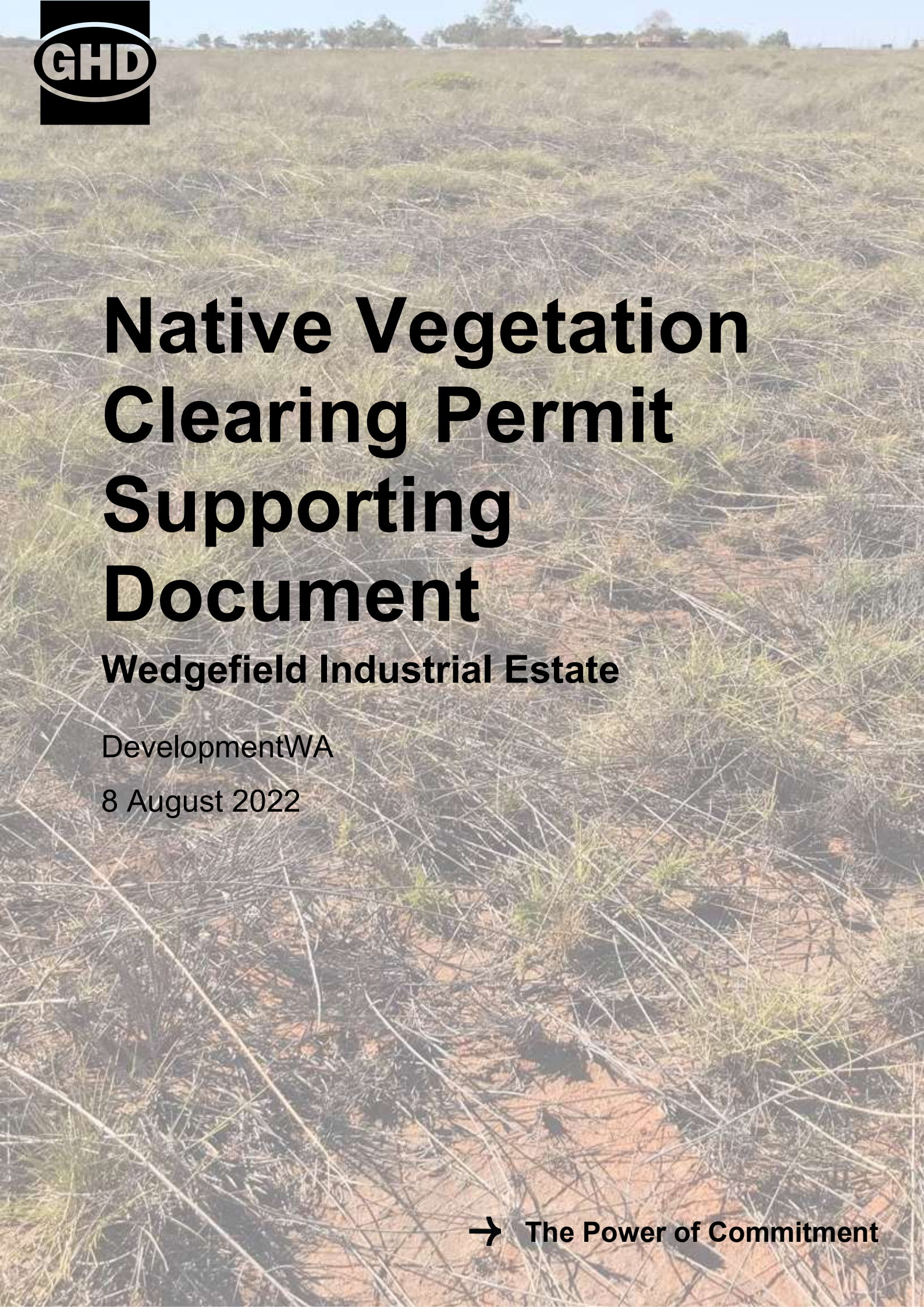

Native Vegetation Clearing Permit Supporting Document

Wedgefield Industrial Estate

DevelopmentWA

8 August 2022

The Power of Commitment

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Executive Summary

DevelopmentWA is undertaking subdivision works in the Wedgefield Industrial Estate, located in Port Hedland, Western Australia (WA). DevelopmentWA have commenced planning for Stage 4 of the Wedgefield Industrial Estate, which will be subject to a subdivision approval by Department of Planning, Lands and Heritage (DPLH). The Project was referred to the Environmental Protection Authority (EPA) in April 2010 with an outcome of "Not Assessed- Advice Given".

To support the development of Stage 4, the clearing of three areas outside of the proposed subdivision boundary (the Development Envelope (DE)) will be required. These three areas will be in subdivision Stages 5 and 6, however the Wedgefield Structure Plan is currently being restructured and approval for Stages 5 and 6 is several years away. To allow for the proposed clearing, a clearing permit is required under the *Environmental Protection Act 1986*.

A Vegetation and Fauna Management Plan (VFMP) was originally developed to manage the development of the Wedgefield Industrial Estate in July 2011. This VFMP was originally developed in response to advice from the then Department of Environment and Conservation (DEC, now Department of Water and Environment Regulation (DWER)) and has since been updated in 2022, based on comments provided by the Department of Biodiversity, Conservation and Attractions.

GHD Pty Ltd (GHD) was engaged by DevelopmentWA to prepare this document in support of an application for a Native Vegetation Clearing Permit (NVCP) under Section 51E of Part V of the *Environmental Protection Act 1986* (EP Act), to clear native vegetation within Lot 5859 on Deposited Plan 191016 and Lot 528 on Deposited Plan 415099.

The proposed clearing will involve the mechanical removal of up to 23.78 ha native vegetation in Excellent-Very Good to Completely Degraded condition. Clearing of native vegetation associated with the Project has been assessed against the Ten Clearing Principles (Schedule 5 EP Act) and is deemed 'not at variance', or 'unlikely to be at variance', to the Ten Clearing Principles.

The DE has been subject to historical biological surveys and recent targeted fauna surveys for the Mulgara (*Dasycercus cristicauda* – EPBC Act, Vulnerable). Although the Project will result in the clearing of native vegetation in Excellent-Very Good to Completely Degraded condition, the vegetation is well represented at a local, regional and State level. The DE is historically disturbed and impacted by edge effects by adjacent development, roads and cleared access tracks. The presence of weeds species and tracks within the DE reflects the extent of human disturbance. Vegetation within the DE does not represent any significant ecological communities.

No Threatened or Priority flora species listed under the *Biodiversity Conservation Act 2016* (BC Act) and/or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have previously been recorded within the DE (GHD 2009). No significant fauna species have been previously recorded in the DE, however one species, Mulgara, is considered likely to occur and an additional three species may possibly occur.

The DE comprises Marginal Grasslands and Mulgara Habitat fauna habitat types as mapped by GHD in 2021 and 2022. The fauna habitats extend outside of the DE and are not restricted to the areas within the DE. Targeted Mulgara assessments completed within areas adjacent to the DE identified 7 active burrows. Camera monitoring assessment of active burrows adjacent to the DE detected Mulgara activity at one of the burrows. The resident Mulgara appeared to vacate the burrow following ground disturbance clearing.

The vegetation in the DE is considered unlikely to comprise habitat necessary for the maintenance of conservation significant flora and fauna due to the abundance of analogous, contiguous habitat in areas surrounding the DE.

The Project may result in limited indirect impacts on adjacent vegetation such as the introduction and spread of weeds. All indirect impacts to native vegetation will be appropriately managed through the implementation of the VFMP. Impacts associated with the Project will be minimised where possible to prevent the clearing of native vegetation.

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1. Introduction

1.1 Project background

DevelopmentWA is undertaking subdivision works in the Wedgefield Industrial Estate, located in Port Hedland, Western Australia (WA). DevelopmentWA have commenced planning for Stage 4 of the Wedgefield Industrial Estate, which will be subject to a subdivision approval by Department of Planning, Lands and Heritage (DPLH). The Project was referred to the Environmental Protection Authority (EPA) in April 2010 with an outcome of "Not Assessed- Advice Given".

To support the development of Stage 4, the clearing of three areas outside of the proposed subdivision boundary (the Development Envelope (DE)) (Figure 1, Appendix A) will be required. These three areas will be in subdivision Stages 5 and 6, however the Wedgefield Structure Plan is currently being restructured and approval for Stages 5 and 6 is several years away. To allow for the proposed clearing, a clearing permit is required under the *Environmental Protection Act 1986* (EP Act).

The areas to be cleared are intended to be used as part of earthworks activities required to deliver the Stage 4 subdivision. One of the three cleared areas will be used to stockpile topsoil and cleared vegetation, with the remaining two areas being used to provide fill for the Stage 4 development.

GHD Pty Ltd (GHD) was engaged by DevelopmentWA to prepare an application for a Native Vegetation Clearing Permit (NVCP) under Section 51E of Part V of the EP Act, to clear native vegetation within Lot 5859 on Deposited Plan 191016 and Lot 528 on Deposited Plan 415099.

1.2 Purpose of this report

This document has been prepared in support of a NVCP application under Section 51E of Part V of the EP Act, to clear up to 23.78 hectares (ha) of native vegetation within the DE of 26.38 ha. This document includes:

- An overview of works required and description of clearing activities to be undertaken (Section 4)
- An overview of the existing environment (Section 5)
- Assessment of impacts (Sections 6 and 8)
- Environmental management measures to be implemented to minimise clearing impacts (Section 7)
- An assessment against the Ten Clearing Principles, as defined in Schedule 5 of the EP Act (Section 8).

1.3 Scope and limitations

This report has been prepared by GHD for DevelopmentWA and may only be used and relied on by DevelopmentWA for the purpose agreed between GHD and DevelopmentWA as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than DevelopmentWA arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible. The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

GHD has prepared this report on the basis of information provided by DevelopmentWA and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared. The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

2. Survey effort and environmental management

The DE and surrounding areas have been subject to historical biological surveys that were undertaken as part of subdivision approvals (Figure 2, Appendix A). These surveys include:

- GHD 2009 Preliminary Environmental Impact Assessment and Biological Survey: Report for LandCorp Industrial Land LIA 3,4,5 and General Transport Part A and Part B (Appendix B)
- GHD 2011 Wedgefield Industrial Estate – LIA 3 and Transport Area A Additional Mulgara Assessment.

Subsequent targeted fauna searches have been undertaken, including:

- GHD 2021 Wedgefield Industrial Estate Clearing – Mulgara Fauna Assessment Letter 8 September 2021 (Appendix B)
- GHD 2022 Wedgefield Industrial Estate Clearing – Mulgara Fauna Assessment Letter 14 February 2022 (Appendix B).

A Vegetation and Fauna Management Plan (VFMP) was originally developed to manage the development of the Wedgefield Industrial Estate in July 2011. This VFMP was originally developed in response to advice from the then Department of Environment and Conservation (DEC, now Department of Biodiversity, Conservation and Attractions (DBCA)) and has since been updated in 2022, based on comments provided by DBCA. All clearing undertaken at Wedgefield by DevelopmentWA is in accordance with the VFMP. The updated VFMP is provided in Appendix C.

3. Location and land ownership

The DE is part of the Wedgefield Industrial Estate, leased by DevelopmentWA. The location of the DE is provided in Figure 1, Appendix A.

The DE for the proposed clearing comprises 26.38 ha, split across three areas. The DE is located within the suburb of Wedgefield, approximately 400 m east of the Wedgefield town centre and 7.2 kilometres (km) south-east of Port Headland, within the Pilbara Region of WA. The Project is bound by Wallwork Road to the east, Schillaman Street to the South and Great Northern Highway to the north.

The Project is located on Lot 5859 on Deposited Plan 191016 and on Lot 528 on Deposited Plan 415099. DevelopmentWA holds a Development Lease (L708221) from DPLH for Lots 5859 and 528. The lease agreement and authority to access and clear native vegetation letter are provided in Appendix D.

4. Description of proposed clearing activities

The Project will require the clearing of up to 23.78 ha of native vegetation. Historical data (GHD 2009) shows this vegetation to be in Excellent-Very Good to Completely Degraded condition, with the majority in Very Good-Good condition (20.84 ha, 87.6%).

It is proposed vegetation be cleared via mechanical clearing/bulldozing as part of the earthworks activities required to deliver the Stage 4 subdivision at the Wedgefield Industrial Estate. The DE will be progressively cleared, with the area to the west of the DE being cleared first and used to stockpile topsoil and cleared vegetation. Clearing of this area will occur in conjunction with the stripping of topsoil. Of the two remaining areas within the DE, the area directly north of Schillaman Street will be earth-worked first. Once the available fill material from that area is exhausted, the areas directly to the west of Wallwork Road will then be cleared.

Areas where earthworks are completed will be stabilised progressively to manage the risk of dust impacts. At the completion of earthworks activities, erosion control fencing will also be installed to limit any migration of soil during rainfall events. Stabilisation will utilise spray-on products to help bind and hold the surface soil.

These three areas (the DE) will be in subdivision Stages 5 and 6, however the Wedgefield Structure Plan is currently being restructured and approval for Stages 5 and 6 is several years away. The final land use for the DE areas will be industrial development.

5. Existing environment

5.1 Climate

Port Hedland is characterised by long, hot summers and dry windy winters. The closest Bureau of Meteorology (BoM) weather station is Port Hedland Airport (ID: 004032), located approximately 2.3 km south-east of the DE. Climate data from this station indicates that the mean maximum temperature ranges from 36.8°C in March to 27.4°C in July. The mean minimum temperature ranges from 25.7°C in December to 12.5°C in July. The mean annual rainfall is 317.7 millimetres (mm), with approximately 20.3 rain days a year (BoM 2022).

5.2 Landforms and soils

The DE area intersects two bedrock geological formations, outlined in Table 1 (GoWA 2022). The DE occurs across one soil system, the Uaroo system, described in Table 2 (GoWA 2022).

Table 1 Bedrock geology within the DE

Code	Name	Description
A-ST-xg-o	Sisters Supersuite	Granitic and ultramafic to mafic intrusive rocks; metamorphosed
A-DG-xs-c	De Grey Supergroup	Clastic sedimentary rocks, banded iron-formation and chert, and subordinate mafic and felsic volcanic rocks; weakly metamorphosed

Table 2 Soil system within the DE

Code	Land system	Description
281Ua	Uaroo	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.

5.2.1 Acid sulphate soils

The Australian Soil Resource Information System Acid Sulphate Soils dataset (ASRIS 2022) indicates that the DE areas have an extremely low probability of Acid Sulphate Soils (ASS), however the rating is provisional due to lack of data in the area.

5.3 Hydrology

5.3.1 Groundwater and surface water

The DE is located within the Pilbara groundwater area, proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act) (GoWA 2022). The DE also falls within the Pilbara surface water area, proclaimed under the RIWI Act (GoWA 2022). The DE is not located within a Public Drinking Water Source Area (PDWSA), irrigation district, proclaimed river or waterway management areas. No waterways or rivers are located within the vicinity of the DE. The Indian Ocean is located approximately 6.9 km north of the DE, with inlets located approximately 1.9 km north.

There are no Internationally Recognised (RAMSAR) Wetlands within the vicinity of the DE. In addition, no Nationally important wetlands intersect the DE, with the closest, the Leslie Saltfields System, is over 10 km north-west of the DE (GoWA 2022).

5.4 Flora and vegetation

5.4.1 Regional biogeography

The DE is located within the Pilbara bioregion and the Roebourne sub-region as described by the Interim Biogeographic Regionalisation of Australia (IBRA).

The Pilbara bioregion is characterised by vast coastal plains and inland mountain ranges with cliffs and deep gorges. Vegetation is predominantly mulga low woodlands or snappy gum over bunch and hummock grasses. Tenure comprises Aboriginal land, leasehold (for grazing cattle) and conservation reserves. The bioregion provides the majority of WA's exports in petroleum, natural gas and iron ore. Major population centres are Karratha, Port Hedland, Newman and Tom Price (DAWE 2008).

The Roebourne subregion is described by Kendrick and Staley (2001) as 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.

5.4.2 Broad vegetation association mapping and extent

Broad scale (1:100,000) pre-European vegetation mapping of the DE was completed by Beard (1977) at an association level. The DE intersects one vegetation association (Figure 3, Appendix A):

- Association 647 - Hummock grasslands, dwarf-shrub steppe; *Acacia translucens* over soft spinifex.

The pre-European mapping has been adapted and digitised by Shepherd et al. (2002). The extent of vegetation associations have been determined by the state-wide vegetation remaining extent calculations maintained by DBCA (latest update March 2019 – GoWA 2021). As shown in Table 3, the current extent remaining for vegetation association 647 is over 97% of its calculated pre-European extent at all scales.

Table 3 Extent of pre-European vegetation association mapped within the DE

Vegetation association	Scale	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	% Current extent in all DBCA managed land (proportion of current extent)
647	State: WA	195,860.89	191,711.41	97.88	-
	IBRA Bioregion: Pilbara	195,859.95	191,710.92	97.88	-
	IBRA Subregion: Roebourne	188,901.32	184,774.70	97.82	-
	LGA: Town of Port Hedland	180,908.49	176,759.02	97.71	-

5.4.3 Vegetation types and condition

Historical surveys of the area indicate that the DE intersects three native vegetation types and one disturbed area (GHD 2009):

- Bare areas/tidal flats (1.11 ha)
- Low shrubland over mixed tussock grassland over very open herbs (16.45 ha)
- Tussock grassland over scattered herbs (7.60 ha)

– Disturbed areas (1.22 ha).

The vegetation types mapped during the GHD (2009) survey covered the entire DE, of which 25.16 (95%) was mapped as native vegetation, with the remainder of the DE being disturbed or unvegetated.

Historical imagery of the DE and surrounding area indicates minimal changes to the vegetation structure and condition has occurred since the 2009 survey (2012-2020), apart from the clearing of additional tracks throughout the DE (Landgate 2022). The GHD (2009) survey data and aerial imagery was used to understand the current status of native vegetation within the DE.

Based on a review of aerial imagery and the GHD (2009) survey spatial data, the current extent of the vegetation types mapped within the DE are as follows:

– Bare areas/tidal flats (0.53 ha)

– Low shrubland over mixed tussock grassland over very open herbs (16.08 ha)

– Tussock grassland over scattered herbs (7.17 ha).

The total native vegetation extent within the DE is 23.78 ha (92%) and the remaining 1.99 ha (8%) comprises cleared areas (Figure 5, Appendix A). The condition of native vegetation in the DE ranges from Excellent-Very Good to Completely Degraded, with the majority in Very Good-Good condition (20.84 ha, 87.6%) (Figure 5, Appendix A).

The DE is encompassed by existing infrastructure, including roads, tracks and previous development and infrastructure. The vegetation is almost completely uniform across the DE, with minor changes due to differing dominance of individual grass/Spinifex species, and also due to historical disturbance (GHD 2009). The vegetation type matches the descriptions by Beard (1977).

Within a 10 km radius of the DE there is approximately 21,929 ha of native vegetation (GoWA 2022). The vegetation surrounding the DE is anticipated to be of similar or better condition than the native vegetation within the DE. The reason for this being the proximity to anthropogenic disturbances such as, urban development, roads and industrial infrastructure.

5.4.4 Significant ecological communities

The EPBC Act Protected Matters Search Tool (PMST) and DBCA database searches do not indicate the presence of any Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within a 10 km radius of the DE. The GHD (2009) survey did not recorded any vegetation representative of TECs or PECs.

5.4.5 Flora diversity

The *NatureMap* (DBCA 2007-) search identified the presence of 667 flora taxa within a 10 km radius of the DE. This total included:

– 31 Alga taxa
– 535 Dicot taxa
– One fern
– 100 Monocot taxa.

5.4.6 Significant flora

Desktop searches of the EPBC Act PMST and *NatureMap* databases identified one Threatened flora species, *Seringia exastia* within a 10 km radius of the DE.

Seringia exastia is currently listed as Threatened, however, a recent genomic data study synonymised the common species, *Seringia elliptica* under *Seringia. Exastia* (Binks et al. 2020). The records of *Seringia. Exastia* recorded within the DE would have been representative of the non-significant species *Seringia elliptica* under the previous classification. The taxon retains its Threatened status until the updated name has been officially endorsed and appears in the Gazettal Notice and updated on Florabase (WA Herbarium 1998-). As such, although

this species is currently listed as Threatened, it is not considered to be significant in this context and has been removed from this assessment.

The desktop searches also identified eight Priority species within 10 km radius, including:

- *Bulbostylis burbidgeae* (Priority 4)
- *Eragrostis crateriformis* (Priority 3)
- *Gomphrena pusilla* (Priority 2)
- *Goodenia nuda* (Priority 4)
- *Gymnanthera cunninghamii* (Priority 3)
- *Heliotropium muticum* (Priority 3)
- *Tephrosia rosea* var. Port Hedland (A.S. George 1114) (Priority 1)
- *Rothia indica* subsp*. australis* (Priority 3).

The DBCA database indicated only one record of a Priority 3 species within 10 km of the DE. This record is located approximately 7.8 km north-west of the DE (Figure 6, Appendix A).

Five of the species above were considered in the GHD (2009) survey. The remaining four species, their preferred habitats and likelihood of occurrence are considered in Appendix E. No Threatened or Priority flora species have previously been recorded within the DE (GHD 2009). The large shrub species, *Gymnanthera cunninghamii*, is unlikely to have been overlooked during the GHD (2009) survey, as there were very few tall shrubs within the survey area. Other species, such as *Gomphrena pusilla* and *Bulbostylis burbidgeae* are known to grow on soil types that were not present in the area, so are unlikely to be present.

Of the four species not considered within GHD (2009), one species, *Rothia indica* subsp*. australis* has the potential to occur within the DE, due to the presence of suitable habitat and records within the vicinity of the DE. The remaining species are considered likely to occur.

5.5 Fauna

5.5.1 Fauna habitat

Two broad fauna habitat types were identified within the DE, based on the dominant landforms, soil and vegetation structure in the area, and the targeted fauna surveys undertaken by GHD to date (GHD 2021, 2022) (Figure 7, Appendix A).

These fauna habitats include:

- Marginal Grasslands (2.43 ha): Paucity of *Triodia* and substrate heavier clay soil supporting tussock grasses. The habitat type forms marginal shelter habitat and provides habitat for dispersal and movement
- Mulgara Habitat (21.60 ha) - This habitat is generally widespread within the local vicinity including the DE and surrounds and also regionally extensive. It is characterized as Abydos Plains Grass-steppe *Triodia* hummock grasslands and includes areas with additional sparse emergent *Mallee*, *Acacia* and *Grevillea* shrubs over *Triodia*. Soils are red sandy loam and provides suitable burrowing and foraging habitat for Brush-tailed Mulgara.

The remaining 0.36 ha of vegetated areas within the DE have low value to fauna species. The fauna habitats extend outside of the DE and are not restricted to the areas within the DE. Within a 10 km radius there is an estimated 19,188 ha of Mulgara Habitat and 844 ha of Marginal Grasslands.

5.5.2 Fauna diversity

The *NatureMap* (DBCA 2007-) search identified the presence of 6,083 fauna species within a 10 km radius of the DE. Marine and aquatic species were removed from the total due to the DE not containing and marine or water environments. The total included:

- 55 Amphibian species
- 2,912 bird species

- 208 invertebrate species
- 309 mammal species
- 2,499 reptile species.

5.5.3 Significant fauna

The EPBC PMST and the *NatureMap* database indicates the potential presence of 18 Threatened species within 10 km of the DE (Table 4). Marine and migratory species were removed as there is no suitable habitat (coastal areas, wetlands and watercourses) within the vicinity of the DE.

Table 4 Significant fauna

Scientific Name	Common Name	Class	Conservation Status	
			EPBC Act	BC Act / DBCA
Limosa lapponica menzbieri	Northern Siberian Bar-tailed Godwit	Bird	Critically Endangered	Critically Endangered
Rostratula australis	Australian Painted Snipe	Bird	Endangered	-
Dasyurus hallucatus	Northern Quoll	Mammal	Endangered	Endangered
Pezoporus occidentalis	Night Parrot	Bird	Endangered	-
Falco hypoleucos	Grey Falcon	Bird	Vulnerable	-
Rhinonicteris aurantia (Pilbara form)	Pilbara Leaf-nosed Bat	Mammal	Vulnerable	-
Macrotis lagotis	Greater Bilby	Mammal	Vulnerable	Vulnerable
Liasis olivaceus barroni	Olive Python (Pilbara subspecies)	Reptile	Vulnerable	-
Macroderma gigas	Ghost Bat	Mammal	Vulnerable	-
Calidris canutus	Red Knot	Bird	Endangered	Endangered
Sternula nereis nereis	Fairy Tern	Bird	Vulnerable	Vulnerable
Numenius madagascariensis	Eastern Curlew	Bird	Critically Endangered	Critically Endangered
Mormopterus cobourgianus	North-western free-tailed bat	Mammal	-	Priority 1
Lagostrophus fasciatus fasciatus	Banded hare-wallaby	Mammal	Vulnerable	Vulnerable
Falco peregrinus	Peregrine Falcon	Bird	-	Other Specially Protected Fauna
Dasycercus cristicauda	Crest-tailed Mulgara	Mammal	-	Priority 4
Dasycercus blythi	Brush-tailed Mulgara	Mammal	-	Priority 4
Ctenotus angusticeps	Airlie Island Ctenotus	Reptile	Vulnerable	Priority 3

In addition, the DBCA datasets identified 3,028 records of significant fauna species within a 10 km radius of the DE (Figure 6, Appendix A).

Eight of the species above were considered in the GHD (2009) survey. The GHD (2009) survey did not identify any significant fauna species within the DE, however, a number of fauna burrows were observed and Mulgara (*Dasycercus cristicauda* and *Dasycercus blythiare*) is known to occur adjacent to the DE. In addition, the North-western free-tailed bat and the Pilbara Leaf-nosed Bat may occasionally utilise the DE for foraging, however the DE does not contain core habitat for these species. The remaining four species were considered unlikely to occur within the DE (GHD 2009).

The North-Western Free-tailed Bat is restricted to mangroves and adjacent vegetation. While the DE is located within the vicinity of mangroves, none occurs within the DE and there is a large amount of similar suitable habitat within the Port Hedland area and it is unlikely that the bat would be reliant on the vegetation within the DE. There

are no suitable roosting areas for the Pilbara Leaf-nosed Bat within the DE, making the species unlikely to occur, except possibly as a forager (GHD 2009).

Additional targeted Mulgara assessments were completed within areas adjacent to the DE (Figure 2, Appendix A) (GHD 2021 & 2022). The GHD (2021) assessment identified 7 active burrows, indicating the presence of Mulgara within the DE and surrounding area. A supplementary camera monitoring assessment of the active burrows was undertaken, during which Mulgara activity was detected at one of the burrows on three nights pre-ground disturbance (GHD 2022). The resident Mulgara appeared to vacate the burrow following ground disturbance around the burrow.

The remaining ten species not considered by GHD (2009), their preferred habitats and likelihood of occurrence are considered in Appendix E. Aside from the Peregrine Falcon and the Grey Falcon, all species were considered unlikely to occur within the DE. The Peregrine Falcon is a wide-ranging species and may occur within the DE on an occasional basis, however the DE does not contain core habitat for the species. The Grey Falcon may utilise the DE for occasional foraging, however, is unlikely to rely solely on habitat within the DE. The habitats within the DE extend outside of the DE where it is likely to be in similar or better condition.

5.6 Conservation area and reserves and Environmentally Sensitive Areas

No DBCA managed areas are located within the vicinity of the DE. In addition, the DE is does not intersect any Environmentally Sensitive Areas (ESAs). The closest ESA occurs approximately 7 km north of the DE and is associated with the marine environment.

6. Potential impacts

6.1 Impact avoidance through design

The DE will be progressively cleared, with the western most area of the DE (the most sparely vegetated area) being cleared first and used to stockpile topsoil and cleared vegetation. Clearing of this area will occur in conjunction with the stripping of topsoil. Of the two remaining areas within the DE, the area directly north of Schillaman Street will be earth-worked first. Once the available fill material from that area is exhausted, the areas directly to the west of Wallwork Road will then be cleared.

Areas where earthworks are completed will be stabilised progressively to manage the risk of dust impacts. At the completion of earthworks activities, erosion control fencing will also be installed to limit any migration of soil during rainfall events. Stabilisation will utilise spray-on products to help bind and hold the surface soil.

The following avoidance measures have been considered:

- No native vegetation will be cleared for temporary works outside the DE
- Implementation of a VFMP, updated based on comments provided by DBCA and submitted to the Town of Port Hedland.

6.2 Potential impacts to vegetation and flora

The proposed clearing will involve the mechanical removal of up to 23.78 ha of native vegetation, which is predominantly low shrubland over mixed tussock grassland over very open herbs (16.45 ha) and tussock grassland over scattered herbs (7.17 ha). This vegetation ranges in condition from Excellent-Very Good to Completely Degraded, with the majority in Very Good-Good condition (20.84 ha, 87.6%). The tussock grassland vegetation is well represented outside of the DE.

No Threatened or DBCA listed flora have been previously identified or recorded within the DE (GoWA 2022, GHD 2009). One species, *Rothia indica* subsp*. australis* has the potential to occur within the DE, due to the presence of suitable habitat and records within the vicinity of the DE.

The Project may result in limited indirect impacts on adjacent vegetation such as the introduction and spread of weeds. These will be managed as part of the VFMP (Appendix B).

6.3 Potential impacts to fauna and fauna habitat

The DE contains 23.03 ha fauna habitat, namely Marginal Grasslands and Mulgara Habitat. The fauna habitats extend outside of the DE and are therefore not restricted to the areas within the DE.

The DE comprises vegetation that provides foraging and burrowing habitat for the Mulgara. In addition, the Marginal Grasslands habitat type provides foraging / dispersal habitat for the Mulgara. While the North-Western Free-tailed Bat, the Pilbara Leaf-nosed Bat, Peregrine Falcon and the Grey Falcon have the potential to occur within the DE, the DE is does not provide core habitat for these species.

The DE is surrounded by developed and industrial areas, which have been previously cleared. The DE is also encompassed by roads. Clearing required for the Project will not bisect any areas of contiguous vegetation, reducing the extent of impacts to fauna species, particularly Mulgara. Indirect impacts to fauna include vehicle strikes and deaths during Project construction, as well as secondary impacts such as dust, noise and vibration.

7. Environmental management framework

A VFMP was originally developed for the entire development of the Wedgefield Industrial Estate and has since been revised to incorporate additional clarity regarding management measures specifically for Mulgara.

The purpose of the VFMP is to outline the required management measures, and monitoring and corrective actions for the development of the Wedgefield Industrial Estate, as they relate to vegetation and fauna values, in particular Mulgara.

The VFMP is provided in Appendix B and includes the following flora and fauna management objectives (Table 5).

Table 5 Ecological management objectives

Environmental Aspect	Objective
Vegetation Clearance	To minimise the area of vegetation that is removed or disturbed outside of the development footprint.
Threatened Flora	To minimise the potential impacts on conservation significant flora species.
Weed Management	To minimise the potential for the spread or introduction of weeds.
Rehabilitation	To utilise existing vegetative resources for rehabilitation, re-establish locally occurring vegetation and minimise the risks of erosion and nuisance dust.
Fauna Protection	To minimise disturbance to any native fauna species and in particular Mulgara.

8. Assessment of impacts

8.1 Assessment against the 10 Clearing Principles

The clearing of vegetation in WA 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 under the Environmental Protection (Clearing of 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 Ten Clearing Principles contained in Schedule 5 of the EP Act so far as they are relevant to the matter under consideration. Assessment against 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 Project, an assessment of the proposed clearing against the Ten Clearing Principles has been undertaken and presented in Table 6.

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).

Based on the following assessment, the clearing of native vegetation within the DE associated with this proposal is deemed 'not at variance', or 'unlikely to be at variance', to the Ten Clearing Principles.

Table 6 Assessment against 10 Clearing Principles

Principle	Assessment
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	The DE comprises approximately 23.78 ha of native vegetation in Excellent-Very Good to Completely Degraded condition (GHD 2009). The dominant vegetation type across the DE is 'Low shrubland over mixed tussock grassland over very open herbs'. The DE intersects vegetation Association 647, this association is well represented with over 97.71% remaining at a local, regional and state level. The DE is surrounded by existing infrastructure, including roads, tracks and previous development and infrastructure. The vegetation is almost completely uniform across the DE, with minor changes due to differing dominance of individual grass/Spinifex species, and historical disturbance (GHD 2009). The DE is impacted by edge effects due adjacent development and surrounding roads. The presence of access tracks throughout the DE indicates historical human disturbance. There are areas of native vegetation in the general region of the DE that have similar and higher levels of biological diversity to that within the DE. The EPBC Act PMST and DBCA database searches did not indicate the presence of any TECs or PECs within a 10 km radius of the DE. In addition, the GHD (2009) survey did not record any vegetation representative of TECs or PECs within the DE. Desktop searches of the EPBC Act PMST and *NatureMap* databases identified one Threatened flora species, *Seringia exastia* within a 10 km radius of the DE. In addition, the desktop searches identified eight Priority species within 10 km radius. Desktop searches of the DBCA databases identified one Priority 3 species record within 10 km of the DE. This record is located approximately 7.8 km north-west of the DE. No Threatened flora listed under the EPBC Act and/or BC Act are known to occur within a 10 km radius of the DE, and no Threatened or Priority flora species have previously been recorded within the DE (GHD 2009). One species, *Rothia indica* subsp. *australis* has the potential to occur within the DE, due to the presence of suitable habitat and records within the vicinity of the DE. There are 21 *FloraBase* records of the species, occurring in low to high frequency. The Project is unlikely to significantly impact upon this species. Two broad fauna habitat types were identified within the DE based on the predominant landforms, soil and vegetation structure in the area (GHD 2021, 2022). These include Marginal Grasslands and Mulgara Habitat. The EPBC Act PMST and the *NatureMap* database indicated the potential presence of 18 significant fauna species (not including marine or migratory) within a 10 km radius of the DE. The DBCA datasets identified 3,028 records of significant fauna species within a 10 km radius of the DE. Eight of the above species were considered in the GHD (2009) survey. The GHD (2009) survey did not identify any significant fauna species within the DE. A likelihood of occurrence assessment (GHD 2009) concluded that one species, Mulgara is likely to occur within the DE, given the presence of suitable habitat and burrows. In addition, two significant species were considered as possibly occurring within the DE: – *Mormopterus cobourgiana* – North-Western Free-Tailed bat (Priority 1) – *Rhinonicteris aurantia* (Pilbara form) - Pilbara Leaf-nosed Bat (EPBC Act Vulnerable). Targeted Mulgara assessments were completed within areas adjacent to the DE. These assessments identified 7 active Mulgara burrows, indicating the presence of this species within the DE and surrounds. Of the remaining species ten species not considered by GHD (2009), the Peregrine Falcon and the Grey Falcon have the potential to occur within the DE. The impact of native vegetation clearing on these fauna species is considered further in Principle (b). Whilst the Project will result in the loss of up to 23.78 ha native vegetation in Excellent-Very Good to Completely Degraded condition, the vegetation is well represented locally and regionally with approximately 21,929 ha of native vegetation within a 10 km radius. Clearing for the Project will impact upon less than 0.001% of the remaining native vegetation. The native vegetation within the DE does not comprise a high biological diversity at a local or regional scale. **The proposed clearing is unlikely to be at variance with this Principle.**
(b) Native vegetation should not be cleared if it comprises the whole or part of, or is	Two broad native fauna habitat types were identified within the DE, based on the predominant landforms, soil and vegetation structure in the area, and the targeted fauna surveys undertaken by GHD to date (GHD 2021, 2022). These fauna habitats include:

Principle	Assessment
necessary for the maintenance of, a significant habitat for fauna indigenous Western Australia.	– Marginal Grasslands (2.43 ha): Paucity of *Triodia* and substrate heavier clay soil supporting tussock grasses. The habitat type forms marginal shelter habitat and provides habitat for dispersal and movement. – Mulgara Habitat (21.60 ha): This habitat is generally widespread within the local vicinity including the DE and surrounds and also regionally extensive. It is characterized as Abydos Plains Grass-steppe *Triodia* hummock grasslands and includes areas with additional sparse emergent *Mallee*, *Acacia* and *Grevillea* shrubs over *Triodia*. Soils is red sandy loam and provides suitable burrowing and foraging habitat for Brush-tailed Mulgara. The fauna habitats extend outside of the DE and are not restricted to the areas within the DE. Within a 10 km radius there is approximately 19,188 ha of Mulgara Habitat and 844 ha of Marginal Grasslands, based on broadscale mapping. Clearing of the Mulgara Habitat and Marginal Grasslands represents 0.1% and 0.3% of the regional habitat availability respectively. The EPBC Act PMST and the *NatureMap* database indicated the potential presence of 18 significant fauna species (not including marine or migratory species) within a 10 km radius of the DE. The DBCA datasets identified 3,028 records of significant fauna species within a 10 km radius of the DE. Eight of the above species were considered in the GHD (2009) survey. The GHD (2009) survey did not identify any significant fauna species within the DE. A likelihood of occurrence assessment (GHD 2009) concluded that one species, Mulgara is likely to occur within the DE, given the presence of suitable habitat and burrows. In addition, two significant species were considered as possibly occurring within the DE: – *Mormopterus cobourgiana* – North-Western Free-Tailed bat (Priority 1) – *Rhinonicteris aurantia* (Pilbara form) - Pilbara Leaf-nosed Bat (EPBC Act Vulnerable). The Little North-western Mastiff Bat is restricted to mangroves and adjacent vegetation. While the DE is located within the vicinity of mangroves, there is a large amount of similar suitable habitat within the Port Hedland area and it is unlikely that the bat would be reliant on the vegetation within the DE. There are no suitable roosting areas for the Pilbara Leaf-nosed Bat within the DE, making the species unlikely to occur, except possibly as a forager (GHD 2009). Targeted Mulgara assessments were completed within areas adjacent to the DE (Lots 350, 351 and 352, Figure 2) (GHD 2021 & 2022). The GHD (2021) assessment identified 7 active burrows, indicating the presence of Mulgara within the surrounding area. A supplementary camera monitoring assessment of the active burrows was undertaken, during which Mulgara activity was detected at one of the burrows on three nights pre-ground disturbance activity (GHD 2022). The resident mulgara appeared to vacate the burrow following ground disturbance clearing. Of the remaining ten species not considered by GHD (2009), the Peregrine Falcon and the Grey Falson have the potential to occur within the DE. The Peregrine Falcon is a wide-ranging species and may occur within the DE on an occasional basis, however the DE does not contain core habitat for the species. The Grey Falcon may utilise the DE for occasional foraging, however, is unlikely to rely solely on habitat within the DE. The habitats within the DE extend outside of the DE where it is likely to be in similar or better condition. There is potential for fauna to be impacted by clearing activities due to the removal of 23.03 ha of native vegetation that may support fauna. However, these impacts are not expected to be long term or significant, as the native vegetation in the DE is well represented locally and regionally. There is native vegetation in similar and better condition available in the surrounding area. The abundance of analogous, contiguous habitat in areas surrounding the DE allows any significant fauna species to relocate beyond the DE. The vegetation in the DE is considered unlikely to comprise habitat necessary for the maintenance of significant fauna. **The proposed clearing is unlikely to be at variance with this Principle.**
(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	Desktop searches did not identify any Threatened flora records within a 10 km radius of the DE. No Threatened or Priority flora species have previously been recorded or considered likely to occur within the DE (GHD 2009). It is unlikely that the native vegetation within the DE supports the existence of Threatened flora. **The proposed clearing is unlikely to be at variance with this Principle.**

Principle	Assessment
(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.	Desktop searches did not identify the presence of any TECs within a 10 km radius of the DE. The GHD (2009) survey did not recorded any vegetation representative of TECs. **The proposed clearing is not at variance with this Principle.**
(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.	Broad scale (1:100,000) pre-European vegetation mapping of the DE was completed by Beard (1977) at an association level. The DE intersects vegetation association 647. This association is well represented within the region with over 97.71% of its pre-European mapped extent remaining from the LGA to State level. Project clearing of up to 23.78 ha of native vegetation represents less than 0.014% of vegetation association 647 across the local, regional and State extent. **The proposed clearing is not at variance with this Principle.**
(f) Native vegetation should not be cleared if it is growing in or in association with a watercourse or wetland.	There are no wetlands or watercourses within the DE. There will be no clearing of any vegetation growing in, or in association with, a watercourse or wetland. **The proposed clearing is not at variance with this Principle.**
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	Whilst the Project will result in the loss of up to 23.78 ha native vegetation, the DE is historically disturbed and impacted by edge effects from adjacent development and infrastructure. The presence of tracks and weed species within the DE reflects the existing disturbance. The clearing of native vegetation may cause some land degradation, including dust and erosion. These impacts are expected to be minimal as the DE is entirely encompassed by roads and existing infrastructure, with proposed post clearing management measures associated with the works. **The proposed clearing is not likely to be at variance to this Principle.**
(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.	No conservation areas are located within the vicinity of the DE. The proposed clearing of native vegetation will impact on the environmental values of any conservation areas. **The proposed clearing is not at variance with this Principle.**
(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.	The DE is located within the Pilbara groundwater area and Pilbara surface water area, both proclaimed under the RIWI Act. The DE is not located within a PDWSA, an irrigation district, proclaimed river, or waterways management area. No wetlands of International Importance (Ramsar) or Nationally Important wetlands intersect the DE. The closest Nationally Important wetland, the Leslie Saltfields System, is located over 10 km from the NVCP area. Given the relatively flat landscape, proposed future land use (industrial), and proposed post clearing management measures, it is considered unlikely any clearing will significantly disturb or interrupt natural drainage and surface run-off patterns. **The proposed clearing is unlikely to be at variance with this Principle.**
(j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the intensity of flooding.	Based on climate data from the nearby BOM Port Hedland Airport (ID: 004032) weather station, located approximately 2.3 km south-east of the DE, the region receives an annual average rainfall of 317.7 millimetres (mm) with over half of the rain falling between January and March. The clearing of native vegetation may cause, or exacerbate, the incidence or intensity of short term flooding due to increased runoff in localised areas. However, high intensity rainfall events during the wet season can lead to flooding events across the region and the proposed clearing is not anticipated to exacerbate these.

Principle	Assessment
	At the completion of earthworks activities, erosion control fencing will be installed to limit the migration of soil during rain fall events. **The proposed clearing is unlikely to be at variance with this Principle.**

8.2 Stakeholder engagement

Regular and ongoing engagement with relevant stakeholders (e.g. Town of Port Headland and DBCA) and the local community regarding the proposed development is underway. This consultation is assisting to identify key issues and concerns to enable proactive management, keep stakeholders informed, and avoid any risk to the timely delivery of the Project.

DevelopmentWA have been in consultation with DBCA, regarding clearing activity in the Wedgefield Industrial Estate under sub-division approval and the revision of the VFMP. The updated VFMP has been submitted to the Town of Port Hedland for approval as part of the most recent sub-division approval.

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