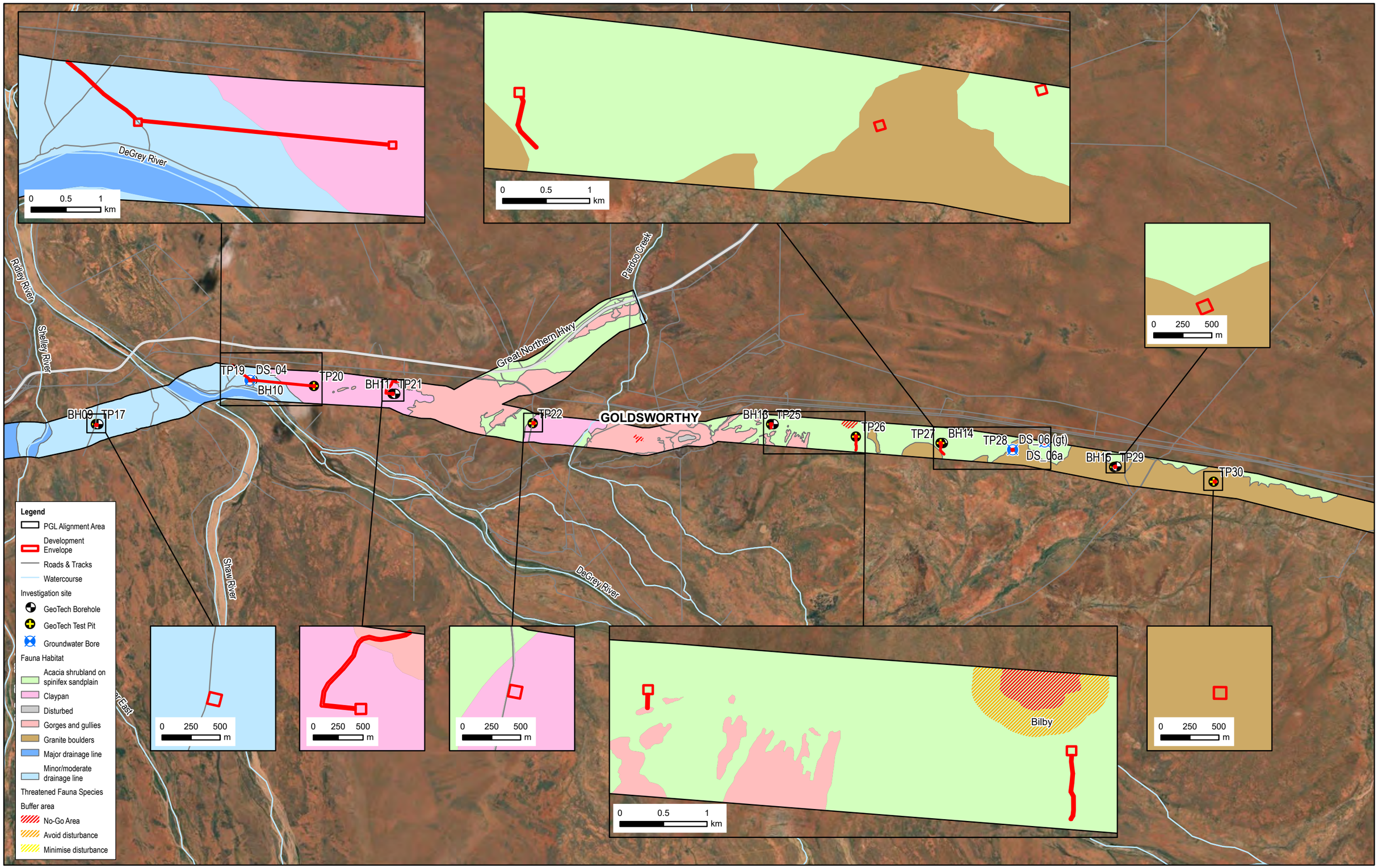

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Investigation Area- Permit Activities

Environmental Constraints Fauna Habitat

Project No. **12657458**
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FIGURE 7.2

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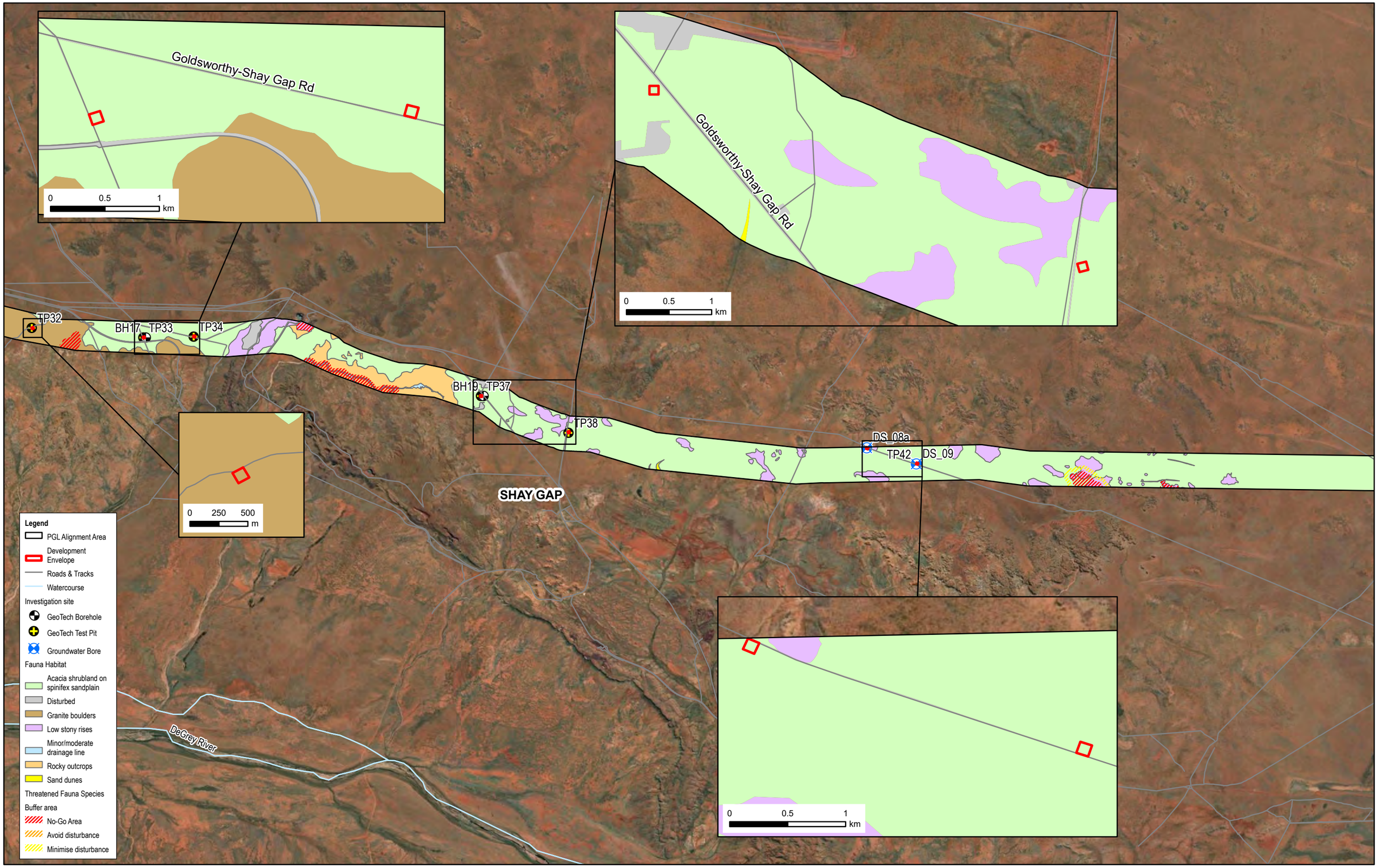

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Pilbara Green Link

Investigation Area - Permit Activities

Environmental Constraints Fauna Habitat

Project No. **12657458**
Revision No. **A**
Date **5/02/2025**

FIGURE 7.3

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3.3.2 Vertebrate fauna diversity

The Dandjoo database search (Appendix C) identified 642 vertebrate fauna species previously recorded within 20km of the PGL Alignment Area. This included:

- 309 Birds
- 170 Reptiles
- 75 Fish
- 71 Mammals
- 17 Amphibians

Biota (2024) identified 121 vertebrate species comprising of 24 mammals (including 11 bat species), 73 bird species, 23 reptile species and one amphibian species within the PGL Alignment Area.

Of the 121 species, four introduced fauna species were recorded: Dingo (*Canis familiaris*), Feral Domestic Cat (*Felis catus*), Camel (*Camelus dromedarius*) and European Cattle (*Bos primigenius taurus*).

3.3.3 Conservation significant vertebrate fauna

The Biota field survey (2024) confirmed the presence of five Conservation Significant fauna species (Table 12) within the PGL Alignment Area. A further eight species have been described as likely to occur due based on previous records within the PGL Alignment Area and/or the availability of suitable habitat. Ten species were identified by Biota (2024) as may occur in the PGL Alignment Area.

Three of the known species are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as Matters of National Environmental Significance (MNES) and the Western Australian *Biodiversity Conservation Act 2016* (BC Act). These species are the Northern Quoll, Bilby and Pilbara Leaf-nosed Bat (Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2024). The two other known significant species, the Brush-tailed Mulgara and Western Pebble-mound Mouse, are listed as Priority 4 by DBCA under the BC Act.

Table 12 State Conservation Significant Fauna Species in the PGL Alignment Area

Taxon	Common Name	Status	
		BC Act/DBCA	EPBC Act
Known			
Dasyurus hallucatus	Northern Quoll	Endangered	Endangered
Macrotis lagotis	Bilby	Vulnerable	Vulnerable
Rhinonicteris aurantia (Pilbara form)	Pilbara Leaf-nosed Bat	Vulnerable	Vulnerable
Dasycercus blythi	Brush-tailed Mulgara	Priority 4	-
Pseudomys chapmani	Western Pebble-mound Mouse	Priority 4	-
Likely			
Falco hypoleucos	Grey Falcon	Vulnerable	Vulnerable
Liasis olivaceus barroni	Pilbara Olive Python	Vulnerable	Vulnerable
Macroderma gigas	Ghost Bat	Vulnerable	Vulnerable
Apus pacificus	Pacific Swift	Migratory	Migratory
Glareola maldivarum	Oriental Pratincole	Migratory	Migratory
Gelochelidon [nilotica] macrotarsa	Australian [Gull-billed] Tern	Migratory	Migratory
Hydroprogne caspia	Caspian Tern	Migratory	Migratory

Falco peregrinus	Peregrine Falcon	Other specially protected	-
May			
Petrogale lateralis lateralis	Black-footed Rock-wallaby	Endangered	Endangered
Actitis hypoleucos	Common Sandpiper	Migratory	Migratory
Anarhynchus veredus	Oriental Plover	Migratory	Migratory
Chlidonias leucopterus	White-winged Tern	Migratory	Migratory
Plegadis falcinellus	Glossy Ibis	Migratory	Migratory
Numenius minutus	Little Curlew	Migratory	Migratory
Tringa glareola	Wood Sandpiper	Migratory	Migratory
Lerista separanda	Dampierland Plain Slider	Priority 2	-
Lagorchestes conspicillatus	Spectacled Hare-Wallaby	Priority 4	-
Leggadina lakedownesis	Short-tailed Mouse	Priority 4	-

3.3.4 Invertebrate fauna habitats

Ten fauna habitats were identified and mapped through in-field habitat assessment and consideration of the ecological niches relevant to SRE fauna (Biota 2024). Table 13 describes the microhabitats likely to support SRE species within each of the broader fauna habitat units of the PGL Alignment Area.

Based on the review of spatial data and ground-truthing in contextual areas, the SRE fauna habitats present are not confined to the PGL Alignment Area and extend contiguously beyond, reducing the likelihood that any species would be restricted in distribution to the PGL Alignment Area.

Table 13 Microhabitats likely to support SRE species

Fauna Habitat	SRE Microhabitat Description
Acacia shrubland on spinifex sandplain	Accumulations of leaf litter, areas of clayey soils, mature *Triodia* hummocks.
Granite boulders	Mature *Triodia* hummocks, leaf litter accumulations, granite outcrops.
Gorges and gullies	Accumulations of leaf litter, areas of clayey soils, mature *Triodia* hummocks.
Claypan	Extensive areas of high clay content soils, mature *Triodia* hummocks
Minor/moderate drainage line	Leaf litter accumulations, areas of high clay-content soils on floodplains.
Low stony rises	Sandy/stony soils, accumulations of leaf litter, patches of mature *Triodia* hummocks.
Rocky outcrops	Accumulations of leaf litter.
Major drainage lines	Floodplains of high clay content soils, permanent pools, leaf litter accumulations
Sand dunes	Nil
Cleared areas	Nil

3.3.5 Invertebrate diversity

The Biota field survey (2024) identified the following invertebrates across the PGL Alignment Area:

– 11 Mygalomorph spiders from 11 sites
– 16 Camaenid Snails from six sites
– Two Scorpions from two sites

– Two Pseudoscorpions from one site
– 11 Isopods from six sites
– Three Centipedes from three sites
– One Selenopid spider from one site

3.4 Conservation Areas

There are no DBCA Legislated Lands or Waters occurring within the PGL Alignment Area (DWER 2024).

3.5 Environmentally Sensitive Areas

There is one Environmentally Sensitive Area (ESA) that intersects the PGL Alignment Area, the De Grey River (DWER 2021b). The PGL Alignment Area overlaps 300 ha of the De Grey River, which is listed on the Directory of Important Wetlands of Australia (DCCEEW 2018), and is also listed as an ESA under the EP Act (DWER 2021b)(Figure 8). This wetland is known to support some significant fauna species such as the Grey Falcon (Vulnerable), the Far Eastern Curlew (Vulnerable) and the Pilbara Dragonfly (Priority 2). The De Grey River also has high potential to support vegetation representing GDEs (Bureau of Meteorology 2024). The Investigation Pads identified in this NVCP are not located within the De Grey River.

3.6 Hydrology

Desktop review of Government of Western Australia's hydrology related data layers identified the water resources present in the PGL Alignment Area. There are detailed below in Table 14.

Table 14 Water Resources within the DE

Aspect	Details	Results
Groundwater Areas (Department of Water and Environmental Regulation (DWER), 2018a)	Groundwater areas proclaimed under the Rights in Water and Irrigation Act 1914 (RIWI Act)	Pilbara Groundwater Area – Ashburton Subarea – East Pilbara Subarea Canning-Kimberly Groundwater Area – West Canning-Yarrie Subarea
Surface Water Areas	Surface water areas proclaimed under the RIWI Act	Pilbara Surface water Area
Irrigation District	Irrigation Districts proclaimed under the RIWI Act	None present
Rivers	Rivers proclaimed under the Rights in RIWI Act	None present
Public Drinking Water Source Areas (DWER 2024b)	PDWSA is a collective term used for the description of Water Reserves, Catchment Areas and Underground Pollution Control Areas declared (gazetted) under the provisions of the Metropolitan Water Supply, Sewage and Drainage Act 1909 (WA) or the Country Areas Water Supply Act 1947 (WA)	De Grey River Water Reserve (shown in Figure 8)
Waterways Management Area	Areas proclaimed under the Waterway Conservation Act 1976 (WA). These are Albany waterways, Avon River, Wilson Inlet, Peel– Harvey estuaries and Leschenault Inlet.	None present

3.6.1 Groundwater

The PGL Alignment Area intersects one Public Drinking Water Source Area: De Grey River Water Reserve (DWER 2024) (Figure 8). Within this water reserve, the De Grey River wellfield is used to supply water for Port Hedland (DWER 2018b). The De Grey River wellfield is operated by the Water Corporation and draws groundwater from the alluvial deposits of the De Grey River.

The PGL Alignment Area falls within the Pilbara Groundwater Area and Canning-Kimberly Groundwater Area. Groundwater in the Pilbara originates from direct infiltration by rainfall and surface water flows, such as rivers. The most significant aquifers in the region can be grouped into three types:

– Alluvial aquifers that are either unconsolidated sedimentary aquifers or chemically deposited aquifers
– Consolidated sedimentary (or sedimentary rock) aquifers
– Fractured rock aquifers

Groundwater in the Pilbara region is typically fresh, with low salinity levels (200-1500 mg/L). Salinity is higher in well sites than bores and mean TDS was found to increase toward the coast (Reeves et al. 2007).

3.6.2 Surface water and drainage

De Grey River is intersected by the PGL Alignment Area, crossing through the central portion of the area (DWER 2018c). This system of permanent river pools constitutes a significant drought refuge area for freshwater fishes and waterbirds in the bioregion. Drainage through the PGL Alignment Area is shown in Figure 8.

The PGL Alignment Area is within the Indian Ocean and Western Plateau catchment divisions of Western Australia. Within these divisions, the PGL Alignment Area falls within the De Grey River, Port Hedland Coast, and Sandy Desert basins. The PGL Alignment Area is spread out between five different catchments, and three different sub catchment management areas within these catchments, as detailed in Table 15.

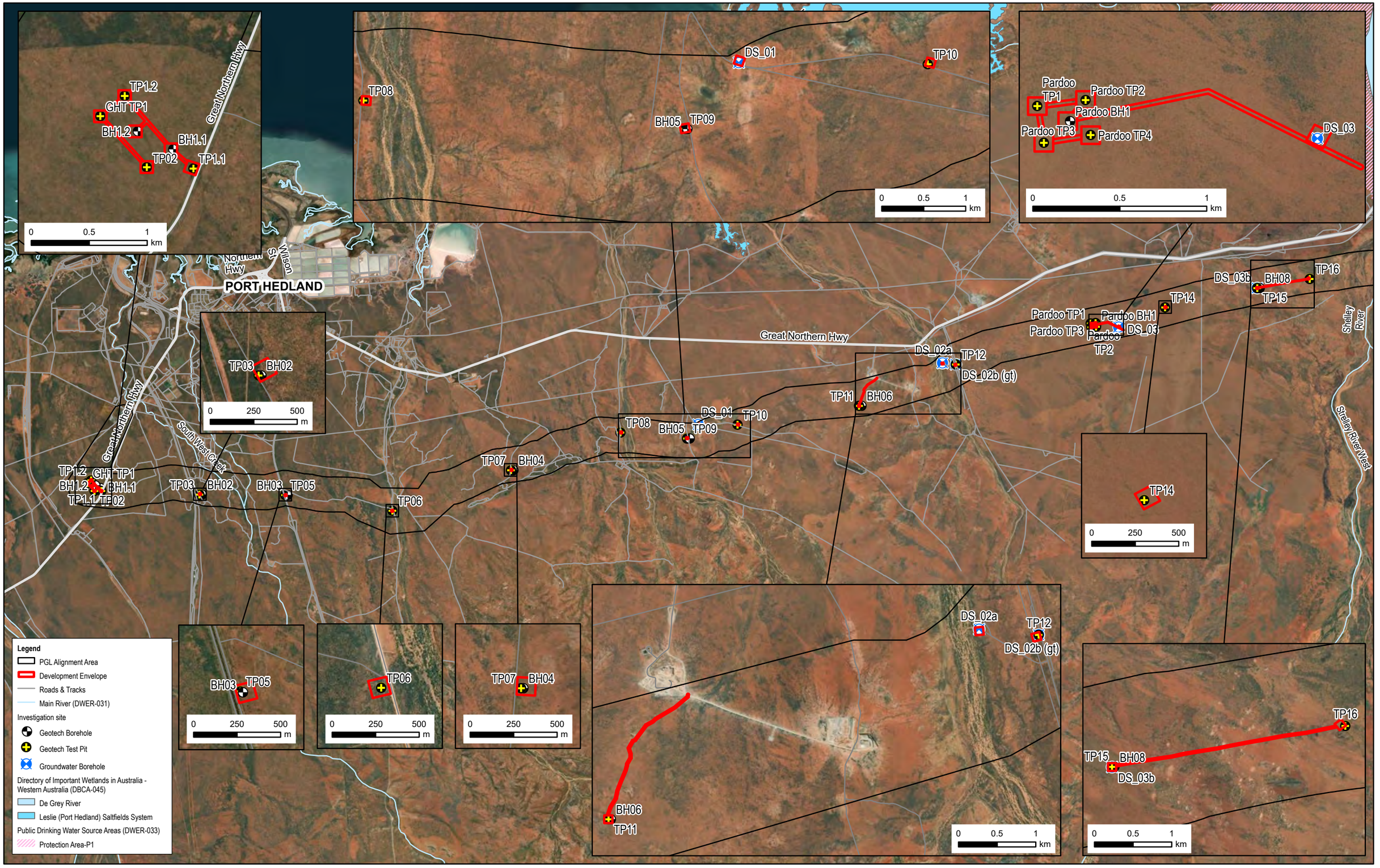
Table 15 Catchments that intersect the PGL Alignment Area

Catchment Order				Area (ha)
Division	Basin	Catchment	Sub catchment	
Indian Ocean	De Grey River	De Grey River	De Grey	13,234.95
		Strelley River	De Grey	1,818.62
		Coastal	De Grey	15,648.34
	Port Hedland Coast	Southwest Creek	Turner	2,478.65
		Coastal	Turner	9,448.97
Western Plateau	Sandy Desert	Sandy Desert Lake Dora	Sandy Desert Basin	7,372.40

3.6.3 Wetlands

The PMST search identified one Wetland of International Importance (Ramsar) within the 19km of the PGL Alignment Area, Eighty Mile Beach (DBCA 2017). The PGL Alignment Area does not intersect with Eighty-Mile Beach, which sits approximately 19km north of the northeast portion of the PGL Alignment Area. Additionally, no indirect impacts to the Ramsar site are anticipated.

The De Grey River, which is also classified as a Nationally Important Wetland, intersects the PGL Alignment Area through the central portion (Figure 8) (DBCA 2018). The PGL Alignment Area overlaps 300 ha of the De Grey River. The Investigation Pads identified in this NVCP are not located within the De Grey River.



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Pilbara Green Link

Investigation Area – Permit Activities

Environmental Constraints Hydrological

Project No. **12657458**
Revision No. **A**
Date **5/02/2025**

FIGURE 8.1

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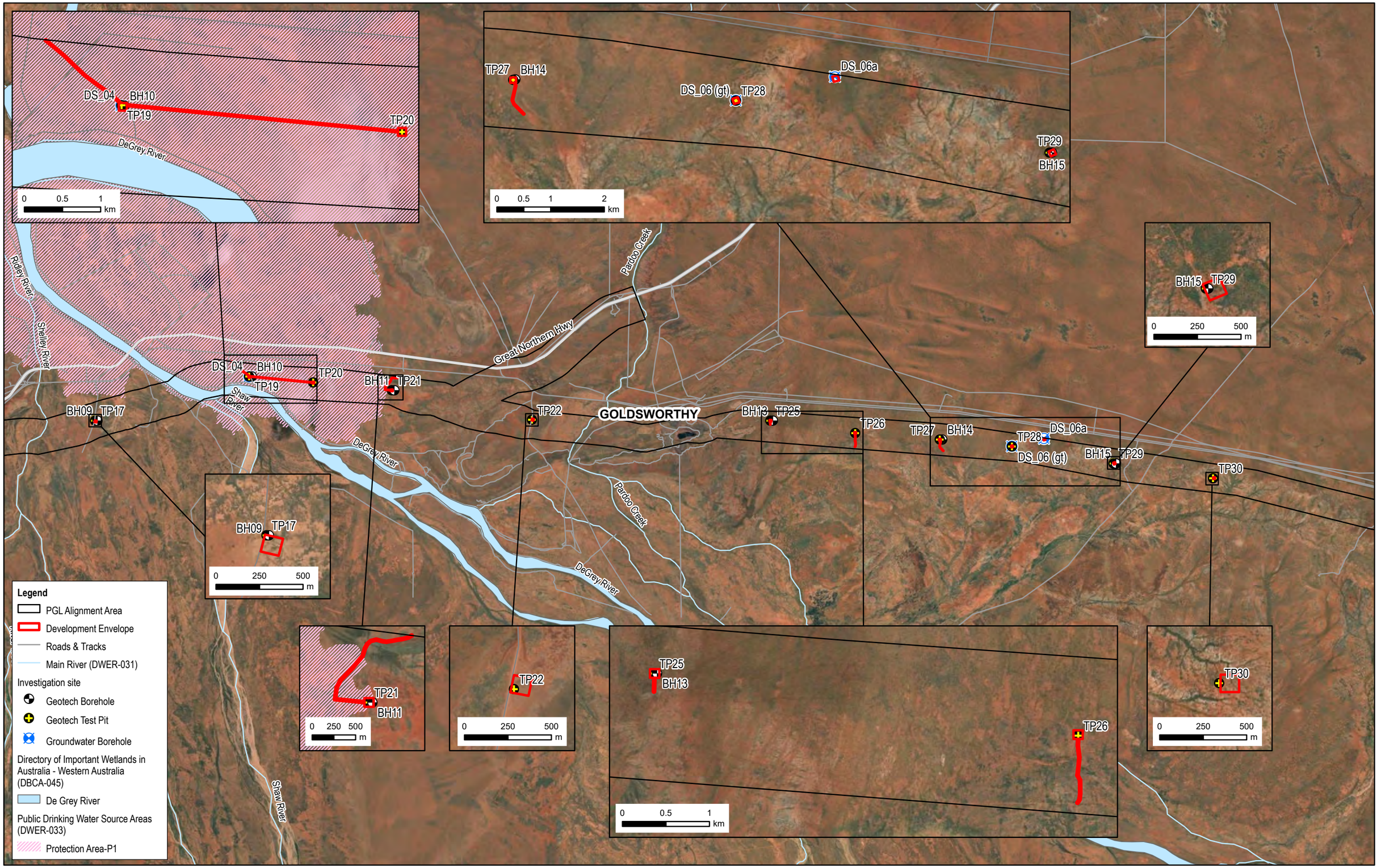

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Pilbara Green Link

Investigation Area – Permit Activities

Environmental Constraint Hydrological

Project No. **12657458**
Revision No. **A**
Date **5/02/2025**

FIGURE 8.2

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Investigation Area – Permit Activities

Environmental Constraint Hydrological

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Revision No. **A**
Date **3/02/2025**

FIGURE 8.3

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3.7 Land use

3.7.1 Land use and sensitive receptors

The Pilbara area and landscape surrounding the Project are remote and mainly used for iron ore mining and pastoral activities (cattle grazing). Within this broader region, notable sensitive receptors are conservation areas and reserves. The following four conservation reserves exist within 20km of, but are not intersected by, the PGL Alignment Area (Landgate 2024) (Table 16).

Table 16 Conservation reserves occurring within 20 km of the PGL Alignment Area

Reserve Name	Reserve Class	Distance from the PGL Alignment Area
Karijini National Park	A	13 km
Eighty Mile Beach Marine Park	A	19 km
Leslie (Port Hedland) Saltfields System	Directory of Important Wetlands in Australia	19 km
Mungaroona Range Nature Reserve	A	20 km

The nearest localities to the PGL Alignment Area are listed in Table 17 below. The Investigation Pads identified as part of this NVCP do not intersect with any localities. Table 24 identifies the Land Parcels which will be impacted by the clearing required for Investigation Activities to occur.

Table 17 Localities surrounding the PGL Alignment Area

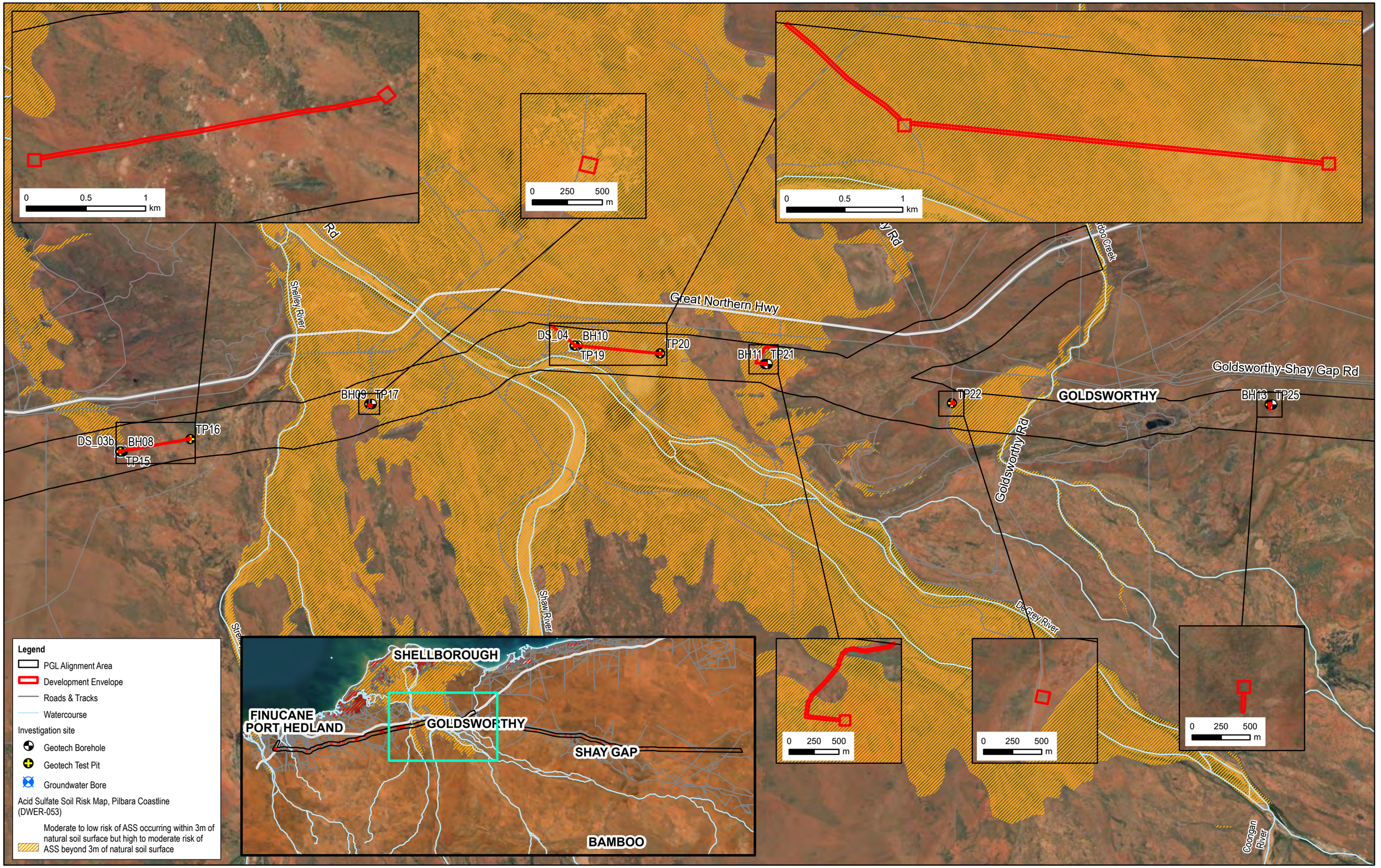
Locality	Distance from the PGL Alignment Area
Shay Gap (historic locality)	Intersects
Goldsworthy (historic locality)	70 m
Port Hedland	1.8 km
Finucane Island	12.6 km
Shellborough (historic locality)	31.7 km

3.7.2 Contaminated Sites

There are no contaminated sites mapped with the PGL Alignment Area (DWER 2024a).

3.7.3 Acid Sulfate Soils

Within the PGL Alignment Area, the area surrounding the De Grey River and its tributaries is classified as Moderate to low risk of Acid Sulfate Soils (ASS) (DWER 2014) (Figure 9).



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Pilbara Green Link

Investigation Area – Permit Activities

Environmental Constraints
Acid Sulfate Soil Risk

Project No. **12657458**
Revision No. **A**
Date **3/02/2025**

FIGURE 9

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Data source: World Imagery: Earthstar Geographics
World Imagery: Maxar. Created by: nstjepanovic

4. Assessment of impacts

4.1 Potential impacts to vegetation and flora

4.1.1 Vegetation

Potential impacts to vegetation include:

– Direct impact to native vegetation as a result of the mechanical clearing of a maximum of 17.04 ha (within the 84.22 ha DE) to allow for the development of access tracks to enable light and heavy vehicle access to the investigation locations.
– Direct impact to native vegetation as a result of the mechanical clearing of a maximum of 6.84 ha (within the 84.22 ha DE) for geotechnical boreholes and test pits and groundwater boreholes.
– Indirect impact to native vegetation as a result of the potential introduction or spread of weeds during Investigation Activities.
– Indirect impact to native vegetation as a result of fugitive dust generated during Investigation Activities

The vegetation types and associated condition for each vegetation type proposed to be cleared for the Investigation Activities is detailed in Table 18.

Table 18 Vegetation types and condition within Indicative Impact Area

Vegetation Type (VT)	Vegetation Condition (ha)						Total Indicative Impact Area (ha)
	Excellent	Very Good - Excellent	Very Good	Good – Very Good	Good	Poor - good	
C1			2.95			0.02	2.98
C2					0.10		0.10
C3			0.49	3.97			4.45
H2	0.13	0.02		0.49			0.64
P1		8.68		0.10	0.13		8.90
P2						2.76	2.76
P3	1.11	0.13					1.24
P4		1.09	0.71	0.59			2.39
R2	0.41						0.41
Total	1.65	9.92	4.15	5.15	0.23	2.78	23.88

4.1.2 Flora

No Priority flora are proposed to be cleared within the PGL Alignment Area. The DE was chosen to ensure clearing of known significant flora species was avoided were possible.

4.2 Potential impacts to fauna and fauna habitat

Potential impacts to fauna and fauna habitat include:

– Direct impact to fauna habitat as a result of approximately 23.88 ha of clearing (total) (Table 19)
– Direct impact to Conservation Significant fauna habitat as a result of approximately 23.88 ha of clearing (total) (Table 20).
– Direct impact to Conservation Significant fauna species as a results of increased vehicle movements and potential vehicle strike

– Indirect impact to fauna habitat through the potential introduction and/or spread of weeds as a result of clearing, increased vehicle movement and topsoiling during the Investigation Activities.

There is potential for Conservation Significant fauna and fauna habitat to be impacted by the Investigation Activities. However, clearing of 23.88 ha in the Indicative Impact Area amounts to 0.05% of the 50,119.4 ha of native vegetation within the PGL Alignment Area.

Table 19 Fauna habitat types within the Indicative Impact Area

Fauna Habitat type	Description	Area within PGL Alignment Area (ha)	Proposed clearing (ha)	Proportion of potential habitat in PGL Alignment Area (%)
Acacia shrubland on spinifex sandplain	Open Acacia shrubland with some denser patches and scattered *Corymbia* and *Eucalyptus victrix*, including *A. stellaticeps, A. ancistrocarpa, A. monticola*, over hummock grasslands of spinifex (*Triodia* spp.) on sandplain	32,679.00	12.53	0.04
Granite boulders	Granite boulders with scattered *Corymbia* spp. and *Acacia* spp. over open *Triodia* hummock grassland.	3,836.20	0.64	0.02
Gorges and gullies	Gorges, gullies, large breakaways and associated foot slopes. *Corymbia hamersleyana* low open woodland over *Acacia* spp., over *Triodia* grassland.	3,000.60	0.41	0.01
Claypan	*Triodia* hummock and tussock grasslands on clay.	2,902.30	7.43	0.26
Minor/moderate drainage lines	Minor to moderate drainage lines and floodplains fringed with low eucalypts (*Eucalyptus victrix, Corymbia flavescens*) and *Lysiphyllum cunninghamii* over sparse shrubland and tussock grassland	2,630.60	2.86	0.11

The impact to suitable habitat for each Conservation Significant fauna species was calculated from the known fauna habitat used by the species (Table 11) and the clearing proposed within each fauna habitat (Table 19).

Table 20 Disruption of potential habitat clearing on Conservation Significant fauna species

Fauna Species	BC Act/ DBCA	Potential area of habitat to be cleared (ha)	Total area of potentially suitable habitat within PGL Alignment Area (ha)	Proportion of potential habitat impacted (%)
Dasyurus hallucatus - Northern Quoll	EN	16.45	42,146	0.04
Macrotis lagotis - Bilby	V	12.53	32,679	0.04
Rhinonicteris aurantia (Pilbara form) - Pilbara Leaf-nosed Bat	V	16.45	42,146	0.04
Dasycercus blythi - Brush-tailed Mulgara	P4	15.40	35,310	0.04
Pseudomys chapmani - Western Pebble-mound Mouse	P4	12.95	35,680	0.04
Macroderma gigas - Ghost Bat	V	3.92	9,467	0.04
Falco hypoleucos - Grey Falcon	V	16.45	42,146	0.04
Liasis olivaceus barroni - Pilbara Olive Python	V	2.86	2,631	0.11
Leggadina lakedownesis - Short-tailed Mouse	P4	7.43	2,902	0.26

Fauna Species	BC Act/ DBCA	Potential area of habitat to be cleared (ha)	Total area of potentially suitable habitat within PGL Alignment Area (ha)	Proportion of potential habitat impacted (%)
Petrogale lateralis lateralis - Black-footed Rock-Wallaby	EN	1.05	6,837	0.02
Lagorchestes conspicillatus - Spectacled Hare-Wallaby	P4	12.53	32,679	0.04
Lerista separanda – Dampierland Plain Slider	P2	0.00	21	0

5. Assessment against 10 clearing principles

The clearing of vegetation in Western Australia is regulated by DWER and requires a permit under Part V of the EP Act, except when a Project is assessed under Schedule 6 of the Act or is prescribed by regulation in the *Environmental Protection (Clearing Native Vegetation) Regulations 2004*.

In making a decision about a clearing permit application under section 51O of the EP Act, the CEO of DWER must consider the clearing principles contained in Schedule 5 of the EP Act so far as they are relevant to the matter under consideration. The ten clearing principles aims to ensure that potential impacts resulting from removal of native vegetation can be assessed holistically.

To support the NVCP application for the Investigation Activities associated with the prefeasibility phase of the PGL Project, an assessment of the proposed clearing against the ten clearing principles outlined in Schedule 5 of the EP Act has been undertaken.

The assessment was undertaken with reference to DWER guideline *"A guide to the assessment of applications to clear native vegetation under Part V Division 2 of the Environmental Protection Act 1986"* (DWER 2014).

This assessment concluded the proposed **clearing associated with the Investigation Activities is unlikely to be or not at variance to the clearing principles**.

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Native vegetation should not be cleared if it comprises a high level of biological diversity.
Proposed clearing is not at variance to this Principle.
Assessment Vegetation The vegetation within the PGL Alignment Area, and therefore the DE, is consistent and contiguous with the native vegetation in the surrounding area. As discussed in 3.2.2, all broad-scale Vegetation Associations are well represented across State, IBRA Region, IBRA Subregion, and LGA extents. Most pre-European vegetation associations have 99% or more of their pre-European extent remaining. 24 vegetation types were identified and mapped, stemming from six broad landforms, within the PGL Alignment Area. Four units from drainage areas, four from clay plains, five from plains, three from low stony rises, six from rocky outcrops and breakaways, and two units from sand dunes. The DE will involve the clearing of vegetation within nine of these vegetation types, described in Table 18. Most clearing will occur in vegetation types P1 and C3, with a loss of 0.07% (8.90 ha) and 0.28% (4.45 ha) of available vegetation type in the PGL Alignment Area, respectively. All vegetation types are typical of the wider region. The proportion of clearing proposed in each vegetation type is unlikely to significantly impact the biological diversity of the region. The condition of the mapped vegetation types ranged from Cleared to Excellent. The mapping indicates that the PGL Alignment Area is predominantly in Excellent and Very Good to Excellent condition, with these conditions representing 34.27% and 37.66% respectively. Areas completely devoid of native vegetation were mapped as Cleared ('NA') and were not assigned a condition rating. In total, 1.20% of the PGL Alignment Area has been completely cleared of vegetation (e.g. roads, rails, mining area). As it is a high proportion of the PGL Alignment Area, clearing of vegetation is proposed to occur in areas that are considered Excellent and Very Good to Excellent condition. Where possible, clearing for the DE has been avoided by using previously cleared areas or prioritised in areas of lesser condition value. The condition of vegetation proposed to be cleared within the DE is described below

Vegetation condition	Proposed Indicative Impact Area (ha)	Proportion of PGL Alignment Area (%)
Excellent	1.65	<0.01
Very Good to Excellent	9.92	0.02
Very Good	4.15	0.01
Good to Very Good	5.15	0.01
Good	0.23	<0.01
Poor to Good	2.78	0.01

Native vegetation should not be cleared if it comprises a high level of biological diversity.
Threatened and Priority Ecological Communities The desktop assessment and Biota field survey (2024) identified no potential TECs or PECs within the PGL Alignment Area. The riparian vegetation types D1 and D2 (the De Grey River and its tributaries) are considered as having a high potential to be GDEs or GDVs due to the phreatophytic species *Eucalyptus camaldulensis, Eucalyptus victrix* and *Melaleuca argentea* being dominant taxa. Neither of these vegetation types will be directly impacted by the proposed clearing. Flora Diversity The Dandjoo search identified 871 vascular flora species previously recorded within the PGL Alignment Area. During the field survey, Biota (2024) recorded a total of 420 native flora species from 148 genera and 51 families. Fabaceae and Poaceae represented the two most dominant native families. These families and genera recorded within, are typical of species lists from the region. Significant flora No threatened flora taxa pursuant to the EPBC Act and/or gazetted as Threatened pursuant to the Biodiversity and Conservation Act 2016 (BC Act) were recorded within the PGL Alignment Area. The Biota (2024) field survey has identified eleven DBCA Priority species occurring with the PGL Alignment Area comprising: – One Priority 2 species – Nine Priority 3 species; and – One Priority 4 species Following a post-survey analysis an additional 15 conservation significant flora species were included in the likelihood of occurrence assessment. Of the 26 significant flora species, 18 were considered to have a high likelihood of occurrence (Table 10). No known Priority flora will be cleared as part of the Investigation Activities as the Sites have been developed to avoid clearing of Priority Flora. Priority flora have at least a 50m buffer away from the Indicative Impact Areas. With Investigation Activities able to avoid environmental constraints within each Investigation Pad, an approach of avoid and minimise during clearing will reduce the impact on significant flora species. Fauna Habitat From the field survey (Biota, 2024), nine fauna habitats were identified within PGL Alignment Area. Five of these habitats will be impacted by clearing within the DE (shown Figure 7). The proportion of each fauna habitat impacted is as below: – Acacia shrubland on spinifex sandplain = 0.04% (12.53 ha) – Gorges and gullies = 0.01% (0.41 ha) – Minor/moderate drainage line = 0.11% (2.86 ha) – Granite boulders = 0.02% (0.64 ha) – Claypan = 0.26% (7.43 ha) The impact to each fauna habitat type within the PGL Alignment Area is not expected to impact the availability of significant habitat for fauna indigenous to Western Australia. The habitat proposed to be cleared as part of the DE is available consistently and in comparable condition beyond the PGL Alignment Area.
Methodology Biological Survey (Biota 2024) DCCEEW Protected Matters Search Tool Report (DCCEEW 2024b) Dandjoo Database Search (DBCA 2024) Government GIS Shapefiles: DBCA Threatened and Priority Ecological Community database search (Accessed November 2024) DBCA Threatened and Priority flora database search (Accessed November 2024) DBCA Threatened and Priority fauna database search (Accessed November 2024) WA Herbarium Threatened and Priority flora (Accessed November 2024) Statewide Vegetation Statistics (Government of Western Australia)

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Proposed clearing is unlikely to be at variance to this Principle.

Assessment

Fauna Habitat

From the field survey (Biota, 2024), nine fauna habitats were identified within PGL Alignment Area. Five of these habitats will be impacted by potential clearing within the DE (shown in Table 19). The proportion of each fauna habitat impacted is as below:

- Acacia shrubland on spinifex sandplain = 0.04% (12.53 ha)
- Gorges and gullies = 0.01% (0.42 ha)
- Minor/moderate drainage line = 0.11% (2.86 ha)
- Granite boulders = 0.02% (0.64 ha)
- Claypan = 0.26% (7.43 ha)

The impact to each fauna habitat type within the PGL Alignment Area is not expected to impact the availability of significant habitat for fauna indigenous to Western Australia. The habitat proposed to be cleared as part of the DE is available consistently and in comparable condition beyond the PGL Alignment Area.

Fauna

The field survey (Biota 2024) recorded the presence of five conservation significant vertebrate fauna species. An additional eight species are considered likely to occur or have been previously recorded in the PGL Alignment Area and a further ten species which may occur within the PGL Alignment Area.

The impact of the proposed clearing was assessed based on the proportion of habitat the activities would disturb for each species within the PGL Alignment Area. This is described in the table below (Table 21) for all species considered to potentially occur.

Table 21 Impact of DE clearing on Conservation Significant Fauna Species

Scientific name / Common Name	BC Act / DBCA	Likelihood of occurrence	Impact
Dasyurus hallucatus Northern Quoll	EN	Known	There is 42,146 ha of habitat for the Northern Quoll in the PGL Alignment Area. The proposed clearing will result in impact to 0.04% (16.45 ha) of suitable habitat for the Northern Quoll within the PGL Alignment Area. The habitats available within the PGL Alignment Area are representative of the greater Pilbara region. Placement of the proposed DE has avoided areas where the Northern Quoll was recorded during field surveys (Biota 2024). A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the local population.
Macrotis lagotis Bilby	V	Known	There is 32,679 ha of suitable habitat for Bilby's available within the PGL Alignment Area. The proposed clearing will result in an impact to 0.04% (12.53 ha) of suitable habitat for the Bilby within the PGL Alignment Area. Placement of the proposed DE has avoided areas where the Bilby was recorded during field surveys (Biota 2024). A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the local population.
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat	V	Known	There is 42,416 ha of suitable habitat for Pilbara Leaf-nosed Bat within the PGL Alignment Area. The proposed clearing will result in an impact to 0.04% (16.45 ha) of suitable habitat for the Pilbara Leaf-nosed Bat within the PGL Alignment Area. No Suitable roosting and breeding sites were detected during the field survey (Biota 2024). The observed foraging habitat for the species is found consistently within the PGL Alignment Area and the greater region. A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the local population.

Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.			
Dasycercus blythi Brush-tailed Mulgara	P4	Known	There is 35,310 ha of suitable habitat for Brush-tailed Mulgara within the PGL Alignment Area. The proposed clearing will result in an impact to 0.04% (15.40 ha) of suitable habitat for the Brush-tailed Mulgara within the PGL Alignment Area. The species has a widespread distribution across WA, typically occurring in spinifex grasslands on sandplains from the Pilbara down to the Gascoyne. A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the species.
Pseudomys chapmani Western Pebble-mound Mouse	P4	Known	There is 35,680 ha of suitable habitat for Western Pebble-mound Mouse within the PGL Alignment Area. The proposed clearing will result in an impact to 0.04% (12.95 ha) of suitable habitat for the Western Pebble-mound Mouse within the PGL Alignment Area. The species has a widespread distribution across the Pilbara and Gascoyne regions. Placement of the proposed DE has avoided known Western Pebble-mound Mouse mounds. A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the species.
Macroderma gigas Ghost Bat	V	Likely	There is 9,467 ha of suitable habitat for Ghost Bats within the PGL Alignment Area. The proposed clearing will result in an impact to 0.04% (3.92 ha) of suitable habitat for the Ghost Bat within the PGL Alignment Area. No Suitable roosting and breeding sites were detected during the field survey (Biota 2024). Foraging habitat for the species is readily available across most habitat types found within the PGL Alignment Area. A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the local population.
Falco hypoleucos Grey Falcon	V	Likely	There is 42,146 ha of suitable habitat for Grey Falcon within the PGL Alignment Area. The proposed clearing will result in an impact to 0.04% (16.45 ha) of suitable habitat for the Grey Falcon within the PGL Alignment Area. The species has a widespread distribution across northern and arid inland Australia. The observed foraging habitat for the species is found consistently within the PGL Alignment Area and the greater region. A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the species.
Liasis olivaceus barroni Pilbara Olive Python	V	Likely	There is 2,631 ha of suitable habitat for Pilbara Olive Python within the PGL Alignment Area. The proposed clearing will result in an impact to 0.11% (2.86 ha) of suitable habitat for the Pilbara Olive Python within the PGL Alignment Area. The species is distributed across the Pilbara region with large home ranges (between 88 – 449 ha) (Biota 2024). The observed suitable habitat for the species is found consistently within the PGL Alignment Area and the greater region. A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the species.
Petrogale lateralis lateralis Black-footed Rock-Wallaby	EN	May	There is 6,837 ha of suitable habitat for Black-footed Rock-wallaby within the PGL Alignment Area. The proposed clearing will result in an impact to 0.02% (1.05 ha) of suitable habitat for the Black-footed Rock-wallaby within the PGL Alignment Area. The observed suitable habitat for the species is found consistently within the PGL Alignment Area and the greater region. A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the species.
Lerista separanda Dampierland Plain Slider	P2	May	There is 21 ha of suitable habitat for Dampierland Plain Slider within the PGL Alignment Area. The proposed clearing will not impact suitable habitat for the Dampierland Plain Slider and therefore is unlikely to pose a significant risk to the survival of the species.
Leggadina lakedownesis Short-tailed Mouse	P4	May	There is 2,902 ha of suitable habitat for Short-tailed Mouse within the PGL Alignment Area. The proposed clearing will result in an impact to 0.26% (7.43 ha) of suitable habitat for the Short-tailed Mouse within the PGL Alignment Area. The species has a widespread distribution across the Pilbara and Kimberley regions. A loss of this proportion of habitat is unlikely to pose a significant risk to the survival of the species.
Lagorchestes conspicillatus Spectacled Hare-Wallaby	P4	May	There is 32,679 ha of suitable habitat for Spectacled Hare-wallaby within the PGL Alignment Area. The proposed clearing will result in an impact to 0.04% (12.53 ha) of suitable habitat for the Spectacled Hare-wallaby within the PGL Alignment Area. The observed suitable habitat for the species is found consistently within the PGL Alignment Area and the greater region. A loss of

Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.			
			this proportion of habitat is unlikely to pose a significant risk to the survival of the species.

The following migratory species were excluded from the assessment:

– *Actitis hypoleucos* – Common Sandpiper
– *Anarhynchus veredus* – Oriental Plover
– *Apus pacificus* - Pacific Swift
– *Chlidonias leucopterus* – White-winged Tern
– *Gelochelidon [nilotica] macrotarsa* - Australian [Gull-billed] Tern
– *Glareola maldivarum* - Oriental Pratincole
– *Hydroprogne caspia* – Caspian Tern
– *Numenius minutus* – Little Curlew
– *Plegadis falcinellus* – Glossy Ibis
– *Tringa glareola* – Wood Sandpiper

Foraging for these species either occurs aerially or across most habitats available within the PGL Alignment Area. All species attend the PGL Alignment Area as non-breeding migrants and therefore no breeding sites will be impacted by the Investigation Activities. These species are likely to predominately use the PGL Alignment Area for gathering around drainage areas. A maximum clearing of 2.86 ha in minor/moderate drainage lines associated with access tracks is proposed within the DE. A clearing of this proportion represents 0.11% of this habitat with the PGL Alignment Area and is unlikely to significantly impact the availability of this habitat for migratory species.

The clearing of 23.88 ha amounts to 0.05% of the 50,119.4 ha of native vegetation within the PGL Alignment Area. The potential fauna habitat types within the Indicative Impact Area will remain well connected and part of a larger contiguous landscape of similar habitats within the local area and surrounding region. The Indicative Impact Area is unlikely to support fauna habitat that is in better condition than the surrounding available habitat. Furthermore, the Indicative Impact Area is not likely to comprise significant locally or regionally unique habitat for indigenous fauna dependent on the habitats present in within the PGL Alignment Area. It is likely these habitats are well represented in the local and regional area given the extent of native vegetation adjacent to the PGL Alignment Area footprint, and in nearby conservation areas.

The proposed clearing is unlikely to have significant impact on the fauna habitat for conservation significant fauna.

Methodology

– Biological Survey (Biota 2024)
– DCCEEW Protected Matters Search Tool Report (DCCEEW 2024b)
– Dandjoo Database Search (DBCA 2024)
– Government GIS Shapefiles:
  - DBCA Threatened and Priority fauna database search (Accessed November 2024)
– Species specific conservation listing advice and recovery plans

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.

Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.
Proposed clearing is unlikely to be at variance to this Principle.
Assessment No EPBC Act and/or BC Act listed Threatened flora have been identified within the PGL Alignment Area (Biota 2024). Impacts to vegetation as a result of the Investigation Activities is not likely to include or be necessary for the continued existence of rare/threatened flora. No threatened flora is considered likely to occur within the PGL Alignment Area based on the likelihood of occurrence assessment (Biota 2024). The PGL Alignment Area, and subsequent Indicative Impact Areas are part of contiguous vegetation that is not considered more diverse or in better condition than the surrounding vegetation. It is considered that the proposed clearing is unlikely to be at variance to this principle.
Methodology – Biological Survey (Biota 2024) – DCCEEW Protected Matters Search Tool Report (DCCEEW 2024) – Government GIS shapefiles: • DBCA Threatened flora database search (Accessed March 2024) • WA Herbarium Threatened and Priority flora (Accessed March 2024)

(d) Native vegetation should not be cleared if it comprises the whole or a part of or is necessary for the maintenance of a threatened ecological community.

Native vegetation should not be cleared if it comprises the whole or a part of or is necessary for the maintenance of a threatened ecological community.
Proposed clearing is not at variance to this Principle.
Assessment The EPBC Act PMST and DBCA TEC databases did not identify any TECs within 20 km of the PGL Alignment Area. The Biota (2024) field survey did not identify any vegetation within the PGL Alignment Area that is representative of TECs. The proposed clearing is not at variance to this principle.
Methodology – Biological Survey (Biota 2024) – DCCEEW Protected Matters Search Tool Report (DCCEEW 2024b) – Government GIS shapefiles: • DBCA Threatened Ecological Community database search

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Proposed clearing is not at variance to this Principle.

Assessment

Vegetation Association

Broad-scale (1:250,000) pre-European vegetation mapping identified seven Vegetation Associations present in the PGL Alignment Area (DPIRD 2019). These are shown below.

Pre-European Vegetation Association	Area (ha) in PGL Alignment Area	Indicative Impact Area (ha)	Prop. of Veg Association clearing (%)
93: Hummock grasslands, shrub steppe; kanji over soft spinifex	15,450	9.49	0.06
101: Hummock grasslands, shrub steppe; *Acacia pachycarpa* over soft spinifex	5,428	0.49	0.17
117: Hummock grasslands, grass steppe; soft spinifex	18,473	1.65	0.01
171: Hummock grasslands, low tree steppe; snappy gum over soft spinifex & *Triodia briziodes*	537	0	0
589: Mosaic: Short bunch grassland – savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex	7,792	10.29	0.13
619: Medium woodland; river gum (*Eucalyptus camaldulensis*)	722	0.02	1.31
647: Hummock grasslands, dwarf-shrub steppe; *Acacia translucens* over soft spinifex	1,659	1.94	0.12

All Vegetation Associations are well represented across State, IBRA Region, IBRA Subregion, and Local Government Area (LGA) extents. Most pre-European vegetation associations have 99% or more of their pre-European extent remaining (Table 6). Veg Assoc No. 117, described as “hummock grasslands, grass steppe; soft spinifex”, has historically been subject to the highest proportional amount of clearing, seen at a subregional scale (Pindanland) and LGA scale (Shire of Broome). Retention of pre-European vegetation at this scale is approximately 76% and 63%, respectively. However, a relatively high proportion of this remaining vegetation now exists in DBCA reserves where it is protected from future clearing.

The National Objectives and Targets for Biodiversity Conservation Australia have been set to prevent clearance of ecological communities with less than 30% of their pre-European extent, below which species loss appears to accelerate exponentially (Commonwealth of Australia 2001). The current extent of all Vegetation Associations is higher than 30% for pre-European extent at all scales (Statewide, IBRA Bioregion, IBRA Subregion, LGA). The proposed clearing of 1.65 ha of Veg Assoc. No. 117 will reduce the total remain of the pre-European extent by <0.001%.

Approximately 50,119.4 ha of native vegetation is present within the PGL Alignment Area. Potential clearing of 23.88 ha amounts to 0.05% of the 50,119.4 ha of native vegetation within the PGL Alignment Area. After native vegetation clearing has been undertaken, sufficient pre-European vegetation remain in the region. The proposed clearing will not impact the maintenance of ecological values in the landscape. The proposed clearing is not at variance to this principle.

Vegetation proposed to be cleared is not significant as a remnant of native vegetation.

Methodology

– Biological Survey (Biota 2024)
– Government GIS shapefiles:
  - Pre-European vegetation (Accessed September 2024)

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
Proposed clearing is not at variance to this principle
Assessment The DE is not located within and does not intersect an internationally Important Wetland (RAMSAR). The nearest RAMSAR wetland is the Eighty Mile Beach System, located approx.19 km north-east of the PGL Alignment Area at its closest point. The DE will not have direct impacts to this RAMSAR wetland, nor will it have indirect impacts based on current understanding. The PGL Alignment Area does intersect a Nationally Important Wetland, the De Grey River. The De Grey River is also identified as an ESA. The PGL Preliminary Design Principles (HP 2024) have utilised avoidance measures when selecting Investigation Sites, therefore the DE does not intersect with the De Grey River (Figure 9.2). Biota (2024) mapped two vegetation types as potentially containing GDV, D1 and D2. Based on this mapping, there are seven occurrences of GDVs within the PGL Alignment Area, totalling 919 ha, or 1.8%. The D1 vegetation type is associated with the De Grey River, while D2 is associated with other drainage lines found between the De Grey River and Boodarie. The riparian vegetation types D1 and D2 are considered as having a high potential to be GDEs or GDV due to the phreatophytic species *Eucalyptus camaldulensis, Eucalyptus victrix* and *Melaleuca argentea* being dominant taxa. The DE does not intersect with either GDV. In line with the PGL Preliminary Design Principles, the proposed investigation locations were selected to avoid minor intermittent surface water drainage lines where riparian vegetation is present, with a buffer of 50m applied to these riparian areas. However, the DE intersects the borders of minor/broad ephemeral drainage habitats. These drainage habitats are likely to be associated with infrequent surface water caused by sporadic weather events like seasonal cyclones. As the Important Wetlands and potential GDV species are not intersected by the proposed DE it is considered unlikely that significant impacts will occur as a result of the Investigation Activities. The proposed clearing is not at variance to this principle.
Methodology – Biological Survey (Biota 2024) – Government GIS shapefiles: • Geomorphic Wetlands (Accessed September 2024) • Ramsar Wetlands (Accessed September 2024) • Important Wetlands (Accessed September 2024) • Watercourses (Accessed September 2024) • RiWI Act Rivers (Accessed September 2024)

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Proposed clearing is not likely to be at variance to this Principle.

Assessment

According to DPIRD (2022a) the PGL Alignment Area is located across four unique soil landscape zones; The Nita Sandplain (Zone 117), De Grey-Roebourne Lowlands (Zone 281), Great Sandy Desert (Zone 112) and the Nullagine Hills (Zone 280).

The table below shows the impacts to the two soil landscape zones impacted by clearing within the Indicative Impact Area

Zone	Description	Indicative Impact Area (ha)
Zone 117 (Nita Sandplain Zone)	Sandplains and dunes on cretaceous canning basin sedimentary rocks with red deep sands and some red sandy earths.	2.92
Zone 281 (De Grey-Roebourne Lowlands Zone)	Alluvial plains and sandplains on alluvial and marine deposits over the northern Pilbara craton with red deep sandy duplexes, red loamy earths, red/brown non-cracking clays, cracking clays, red sandy earths and red deep loamy duplexes.	20.95

Land zones have been further classified into soil-landscape systems (DPIRD 2022b). The PGL Alignment Area is located across 16 soil-landscape systems. The table below shows the impacts to the nine soil landscape systems impacted by clearing within the Indicative Impact Area.

System	Description	Indicative Impact Area (ha)
Boolaloo System (281Bo)	Granite hills, domes, tor fields and sandy plains supporting spinifex grasslands with scattered shrubs.	0.59
Capricorn System (281Cp)	Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs.	0.41
Horseflat System (281Hf)	Gilgaied clay plains supporting Roebourne Plains grass grasslands and minor grassy snakewood shrublands.	0.02
Macroy System (281Mc)	Stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands.	1.33
Mallina System (281Ma)	Sandy surfaced alluvial plains supporting soft spinifex grasslands and minor hard spinifex and tussock grasslands.	3.44
Nita System (117Nt)	Sandplains supporting shrubby spinifex grasslands with occasional trees.	2.92
Paradise System (281Pd)	Alluvial plains supporting soft spinifex grasslands and tussock grasslands.	4.07
River System (281Ri)	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.	3.27
Uaroo System (281Ua)	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.	7.80

An inventory and condition survey of the Pilbara region, undertaken by van Vreeswyk et al. (2004), for the Western Australian Department of Agriculture (now DPIRD), profiled each soil-landscape system, the current condition and the management measures required to maintain the system. Most soil-landscape systems described above are known to be resistant to and have experience nil to minimal soil erosion while being largely resistant to degradation. Two systems were identified as being potentially susceptible to soil erosion and degradation: the Mallina system and the River system. These systems are prone to degradation when vegetation is depleted.

Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
The DE intersects only small portions of each soil-landscape system (3.44 ha of the Mallina System, and 3.27 ha of the River system). By extension, clearing of vegetation within each system will be minimal and not pose significant impacts to the entirety of any individual system. The SLIP/ASRIS database indicates that the area surrounding the De Grey River and its tributaries is classified as Moderate to low risk of Acid Sulfate Soils (ASS). The proposed vegetation clearing is not expected to disturb ASS, however, ASS management measures will be incorporated into a EMP to appropriately manage the associated Investigation Activities and will ensure that any potential disturbance of ASS will be appropriately managed and adverse ASS related impacts are avoided. Given that risk to soil systems is likely to be minimal and that risk of ASS is likely low, it is unlikely that clearing is at variance to this principle.
Methodology – Biological Survey (Biota 2024) – CSIRO Atlas of Acid Sulfate Soils (Accessed November 2024)

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.
Proposed clearing is not at variance to this Principle.
Assessment No conservation areas are located within the PGL Alignment Area and therefore will not be impacted by the proposed clearing within the DE. The proposed clearing will not impact the environmental values of conservation areas and is therefore not at variance to this principle.
Methodology – Biological Survey (Biota 2024) – DCCEEW Protected Matters Search Tool Report (DCCEEW 2024b) – Government GIS Shapefiles: • DBCA Legislated Lands and Waters & Lands of Interest (Accessed May 2024)

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.
Proposed clearing is not likely to be at variance to this Principle.
Assessment The climate of the Pilbara is described as arid-tropical with two distinct seasons. Rainfall in the Pilbara is highly variable and may occur during both seasons. Average long-term annual rainfall for the area is between 314.1 mm and 375.0 mm (Port Hedland Airport, station number 4032 and Madora, station number 4019) which can occur in heavy localised falls. Based on very high annual evaporation rates, any surface runoff resulting from rainfall events is likely to be relatively short lived. In addition, the PGL Alignment Area is largely surrounded by native vegetation, and it is likely that a large proportion of runoff will be absorbed by this natural environment. The PGL Alignment Area lies within the Pilbara Groundwater Area and Canning-Kimberly Groundwater Area which are proclaimed under the RiWI Act 1914 (DWER 2018). Within this groundwater area, the PGL Alignment Area intersects three groundwater subareas: Ashburton, West Canning - Yarrie and East Pilbara. The PGL Alignment Area intersects one Public Drinking Water Source Area, the De Grey River Water Reserve (DWER 2024b). Within this water reserve, the De Grey River wellfield is used to supply water for Port Hedland (Water and Rivers Commission 1999). The De Grey River wellfield is operated by the Water Corporation and draws groundwater from the alluvial deposits of the De Grey River. It is considered unlikely any clearing will significantly disturb or interrupt natural drainage and surface run-off patterns. However, during heavy localised rainfall events, erosion may occur in cleared areas resulting in localised, short-term soil erosion and/or sedimentation. It is unlikely clearing will have an impact on groundwater levels or quality. The proposed Investigation Activities associated with the clearing will not alter the current hydrological regime. Due to small proportion of clearing proposed within each area, the surrounding native vegetation and natural ground will minimise sheet flow over the duration of each Investigation Activity Standard construction measures regarding erosion and sediment control (include topsoil management) will be included as part of a EMP and implemented during construction works to manage the risks of erosion within cleared areas. The proposed clearing is unlikely to cause deterioration in surface water and ground water quality
Methodology – Biological Survey (Biota 2024) – Government GIS Shapefiles: • RiWI Act, Surface Water Areas and Irrigation Districts (Accessed May 2024) • RiWI Act, Groundwater Areas (Accessed May 2024) • Public Drinking Water Source Areas (Accessed May 2024)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.
Proposed clearing is not at variance to this Principle.
Assessment The Pilbara region receives an average rainfall between 314.1 – 375.0 mm per year (Port Hedland Airport weather station (site number: 4032) & Madora weather station (site number: 4019)) (BoM 2024). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. Removal of vegetation in areas with clay soils can exacerbate the incidence or intensity of flooding or localised waterlogging. However, the total DE and Indicative Impact Areas proposed is relatively small considering the amount of remaining native vegetation in the surrounding area. The surrounding areas are predominantly undeveloped. Therefore, it is unlikely clearing will increase the incidence of flooding and compaction of soils. In addition, the removal of vegetation for testing and replacement of this vegetation is not likely to result in compaction and flooding. The proposed clearing is unlikely exacerbate the incidence of intensity of flooding and therefore not at variance to this principle.
Methodology – Biological Survey (Biota 2024) – BoM Website (Accessed March 2024) – PGL Preliminary Design Principles (HP 2024)

6. Environmental Avoidance and Management

PGL have and will continue to utilise the disturbance hierarchy of avoid, minimise, reduce and rehabilitate to mitigate the potential environmental impacts of the Investigation Activities. This approach has occurred during the design and planning phase (Section 6.1), and will continue into the field activities (Section 0) being implemented through a Environmental Management Plans (EMPs).

6.1 Impact avoidance and minimisation through design and planning

6.1.1 Flora, Vegetation and Fauna

Flora and vegetation loss was avoided through design of the investigation locations and access tracks within the PGL Alignment Area by avoiding vegetation clearing where possible. Avoidance and minimisation strategies included:

– When considering placement of the Investigation Pads, a site-by-site assessment with engineers, geotechnicians, hydrogeologists, heritage, land-tenure, and environmental disciplines occurred, to identify constraints and the most practicable location of the Investigation Pads and access tracks.
– No proposed borehole and test pit locations or access tracks intersect GDE vegetation types D1 or D2.
– Known populations of Priority flora have at least a 50 m buffer away from Indicative Impact Areas.
– Potential impacts to flora and vegetation have been minimised by selecting existing access tracks where possible.
– Where testing requirements for each investigation type is feasible, co-location of proposed Investigation Activities has occurred to minimise clearing required.
– The location of the Investigation Pads and access tracks have avoided known heritage locations

Impacts to native fauna and fauna habitat were avoided during the design of DE within the PGL Alignment Area by avoiding areas where threatened species were recorded during the Biota (2024) survey. This included the adoption of the PGL Preliminary Design Principles which outlines buffer areas required to avoid and minimise disturbances to each species (refer to Figure 7). Further, defined habitat features (such as boulder outcrops, rocky hills, gorges and deep gullies, water holes and cave areas) that have the potential to support threatened species were avoided where possible. Known threatened species were avoided through adoption of the PGL Preliminary Design Principles which outlines no-go and buffer areas required for each species to avoid and minimise disturbances.

6.2 Impact avoidance and minimisation measures applied on site

The following avoidance and minimisation management measures will be adopted onsite during the Investigation Activities. These management measures aim to reduce the loss of vegetation, flora and fauna species habitat affected by the direct and indirect potential impacts outlined in Section 4.

Aspect	Management measure
Extent of clearing	– Clearing of native vegetation will be restricted to the Indicative Impact Areas chosen within the DE – The investigation teams will utilise existing tracks and roads where possible. New tracks will be established using the shortest appropriate distance from an existing track to where the Site is required within the DE. Access tracks with a maximum width of approximately 10 meters will allow for the drill rig and light vehicle access to investigation locations.

Aspect	Management measure
	– The Indicative Impact Area is to be demarcated with flagging tape or similar prior to clearing activities. No clearing of native vegetation or ground disturbance is to occur outside of this area. – Upon the conclusion of each Investigation Activity, the same access track will be used to return to the main road. – Preference will be given to previously disturbed or already cleared vegetation when selecting access tracks where terrain allows.
Flora and Vegetation	– Areas that are sparsely vegetated and/or previously cleared will be used preferentially for the location of pads and access tracks required for the Investigation Activities. – Minimise vegetation removal by avoiding large trees and shrubs and where feasible, leaving rootstock in the ground to assist with stabilisation and natural regeneration. – The investigation team will be provided material that identifies known Environmentally sensitive areas within the DE to be avoided. – Boreholes are to be capped, and the cleared drill pad area will have stripped topsoil and vegetation respread to facilitate natural regrowth. – Topsoil (i.e. typically the top 10 mm of soil) will be separately stockpiled and re-spread over temporarily cleared areas – Test pits will be backfilled with the excavated material on completion in accordance with the Western Australian Dept. of Energy, Mines, Industry Regulations and Safety's Exploration and Prospecting Rehabilitation Guidance, including mounding over the backfilled hole to facilitate water shedding away from the backfilled areas to the surface and then cover with recovered topsoil and vegetation. – Drill pads and test pits will be rehabilitated back to original contour, so that the surface of the rehabilitated area is consistent with the shape of the surrounding uncleared land
Fauna and Fauna Habitat	– Clearing of native vegetation will be undertaken in a slow, progressive manner in one direction to allow fauna to move away from the clearing area. – Construction personnel will be provided with fauna identification materials for relevant conservation significant species for on-site identification and active avoidance. – Construction personnel are not permitted to touch, feed or otherwise directly interact with fauna. – Injury or mortality of fauna will be recorded as an environmental incident. – Any excavations left open overnight will include fauna egress and be inspected at the start and end of each day for fauna – Vehicle and machinery speeds within the Indicative Impact Area will be restricted to reduce the likelihood of fauna strike. – All waste containers will have lids to prevent fauna from eating food scraps or becoming trapped in waste containers. – Any tree branches and rocks originally removed as part of pad establishment will be used in rehabilitation to promote ground stability and to promote potential fauna habitat.
Heritage	– No construction activities are permitted to occur within areas designated as Registered Aboriginal Sites without the appropriate permit and/or stakeholder consultation – Heritage sites within the Development Envelope are to be appropriately demarcated. – A New Finds process will be included in the EMP, including the discovery of potential human bones.
Weeds	– Standard biosecurity measures will be developed in the EMP and be implemented to mitigate the risk of weeds entering the site or spreading. Prior to vehicles, plant and equipment coming to the Site, and prior to moving vehicles, plant and equipment to the next location, they shall be free of plant material and soil clumps.
Erosion	– Standard management measures regarding erosion and sediment control (including topsoil management) will be implemented during the Investigation Activities.
Dust	– Standard dust control and mitigation measures will be implemented during clearing. This may include the use of a water truck(s). – Ground disturbance and/or clearing of vegetation will be restricted during high winds if dust cannot be adequately controlled. – Review of weather forecasts will be undertaken prior to native vegetation clearing to identify periods of extreme weather conditions likely to result in increased dust emissions so that additional mitigation measures can be implemented.

Aspect	Management measure
Fire	– Basic fire-fighting equipment such as fire extinguishers will be provided in all motor vehicles and mobile plant and during any hot works. – Fires will not be permitted on sites.
Noise	– Standard construction noise management measures will be implemented. – Complaints regarding noise will be recorded and investigated by the PGL Project.
Waste	– Management strategies will be implemented to ensure the generation of waste during the Investigation Activities is minimised. – Rubbish will be disposed of in appropriate containers with lids and all waste will be removed from the site and disposed of lawfully.
Acid Sulphate Soils	– ASS management measures will be incorporated into a EMP to appropriately manage the associated Investigation Activities and will ensure that any potential disturbance of ASS will be appropriately managed.

7. Other approvals

Following review of approval requirements under the *Environmental Protection Act 1986* the following approvals are not considered necessary for the purpose of these Investigation Activities:

- *Planning and Development Act 2005*
- Works Approval or Licence under EP Act
- Referral to DCCEEW
- State or municipal heritage approvals
- Aboriginal Sites of significance under the *Aboriginal Heritage Act 1972*

7.1 Referral to Environmental Protection Authority

The Investigation Activities described in this application are not considered to be a significant impact under s38 of the *Environmental Protection Act 1986* and therefore will not be referred to the Environmental Protection Authority.

7.2 Approvals under the Rights in Water and Irrigation Act (1914)

PGL has liaised with DWER on the potential approvals required to drill groundwater bores and abstract groundwater, including for monitoring purposes. Appropriate approvals will be sought in accordance with the *Rights in Water and Irrigation Act 1914*.

7.3 Aboriginal Heritage

The *Aboriginal Heritage Act 1972* (AH Act) states that compliance means that the proponent is obligated to identify and protect all Aboriginal heritage places as defined by Section 5 of the AH Act before development occurring. If protection is not an option, then consent to affect such places can be sought from the Department of Planning, Land and Heritage (DPLH) and the Minister of Aboriginal Affairs under Sections 16 and 18 of the AH Act, or Regulation 10 of the *Aboriginal Heritage Regulations 1974*.

PGL is responsible for the necessary cultural heritage surveys and any subsequent approvals for all Investigation Activities. PGL has engaged with the relevant Traditional Owner groups and knowledge holders associated with the Alignment Area. This engagement has also included the attendance of Cultural Safety Monitors during biological surveys.

The Investigation Activities shall avoid all identified exclusion areas of heritage significance included in a proposed Heritage Management Plan. All areas of heritage significance identified within the vicinity of each Investigation Activity shall be appropriately protected in consultation with the relevant Tradition Owner representatives and in accordance with the proposed Heritage Management Plan requirements so that the Contractor's personnel are aware of the area to be avoided. During the Investigation Activities the Contractor shall inform its personnel of the heritage areas to be avoided which have been identified, and the process to protect those additional areas that have been identified during the undertaking of the Investigation Activities.

8. Offsets

Environmental offsets are conservation actions that provide environmental benefits intended to counterbalance significant residual environmental impacts associated with a proposal (GoWA 2014).

PGL have considered requirements to counterbalance the residual impacts through environmental offsets for Investigation Activities. Consideration has been given to requirements of the Western Australian Government's Environmental Offset Policy (GoWA 2011) and the Western Australian Offsets Guidelines (GoWA 2014).

PGL operates on a hierarchy of avoid, minimize, reduce, rehabilitate and offset environmental impacts. This hierarchy is achieved primarily through changes in scope and design, development and implementation of the environmental management plans or strategies and finally, if required, development of an offset proposal.

Application of the management hierarchy has been applied throughout the selection of investigation sites and described in this document. The assessment against the ten clearing principles concluded the proposed clearing is not or unlikely to be, at variance with any of the ten clearing principles. Therefore, offsets are not proposed to compensate for the residual impacts associated with the proposed clearing.

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Appendix A

Investigation sites and activities

Table 22 Definition of acronyms

Acronym	Term
GT	Geotechnical
GW	Groundwater
TP	Test Pit
BH	Geotechnical Borehole
DS	Groundwater Borehole

Table 23 Investigation Pads and activities

Investigation Pad	Name	Investigation Activity	Discipline	Total Clearing proposed (ha)
1	TP1.1	Test Pit	GT	
	Access track to Investigation Pad 1,3 & 4	Access Track	GT	1.42
2	BH1.1	Borehole	GT	0.08
3	BH1.2	Borehole	GT	
	Access track to BH1.2	Access Track	GT	0.17
4	TP1.2	Test Pit	GT	0.02
5	GHT TP1	Test Pit	GT	0.02
6	TP02	Test Pit	GT	0.02
7	TP03	Test Pit	GT	
	BH02	Borehole	GT	0.10
8	TP05	Test Pit	GT	
	BH03	Borehole	GT	0.10
9	TP06	Test Pit	GT	0.02
10	TP07	Test Pit	GT	
	BH04	Borehole	GT	0.10
11	TP08	Test Pit	GT	0.02
12	TP09	Test Pit	GT	
	BH05	Borehole	GT	0.10
13	DS_01	Borehole	GW	0.49
14	TP10	Test Pit	GT	0.02
15	TP11	Test Pit	GT	
	BH06	Borehole	GT	
	Access track to Investigation Pad 12	Access Track	GT	2.16
16	DS_02a	Borehole	GW	0.49
17	DS_02b	Borehole	GW	
	TP12	Test Pit	GT	0.49
18	Pardoo BH1	Borehole	GT	
	Access track to Pardoo Investigation Pads	Access Track	GT	2.46
19	Pardoo TP1	Test Pit	GT	0.02
20	Pardoo TP2	Test Pit	GT	0.02
21	Pardoo TP3	Test Pit	GT	0.02

Investigation Pad	Name	Investigation Activity	Discipline	Total Clearing proposed (ha)
22	Pardoo TP4	Test Pit	GT	0.02
23	DS_03	Borehole	GW	0.49
24	TP14	Test Pit	GT	0.02
25	DS_03b	Borehole	GW	
	BH08	Borehole	GT	
	TP15	Test Pit	GT	
	Access track to Investigation Pad 22	Access Track	GT	3.42
26	TP16	Test Pit	GT	0.02
27	TP17	Test Pit	GT	
	BH09	Borehole	GT	0.10
28	BH10	Borehole	GT	
	TP19	Test Pit	GT	
	Ds_04	Borehole	GW	
	Access track to Investigation Pad 25	Access Track	GT	1.80
29	TP20	Test Pit	GT	
	Access track to Investigation Pad 26	Access Track	GT	3.58
30	TP21	Test Pit	GT	
	BH11	Borehole	GT	
	Access track to Investigation Pad 27	Access Track	GT	1.77
31	TP22	Test Pit	GT	0.02
32	TP25	Test Pit	GT	
	BH13	Borehole	GT	
	Access track to Investigation Pad 29	Access Track	GT	0.28
33	TP26	Test Pit	GT	
	Access track to Investigation Pad 30	Access Track	GT	0.81
34	TP27	Test Pit	GT	
	BH14	Borehole	GT	
	Access track to Investigation Pad 31	Access Track	GT	0.81
35	TP28	Test Pit	GT	
	DS_06 (gt)	Borehole	GW	0.49
36	DS_06a	Borehole	GW	0.49
37	TP29	Test Pit	GT	
	BH15	Borehole	GT	0.10
38	TP30	Test Pit	GT	0.02
39	TP32	Test Pit	GT	0.02
40	TP33	Test Pit	GT	
	BH17	Borehole	GT	0.10
41	TP34	Test Pit	GT	0.02
42	BH19	Borehole	GT	

Investigation Pad	Name	Investigation Activity	Discipline	Total Clearing proposed (ha)
	TP37	Test Pit	GT	0.10
43	TP38	Test Pit	GT	
	Access track to Investigation Pad40	Access Track	GT	0.03
44	DS_08a	Borehole	GW	0.49
45	TP42	Test Pit	GT	
	DS_09	Borehole	GW	0.49

Appendix B

Land parcel clearing

Table 24 Impacts of proposed clearing on Land Parcels

Cadastre			Proposed Indicative Impact Area ha)	Investigation Pad
Pi Parcel	**Land type**	**Usage Description**		
P404497 - 1499	FHOLD	Transfer of Land Act (Type 1)	1.73	1, 2, 3, 4, 5, 6,
P220387 - 202	CROWN	Land Act (Type 2)	0.35	8, 9, 10, 11, 12
P220785 - 104	CROWN	Land Act (Type 2)	7.14	28, 29, 30
P238018 - 101	CROWN	Land Act (Type 2)	0.13	40, 42, 43
P238025 - 100	CROWN	Land Act (Type 2)	0.15	39 ,40, 41
P238657	CROWN	Land Act (Type 2)	3.07	18, 19, 20, 21, 22, 23, 24
LPL N050027	LEASE	Lease (Type 3 L)	5.49	25, 26, 27, 31, 34, 35, 36, 37, 38
LPL N050091	LEASE	Lease (Type 3 L)	2.65	15, 16
LPL N050324	LEASE	Lease (Type 3 L)	1.09	32, 33
P ROAD	ROAD	Road Isolation (Type 3 P)	0.51	13, 14
P058181 - 300	ROAD	Road Isolation (Type 3 P)	0.49	17
V Crown Land	OTHER	Unallocated Crown Land (Type 3 V)	1.08	7, 44, 45

Appendix C

Dandjoo Database Search Results

Row Labels	Count of TAXON
CR	**153**
Animalia	**153**
BIRD	153
Calidris ferruginea	46
Calidris tenuirostris	56
Limosa lapponica subsp. menzbier	12
Numenius madagascariensis	39
EN	**997**
Animalia	**997**
BIRD	67
Calidris canutus	30
Charadrius mongolus	37
MAMMAL	930
Dasyurus hallucatus	930
MI	**1257**
Animalia	**1257**
BIRD	1257
Actitis hypoleucos	69
Apus pacificus	4
Arenaria interpres	82
Calidris acuminata	40
Calidris alba	56
Calidris melanotos	2
Calidris ruficollis	96
Calidris subminuta	6
Charadrius veredus	30
Chlidonias leucopterus	27
Fregata ariel	10
Gallinago megala	2
Gallinago stenura	4
Gelochelidon nilotica	41
Glareola maldivarum	32
Hirundo rustica	18
Hydroprogne caspia	86
Limicola falcinellus	18
Limnodromus semipalmatus	14
Limosa lapponica	75
Limosa limosa	17
Numenius minutus	28
Numenius phaeopus	71
Oceanites oceanicus	2
Onychoprion anaethetus	2
Pandion cristatus	61
Phalaropus lobatus	11
Philomachus pugnax	1
Plegadis falcinellus	12
Pluvialis fulva	40
Pluvialis squatarola	51
Sterna dougallii	2
Sterna hirundo	23
Sternula albifrons	40
Thalasseus bergii	44
Tringa glareola	23
Tringa nebularia	58
Tringa stagnatilis	31
Xenus cinereus	28
MI & P4	**76**
Animalia	**76**

BIRD	76
Tringa brevipes	76
OS	**7**
Animalia	**7**
BIRD	6
Falco peregrinus	6
MAMMAL	1
Dugong dugon	1
P1	**40**
Plantae	**40**
DICOT	38
Corchorus sp. Yarrie (J. Bull & D. F	2
Heliotropium parviantrum	1
Tephrosia rosea var. Port Hedland	35
MONOCOT	2
Fimbristylis sp. H Kimberley Flora (	1
Fimbristylis sp. Shay Gap (K.R. Ne	1
P2	**9**
Animalia	**2**
REPTILE	2
Lerista separanda	2
Plantae	**7**
DICOT	7
Gomphrena pusilla	7
P3	**131**
Animalia	**17**
INVERT	1
Antipodogomphus hodgkini	1
REPTILE	16
Ctenotus angusticeps	16
Plantae	**114**
DICOT	98
Abutilon sp. Pritzelianum (S. van L	28
Bonamia oblongifolia	3
Croton aridus	2
Euphorbia clementii	7
Gomphrena leptophylla	1
Gymnanthera cunninghamii	5
Heliotropium muticum	31
Indigofera ammobia	2
Nicotiana umbratica	3
Polymeria distigma	2
Rothia indica subsp. australis	9
Terminalia kumpaja	5
MONOCOT	16
Eragrostis crateriformis	15
Fuirena incrassata	1
P4	**272**
Animalia	**261**
MAMMAL	261
Dasycercus blythi	210
Dasycercus cristicauda	3
Lagorchestes conspicillatus subsp.	2
Leggadina lakedownensis	5
Notoryctes caurinus	7
Pseudomys chapmani	32
Rhinonicteris aurantia	2
Plantae	**11**
DICOT	8

Goodenia nuda	7
Ptilotus mollis	1
MONOCOT	3
Bulbostylis burbidgeae	3
VU	**2521**
Animalia	**2521**
BIRD	70
Charadrius leschenaultii	66
Falco hypoleucos	4
MAMMAL	175
Lagostrophus fasciatus subsp. fasc	1
Macroderma gigas	65
Macrotis lagotis	106
Rhinonicteris aurantia (Pilbara)	3
REPTILE	2276
Chelonia mydas	2
Liasis olivaceus subsp. barroni	4
Natator depressus	2268
Pogona minor subsp. minima	2
(blank)	**19814**
Animalia	**16189**
ALGA	6
Lobophora sp.	1
Turbinaria spp	5
AMPHI	235
Cyclorana australis	10
Cyclorana longipes	1
Cyclorana maini	19
Limnodynastes spenceri	2
Litoria caerulea	1
Litoria nasuta	2
Litoria rothii	1
Litoria rubella	24
Neobatrachus aquilonius	21
Neobatrachus sutor	1
Notaden nichollsi	76
Platyplectrum spenceri	9
Uperoleia glandulosa	36
Uperoleia micromeles	14
Uperoleia russelli	2
Uperoleia saxatilis	4
Uperoleia talpa	12
BIRD	8970
Acanthagenys rufogularis	4
Accipiter cirrocephalus	17
Accipiter fasciatus	20
Accipiter fasciatus subsp. fasciatus	3
Acrocephalus australis	2
Aegotheles cristatus	19
Amytornis striatus	3
Anas gracilis	104
Anas rhynchotis	1
Anas superciliosa	108
Anhinga melanogaster	2
Anhinga melanogaster subsp. nova	2
Anhinga novaehollandiae	45
Anthus australis	17
Anthus australis subsp. australis	2
Aquila audax	37

Aquila morphnoides	2
Ardea alba	1
Ardea alba subsp. modesta	3
Ardea garzetta	3
Ardea garzetta subsp. nigripes	2
Ardea ibis	1
Ardea intermedia	11
Ardea modesta	69
Ardea novaehollandiae	8
Ardea pacifica	47
Ardeotis australis	70
Arenaria interpres subsp. interpres	8
Artamus cinereus	166
Artamus cinereus subsp. melanops	1
Artamus leucorynchus	131
Artamus leucorynchus subsp. leuco	6
Artamus minor	18
Artamus personatus	24
Artamus superciliosus	2
Aythya australis	42
Barnardius zonarius	40
Burhinus grallarius	39
Butorides striata	30
Butorides striatus	2
Cacatua roseicapilla	24
Cacatua roseicapilla subsp. assimil	4
Cacatua sanguinea	108
Cacatua sanguinea subsp. westrale	3
Cacomantis pallidus	39
Calidris fuscicollis	1
Calyptorhynchus banksii	3
Centropus phasianinus	21
Certhionyx niger	2
Certhionyx variegatus	6
Charadrius leschenaultii subsp. les	3
Charadrius melanops	15
Charadrius ruficapillus	110
Chenonetta jubata	7
Cheramoeca leucosterna	3
Cheramoeca leucosternus	1
Chroicocephalus novaehollandiae	82
Chrysococcyx basalis	4
Chrysococcyx osculans	1
Cincloramphus cruralis	26
Cincloramphus mathewsi	52
Circus approximans	15
Circus assimilis	38
Cladorhynchus leucocephalus	17
Climacteris melanura	21
Colluricincla harmonica	34
Colluricincla harmonica subsp. brur	1
Colluricincla harmonica subsp. rufiv	1
Columba livia	20
Coracina novaehollandiae	223
Coracina novaehollandiae subsp. s	1
Corvus bennetti	14
Corvus coronoides	32
Corvus orru	139
Corvus orru subsp. cecilae	3

Coturnix pectoralis	3
Coturnix ypsilophora	35
Coturnix ypsilophora subsp. austral	2
Cracticus nigrogularis	131
Cracticus tibicen	11
Cracticus torquatus	4
Cuculus pallidus	10
Cygnus atratus	55
Dacelo leachii	77
Daphoenositta chrysoptera	1
Dendrocygna arcuata	2
Dendrocygna eytoni	39
Dicaeum hirundinaceum	1
Dromaius novaehollandiae	9
Egretta garzetta	46
Egretta novaehollandiae	59
Egretta sacra	43
Elanus axillaris	14
Elanus caeruleus	9
Elanus caeruleus subsp. axillaris	7
Elseyornis melanops	101
Emblema pictum	62
Eolophus roseicapillus	71
Eopsaltria pulverulenta	4
Ephippiorhynchus asiaticus	40
Epthianura aurifrons	4
Epthianura tricolor	18
Eremiornis carteri	18
Erythrogonys cinctus	22
Esacus magnirostris	2
Esacus neglectus	2
Eurostopodus argus	29
Falco berigora	109
Falco berigora subsp. berigora	5
Falco cenchroides	148
Falco cenchroides subsp. cenchroi	1
Falco longipennis	24
Fulica atra	36
Fulica atra subsp. australis	2
Gallirallus philippensis	3
Gallirallus philippensis subsp. mell	1
Gavicalis virescens	68
Gelochelidon nilotica subsp. affinis	1
Geopelia cuneata	134
Geopelia humeralis	28
Geopelia placida	1
Geopelia striata	183
Geopelia striata subsp. placida	12
Geophaps plumifera	54
Gerygone fusca	2
Gerygone tenebrosa	23
Grallina cyanoleuca	300
Grus rubicunda	16
Haematopus fuliginosus	18
Haematopus longirostris	107
Haliaeetus leucogaster	47
Haliastur indus	71
Haliastur sphenurus	170
Hamirostra melanosternon	4

Heteromunia pectoralis	3
Heteroscelus brevipes	8
Hieraaetus morphnoides	27
Himantopus himantopus	79
Hirundo ariel	8
Hirundo neoxena	15
Hirundo nigricans	24
Lalage tricolor	24
Larus novaehollandiae	17
Larus novaehollandiae subsp. nova	6
Lichenostomus keartlandi	37
Lichenostomus penicillatus	236
Lichenostomus plumulus	1
Lichenostomus virescens	200
Lichmera indistincta	106
Lichmera indistincta subsp. indistin	1
Lophoictinia isura	1
Malacorhynchus membranaceus	19
Malurus lamberti	61
Malurus lamberti subsp. assimilis	2
Malurus leucopterus	97
Malurus splendens	1
Manorina flavigula	214
Megalurus cruralis	2
Melanodryas cucullata	2
Melithreptus gularis	13
Melithreptus gularis subsp. laetior	1
Melopsittacus undulatus	148
Merops ornatus	282
Microcarbo melanoleucos	30
Milvus migrans	98
Milvus migrans subsp. affinis	2
Mirafra javanica	118
Motacilla flava subsp. simillima	2
Neochmia ruficauda	16
Neochmia ruficauda subsp. subclar	1
Ninox connivens	20
Ninox novaeseelandiae	30
Numenius phaeopus subsp. varieg	1
Nycticorax caledonicus	17
Nycticorax caledonicus subsp. hilli	1
Nymphicus hollandicus	67
Ocyphaps lophotes	188
Onychoprion fuscata	1
Oreoica gutturalis	12
Pachycephala lanioides	35
Pachycephala melanura	8
Pachycephala rufiventris	22
Pandion haliaetus	3
Pandion haliaetus subsp. cristatus	4
Pardalotus rubricatus	75
Pardalotus striatus	8
Pardalotus striatus subsp. murchis	2
Passer montanus	30
Pelecanus conspicillatus	116
Peneoenanthe pulverulenta	2
Petrochelidon ariel	97
Petrochelidon nigricans	83
Petroica goodenovii	12

Phalacrocorax carbo	9
Phalacrocorax melanoleucos	5
Phalacrocorax sulcirostris	44
Phalacrocorax varius	53
Phaps chalcoptera	1
Phaps elegans	1
Phaps histrionica	2
Philemon citreogularis	2
Platalea flavipes	6
Platalea regia	34
Platycercus spurius	1
Platycercus zonarius	2
Podargus strigoides	9
Poliocephalus poliocephalus	11
Pomatostomus temporalis	67
Porphyrio porphyrio	1
Porzana fluminea	3
Ptilonorhynchus guttatus	20
Ptilonorhynchus maculatus	2
Ptilonorhynchus maculatus subsp.	5
Ptilotula keartlandi	6
Ptilotula penicillata	1
Ptilotula penicillatus	23
Purnella albifrons	1
Recurvirostra novaehollandiae	29
Rhipidura albiscapa	6
Rhipidura fuliginosa	1
Rhipidura leucophrys	166
Rhipidura leucophrys subsp. leucop	1
Rhipidura phasiana	20
Smicrornis brevirostris	8
Sterna albifrons	8
Sterna albifrons subsp. sinensis	3
Sterna bengalensis	22
Sterna bergii	14
Sterna caspia	11
Sterna hirundo subsp. longipennis	4
Sterna hybrida	9
Sterna hybrida subsp. javanica	1
Sterna leucoptera	11
Sterna nereis	2
Sterna nilotica	3
Stiltia isabella	17
Sugomel niger	11
Tachybaptus novaehollandiae	46
Tachybaptus novaehollandiae subs	4
Taeniopygia guttata	315
Thalasseus bengalensis	15
Threskiornis molucca	56
Threskiornis spinicollis	79
Todiramphus chloris	6
Todiramphus chloris subsp. pilbara	1
Todiramphus pyrrhopygia	14
Todiramphus pyrrhopygius	85
Todiramphus sanctus	87
Todiramphus sanctus subsp. sanct	1
Tribonyx ventralis	1
Tringa cinerea	3
Tringa hypoleucos	2

Turnix pyrrhothorax	3
Turnix velox	80
Tyto alba	1
Tyto alba subsp. delicatula	1
Tyto delicatula	1
Vanellus miles	39
Vanellus tricolor	2
Zosterops luteus	51
FISH	119
? ?	2
Abudefduf bengalensis	1
Acanthopagrus australis	1
Acanthopagrus latus	5
Amniataba caudavittata	1
Amphiprion clarkii	1
Apogon rueppellii	2
Arrhamphus sclerolepis	1
Atelomycterus sp.	2
Bathygobius fuscus	2
Batrachomoeus dahli	2
Butis butis	1
Caranx ignobilis	1
Caranx sp.	1
Centrogenys vaigiensis	1
Cephalopholis boenak	1
Chiloscyllium punctatum	2
Choerodon cyanodus	1
Craterocephalus cuneiceps	2
Dactyloptena papilio	1
Drepane punctata	1
Eleutheronema tetradactylum	1
Epinephelus areolatus	1
Epinephelus malabaricus	1
Epinephelus quoyanus	2
Filicampus tigris	1
Gerres subfasciatus	1
Glossamia aprion	1
Halophryne diemensis	5
Herklotsichthys koningsbergeri	3
Herklotsichthys lippa	1
Hyporhamphus quoyi	1
Hyporhamphus sp.	1
Hypseleotris compressa	1
Hypseleotris compressa?	1
Ichthyscopus spinosus	2
Labracinus sp.	1
Leiopotherapon unicolor	4
Leptobrama muelleri	1
Liza vaigiensis	2
Lophiocharon trisignatus	2
Lutjanus carponotatus	2
Megalops cyprinoides	2
Melanotaenia australis	5
Monodactylus argenteus	3
Mugil cephalus	2
Nematalosa erebi	1
Nematalosa vlaminghi	1
Neoarius graeffei	1
Neosilurus hyrtlii	1

Omobranchus sp.	1
Ophichthus rutidoderma	1
Opistognathus inornatus	1
Ostracion sp.	1
Paraplotosus albilabris	2
Parascorpaena picta	1
Pentapodus porosus	1
Periophthalmodon freycineti	1
Protonibea diacanthus	1
Rastrelliger serventyi (invalid)	1
Rendahlia jaubertensis	1
Rhynchostracion nasus	1
Salarias sexfilum	1
Salarias sp.	1
Scaevius milii	1
Scomberoides commersonnianus	1
Scomberomorus semifasciatus	1
Selenotoca multifasciata	4
Sillago analis	3
Sillago schomburgkii	1
Strongylura strongylura	2
Synanceia horrida	2
Synodus sageneus	1
Terapon jarbua	1
Yongeichthys nebulosus	2
Zabidius novemaculeatus	2
INVERT	2651
?Simarus sp2	2
Acariformes sp.	8
Achnanthes exigua Grun.	4
Achnanthes exilis K???tz.	2
Achnanthidium minutissima (K???t	10
Adversaeschna brevistyla	1
Aeolosoma sp. 1 (PSS)	2
Aeshnidae sp.	1
Aganippe myg207	1
Aganippe sp.2	1
Agraptocorixa parvipunctata	1
Albia sp.	1
Alleculinae Genus 1 sp3	1
Allodessus bistrigatus	7
Allonais pectinata	3
Alluaudomyia sp.	1
Alona cf. verrucosa	1
Alona 'davidi vermiculata'	2
Alona rectangula novaezealandiae	2
Alona rigidicaudis	1
Amblystomus sp1	1
Ameriana sp. P1 (PSW)	2
amphipod Genus 2 sp. B14	2
'Amphitritecandona' 'prima'(pss)	3
Amphora coffeaeformis (Ag.) K???	1
Amphora veneta K???tz.	6
Aname ellenae	1
Aname sp.1	1
Aname sp.14	1
Aname sp.15	2
Aname sp.3	1
Anax papuensis	4

Ancylidae sp.	2
Anisops canaliculatus	11
Anisops elstoni	1
Anisops gratus	3
Anisops nasutus	5
Anisops sp.	2
Anisops stali	4
Anisops thienemanni	2
Anomoeoneis brachysira (Br???b.)	2
Anomoeoneis sphaerophora (Ehr.)	1
Anomoeoneis styriaca (Grun.) Hust	2
Anomoeoneis vitrea	1
Anomotarus crudelis	1
Anopheles annulipes s.l.	10
ant sp.	24
Arcella sp.	1
Arcella sp. P1	2
Areacandona cf. 'iuno' (PSS)	1
Areacandona 'fortescueiensis' (PSS	1
Areacandona 'incogitata' (PSS)	1
Areacandona 'iuno' (PSS)	2
Areacandona 'jessicae' (PSS)	1
Argiocnemis rubescens	3
Armatalona macrocopa	1
Arrenurus (Brevicadaturus) sp. 18 (	1
Arrenurus sp. nov. 2 (PSS)	1
Arthrorhabdus paucispinus	1
Asadipus banjiwarn	1
Asadipus barlee	1
Asplanchna sieboldi	1
Asplanchna sp.	1
Aulacoseira ambigua	2
Aulodrilus pigueti	5
Austracantha minax	1
Australiobates queenslandensis	2
Australiobates sp. P3 (nr crassisetu	1
Australobolbus impressicollis	1
Australobolbus pseudobscurius	1
Australutica sp.1	3
Australutica sp.3	2
Austraturus sp. P3 (PRP)	1
Austroagrion pindrina/Ischnura hete	1
Austroepigomphus (Xerogomphus)	3
Austrogomphus mjobergi	7
Austrolestes analis	1
Austrolestes aridus	1
Austropeplea lessoni	2
Backobourkia collina	1
Baetidae sp.	3
Batrachomatus wingi	2
Bdelloidea sp. 2:2	5
Bennelongia australis lineage	1
Bennelongia australis OrdX (PSW)	1
Bennelongia barangaroo lineage	3
Bennelongia nimala	1
Bennelongia strellyensis	1
Berosus josephenae	1
Berosus nr josephenae (was Pilbar	4
Berosus pulchellus	4

Berosus sp.	6
Bezzia sp. P3 (PSW)	1
Bidessodes denticulatus	1
Blackburnium neocavicolle	1
Blackburnium sp. nov. nr. paurperc	1
Blackburnium sp. nr. neocavicolle	1
Boeckella triarticulata	4
Bogidiellidae sp.	2
Bolbobaineus planiceps	1
Bolboleaus truncatus	4
Boreosaragus sp1	16
Boreosaragus sp3	1
Brachionus angularis	1
Brachionus calyciflorus	1
Brachionus cf. forficula	1
Brachionus dichotomus	1
Brachionus quadridentatus	4
Branchinella mcraei	1
Buddelundia '14'	1
Buddelundia sp. 10	1
Buddelundia sp. 13	8
Buddelundia sp. 14RE	3
Buddelundia sp. 17	10
Buddelundia sp. 19	9
Buddelundia sp. 44	1
Buddelundia sp. nov. 10	11
Buddelundia sp. nov. 14	31
Buddelundia sp. nov. 17	9
Buddelundia sp. nov. 19	15
Buddelundia sp. nov. 31	3
Caedius sp4	1
Caedius sp5	1
Caenidae sp.	4
Calamoecia baylyi (Cue form) (ex r	4
Caloneis molaris (Grun.) Krammer	1
Caloneis pulchra Messikommer	1
Caloneis silicula (Ehr.) Cl.	4
Camponotus cf. evae Forel (sp. JD	6
Camponotus cowlei Froggatt	1
Camponotus crozieri McArthur & L	1
Camponotus discors Forel	9
Camponotus fieldeae Forel	7
Camponotus novaehollandiae Mayı	4
Camponotus wiederkehri Forel	1
Campylodiscus clypeus Ehr.	2
Candonopsis kimberleyi	1
Cardiocondyla nuda (Mayr)	1
Carenum nr. emarginatum sp2	3
Carenum pulchrum	4
Carenum sp10	1
Carenum sp1-black globular	1
Carenum sp8	6
Carenum venustum	1
Catadromus lacordairei	2
Cavisternum clavatum	1
Cephalodella gibba	1
Cephalodella sp. P1 (very long toes	1
Cerapachys fervidus (Wheeler)	1
Ceratopogonidae sp.	4

Ceriodaphnia cornuta	6
Chalcopteroides sp5	1
Chaoborus punctilliger	2
Cheumatopsyche dostinei	1
Cheumatopsyche wellsae	2
Chilibathynella sp.	1
Chimarra sp AV17 (PSW)	1
Chironominae sp.	3
Chironomus aff. alternans (V24) (C	4
Chlaenius ?darlingensis	1
Chlaenius australis	5
Chydorus eurynotus	1
Clinotanypus crux	5
Cloeon sp.	17
Cnephia nr aurantiacum	1
Cnephia tonnoiri	1
Cocconeis placentula var. euglypta	2
Coelopynia pruinosa	17
Coenagrionidae sp.	5
Conchostraca (unident.)	3
Conochilus dossuarius	1
Conopterum pyripenne	1
Copelatus nigrolineatus	3
Corbicula sp.	7
Corixidae sp.	5
Cormocephalus strigosus	2
Corynoneura sp.	1
Craticula cuspidata (Grun. ex. Van	2
Craticula halophila (Grun. ex. Van H	1
Crematogaster frivola Forel	1
Crematogaster queenslandica gp. s	8
Crocothemis nigrifrons	1
Cryptochironomus griseidorsum	10
Cryptoerithrus occultus	1
Cryptoerithrus sp.8	2
Culex (Culex) annulirostris	3
Culex crinicauda	3
Culex nr. crinicauda (PSW)	1
Culex sp.	1
Culicidae sp.	1
Culicoides sp.	1
Culicoides sp. P2 (PSW)	1
Cybister tripunctatus	8
Cylotella stelligera Cl. & Grun.	1
Cymbella affinis K???tz.	4
Cymbella cymbiformis Ag.	1
Cymbella delicatula K???tz.	3
Cypretta baylyi	5
Cypretta seurati	5
Cypretta sp PSW074	4
Cypretta sp. PSW018 (PSW)	1
Cypricercus salinus	4
Cypricercus sp. 422 (CB)	1
Cypricercus sp. 444/885 (CB)	1
Cyprinotis 'maximus' n. sp.	2
Cyprinotus cingalensis (ex kimberle	3
Daphnia carinata	1
Daphnia cf. cephalata	1
Darwinula stevensoni	1

Dasyhelea sp.	1
Dasyheleinae sp. P1 (PSW)	4
Dasyheleinae sp. P2 (PSW)	2
Dero furcata	1
Dero nivea	3
Diacyclops cockingi	5
Diacyclops einslei	1
Diacyclops humphreysi humphreys	5
Diacyclops humphreysi s. str X unis	1
Diacyclops scanloni	7
Diacyclops sobeprolatus	2
Diacyclops sp.	1
Diaphanosoma unguiculatum	2
Dicranophorus halbachi	2
Dicrotendipes jobetus	6
Dicrotendipes sp P4 (PSW)	1
Difflugia sp. P1	4
Difflugia sp. P2	1
Dineutus australis	4
Diplacodes bipunctata	4
Diplacodes haematodes	11
Diploneis pseudovalis Hust.	1
Diplonychus eques	1
Dolichopodidae sp.	3
Dolichopodidae sp. A (SAP)	1
Dunhevedia crassa	2
Dytiscidae sp.	3
Ecnomidae sp.	3
Ecnomus pilbarensis	16
Ecnomus sp. AV16 (PSW)	2
Ectocyclops phaleratus	2
Egadroma sp1 (? piceum)	2
Elaphoidella humphreysi	9
Encentridophorus sarasini	4
Enchytraeidae sp.	4
Encyonema gracile Rabh.	1
Enochrus deserticola	5
Enochrus elongatulus	3
Enochrus maculiceps/deserticola (f	1
Enochrus sp.	2
Enteroplea cf. lacustris (PSW)	1
Eodiaptomus lumholtzi	5
Eolimna minima (Grun.) Lange-Ber	1
Eolimna miniscula (Grun.) Lange-B	1
Eolimna subminiscula (Grun.) Lang	4
Ephemeroporus barroisi s.l.	1
Epistylis sp	2
Epithemia adnata (K???tz.) Br???b	1
Epithemia smithii Carruthers	3
Eretes australis	7
Ergasilidae sp.	1
Ethmostigmus curtipes	6
Ethmostigmus parkeri	1
Ethmostigmus rubripes	1
Euasteron sp.1	1
Euchlanis dilatata	8
Euchlanis incisa	1
Euchlanis oropha	3
Eucyclops australiensis	2

Euglypha sp.	4
Eunotia bilunaris (Ehr.) Mills.	3
Eunotia pectinatus (Dillw.) Rabh.	9
Euoniticellus intermedius	1
Euryscaphus waterhousei	2
Eurysticta coolawanyah	8
Eylais sp.	3
Flosculariidae sp.	1
Forcypomyia sp.	1
Fragilaria capucina Desm.	1
Fragilaria capucina var. vaucheriae	1
Fragilaria nitzschoides	1
Fragilaria ulna (Nitz.) Lange Bertalo	5
Gamasomorpha sp.1	2
Gamasomorpha sp.2	2
Geoscaptus laevissimus	2
Gerridae sp.	1
Gigadema sulcatum	3
Glyptophysa sp	1
Gnathaphanus aridus	5
Gnathaphanus melbournensis	1
Gnathaphanus multipunctatus	5
Gomphema gracile Ehr.	1
Gomphidae sp.	1
Gomphonema parvulum (K???tz.) I	6
Gonocephalum sp1	2
Gonocephalum sp2	1
Grayenulla australensis	1
Grayenulla sp. 1	3
Grayenulla sp. 11	1
Grayenulla sp. 19	1
Grayenulla sp. 5	1
Grayenulla waldockae	1
Gretacarus nsp. P1 (PSW)	2
Grymeus sp.10	1
Grymeus sp.12	1
Gyraulus hesperus	14
Gyrosigma attenuatum (K???tz.) R	1
Gyrosigma fonticolum Hust. (in Foc	1
Habronestes sp.8	1
Halicyclops (Rochacyclops) calm	9
Halicyclops (Rochacyclops) roachi	1
Haliplidae sp.	1
Haliplus halsei	1
Haliplus sp.	1
Hantzschia amphioxys (Ehr.) Grun.	6
Hantzschia virgata	2
Harpacticoida sp	1
Helea sp5	5
Hellyethira sp.	1
Helochares/E mastersi larvae	2
Hemicordulia tau	7
Heteronyx beltanae/frenchi	1
Heteronyx parvulus	1
Heteronyx pellucida	1
Heteronyx tepperi	1
Hexarthra cf brandorffi (PSW)	3
Hexarthra mira	1
Hogna sp.2	1

Hogna sp.5	2
Holconia neglecta	1
Holoplatys meda	1
Holoplatys sp. 7	2
Humphreyscandona 'capillus' (PSS	7
Humphreyscandona sp.	1
Humphreyscandona waldockae	1
Hydaticus quadrivittatus	1
Hydra sp.	3
Hydrachna sp.	2
Hydrachna sp. 4/5 (PSW)	3
Hydraena barbipes	6
Hydraena cf. rudallensis (PSW)	3
Hydraena sp.	1
Hydrobiidae sp P1 (not assimineid)	1
Hydrochus burdekinensis	1
Hydrochus group 3 "black" (PSW)	3
Hydrochus interioris	1
Hydrochus macroaquilonius	1
Hydrochus sp. P1 (PSW)	2
Hydrochus sp. P5	1
Hydroglyphus basalis	3
Hydroglyphus basalis var fuscolinea	1
Hydroglyphus grammopterus (=trilii	9
Hydroglyphus leai	4
Hydroglyphus orthogrammus	4
Hydrophilidae sp.	2
Hydrophilus brevispina	2
Hydrovatus rufoniger	3
Hydrovatus weiri	1
Hypharpax sp2	1
Hypharpax sp3	1
Hypharpax sp4	1
Hypharpax sp5	2
Hyphydrus lyratus	8
Hyphydrus sp.	1
Ilyocryptus raridentatus	3
Ilyocypris australiensis	2
Ilyocypris perigundi	1
Ilyocypris 'spiculata' (ms name) (SA	2
Ilyodromus sp. PB	4
Indolpium sp.	13
Iridomyrmex anceps (Roger)	5
Iridomyrmex bicknelli azureus Vieh	1
Iridomyrmex chasei complex sp. JD	1
Iridomyrmex chasei concolor Forel	5
Iridomyrmex chasei Forel	1
Iridomyrmex hartmeyeri Forel	1
Iridomyrmex hartmeyeri gp sp. JDM	10
Iridomyrmex sanguineus Forel	1
Iridomyrmex sp. JDM 133	4
Iridomyrmex sp. JDM 137 (incl. '31	4
Iridomyrmex sp. JDM 319	6
Iridomyrmex sp. JDM 843	6
Ischnura aurora aurora	13
Ischnura heterosticta heterosticta	2
Isidorella egraria	6
Isocypris williamsi (ex Ilyodromus s	4
Karayevia clevei cf.	2

Keratella australis	1
Keratella procurva	6
Keratella slacki	1
Keratella sp. nov. (aff. australis grp	1
Keratella tropica	4
Knoelle clara	5
Kurzia longirostris	1
Kwonkan myg007	4
Kwonkan sp.1	1
Kymberlia sp.1	1
Laccobius matthewsi	2
Laccophilus clarki	1
Laccophilus sharpi	9
Laccotrephes tristis	1
Lagynochthonius leemouldi	7
Lampona ampeinna	4
Lamponina scutata	19
Larsia albiceps	19
Latonopsis australis	2
Latonopsis brehmi	1
Latrodectus hasseltii	1
Leberis cf. diaphanus (striate) (PSV	1
Lecane bulla	5
Lecane cf. spenceri (PSW)	1
Lecane crepida	1
Lecane decipiens	1
Lecane hornemanni	1
Lecane ludwigi form P1	1
Lecane luna	2
Lecane obtusa	1
Lecane papuana	2
Lecane ungulata	1
Lecanomerus sp1	1
'Leicacandona' 'gyralea' (PSS)	1
'Leicacandona' 'mookae' (PSS)	1
'Leicacandona' 'quasimookae' (PSS	3
Lepadella amphitropis	1
Lepadella ovalis	2
Lepadella patella	1
Lepidoptera (non-pyralid) Pilbara sp	1
Lepidoptera sp.	1
Leptoceridae sp.	3
Lesquereusia spiralis	1
Lethocerus distinctifemur	3
Leydigia australis	4
Libellulidae sp.	3
Limbodessus compactus	2
Limnebius sp.	1
Limnesia sp.	1
Limnesia sp. 4 (PSW)	3
Limnichidae sp.	1
Limnochares australica	3
Limnocythere dorsosicula	3
Limnocythere sp BOS068	1
Limnocythere stationis	1
Limnocytheridae n.gen. sp 419 (CE	2
Limnogonus luctuosus	2
Liparetrus sp. nr. atrox	1
Loxandrus laevigatus	3

Loxandrus micantior	3
Loxandrus WA n sp1	2
Luticola goeppertiana (Bleisch) Ma	1
Luticola mutica (K???tz.) Mann	1
Lychas ???bituberculatus???	3
Lychas 'adonis'	2
Lychas annulatus	4
Lychas annulatus' Glauert, 1925	1
Lychas bituberculatus	8
Lychas 'harveyi'	5
Lychas sp. 2	4
Lychas sp. 3	1
Lychas sp. 4	4
Lychas sp. 6	1
Lychas sp. 8	2
Lycidas sp. 1	1
Lycidas sp. 11	4
Lynceus argillaphilus	1
Macrobrachium sp. P1	1
Macrochaetus altamirai	3
Macrodiplax cora	4
Macrothrix capensis	1
Macrothrix cf. pectinata	1
Macrothrix indistincta	1
Macrothrix sp.	1
Masasteron tealei	5
Mastogloia elliptica (Ag.) Cl.	4
Mastogloia elliptica var. danseii (th	3
Mastogloia smithii Thwaites	3
Mayamaea atomus	1
Megaporus ruficeps	1
Megaporus sp.	1
Melaps sp2	1
Melitidae sp.	1
Melitidae sp. 1 (PSS)	4
Melophorus bagoti Lubbock	1
Melophorus froggatti Forel	1
Melophorus ludius sulla Forel	4
Melophorus nr. aeneovirens (Lown	2
Melophorus turneri Forel	2
Melophorus wheeleri complex sp. J	1
Melophorus wheeleri Forel	1
Mesocyclops brooksi	10
Mesocyclops darwini	1
Mesomorphus sp1	2
Mesovelia horvathi	1
Mesovelia hungerfordi	2
Mesovelia vittigera	1
Metacyclops/Pescecyclops sp.	2
Metistete sp1	1
Microcerberidae sp.	4
Microchironomus 'K1' (PSW)	1
Microcyclops varicans	10
Micronecta adelaidae (ex P4)	3
Micronecta gracilis	2
Micronecta micra	11
Micronecta n. sp. P3 (PSW)	3
Micronecta robusta	4
Micronecta sp.	1

Microvelia (Austromicrovelia) austra	1
Microvelia (Austromicrovelia) peran	1
Microvelia (Pacificovelia) oceanica	2
Microvelia sp.	1
Minasteron minusculum	10
Miralona victoriensis	1
Missulena rutraspina	1
Missulena sp.3	1
Moina aff weismanni	2
Moina cf. australiensis (CB)	1
Moina micrura s.l.	3
Monomorium carinatum Heterick	1
Monomorium disetigerum Heterick	11
Monomorium fieldi Forel	4
Monomorium insolescens Wheeler	1
Monomorium laeve Mayr	11
Monomorium rothsteini Forel	5
Monomorium sydneyense Forel (se	1
Monopylephorus n. sp. WA29 (ex F	10
Morebilus diversus	4
Muscidae sp. A (SAP)	3
Muscidae sp. N	1
Myrmopopaea sp.13	2
Myrmopopaea sp.15	1
Myrmopopaea sp.8	1
Mytilina ventralis macracantha	3
Naididae (ex Tubificidae)	11
Nais communis	1
Navicula absoluta	1
Navicula bryophila Petersen	2
Navicula cryptocephala K???tz.	5
Navicula cryptonella Lange-Bertalo	1
Navicula elginensis (Greg.) Ralfs.	2
Navicula kriegerii	1
Navicula molestiformis Hust.	7
Navicula muraliformis	1
Navicula rhynchocephala K???tz.	2
Navicula schroeterii Meister	1
Navicula similis Krasske	1
Navicula subrhynchocephala Hust.	4
Navicula tenelloides Hust.	1
Navicula veneta K???tz.	1
Nedsia nr hurlberti	2
Nedsia sp.	12
Nematoda sp.	3
Nematoda sp. P2/P4 (PSW)	2
Nematoda sp. P6 (PSW)	1
Nematoda sp. P8 (PSW)	1
Neocarenum blackburni	2
Neocarenum sp2	3
Neostorena sp.5	1
Neothrix superarmata	3
Nephila edulis	1
Nilobezzia sp.	1
Nilobezzia sp. P2 (PSW)	5
Nitzschia amphibia Grun.	4
Nitzschia calida Grun.	1
Nitzschia capitellata	1
Nitzschia compressa (Bailey) Boye	2

Nitzschia compressa var. elongata	1
Nitzschia constricta (Greg.) Grun.	3
Nitzschia desertorum Hust.	1
Nitzschia dissipata (K???tz.) Grun.	2
Nitzschia filiformis (W. Sm.) Van H	5
Nitzschia frustulum (K???tz.) Grun.	4
Nitzschia intermedia Hantz.	1
Nitzschia levidensis var. victoriae (g	1
Nitzschia linearis (Ag.) W. Sm.	1
Nitzschia microcephala Grun.	2
Nitzschia palea (K???tz.) W. Sm.	9
Nitzschia perminuta (Grun.) M. Per	1
Nitzschia sigma (K???tz.) W. Sm.	7
Nitzschia sublinearis Hust.	1
Nitzschia umbonata (Ehr.) Lange-B	2
No invertebrates	21
Nomindra leeuwenii	3
Notobathynella sp.	2
Notobia sp1	3
Notommata cf. pachyura (PSW)	1
Notommata nr cerberus (PSW)	1
Notonectidae sp.	4
Nototarus sp. nov. 14 (MB)	1
Nototarus sp. nov. 57 (MB)	1
Nototarus sp. nov. 69 (MB)	1
Ochetellus flavipes (Kirby)	5
Ochthebius sp. P1 (PSW)	1
Ochthebius sp. P2 (PSW)	2
Odontomachus ruficeps Smith	6
Oecetis sp.	1
Oecetis sp. Pilbara 2 (PSW)	1
Oecetis sp. Pilbara 4 (PSW)	3
Oecetis sp. Pilbara 5 (PSW)	10
Oecetis sp. Pilbara 6 (PSW)	1
Oecetis sp. Pilbara 8 (PSW)	1
Oligochaeta sp.	1
Onthophagus consentaneus	1
Onthophagus gazella	12
Onthophagus margaretensis	9
Onthophagus minusculus	3
Onthophagus mjobergi	1
Onthophagus pugnacior	1
Oodes sp1	1
Oodes sp4	1
Oodes sp5	2
Opisthopsis haddoni rufoniger Fore	4
Opopaea sp.17	2
Opopaea sp.2	3
Oribatida group 1 (PSS)	2
Oribatida sp. 4 (PSW)	1
Orthetrum caledonicum	13
Orthetrum pruinosum migratum	2
Orthocladiinae sp.	1
Ostracoda (unident.)	11
Ovatalona cf. cambouei	2
Oxus orientalis	1
Ozestheria packardi	5
Pachycondyla (Brachyponera) lutea	3
Palorinae sp2	1

Pantala flavescens	2
Paracladopelma sp. P1 (nr M1) (P	1
Paracladopelma sp. P2 (nr M2) (P	3
Paracyclops chiltoni	3
Paracymus pygmaeus	2
Paracymus spenceri	5
Paramelitidae cf. sp. 2 (PSS)	2
Paramelitidae sp.	2
Paramelitidae sp. 2 (PSS)	4
Paramelitidae sp. 6 (PSS)	2
Paramelitidae sp. 8 (PSS)	1
Parametriocnemus ornaticornis	1
Parametriocnemus sp P1 (PSW)	1
Paranacaena sp. P1	1
Paranyctiophylax sp AV5 (KIM-UW	1
Parastenocarididae sp.	1
Parastenocaris jane	1
Paratanytarsus sp. P1 (PSW)	1
Paratendipes sp. 'K1' (PSW)	1
Paratrechina braueri glabrior (Forel	1
Paratrechina minutula (Forel)	2
Pellenes bitaeniata	1
Pentaneurini sp. P3 (PSW)	1
Pentaneurini sp. P6 (PSW)	1
Pescecyclops sp. P1	1
Pheidole sp. JDM 1068	2
Pheidole sp. JDM 1176	1
Pheidole sp. JDM 280	2
Pheidole sp. JDM 337	1
Pheidole sp. JDM 536	3
Phorticosomus ?grandis	1
Phorticosomus gularis	13
Phorticosomus sp1	2
Phorticosomus sp2	1
Phorticosomus sp3	3
Phreodrilid with dissimilar ventral cl	6
Phreodrilid with similar ventral chae	2
Pilbarascutigera incola	2
Pilbarus millsi	1
Pinnularia brevicostata Cl.	1
Pinnularia divergens W. Sm.	5
Pinnularia gibba Ehr.	1
Pinnularia obscura	1
Pinnularia subcapitata Greg.	1
Pinnularia subrostrata (A. Cl.) Cl.-E	2
Planorbidae sp.	4
Planothidium lanceolata var. rostra	1
Plationus patulus	2
Platycoelus melliei	2
Platycoelus sp1	1
Platyias quadricornis	2
Platynectes decempunctatus var d	2
Pleidae sp.	3
Pleurosigma delicatulum W. Sm.	1
Plotiopsis australis	13
Polyarthra dolichoptera	5
Polypedilum griseoguttatum	1
Polypedilum leei	10
Polypedilum nr vespertinus (M2) (S	1

Polypedilum nubifer	4
Polypedilum watsoni	6
Polyrhachis (Campomyrma) incons	2
Polyrhachis (Campomyrma) sp. JD	1
Polyrhachis (Chariomyrma) 'aurea'	2
Polyrhachis (Chariomyrma) nr. heir	1
Polyrhachis (Chariomyrma) senilis	2
Polyrhachis (Hagiomyrma) crawley	1
Polyrhachis (Hagiomyrma) sp. JDM	1
Polyrhachis (Hagiomyrma) sp. JDM	1
Prethopalpus eberhardi	2
Pristina longiseta	3
Pristina sima	1
Procladius paludicola	6
Procordulia affinis	1
Pseudagrion aureofrons	10
Pseudagrion microcephalum	8
Pseudectinosoma galassiae	2
Pseudholophylla sp. nov.	1
Pseudocloeon hypodelum (ex Baet	5
Pseudomonospilus diporus	1
pseudoscorpion austrohorus	5
pseudoscorpion Genus 7/4	6
pseudoscorpion indolpium	267
pseudoscorpion sp.	4
Ptygura sp.	2
Pyralidae nr. sp. 39/40 of JHH (SAI	2
Pyralidae Pilbara sp 2 (PSW)	5
Pyralidae Pilbara sp 5 (PSW)	2
Pyralidae Pilbara sp 6 (PSW)	1
Pyralidae sp.	3
Recifella sp.	1
Regimbartia attenuata	7
Reimeria sinutata	1
Renneria kamouni	1
Rhagada cf. richardsonii	7
Rhagada sp. (juv)	2
Rhagadotarsus anomalus	1
Rheocricotopus sp. P1 (PSW)	2
Rheotanytarsus christinae	1
Rheotanytarsus sp.	1
Rheotanytarsus trivittatus	2
Rhopalodia gibba (Ehr.) O. Mull.)	5
Rhytidoponera crassinoda (Forel)	7
Rhytidoponera taurus Forel	2
Rhytidoponera tyloxys Brown & Do	4
Rhytidoponera violacea (Forel)	1
Rhytisternus large sp2	1
Rhytisternus medium sp1	1
Rhytisternus small sp1	1
Rotifera sp.	1
Saldidae sp.	3
Sarothrocrepis benefica	1
Scaridium bostjani	1
Schizopera sp.	1
Scirtidae sp.	3
Scolopendra laeta	8
Scolopendra morsitans	7
Scopodes sp (denticollis-gr)	1

Sellephora pupula (K???tz) Meresc	1
Sellophora seminulum (Grun.) Man	1
Simulium ornatipes	1
Skusella nr "V12 ex-WA" (Cranstor	4
Sobas ?minor	3
Spercheus platycephalus	1
Spinasteron arenarium	1
Spinasteron sp.2	2
Spongillidae sp.	2
Staphylinidae sp.	4
Stauroneis anceps Ehr.	4
Stauroneis phoenicenteron (Nitz.) E	3
Stauroneis producta	1
Staurosira construens Ehr.	2
Stenaspidius sp. nov. nr. albosetos	2
Stereomyrmex anderseni (Taylor)	2
Sternolophus australis	1
Sternopriscus multimaculatus	3
Sternopriscus pilbarensis	2
Sternopriscus sp.	4
Stigmacros sp. JDM 829	1
Stilobezzia sp P1 (PSW)	1
Strandesia sp.	2
Stratiomyidae sp.	4
Stygonitocrella bispinosa	5
Stygonitocrella trispinosa	9
Stygonitocrella unispinosa	1
Supunna sp.1	7
Supunna sp.11	1
Supunna sp.13	2
Supunna sp.16	1
Surirella ovalis Br???b.	1
Surirella striatula Turp.	1
Synothele sp.2	1
Tabanidae sp.	7
Tamopsis facialis	1
Tanypodinae sp.	4
Tanytarsus fuscithorax/semibarbita	4
Tanytarsus sp. D (SAP)	1
Tanytarsus sp. G (SAP)	2
Tanytarsus sp. P10 (PSW)	1
Tanytarsus sp. P2 (PSW)	1
Tanytarsus sp. P4 (PSW)	3
Tapinoma sp. JDM 78	5
Tasmanocoenis arcuata	15
Tasmanocoenis sp. E (PSW)	1
Tesserodon granulatum	1
Tesserodon novaehollandiae	4
Testudinella cf trilobata (=sp P3 PS	1
Testudinella cf. elliptica (PSW)	1
Testudinella patina	6
Testudinella sp P2 (PSW)	1
Tetrablemma alaus	6
Tetramorium sjostedti Forel	3
Tetramorium spininode Bolton	7
Tetramorium striolatum gp. sp. JDM	1
Tetramorium striolatum Viehmeyer	6
Thermocyclops decipiens	2
Thiaridae sp.	3

Thienemanniella sp. P1 (PSW)	1
Tiporus tambreyi	4
Tipulidae sp.	1
Tipulidae type P1 (PSW)	2
Tramea stenoloba	4
Triaenodes sp. P1=P2 (PSW)	8
Trichocarenum cylindricum	2
Trichocerca braziliensis	1
Trichocerca similis	7
Trichocyclus gnalooma	3
Triplectides australis	8
Tropocyclops confinis (ex Paracycl	1
Tubificidae stygo type 4	1
Turbellaria sp.	2
Tyrannochthonius aridus	1
Unidentati genus 5 sp. 1	3
Unionicola crassipalpis	2
Unionicola nr minutissima (PSW)	1
Unionicola nr vidrinei (PSW)	1
Unionicola sp P1 (PSW)	1
Unionicola vidrinei	1
Urodacus armatus	1
Urodacus hoplurus	2
Urodacus sp. 2	1
Urodacus sp. 5	1
Urodacus sp. 6	2
Urodacus varians	1
Urodacus yaschenkoi	1
Veliidae sp.	1
Venator sp.5	1
Vestalenula matildae	2
Xanthagrion erythroneurum	3
Xenochironomus sp P3 (PSW)	1
Yilgarnia sp.2	1
Zebraplatys keyserlingi	5
Zenodorus orbiculatus	1
Zonocypretta kalimna	2
Zyxomma elgneri	2
MAMMAL	1721
Antechinomys laniger	1
Bos taurus	8
Camelus dromedarius	2
Canis dingo	2
Canis familiaris	1
Canis lupus	7
Canis lupus subsp. dingo	2
Canis lupus subsp. familiaris	5
Chaerephon jobensis	4
Chalinolobus gouldii	9
Dasycercus sp.	17
Dasykaluta rosamondae	138
Dasykaluta rosemondae	1
Equus caballus	2
Felis catus	67
Macropus agilis	2
Macropus robustus	29
Macropus robustus subsp. erubesc	11
Macropus rufus	18
Mormopterus (Ozimops) cobourgia	5

Mormopterus loriae	1
Mormopterus loriae subsp. cobourg	1
Mus musculus	127
Ningaui timealeyi	17
Notomys alexis	482
Nyctophilus arnhemensis	2
Nyctophilus geoffroyi	1
Nyctophilus geoffroyi subsp. palles	1
Oryctolagus cuniculus	3
Osphranter robustus	3
Ozimops cobourgianus	1
Petrogale rothschildi	14
Planigale ingrami	8
Planigale maculata	1
Planigale Sp.1 (WAM)	13
Pseudantechinus roryi	2
Pseudantechinus woolleyae	9
Pseudomys delicatulus	10
Pseudomys desertor	72
Pseudomys hermannsburgensis	348
Pseudomys nanus	4
Pteropus scapulatus	4
Rattus rattus	2
Rhinonicteris aurantius	14
Saccolaimus flaviventris	6
Scotorepens greyii	4
Sminthopsis macroura	25
Sminthopsis youngsoni	56
Sousa chinensis	3
Tachyglossus aculeatus	7
Tadarida australis	1
Taphozous georgianus	40
Taphozous hilli	1
Tursiops aduncus	1
Tursiops sp.	1
Vespadelus finlaysoni	37
Vulpes vulpes	8
Zyzomys argurus	60
REPTILE	2487
Acanthophis GT NOTHERN specie	1
Acanthophis pyrrhus	16
Acanthophis wellsei	1
Aipysurus laevis	2
Amphibolurus gilberti	5
Amphibolurus longirostris	23
Anilios ammodytes	11
Antaresia perthensis	8
Antaresia stimsoni	6
Antaresia stimsoni subsp. stimsoni	3
Aspidites melanocephalus	6
Aspidites ramsayi	9
Brachyurophis approximans	3
Brachyurophis fasciolatus subsp. fa	1
Carlia munda	19
Carlia triacantha	19
Chelonia sp.	3
Crenadactylus ocellatus subsp. hor	3
Cryptoblepharus buchananii	1
Cryptoblepharus plagiocephalus	1

Cryptoblepharus ustulatus	4
Ctenophorus caudicinctus	31
Ctenophorus caudicinctus subsp. c	27
Ctenophorus isolepis	95
Ctenophorus isolepis subsp. gularis	1
Ctenophorus isolepis subsp. isolep	69
Ctenophorus nuchalis	73
Ctenophorus reticulatus	2
Ctenotus brooksi	1
Ctenotus colletti	1
Ctenotus duricola	26
Ctenotus duricola/piankai	8
Ctenotus dux	1
Ctenotus grandis	21
Ctenotus grandis subsp. grandis	4
Ctenotus grandis subsp. titan	5
Ctenotus hanloni	8
Ctenotus helenae	42
Ctenotus pantherinus	80
Ctenotus pantherinus subsp. ocellif	40
Ctenotus piankai	16
Ctenotus quattuordecimlineatus	7
Ctenotus robustus	1
Ctenotus rubicundus	3
Ctenotus rufescens	8
Ctenotus rutilans	2
Ctenotus saxatilis	103
Ctenotus schomburgkii	9
Ctenotus schomburgkii Western Pi	2
Ctenotus serventyi	31
Cyclodomorphus melanops	2
Cyclodomorphus melanops subsp.	3
Delma borea	1
Delma butleri	6
Delma desmosa	21
Delma elegans	2
Delma haroldi	11
Delma nasuta	8
Delma pax	31
Delma sp.	2
Delma tincta	16
Demansia angusticeps	1
Demansia psammophis	2
Demansia psammophis subsp. cup	1
Demansia psammophis subsp. psa	1
Demansia rufescens	7
Demansia sp.	1
Demansia torquata	1
Diplodactylus conspicillatus	95
Diplodactylus laevis	12
Diplodactylus savagei	7
Diplodactylus stenodactylus	1
Diporiphora paraconvergens	2
Diporiphora pindan	26
Diporiphora valens	1
Diporiphora vescus	10
Diporiphora winneckei	5
Egernia depressa	3
Egernia epsisolus	4

Egernia striata	1
Ephalophis greyae	1
Eremiascincus fasciolatus	6
Eremiascincus isolepis	3
Eremiascincus musivus	30
Eremiascincus pallidus	5
Eremiascincus richardsonii	4
Eretmochelys imbricata subsp. biss	1
Fordonia leucobalia	4
Furina ornata	7
Gehyra 'fenestra'	1
Gehyra pilbara	28
Gehyra punctata	40
Gehyra purpurascens	5
Gehyra sp.	5
Gehyra variegata	50
Gehyra variegata/purpurascens	5
Hemidactylus frenatus	1
Heteronotia binoei	26
Heteronotia spelea	5
Hydrelaps darwiniensis	1
Hydrophis elegans	2
Hydrophis kingii	1
Hydrophis stokesii	2
Lerista aff bipes	15
Lerista bipes	309
Lerista clara	23
Lerista ips	6
Lerista jacksoni	19
Lerista muelleri	2
Lerista sp.	3
Lialis burtonis	19
Liopholis striata	11
Lophognathus gilberti	1
Lophognathus longirostris	4
Lucasium stenodactylum	20
Lucasium wombeyi	6
Lucasium 'woodwardi'	5
Menetia greyii	57
Menetia surda subsp. surda	2
Moloch horridus	2
Morethia ruficauda	24
Morethia ruficauda subsp. exquisita	7
Morethia ruficauda subsp. ruficauda	9
Nephrurus laevissimus	2
Nephrurus levis	4
Nephrurus levis subsp. pilbarensis	10
Notoscincus ornatus	10
Notoscincus ornatus subsp. ornatus	7
Oedura fimbria	4
Oedura marmorata	14
Pogona minor	16
Pogona minor subsp. minor	6
Pogona minor subsp. mitchelli	15
Proablepharus reginae	2
Pseudechis australis	13
Pseudonaja mengdeni	11
Pseudonaja modesta	24
Pseudonaja nuchalis	4

Pygopus nigriceps	12
Ramphotyphlops ammodytes	40
Ramphotyphlops braminus	1
Ramphotyphlops grypus	21
Ramphotyphlops GT NOTHERN s	1
Ramphotyphlops pilbarensis	8
Rhynchoedura ornata	22
Simoselaps anomalus	20
Strophurus ciliaris	12
Strophurus ciliaris subsp. aberrans	22
Strophurus ciliaris subsp. ciliaris	1
Strophurus elderi	4
Strophurus jeanae	29
Suta fasciata	1
Suta punctata	10
Tiliqua multifasciata	26
Varanus acanthurus	62
Varanus brevicauda	30
Varanus bushi	1
Varanus eremius	34
Varanus giganteus	26
Varanus gilleni	1
Varanus gouldii	18
Varanus panoptes	1
Varanus panoptes subsp. rubidus	1
Varanus pilbarensis	18
Fungi	**14**
FUNGUS	12
Anthracocystis paraneurachnis	1
Cercospora ipomoeae	1
Coriolopsis brunneo-leuca	1
Curvularia sp.	1
Ganoderma steyaertanum	1
Macalpinomyces eriachnes	2
Phyllachora sp.	1
Pisolithus tinctorius	1
Polyporus hartmannii	1
Triodiomyces altilis	1
Triodiomyces lituanus	1
LICHEN	2
Xanthoparmelia taractica	2
Plantae	**3592**
ALGA	41
Acanthophora spicifera	3
Anadyomene plicata	1
Asparagopsis taxiformis	2
Caulerpa brachypus	2
Caulerpa chemnitzia	4
Caulerpa cylindracea	1
Caulerpa lamourouxii	3
Caulerpa lentillifera	2
Caulerpa racemosa forma laxa	1
Caulerpa sertularioides	1
Chaetomorpha melagonium	1
Dichotomaria obtusata	1
Dictyosphaeria cavernosa	1
Galaxaura rugosa	1
Gelidiella acerosa	1
Heterosiphonia crassipes	3

Neomeris bilimbata	1
Neomeris van-bosseae	5
Sebdenia flabellata	1
Udotea argentea	5
Udotea glaucescens	1
DICOT	2737
Abrus precatorius	1
Abutilon amplum	1
Abutilon fraseri	1
Abutilon indicum var. australiense	1
Abutilon lepidum	2
Abutilon macrum	2
Abutilon otocarpum	3
Abutilon oxycarpum subsp. Prostra	1
Abutilon sp. Dioicum (A.A. Mitchell	1
Abutilon sp. Pilbara (W.R. Barker 2	1
Acacia acradenia	13
Acacia adoxa var. adoxa	17
Acacia adoxa var. subglabra	3
Acacia ampliceps	4
Acacia ampliceps x bivenosa	3
Acacia anaticeps	15
Acacia ancistrocarpa	26
Acacia bivenosa	11
Acacia bivenosa x sclerosperma su	1
Acacia colei	2
Acacia colei var. colei	25
Acacia colei var. ileocarpa	1
Acacia coriacea	2
Acacia dictyophleba	2
Acacia drepanocarpa subsp. drepa	1
Acacia eriopoda	7
Acacia eriopoda x tumida var. pilba	1
Acacia glaucocaesia	4
Acacia hilliana	14
Acacia hilliana x stellaticeps	1
Acacia inaequilatera	11
Acacia maitlandii	1
Acacia monticola	11
Acacia monticola x tumida var. pilb	2
Acacia orthocarpa	10
Acacia pruinocarpa	1
Acacia ptychophylla	3
Acacia pyrifolia var. pyrifolia	4
Acacia retivenea subsp. clandestin	1
Acacia robeorum	7
Acacia sabulosa	8
Acacia sclerosperma subsp. sclero	5
Acacia sericophylla	9
Acacia sp.	1
Acacia sp. Nalgi (N.T. Burbidge 13	5
Acacia sp. Ripon Hills (B.R. Maslin	1
Acacia sphaerostachya	11
Acacia spondylophylla	1
Acacia stellaticeps	47
Acacia synchronicia	4
Acacia trachycarpa	22
Acacia translucens	1
Acacia trudgeniana	3

Acacia tumida	1
Acacia tumida var. kulparn	6
Acacia tumida var. pilbarensis	16
Acacia tumida var. tumida	1
Achyranthes aspera	5
Adriana tomentosa	1
Adriana tomentosa var. tomentosa	7
Aerva javanica	20
Aeschynomene indica	7
Albizia lebbeck	1
Alstonia linearis	1
Alstonia spectabilis	1
Alternanthera angustifolia	5
Alternanthera denticulata	2
Alternanthera nana	5
Alternanthera nodiflora	1
Alysicarpus muelleri	8
Amaranthus pallidiflorus	6
Amaranthus undulatus	4
Ammannia baccifera	5
Ammannia muelleri	2
Ammannia multiflora	4
Amyema preissii	2
Amyema sanguinea var. pulchra	2
Argemone ochroleuca	1
Argemone ochroleuca subsp. ochro	3
Atalaya hemiglauca	3
Atriplex semilunaris	1
Avicennia marina	6
Avicennia marina subsp. marina	1
Basilicum polystachyon	4
Bauhinia cunninghamii	9
Bergia ammannioides	2
Bergia henshallii	1
Bergia pedicellaris	3
Bergia perennis	2
Bergia perennis subsp. obtusifolia	1
Bergia perennis subsp. perennis	1
Bergia trimera	5
Blumea tenella	6
Boerhavia burbidgeana	1
Boerhavia coccinea	9
Boerhavia gardneri	1
Boerhavia paludosa	1
Boerhavia repleta	1
Bonamia alatisemina	13
Bonamia erecta	12
Bonamia linearis	5
Bonamia media	7
Bonamia pannosa	4
Bonamia pilbarensis	1
Bonamia sp.	1
Bougainvillea glabra	1
Bruguiera exaristata	4
Buchnera linearis	2
Byblis filifolia	3
Byblis liniflora	2
Byblis sp.	1
Cajanus cinereus	7

Cajanus marmoratus	8
Cajanus pubescens	3
Calandrinia pentavalvis	14
Calandrinia ptychosperma	1
Calandrinia pumila	4
Calandrinia sp. Pinga (T.R. Lally TI	2
Calandrinia stagnensis	6
Calandrinia strophiolata	2
Calandrinia tepperiana	6
Calotis hispidula	1
Calotis plumulifera	2
Calytrix carinata	4
Canavalia rosea	12
Capparis spinosa subsp. nummular	2
Carissa lanceolata	8
Cassytha capillaris	12
Cassytha filiformis	3
Centaurium clementii	1
Centipeda minima	4
Centipeda minima subsp. macroce	4
Centipeda minima subsp. minima	1
Ceriops australis	3
Ceriops tagal	1
Chenopodium auricomum	1
Chrysocephalum apiculatum subsp	2
Citrullus amarus	3
Cleome oxalidea	1
Cleome uncifera	9
Cleome uncifera subsp. uncifera	8
Cleome viscosa	17
Clerodendrum tomentosum	1
Clerodendrum tomentosum var. lar	1
Clerodendrum tomentosum var. mo	1
Clerodendrum tomentosum var. tor	1
Clitoria ternatea	1
Coccinia grandis	1
Codonocarpus cotinifolius	8
Conyza bonariensis	1
Conyza parva	1
Corchorus carnarvonensis	1
Corchorus elachocarpus	11
Corchorus incanus	9
Corchorus incanus subsp. incanus	9
Corchorus laniflorus	2
Corchorus lasiocarpus	1
Corchorus parviflorus	3
Corchorus sidoides	2
Corchorus sidoides subsp. sidoides	1
Corchorus sidoides subsp. vermicu	3
Corchorus tectus	2
Corchorus tridens	11
Corchorus trilocularis	1
Corchorus walcottii	4
Corymbia aspera	4
Corymbia candida	1
Corymbia candida / flavescens	1
Corymbia candida subsp. lautifolia	6
Corymbia deserticola subsp. deser	1
Corymbia flavescens	24

Corymbia hamersleyana	14
Corymbia opaca	3
Corymbia zygophylla	15
Crotalaria crispata	1
Crotalaria cunninghamii	11
Crotalaria dissitiflora subsp. bentha	1
Crotalaria medicaginea var. neglec	10
Crotalaria ramosissima	7
Crotalaria spectabilis subsp. specta	1
Cucumis argenteus	2
Cucumis maderaspatanus	7
Cucumis melo	4
Cucumis melo subsp. agrestis	2
Cucumis sp.	1
Cucumis variabilis	7
Cucurbita pepo	1
Cullen cinereum	2
Cullen lachnostachys	6
Cullen leucanthum	6
Cullen leucochaites	1
Cullen martinii	6
Cullen pustulatum	1
Cullen stipulaceum	6
Cyanostegia cyanocalyx	4
Cyanthillium cinereum var. cinereu	1
Cynanchum floribundum	1
Dampiera candicans	7
Datura metel	2
Dentella asperata	4
Dentella minutissima	1
Desmodium filiforme	14
Desmodium muelleri	1
Desmodium scorpiurus	1
Desmodium sp.	1
Dichrostachys spicata	1
Dicrastylis cordifolia	2
Diplopeltis eriocarpa	2
Dissocarpus paradoxus	1
Distimake davenportii	3
Distimake dissectus var. dissectus	2
Dodonaea coriacea	9
Dodonaea hispidula	1
Dolichandrone heterophylla	1
Dolichandrone occidentalis	7
Drosera burmanni	1
Drosera finlaysoniana	2
Drosera indica	5
Duboisia hopwoodii	3
Dysphania plantaginella	6
Dysphania rhadinostachya	1
Dysphania rhadinostachya subsp. r	8
Dysphania sphaerosperma	1
Ehretia saligna	3
Elacholoma hornii	1
Enchylaena tomentosa var. toment	2
Erythrina vespertilio	1
Erythrophleum chlorostachys	3
Eucalyptus camaldulensis subsp. c	3
Eucalyptus camaldulensis subsp. r	10

Eucalyptus leucophloia subsp. leuc	3
Eucalyptus odontocarpa	7
Eucalyptus victrix	9
Euphorbia alsiniflora	1
Euphorbia australis	2
Euphorbia australis var. australis	4
Euphorbia australis var. subtoment	5
Euphorbia biconvexa	1
Euphorbia careyi	1
Euphorbia coghlanii	6
Euphorbia drummondii	1
Euphorbia fitzroyensis	1
Euphorbia myrtoides	6
Euphorbia psilosperma	2
Euphorbia sp.	1
Euphorbia tannensis subsp. eremo	6
Euphorbia tirucalli	1
Euphorbia trigonosperma	6
Euphorbia vaccaria var. vaccaria	5
Euphorbia wheeleri	1
Evolvulus alsinoides	1
Evolvulus alsinoides var. decumbe	12
Evolvulus alsinoides var. villosicaly	10
Ficus aculeata	2
Ficus aculeata var. indecora	3
Ficus brachypoda	5
Ficus cerasicarpa	1
Ficus opposita	1
Ficus virens	1
Flaveria trinervia	5
Flueggea virosa	1
Flueggea virosa subsp. melanthes	2
Frankenia ambita	7
Frankenia cordata	1
Gardenia pyriformis subsp. keartlar	6
Gardenia pyriformis subsp. pyriform	1
Genus D sp.2	1
Glinus lotoides	4
Glinus oppositifolius	2
Glossostigma diandrum	3
Glycine canescens	1
Glycine sp.	1
Glycine tomentella	3
Gompholobium simplicifolium	7
Gomphrena affinis subsp. pilbarens	13
Gomphrena canescens subsp. can	6
Gomphrena celosioides	1
Gomphrena cunninghamii	3
Gomphrena leptoclada	3
Gomphrena leptoclada subsp. lepto	6
Gomphrena sordida	2
Gonocarpus ephemerus	1
Goodenia armitiana	2
Goodenia azurea subsp. hesperia	4
Goodenia forrestii	6
Goodenia lamprosperma	13
Goodenia microptera	15
Goodenia muelleriana	4
Goodenia scaevolina	2

Goodenia sp.	1
Goodenia stobbsiana	5
Gossypium australe	4
Gossypium hirsutum	2
Gossypium robinsonii	1
Grevillea eriostachya	1
Grevillea pyramidalis	6
Grevillea pyramidalis subsp. leucac	3
Grevillea refracta subsp. refracta	10
Grevillea wickhamii	2
Grevillea wickhamii subsp. aprica	2
Grevillea wickhamii subsp. hispidul	7
Grevillea wickhamii subsp. macrod	2
Gyrocarpus americanus	3
Gyrostemon tepperi	3
Hakea chordophylla	1
Hakea lorea	3
Hakea lorea subsp. lorea	4
Hakea macrocarpa	7
Hakea stenophylla	1
Halgania gustafsenii	1
Halgania solanacea	1
Halgania solanacea var. Mt Doreen	1
Halgania solanacea var. solanacea	6
Haloragis gossei	2
Helichrysum luteoalbum	2
Heliotropium ammophilum	2
Heliotropium chrysocarpum	1
Heliotropium conocarpum	1
Heliotropium crispatum	5
Heliotropium cunninghamii	4
Heliotropium curassavicum	1
Heliotropium europaeum	2
Heliotropium foliatum	3
Heliotropium leptaleum	1
Heliotropium ovalifolium	1
Heliotropium pachyphyllum	5
Heliotropium sp.	2
Heliotropium transforme	3
Heliotropium vestitum	3
Hemichroa diandra	2
Hibiscus apodus	4
Hibiscus austrinus var. austrinus	6
Hibiscus brachychlaenus	2
Hibiscus burtonii	2
Hibiscus goldsworthii	1
Hibiscus leptocladus	5
Hibiscus sturtii var. campylochlamy	7
Hibiscus sturtii var. platychlamys	2
Hibiscus verdcourtii	1
Hybanthus aurantiacus	14
Hybanthus enneaspermus subsp. e	1
Hypertelis cerviana	1
Indigastrum parviflorum	2
Indigofera boviperda	1
Indigofera boviperda subsp. bovipe	1
Indigofera colutea	11
Indigofera hirsuta	5
Indigofera hochstetteri	3

Indigofera linifolia	13
Indigofera linnaei	6
Indigofera monophylla	7
Indigofera oblongifolia	11
Indigofera rugosa	2
Indigofera sessiliflora	3
Indigofera trita	8
Ipomoea coptica	5
Ipomoea costata	1
Ipomoea diamantinensis	1
Ipomoea muelleri	12
Ipomoea pes-caprae	1
Ipomoea pes-caprae subsp. brasilie	3
Ipomoea polymorpha	3
Isotropis atropurpurea	6
Jacksonia aculeata	12
Jacquemontia sp.	1
Jasminum calcareum	2
Jasminum didymum subsp. lineare	1
Jatropha gossypiifolia	1
Josephinia eugeniae	1
Josephinia sp.	1
Lepidium muelleri-ferdinandii	1
Leptopus decaisnei	1
Leptosema anomalum	9
Leucaena leucocephala	1
Lobelia arnhemiaca	1
Lotus cruentus	5
Ludwigia perennis	3
Lysiana spathulata subsp. parvifoli	3
Maireana tomentosa subsp. tomen	3
Maireana villosa	2
Melaleuca alsophila	2
Melaleuca argentea	6
Melaleuca glomerata	5
Melaleuca lasiandra	7
Melaleuca linophylla	1
Melhania oblongifolia	4
Melochia pyramidata	2
Microstachys chamaelea	1
Mimulus gracilis	4
Minuria sp.	2
Mirbelia viminalis	2
Mitrasacme connata	3
Mitrasacme exserta	3
Mollugo molluginea	1
Moringa oleifera	1
Muellerolimon salicorniaceum	6
Myoporum montanum	4
Neobassia astrocarpa	13
Neptunia dimorphantha	7
Neptunia monosperma	1
Newcastelia cladotricha	6
Nicotiana benthamiana	4
Nicotiana heterantha	1
Nicotiana occidentalis subsp. obliq	1
Nicotiana occidentalis subsp. occid	1
Nicotiana rosulata subsp. rosulata	1
Notoleptopus decaisnei	4

Nymphoides indica	4
Oldenlandia crouchiana	3
Oldenlandia galioides	3
Oldenlandia pterospora	2
Operculina aequisepala	4
Osbornia octodonta	1
Owenia reticulata	5
Parkinsonia aculeata	1
Passiflora foetida var. hispida	2
Peplidium aithocheilum	1
Peplidium muelleri	4
Peripleura virgata	2
Petalostylis labicheoides	4
Phyla nodiflora var. nodiflora	1
Phyllanthus aridus	1
Phyllanthus eremicus	2
Phyllanthus erwinii	1
Phyllanthus exilis	1
Phyllanthus maderaspatensis	8
Phyllanthus reticulatus	1
Phyllanthus sp.	1
Phyllanthus virgatus	2
Physalis angulata	2
Pimelea ammocharis	2
Pittosporum angustifolium	1
Pluchea dentex	2
Pluchea ferdinandi-muelleri	4
Pluchea rubelliflora	11
Pluchea tetranthera	15
Polycarpaea corymbosa	3
Polycarpaea corymbosa var. corym	12
Polycarpaea holtzei	2
Polycarpaea involucrata	1
Polycarpaea longiflora	4
Polygala galeocephala	8
Polygala glaucifolia	3
Polygala saccopetala	1
Polygala sp.	1
Polymeria ambigua	2
Polymeria lanata	4
Polymeria sp.	2
Portulaca australis	1
Portulaca conspicua	1
Portulaca cyclophylla	2
Portulaca decipiens	2
Portulaca digyna	1
Portulaca oleracea	21
Portulaca pilosa	8
Portulaca sp.	2
Prosopis pallida	1
Pseudognaphalium luteoalbum	2
Pterocaulon intermedium	6
Pterocaulon serrulatum	1
Pterocaulon sphacelatum	8
Ptilotus appendiculatus	1
Ptilotus arthrolasius	8
Ptilotus astrolasius	14
Ptilotus auriculifolius	1
Ptilotus axillaris	14

Ptilotus calostachyus	9
Ptilotus divaricatus	2
Ptilotus exaltatus	5
Ptilotus fusiformis	13
Ptilotus gomphrenoides	3
Ptilotus helipteroides	2
Ptilotus incanus	7
Ptilotus lanatus	1
Ptilotus macrocephalus	1
Ptilotus murrayi	5
Ptilotus nobilis	1
Ptilotus obovatus	4
Ptilotus polystachyus	4
Ptilotus polystachyus var. arthrotric	1
Ptilotus villosiflorus	6
Pupalia lappacea	1
Rhagodia eremaea	6
Rhizophora stylosa	8
Rhynchosia minima	14
Ricinus communis	3
Roepera compressa	2
Rostellularia adscendens var. clem	3
Rotala diandra	9
Salsola australis	2
Samolus repens	2
Sauropus sp.	1
Scaevola amblyanthera	1
Scaevola amblyanthera var. centra	8
Scaevola browniana	2
Scaevola browniana subsp. browni	1
Scaevola crassifolia	1
Scaevola spinescens	1
Schenkia clementii	3
Sclerolaena bicornis var. bicornis	5
Sclerolaena costata	1
Sclerolaena densiflora	1
Sclerolaena glabra	1
Sclerolaena hostilis	3
Sclerolaena uniflora	1
Senna artemisioides subsp. helmsi	1
Senna artemisioides subsp. helmsi	1
Senna artemisioides subsp. oligopl	15
Senna bicapsularis	1
Senna costata	1
Senna curvistyla	6
Senna glutinosa	2
Senna glutinosa subsp. glutinosa	3
Senna notabilis	13
Senna occidentalis	2
Senna stricta	2
Senna symonii	1
Senna venusta	3
Seringia elliptica	6
Seringia nephrosperma	5
Sesbania cannabina	13
Sesbania formosa	6
Sesuvium portulacastrum	1
Sida arenicola	4
Sida cardiophylla	2

Sida clementii	3
Sida echinocarpa	1
Sida fibulifera	3
Sida macropoda	10
Sida rohlenae	8
Sida rohlenae subsp. rohlenae	5
Sida sp.	3
Sida sp. Articulation below (A.A. Mi	5
Sida sp. Pilbara (A.A. Mitchell PRP	12
Sida sp. Pindan (B.G. Thomson 33	5
Sida sp. Rabbit Flat (B.J. Carter 62	3
Sida spinosa	1
Solanum chippendalei	1
Solanum cleistogamum	2
Solanum dioicum	5
Solanum dioicum sens. lat.	1
Solanum diversiflorum	11
Solanum esuriale	6
Solanum horridum	3
Solanum lasiophyllum	5
Solanum lucani	3
Solanum nigrum	2
Solanum phlomoides	10
Spermacoce hillii	2
Spermacoce sp.	1
Stackhousia intermedia	1
Stemodia grossa	9
Stemodia kingii	2
Stemodia lathraia	7
Stemodia sp.	5
Stemodia sp. Shay Gap (B. Cook 7	6
Stemodia viscosa	5
Stenopetalum decipiens	1
Streptoglossa bubakii	1
Streptoglossa cylindriceps	1
Streptoglossa decurrens	8
Streptoglossa macrocephala	2
Streptoglossa odora	5
Streptoglossa sp.	1
Streptoglossa tenuiflora	5
Striga curviflora	1
Striga sp.	1
Striga squamigera	2
Stylidium desertorum	3
Stylobasium spathulatum	3
Stylosanthes guianensis var. guian	3
Stylosanthes hamata	6
Suaeda arbusculoides	2
Surreya diandra	2
Swainsona formosa	2
Swainsona laciniata	1
Swainsona pterostylis	9
Swainsona tanamiensis	1
Symphyotrichum squamatum	1
Synaptantha tillaeacea var. tillaeac	4
Tecticornia auriculata	21
Tecticornia halocnemoides	10
Tecticornia halocnemoides subsp.	1
Tecticornia indica subsp. bidens	1

Tecticornia indica subsp. indica	1
Tecticornia indica subsp. leiostachy	9
Tecticornia pterygosperma subsp.	3
Templetonia hookeri	2
Tephrosia clementii	2
Tephrosia flammea	1
Tephrosia leptoclada	13
Tephrosia rosea	6
Tephrosia rosea var. clementii	5
Tephrosia rosea var. clementii / ros	1
Tephrosia rosea var. Fortescue cre	1
Tephrosia rosea var. rosea	6
Tephrosia rosea var. venulosa	4
Tephrosia simplicifolia	2
Tephrosia sp. B Kimberley Flora (C	11
Tephrosia sp. Bungaroo Creek (M.I	16
Tephrosia sp. Carnarvon (J.H. Ros	1
Tephrosia sp. clay soils (S. van Lee	1
Tephrosia sp. D Kimberley Flora (R	21
Tephrosia sp. Fortescue (A.A. Mitc	3
Tephrosia sp. NW Eremaean (S. va	7
Tephrosia supina	4
Tephrosia virens	6
Terminalia canescens	6
Terminalia circumalata	1
Threlkeldia diffusa	4
Tinospora smilacina	5
Trachymene oleracea subsp. olera	6
Trachymene pilbarensis	1
Trianthema cusackianum	4
Trianthema oxycalyptrum var. oxyc	1
Trianthema pilosum	14
Trianthema portulacastrum	7
Trianthema triquetra	1
Trianthema triquetrum	14
Trianthema turgidifolia	1
Trianthema turgidifolium	9
Tribulopis angustifolia	8
Tribulus cistoides	1
Tribulus hirsutus	2
Tribulus occidentalis	6
Tribulus platypterus	1
Tribulus sp.	1
Tribulus sp. long-styled eichlerianus	1
Trichodesma zeylanicum	3
Trichosanthes cucumerina var. cuc	2
Tridax procumbens	1
Trigastrotheca molluginea	31
Trigonella suavissima	3
Triumfetta appendiculata	4
Triumfetta chaetocarpa	3
Triumfetta clementii	5
Triumfetta deserticola	2
Triumfetta incana	1
Triumfetta johnstonii	3
Triumfetta maconochieana	3
Triumfetta propinqua	2
Triumfetta ramosa	11
Uvedalia linearis var. linearis	2

Velleia panduriformis	2
Vigna lanceolata	3
Vigna lanceolata var. lanceolata	3
Vigna sp.	1
Vigna sp. Hamersley Clay (A.A. Mit	1
Wahlenbergia queenslandica	1
Wahlenbergia tumidifructa	5
Waltheria indica	7
Xanthium occidentale	1
Zaleya galericulata subsp. galericul	2
Zornia albiflora	1
Zornia chaetophora	3
Zornia muelleriana	1
Zornia muelleriana subsp. congesta	3
FERN	18
Cheilanthes brownii	1
Cheilanthes sieberi subsp. sieberi	1
Marsilea drummondii	1
Marsilea exarata	3
Marsilea hirsuta	4
Marsilea sp.	3
Marsilea spp.	5
LIVERWORT	2
Riccia crystallina	1
Riccia singularis	1
MONOCOT	794
Agave americana	1
Amphipogon caricinus var. caricinu	1
Amphipogon sericeus	4
Andropogon gayanus	1
Aristida contorta	11
Aristida holathera	12
Aristida holathera var. holathera	3
Aristida hygrometrica	6
Aristida inaequiglumis	6
Aristida latifolia	3
Astrebla pectinata	2
Bothriochloa ewartiana	1
Brachyachne convergens	1
Bulbostylis barbata	24
Bulbostylis turbinata	2
Cenchrus ciliaris	19
Cenchrus setaceus	1
Cenchrus setiger	6
Centrolepis banksii	1
Chloris barbata	5
Chloris pectinata	1
Chloris pumilio	8
Chloris virgata	1
Chrysopogon fallax	19
Commelina ensifolia	2
Corynotheca micrantha	2
Corynotheca micrantha var. micran	2
Corynotheca pungens	7
Corynotheca sp.	2
Cymbopogon ambiguus	6
Cymbopogon bombycinus	1
Cymbopogon obtectus	5
Cynodon convergens	2

Cynodon dactylon	6
Cynodon radiatus	1
Cyperus bifax	2
Cyperus blakeanus	4
Cyperus bulbosus	5
Cyperus castaneus var. brevimucro	2
Cyperus concinnus	1
Cyperus conicus	5
Cyperus cunninghamii	1
Cyperus cunninghamii subsp. cunn	1
Cyperus difformis	3
Cyperus gymnocaulos / vaginatus	1
Cyperus hesperius	1
Cyperus iria	8
Cyperus ixiocarpus	4
Cyperus macrostachyos	7
Cyperus microcephalus subsp. mic	1
Cyperus microcephalus subsp. sax	1
Cyperus polystachyos	1
Cyperus pulchellus	4
Cyperus pygmaeus	1
Cyperus rigidellus	1
Cyperus squarrosus	8
Cyperus vaginatus	3
Dactyloctenium aegyptium	1
Dactyloctenium radulans	8
Dichanthium fecundum	3
Dichanthium sericeum subsp. humi	2
Dichanthium sericeum subsp. polys	1
Digitaria brownii	3
Digitaria ciliaris	2
Digitaria ctenantha	2
Diplachne fusca	1
Diplachne fusca subsp. fusca	4
Echinochloa colona	7
Eleocharis atropurpurea	4
Elytrophorus spicatus	8
Enneapogon caerulescens	5
Enneapogon lindleyanus	2
Enneapogon pallidus	2
Enneapogon polyphyllus	4
Enneapogon purpurascens	5
Enneapogon robustissimus	3
Enteropogon ramosus	5
Eragrostis cumingii	25
Eragrostis dielsii	5
Eragrostis elongata	1
Eragrostis eriopoda	12
Eragrostis falcata	5
Eragrostis olida	1
Eragrostis pergracilis	1
Eragrostis pilosa	1
Eragrostis speciosa	1
Eragrostis tenellula	11
Eragrostis xerophila	9
Eriachne aristidea	16
Eriachne benthamii	9
Eriachne ciliata	4
Eriachne flaccida	7

Eriachne glauca	2
Eriachne glauca var. glauca	11
Eriachne helmsii	1
Eriachne lanata	8
Eriachne melicacea	2
Eriachne mucronata	3
Eriachne obtusa	11
Eriachne pulchella	6
Eriachne sp.	4
Eriachne sulcata	1
Eriocaulon cinereum	2
Eriochloa procera	3
Eriochloa pseudoacrotricha	2
Eulalia aurea	11
Fimbristylis ammobia	1
Fimbristylis caespitosa	1
Fimbristylis dichotoma	9
Fimbristylis elegans	1
Fimbristylis littoralis	9
Fimbristylis microcarya	5
Fimbristylis neilsonii	5
Fimbristylis nuda	1
Fimbristylis oxystachya	5
Fimbristylis rara	3
Fimbristylis simulans	4
Fuirena ciliaris	1
Halodule uninervis	2
Iseilema dolichotrichum	2
Iseilema eremaeum	1
Iseilema membranaceum	4
Iseilema vaginiflorum	1
Lamarckia aurea	2
Leptochloa digitata	3
Leptochloa fusca subsp. fusca	1
Leptochloa sp.	1
Lipocarpha microcephala	7
Murdannia graminea	4
Panicum decompositum	5
Paraneurachne muelleri	2
Paspalidium clementii	3
Paspalidium rarum	5
Paspalidium tabulatum	6
Paspalum fasciculatum	1
Perotis rara	6
Potamogeton tricarinatus	1
Schizachyrium fragile	3
Schoenoplectiella dissachantha	1
Schoenoplectiella laevis	2
Schoenoplectiella lateriflora	1
Schoenoplectus dissachanthus	4
Schoenoplectus laevis	3
Schoenoplectus lateriflorus	1
Setaria dielsii	3
Setaria italica	1
Setaria sphacelata	1
Setaria surgens	3
Setaria verticillata	1
Sorghum interjectum	2
Sorghum plumosum	8

Sorghum stipoideum	1
Spinifex longifolius	8
Sporobolus actinocladus	1
Sporobolus australasicus	9
Sporobolus mitchellii	4
Sporobolus virginicus	3
Stuckenia pectinata	4
Thalassia hemprichii	1
Themeda avenacea	1
Themeda triandra	4
Triodia biflora	2
Triodia bitextura	1
Triodia epactia	51
Triodia lanigera	4
Triodia longiceps	2
Triodia schinzii	8
Triodia secunda	1
Triodia sp.	1
Triodia wiseana	5
Tripogon loliiformis	1
Triraphis mollis	4
Typha domingensis	1
Urochloa holosericea	1
Urochloa holosericea subsp. velutir	3
Urochloa occidentalis var. occident	3
Urochloa panicoides	1
Urochloa piligera	5
Vallisneria nana	4
Whiteochloa cymbiformis	14
Xerochloa barbata	5
Xerochloa imberbis	1
Yakirra australiensis	16
Yakirra majuscula	1
Protozoa	**19**
ALGA	19
Colpomenia sinuosa	2
Dictyopteris australis	5
Dictyota ciliolata	1
Hormophysa cuneiformis	2
Hydroclathrus clathratus	1
Lobophora variegata	2
Spatoglossum macrodontum	5
Stoechospermum polypodioides	1
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Grand Total	**25277**

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