

Clearing Assessment Report – CPS 818

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Western Australia.*

Bidyadanga Roads Improvement Project – Phase 1
Tip Access Road
Kimberley Region
EOS Number: 2375

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1 PROPOSAL

1.1 Purpose and Justification

The purpose of this Clearing Assessment Report (CAR) is to provide a report detailing the assessment of native vegetation clearing that is proposed to be undertaken using the Statewide Clearing Permit CPS 818 issued to Main Roads Western Australia (Main Roads).

The Shire of Broome has requested that Main Roads Kimberley Region upgrade the local roads within the Bidyadanga Community in Lagrange, Kimberley Region, Western Australia (WA) on numerous occasions in the past few years. Main Roads is currently proposing to upgrade and seal the Tip Access Road extending from Bidyadanga community to the landfill site south of the community (the Proposal). The Proposal is located approximately 200 km south-west of Broome townsite, within the Shire of Broome, Kimberley Region. The road has a low-lying 800 m section, requiring some fill, gravel and a potential culvert.

The CAR outlines the key activities associated with the Proposal, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the project using the ten Clearing Principles, and the strategies used to manage vegetation clearing.

1.1.1 Main Roads Approach to Road Safety and the Environment

Main Roads is committed to minimising the environmental impacts of all of its activities, and manages the State road network to achieve balanced economic, social, safety and environmental benefits for the community. Main Roads recognises that Western Australia's environment is significant from a global perspective and the unique conservation values that are contained within its road reserve. Main Roads road network often adjoins natural areas and, in some locations, the reserve itself hosts remnant vegetation with high environmental values. Although the reserves were not established for this purpose, Main Roads recognises that it has a responsibility to conserve the environmental values that occur within the State's road network and minimise the impact its proposals have on the environment. In addition to providing a safe and efficient road network for all people using the roads under its control, Main Roads is also committed to protecting and enhancing the natural environment.

In accordance with National and State Government road safety policies, Main Roads is also committed to substantially reducing road trauma on the road network through Safe System principles. The Safe System approach acknowledges that more than two thirds of all serious crashes are due to human error rather than deliberate risk taking (e.g. speeding or drink driving) and seeks to improve behaviour through education and enforcement while managing the safety of vehicles, speeds and the road and road infrastructure. It is shown that improving sub-optimal road formation will substantially reduce the likelihood and severity of road crashes. For example, according to the Road Safety Management Guideline, increasing the sealed shoulder from 0.5 m to 2 m will reduce Killed and Seriously Injured numbers by more than 50%.

As the statutory authority responsible for providing and managing a safe and efficient main road network in Western Australia, Main Roads focuses on improving road safety by thoroughly considering all environmental, economic and community benefits and impacts. It operates on a hierarchy of avoiding, minimising, reducing and then, if required, offsetting our environmental impacts. This has been achieved through changes in proposal scope and design. Main Roads

regularly reduces its clearing footprint by restricting earthworks limits for proposals, steepening batters, installing barriers, establishing borrow pits in cleared paddocks and avoiding temporary clearing for storage, stockpiles and turn around bays to avoid and minimise its impacts.

Further details on measures to avoid, minimise and reduce are provided in Section 1.5.

1.2 Proposal Scope

Kimberley Region has identified the requirement to upgrade and seal the Tip Access Road from Bidyadanga Aboriginal community to the landfill site south of the community. This unsealed road is currently subject to prolonged closures during the wet season. The road upgrade and associated works involve the following scope:

- Upgrade of the Tip Access Road including laydown/turnarounds, temporary diversion (side) track, culvert works and drainage upgrades
- Construction and temporary operation of a heavy haulage road (haul road option 2 has been chosen as the preferred haulage route)
- Construction and operation of a workers construction camp.

Material sources, including water, are subject to separate approvals and not part of the Proposal scope. The workers construction camp will be established in a previously cleared gravel pit. The workers construction camp already has CPS818 approval (refer EOS 1924) for any native vegetation clearing that may be necessary.

1.3 Proposal Location

The Proposal Area is located on Tip Access Road, within the Shire of Broome Local Government Authority as shown in Figure 1. The central coordinate of the proposal is [REDACTED] and [REDACTED].

1.4 Clearing Details

Proposed Clearing to be undertaken using CPS 818: Up to 25.1 hectares (ha) of native vegetation within a 33.36 ha Proposal Area.

Areas of Native Vegetation Clearing: The areas of native vegetation to be cleared are shown in Figure 2.

Type of Native Vegetation: Two vegetation types to be cleared under this Proposal were identified and described from the survey area including *Corymbia hamersleyana*, *Corymbia flavescens* and *Bauhinia cunninghamii* open woodland to isolated trees on red brown sandplain (VT01) and *Melaleuca nervosa* and *Acacia colei* var. *colei* open to scattered shrubland on pale brown sand clay low drainage flats (VT02) and are shown in Figure 2.



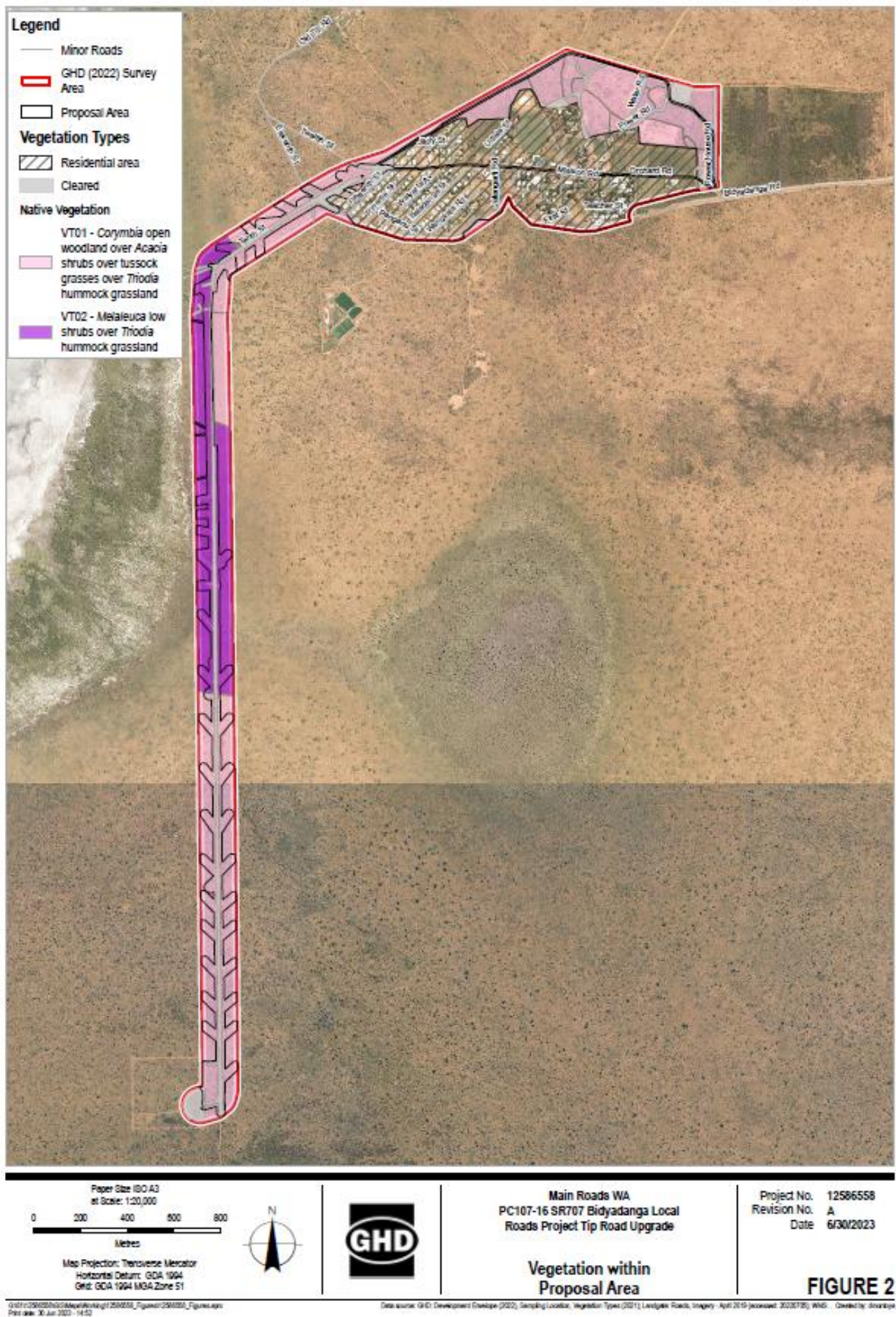


Figure 2. Vegetation within Proposal Area

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

The Proposal has been designed to reduce clearing to the minimum extent necessary to enable construction while achieving safety outcomes. The Proposal is located on an already existing road. Where possible, laydown and turnaround areas have been positioned in locations that are previously disturbed and degraded. Flexible offshoot drainage buffer extents have been incorporated to minimise potential impacts to any sites of heritage significance, large trees, cultural resources and to maximise the utilisation of existing drainage lines wherever possible.

1.6 Measures to Avoid, Minimise, Reduce and Manage Proposal Clearing Impacts

The design and management measures implemented to avoid and minimise the potential clearing impacts of the Proposal are provided in Table 1.

Table 1. Measures Undertaken to Avoid, Minimise, Reduce and Manage the Proposal Clearing Impacts

Design or Management Measure	Discussion and Justification
Alignment to one side of existing road	The Proposal is located on an already existing road that requires upgrading. The temporary sidetrack is located to one side of the road. The sidetrack footprint has been minimised as much as practicable and will be retained as the road clear zone once road upgrade works are completed.
Alternative alignment located within pasture or degraded areas	The Proposal follows the existing road and will result in removal of thin strips of vegetation adjacent to the existing road. Impact to adjacent native vegetation and environmental aspects has been minimised as much as possible.
Simplification of design to reduce number of lanes and/or complexity of intersections	The design has been simplified as much as practicable to minimise impacts to the environment and cultural heritage .
Steepen batter slopes	The design has sought to reduce earthworks as much as possible and to minimise earthworks (fill height/cut depth). The majority of the battering for road improvement has been restricted to existing cleared areas.
Installation of safety barriers	Clearing of vegetation and ground disturbance has been maintained within the existing disturbance footprint as much as possible. Safety barriers were not applicable to the design.
Installation of kerbing	Kerbing is not appropriate in this instance and location.
Use of existing cleared areas for access tracks, construction storage and stockpiling	Temporary access tracks, construction storage, and storage/stockpile locations have been contained within the Proposal Area, away from native vegetation as much as possible.
Drainage modification	The Proposal will improve drainage by replacing an existing culvert and widening to cater for the widened formation. Existing offshoot drains will be fully utilised and be improved to accommodate potentially larger drainage run-off due to the wider sealed area. The location of additional offshoot drainage will be strategically located to avoid vegetation clearing as much as possible.

1.7 Approved Policies and Planning Instruments

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act, Main Roads has also had regard to the below instruments where relevant.

Other Legislation potentially relevant for assessment of clearing and planning/other matters:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)
- *Rights in Water and Irrigation Act 1914*
- *Aboriginal Heritage Act 1972* (WA).

Environmental Protection Policies:

- Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992
- Environmental Protection (Western Swamp Tortoise Habitat) Policy 2011.

Other relevant policies and guidance documents:

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (Government of WA, December 2014)
- Procedure: Native vegetation clearing permits (Government of WA, October 2019)
- Environmental Offsets Guidelines (Government of Western Australia, 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities.
- Approved Recovery Plans for threatened species
- EPBC Act Referral guidelines for the three threatened black cockatoo species
- Strategic advice – EPA.

The Proposal does not require any land acquisition or modifications to land vesting, and as such a Development Application is not required to be obtained.

2 SCOPE AND METHODOLOGY OF CLEARING ASSESSMENT

Native vegetation will be cleared to accommodate this Proposal. This clearing will be undertaken using the Main Roads Statewide Clearing Permit CPS 818/16.

To comply with CPS 818/16, Main Roads must prepare a Clearing Assessment Report (CAR).

The CAR outlines the key activities associated with the Proposal, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the Proposal using the ten Clearing Principles listed under s51 of the *Environmental Protection Act 1986* (EP Act) and strategies used to manage vegetation clearing.

2.1 Report Terminology and Sources

The following terms are used in this Clearing Report:

- **Native Vegetation Clearing Area** – The maximum amount of native vegetation to be cleared for the Proposal that will accommodate the designed earthworks and, typically, a nominal buffer to allow for the safe movement of machinery during construction.
- **Proposal Area** – The total footprint of the Proposal including both cleared and uncleared areas, covering 33.36 ha.
- **Study Area** – Area covered by the Desktop Assessment. The Study Area for the Proposal is confined to a local area of a 40km radius surrounding the Survey Area.
- **Survey Area** – Area surveyed by GHD (2022) in April 2021, which covered an area of 151.78 ha and encompasses the entirety of the Proposal Area.

2.2 Desktop Assessment

A desktop assessment of the Survey Area was undertaken by viewing internal datasets and other government agency managed databases, and consulting with relevant stakeholders where necessary.

GIS layer viewing and mapping is done using ArcMap and/or Main Roads corporate mapping system known as iMaps. Referencing of the GIS layers accessed is done under the relevant methodology section of each clearing principle. Government managed databases were searched to locate additional information, which are found under References in Section 10.

2.3 Surveys and Assessments

GHD Pty Ltd (GHD) conducted a post-wet season single season detailed and targeted flora and vegetation survey and basic and targeted fauna survey April 2021. The GHD (2022) Survey Area covered an area of 151.78 ha which included the Proposal Area assessed in this report.

A summary of the methodology and the results of the above surveys are provided in Section 3.

3 SUMMARY OF SURVEYS

3.1 Overview of Surveys

Biological and targeted surveys conducted for the proposal are outlined in Table 2. A summary of the findings in these reports are presented in Sections 3.2.

Table 2. Summary of Biological and Targeted Surveys Relevant to the Proposal

Consultant & Survey Name	Survey Details
GHD (2022) Bidyadanga Local Roads Upgrade Flora and Fauna Survey	Survey Area: The GHD survey area comprised approximately 151.78 ha inclusive of the Proposal Area, and covered the Bidyadanga Road and Tenth Street intersection, located entirely within the Shire of Broome. Type: Post-wet season detailed and targeted flora and vegetation survey and basic and targeted fauna survey Timing: April 2021 Survey Results Shapefile TRIM Ref: D22#663317 Document TRIM Ref: D22#207130

3.2 Summary of Flora and Vegetation Surveys

The Survey Area contains a combination of native vegetation and highly disturbed areas (cleared areas for tracks and residential areas). Two vegetation types aligning with broad landforms were identified and described from the survey area including *Corymbia hamersleyana*, *Corymbia flavescens* and *Bauhinia cunninghamii* open woodland to isolated trees on red brown sandplain (VT01) and *Melaleuca nervosa* and *Acacia colei* var. *colei* open to scattered shrubland on pale brown sand clay low drainage flats (VT02).

No Threatened Ecological Communities (TECs) listed under the EPBC Act or BC Act or Priority Ecological Communities (PECs) listed by DBCA were identified within the Survey Area during the field survey. The Survey Area occurs within the buffer of the Kimberley Vegetation Association 37 and Roebuck Land System PECs (both Priority 3), however, neither PECs were recorded. The recorded vegetation types did not represent occurrences of these significant vegetation communities.

The condition of the vegetation within the Survey Area ranged from Excellent to Completely Degraded. The vegetation structure was intact with limited signs of cattle activity and low numbers of introduced flora were recorded in areas away from the community. Closer to the community, vegetation condition declined and was degraded. This included areas adjoining roads and tracks with signs of previous disturbance through clearing, soil movement and high introduced species cover.

Ninety-three flora taxa (including subspecies and varieties) representing 30 families and 66 genera were recorded from the survey area during the field survey. This total comprised 85 native taxa and eight introduced flora taxa.

Eight introduced/naturalised flora taxa were recorded in the Survey Area (GHD 2022) namely:

- **Aerva javanica* (Kapok Bush)
- **Azadirachta indica* (Neem)
- **Cenchrus ciliaris* (Buffel)
- **Chloris barbata* (Purpletop Chloris)
- **Citrullus amarus* (Citron melon)
- **Distimake dissectus* var. *dissectus* (Noon flower)
- **Stylosanthes hamata* (Verano Stylo)
- **Vachellia farnesiana* (Mimosa Bush).

None of the eight introduced/naturalised flora taxa identified during the survey are listed as a Declared Pest under the *Biosecurity and Management Act 2007* (BAM Act) or a Weed of National Significance (WoNS).

One listed flora species was recorded from the Survey Area; *Tephrosia andrewii* which is listed as Priority 3 by DBCA. This species has also been previously recorded nearby the Survey Area (Biota 2018). A total of two individuals were recorded from one location within VT01. However, this species was not recorded within the Proposal Area.

It is possible that the population of *Tephrosia andrewii* extends outside the Survey Area immediately to the north, in particular as the habitat is the same in this area. This species is considered to be poorly collected and there would be high likelihood of further unsurveyed populations outside the Survey Area in suitable habitat over the species distribution south of Broome.

The likelihood of occurrence assessment concluded that *Polymeria* sp. Broome (K.F. Kenneally 9759) (P3) and *Bonamia oblongifolia* (P3) are considered possible to occur. This is based on suitable habitat being present and nearby records from Biota (2018), however, there are no current vouchered specimens at the WA Herbarium for both taxa from the locality. Future disturbance events, such as fire, may allow recruitment from soil seed bank for these taxa. All other significant listed taxa are unlikely or highly unlikely to occur within the Survey Area.

Two broad fauna habitat types were described and mapped during the field survey. These comprise *Corymbia* open woodland over *Acacia* shrubs over tussock grasses over *Triodia* hummock grassland on red brown sandplain and *Melaleuca* low shrubs over *Triodia* hummock grassland on low flats on edge of drainage system. The Survey Area is part of a larger continuous area of *Corymbia* open woodland that extends throughout the surrounding area and intersects the edge of a drainage system habitat that extends to the east of the Survey Area to the coast. The habitats within the Survey Area have a high degree of habitat connectivity with surrounding vegetation having similar or better condition vegetation.

A total of 34 fauna species were recorded within the Survey Area, including 22 birds, five mammals and seven reptiles. No BC Act listed fauna or Priority listed fauna by the DBCA were recorded during the survey.

The Greater Bilby (EPBC Act and BC Act listed Vulnerable) has been previously recorded within the Survey Area (GHD 2022). This record is from 2015 and there is doubt over the accuracy of the coordinates as the record is within the community itself, however there are other records 0.3 km northwest of the survey (1899) and 1.6 km northwest (1983) of the Survey Area (GHD 2022). No evidence of Greater Bilby activity (footprints, foraging holes, burrows of scat) was recorded within the Survey Area. GHD (2022) conducted a likelihood of occurrence post-survey and concluded the Bilby is likely to occur in the Survey Area, based on previous records within and nearby the Survey Area and presence of suitable habitat.

The Rainbow Bee-eater (*Merops ornatus*), listed as a Marine species under the EPBC Act but not as a Migratory species, was recorded within the Survey Area. Grey Falcon (*Falco hypoleucos*) (EPBC Act and BC Act listed Vulnerable) and Peregrine Falcon (*Falco peregrinus*) (Other Specially (OS) Protected Fauna under the BC Act) are considered likely to occur. All other significant taxa are unlikely or highly unlikely to occur within the Survey Area.

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The vegetation proposed to be cleared is not considered to represent significant habitat necessary for the maintenance of significant fauna species. The fauna habitat types recorded within the Proposal Area are not exclusive to the Proposal Area and are well represented at a local and regional scale. Significant fauna species may infrequently visit the Survey Area and Proposal Area, however would unlikely be reliant on any of the habitat that occurs within the Survey or Proposal Areas. Given the thin, linear nature of the clearing required for the Proposal from substantially larger patches of contiguous vegetation, it is considered unlikely that the Proposal Area represents key habitat for any significant fauna species.

4 VEGETATION DETAILS

4.1 Proposal Site Vegetation Description

The Proposal Area is situated in the Northern Botanical Province of WA (Beard 1975), within the Dampierland bioregion and Pindanland sub-region as described by the Interim Biogeographic Regionalisation of Australia (IBRA).

The Dampierland bioregion is characterised by extensive plains, ranges and spectacular gorges. The vegetation is characterised by acacia thickets with scattered trees and areas of grasslands and savannas. The bioregion contains Aboriginal land, pastoral leases and some conservation reserves. The main industries are beef cattle, horticulture and tourism. Major population centres are Broome, Derby and Fitzroy Crossing.

The Pindanland sub-region is located in the western part of the Dampierland bioregion and is the coastal, northwestern margin of the Canning Basin. The sub-region encompasses the sandplains of the Dampier Peninsula and western part of Dampier Land, including the hinterland of Eighty Mile Beach. The vegetation within this semi-arid margin is described primarily as Pindan. Graham (2001) describes four basic components to the Pindanland sub-region:

- Quaternary sandplain overlying Jurassic and Mesozoic sandstones with Pindan, hummock grasslands on hills
- Quaternary marine deposits on coastal plains, with mangal, samphire – *Sporobolus* spp. Grasslands, *Melaleuca alsophila* low forests, and *Spinifex* spp. – *Crotalaria* spp. strand communities
- Quaternary alluvial plains associated with the Permian and Mesozoic sediments of Fitzroy Trough support tree savannas of ribbon grass (*Chrysopogon* spp.) – bluegrass (*Dichanthium* spp.) grasses with scattered coolabah (*Eucalyptus microtheca*) – *Bauhinia cunninghamii*
- Riparian forests of river red gum (*Eucalyptus camaldulensis*) and Cadejeput (*Melaleuca* spp.) fringe drainages.

The Proposal Area comprises 25.09 ha of native vegetation ranging from Degraded to Excellent condition, with 96.11% of the native vegetation in Good or better condition (Table 3). The variability of the native vegetation condition within the Proposal Area is a result of being close to the Bidyadanga community. The vegetation structure was intact with limited signs of cattle activity and low numbers of introduced flora were recorded in areas away from the community. Closer to the community, vegetation condition declined and was degraded. This included areas adjoining roads and tracks with signs of previous disturbance through clearing, soil movement and high introduced species cover. Some areas to the west of the tip access road were subject to a recent fire (0-2 years) with native species regenerating.

Table 3 provides details of the vegetation types and their condition within the Proposal Area and Table 4 details the remaining extents of the broadscale vegetation association that intersects the Proposal Area.

Table 3. Summary of Vegetation Types within Proposal Area

Vegetation Type	Extent within Proposal Area (ha)
VT01 - <i>Corymbia hamersleyana</i> , <i>Corymbia flavescens</i> and <i>Bauhinia cunninghamii</i> open woodland to isolated trees over <i>Grevillea pyramidalis</i> subsp. <i>pyramidalis</i> , <i>Grevillea eriostachya</i> and <i>Acacia colei</i> var. <i>colei</i> sparse shrubland over <i>Indigofera monophylla</i> , <i>Acacia arida</i> and <i>Acacia stellaticeps</i> shrubland over <i>Triodia epactia</i> and <i>Triodia schinzii</i> open hummock grassland over <i>Chrysopogon pallidus</i> and <i>Sorghum plumosum</i> open tussock grassland over <i>*Stylosanthes hamata</i> , <i>Indigofera linnaei</i> and <i>Calandrinia strophilata</i> sparse forblnd on red brown sandplain.	- Degraded: 0.65 ha - Good: 2.53 ha - Very Good: 0.29 ha - Excellent: 13.12 ha Total: 16.59 ha
VT02 - <i>Melaleuca nervosa</i> and <i>Acacia colei</i> var. <i>colei</i> open to scattered shrubland over <i>Pluchea tetranthera</i> , <i>Acacia stellaticeps</i> and <i>Corchorus incanus</i> subsp. <i>incanus</i> open shrubland over <i>Trianthema turgidifolium</i> chenopod open shrubland over <i>Eriachne obtusa</i> , <i>Panicum mindanaense</i> and <i>*Chloris barbata</i> open tussock grassland over <i>*Stylosanthes hamata</i> and <i>Calandrinia strophilata</i> open forblnd on pale brown sand clay low drainage flats.	- Degraded: 0.33 ha - Good: 0.63 ha - Excellent: 7.55 ha Total: 8.51 ha
Existing Cleared areas	8.26ha
Total Proposal Area	<u>33.36 ha</u>

Table 4. Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
Veg Assoc No. 699	Statewide WA	1,986,450.05	1,984,438.78	99.90	0.47
	IBRA Bioregion Dampierland	1,976,313.50	1,974,958.06	99.93	0.48
	IBRA Sub-region Pindanland	1,796,194.92	1,794,994.17	99.93	0.52
	Local Government Authority Shire of Broome	1,628,642.72	1,626,791.54	99.89	0.58

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the Proposal's proposed clearing is likely to have a significant impact on the environment, the Proposal was assessed against the ten Clearing Principles (EP Act, Schedule 5).

Each principle has been assessed in accordance with the former Department of Environment Regulation (now Department of Water and Environmental Regulation (DWER) '[A Guide to the Assessment of Applications to Clear Native Vegetation](#)' (Department of Environment Regulation, 2014) and other relevant clearing permit application decision reports prepared by DWER.

The proposed clearing is not likely to be at variance with the ten Clearing Principles.

(a) 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 and flora

The Proposal Area comprises 25.1 ha of native vegetation ranging from Degraded to Excellent condition, with 96.11% of the native vegetation in Good or better condition (GHD 2022).

Two vegetation types are mapped across the Proposal Area (GHD 2022):

- VT01 (16.59 ha) – *Corymbia hamersleyana*, *Corymbia flavesces* and *Bauhinia cunninghamii* open woodland to isolated trees on red brown sandplain
- VT02 (8.51 ha) - *Melaleuca nervosa* and *Acacia colei* var. *colei* open to scattered shrubland on pale brown sand clay low drainage flats.

Desktop searches (EPBC Act PMST and DBCA datasets) identified three State-listed Priority Ecological Communities (PECs) within the Study Area as follows:

- Roebuck Land System, DBCA listed Priority 3, described as "Paleo-tidal coastal plains and tidal flats with saline soil supporting salt-water couch grasslands, samphire low shrublands, melaleuca thickets and mangroves"
- Eighty Mile Land System, DBCA listed Priority 3, described as "Beach foredunes, longitudinal coastal dunes and sandy plains with tussock grasslands and spinifex grasslands"
- Kimberley Vegetation Association 37, DBCA listed Priority 3, described as "Shrublands; teatree thicket".

No vegetation representative of TECs listed under the EPBC Act or BC Act or PECs listed by DBCA were identified within the Survey Area or Proposal Area (GHD 2022).

The *NatureMap* database identified 170 flora taxa, representing 55 families and 106 genera previously recorded within Study Area. This total comprised 164 native flora taxa and six naturalised (introduced) flora taxa. Dominant families recorded included Fabaceae (36 taxa), Malvaceae (13 taxa) and Poaceae (nine taxa) (GHD 2022).

Ninety-three flora taxa (including subspecies and varieties) representing 33 families and 66 genera were recorded from the Survey Area during the field survey. This total comprised 85 native taxa and eight introduced flora taxa (GHD 2022).

Two individuals of *Tephrosia andrewii*, DBCA listed Priority 3 (P3) were recorded within the Survey Area from one location within VT01. The species was not recorded in the Proposal Area. This species is considered to be poorly collected and there would be high likelihood of further unsurveyed populations outside the Survey Area in suitable habitat over the species distribution south of Broome. The likelihood of occurrence assessment concluded that *Polymeria* sp. Broome (K.F. Kenneally 9759) and *Bonamia oblongifolia* (P3) are considered possible to occur (GHD 2022).

Eight introduced/naturalised flora taxa were recorded in the Survey Area (GHD 2022) namely:

- **Aerva javanica* (Kapok Bush)
- **Azadirachta indica* (Neem)
- **Cenchrus ciliaris* (Buffel)
- **Chloris barbata* (Purpletop Chloris)
- **Citrullus amarus* (Citron melon)
- **Distimake dissectus* var. *dissectus* (Noon flower)
- **Stylosanthes hamata* (Verano Stylo)
- **Vachellia farnesiana* (Mimosa Bush).

None of the eight introduced/naturalised flora taxa identified during the survey are listed as a Declared Pest under the BAM Act or a WoNS.

Fauna

Two broad fauna habitat types were described and mapped within the Survey Area (GHD 2022):

- *Corymbia* open woodland over *Acacia* shrubs over tussock grasses over *Triodia* hummock grassland on red brown sandplain (16.59 ha within Proposal Area)
- *Melaleuca* low shrubs over *Triodia* hummock grassland on low flats on edge of drainage system (8.51 ha within Proposal Area).

The fauna habitats of the Proposal Area are part of an extensive area of west Kimberley Region.

The *NatureMap* database identified 288 fauna species previously recorded within the Study Area. This total comprised 177 birds, 51 reptiles, 22 mammals, 3 amphibians, 3 invertebrates and 32 fish. Of the fauna species previously recorded, 285 were native species and three were naturalised (introduced) species (GHD 2022).

The EPBC Act PMST, NatureMap and DBCA database identified the presence/potential presence of 64 significant fauna species occurring within or in proximity of the Study Area (GHD 2022) as follows:

- 15 species listed as Threatened under the EPBC Act and/or the BC Act.
- One species listed as Other specifically protected fauna under the BC Act.
- 47 species listed as migratory (Terrestrial and Wetland) under the EPBC Act and/or as Migratory birds protected under an international agreement under the BC Act
- Seven species listed as Priority by DBCA
- One EPBC marine listed species (bird).

The majority of the species listed as Threatened or Migratory are either marine or wetland dependant shorebirds that are unlikely to occur within the Proposal Area due to lack of suitable habitat.

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A total of 34 fauna species were recorded within the Survey Area, including 22 birds, five mammals and seven reptiles (GHD 2022).

The likelihood of occurrence assessment conducted by GHD (2022) identified one species of significance as known to occur and three species of significance as likely to occur or utilise the habitats within the Proposal Area (GHD 2022). These are discussed further under Principle (b). Clearing of fauna habitat for the Proposal will not significantly impact conservation significant fauna.

Environmentally Sensitive Areas

The Proposal Area is not located within an Environmentally Sensitive Area (ESA). The nearest ESA is located approximately 33 km southwest of the Proposal Area.

Conservation Estates

The Proposal Area is not located within any conservation reserves or DBCA managed lands. The nearest DBCA managed lands are Jinmarnkur Conservation Park (located approximately 43 km south-west of the survey area) and Yawuru Nagulagun / Roebuck Bay Marine Park (located approximately 45 km north-east of the Proposal Area).

The native vegetation present within the Proposal Area does not comprise a high level of biodiversity. The Proposal involves clearing of up to 25.1 ha native vegetation which is well represented locally and regionally. The native vegetation does not support a high level of flora or fauna diversity, including for significant species. Although the majority of the vegetation (96.11%) is in Good or better condition, the adjacent vegetation is in similar or better condition to the Proposal Area.

Proposed clearing is not at variance to this Principle.

Methodology

- GHD (2022)
- DAWE (2022)
- Government GIS Shapefiles:
 - DBCA Legislated Lands and Waters (Accessed June 2023)
 - DWER Clearing Regulations – Environmentally Sensitive Areas (Accessed June 2023).

(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.

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

Assessment

Two broad fauna habitat types were described and mapped during the GHD (2022) survey. The fauna habitats within the Proposal Area comprise:

- *Corymbia* open woodland over *Acacia* shrubs over tussock grasses over *Triodia* hummock grassland on red brown sandplain (16.59 ha)
- *Melaleuca* low shrubs over *Triodia* hummock grassland on low flats on edge of drainage system (8.51 ha).

The NatureMap database identified 288 fauna species previously recorded within the Study Area (GHD 2022). This total comprised 177 birds, 51 reptiles, 22 mammals, 3 amphibians, 3 invertebrates and 32 fish. Of the fauna species previously recorded, 285 were native species and 3 were naturalised (introduced) species.

A total of 34 fauna species were recorded within the Survey Area, including 22 birds, five mammals and seven reptiles (GHD 2022).

The EPBC Act PMST, *NatureMap* and DBCA database identified the presence/potential presence of 64 significant fauna species occurring within or in proximity of the Study Area (GHD 2022). The desktop searches recorded the following:

- 15 species listed as Threatened under the EPBC Act and/or the BC Act.
- One species listed as Other specifically protected fauna under the BC Act.
- 47 species listed as migratory (Terrestrial and Wetland) under the EPBC Act and/or as Migratory birds protected under an international agreement under the BC Act
- Seven species listed as Priority by DBCA
- One EPBC marine listed species (bird).

No BC Act listed fauna or DBCA listed Priority fauna were recorded during the GHD (2022) survey. The Rainbow Bee-eater (*Merops ornatus*), listed as a Marine species under the EPBC Act was recorded within the Survey Area (GHD 2022).

The Greater Bilby (*Macrotis lagotis*), listed as Vulnerable under the EPBC Act and BC Act, has been previously recorded within the Survey Area (GHD 2022). This record is from 2015 and there is doubt over the accuracy of the co-ordinates as the record is within the community itself, however, there are other records 0.3 km northwest of the Survey Area (1899) and 1.6 km northwest (1983) of the Survey Area (GHD 2022). No evidence of Greater Bilby activity (footprints, foraging holes, burrows of scat) was recorded within the Survey Area (GHD 2022). The likelihood of occurrence post survey concluded that the Bilby is likely to occur in the Survey Area, based on previous records within and nearby the Survey Area and presence of suitable habitat (GHD 2022).

The Grey Falcon (*Falco hypoleucos*), listed as Vulnerable under the EPBC Act and BC Act, and Peregrine Falcon (*Falco peregrinus*), listed as OS Protected Fauna under the BC Act, are considered likely to occur in the Survey Area. All other significant taxa are unlikely or highly unlikely to occur within the Survey Area (GHD 2022).

Rainbow Bee-eater (*Merops ornatus*)

The Rainbow Bee-eater was recorded within the Survey Area from a sighting of two individuals. This species would utilise both habitats; *Corymbia* open woodland over *Acacia* shrubs over tussock grasses over *Triodia* hummock grassland on red brown sandplain and *Melaleuca* low shrubs over *Triodia* hummock grassland on low flats on edge of drainage system for foraging. This species is commonly recorded across Western Australia and is widespread and not considered restricted or rare. The Proposal Area comprises 25.09 ha suitable habitat for the Rainbow Bee-eater.

Greater Bilby (*Macrotis lagotis*)

The Greater Bilby (*Macrotis lagotis*) is considered to likely occur within the Survey Area, given presence of near-by records and suitable habitat. However, the likelihood of the species occurring

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is reduced due to the age of known records in the locality (1899 and 1983). The species would utilise *Corymbia* open woodland over *Acacia* shrubs over tussock grasses over *Triodia* hummock grassland on red brown sandplain and *Melaleuca* low shrubs over *Triodia* hummock grassland on low flats on edge of drainage system for foraging. No evidence of Greater Bilby activity (footprints, foraging holes, burrows or scat) was recorded within the Survey Area (GHD 2022). The Proposal Area comprises 25.1 ha suitable habitat for the Greater Bilby.

Grey Falcon (*Falco hypoleucos*)

The Grey Falcon is considered likely to occur in the Survey Area. The species is known to persist in the region, however use would be foraging only across both habitats with no breeding habitat present such as tall structures or trees. The Proposal Area comprises 25.1 ha foraging habitat for the Grey Falcon.

Peregrine Falcon (*Falco peregrinus*)

The Peregrine Falcon is considered likely to occur in the Survey Area. The species is known to persist in the region, however, would use both habitats for foraging only with no breeding habitat present, such as tall structures or steep topography. The Proposal Area comprises 25.1 ha foraging habitat for the Peregrine Falcon.

The Proposal Area is part of a larger continuous area of *Corymbia* open woodland that extends throughout the surrounding area. The habitats within the Proposal Area have a high degree of habitat connectivity with surrounding vegetation having similar or better condition vegetation.

The fauna habitats recorded within the Proposal Area are not exclusive to the area and are well represented at a local and regional scale. Significant fauna species may infrequently visit the Proposal Area, however, would unlikely be reliant on any of the habitat that occurs within the Proposal Area. Given the thin, linear nature of the clearing required for the Proposal from substantially larger patches of contiguous vegetation, it is considered unlikely that the Proposal Area represents key habitat for any significant fauna species.

The proposed clearing is not likely to be at variance to this Principle.

Methodology

- GHD (2022)
- DAWE (2022).

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

Proposal is not at variance to this Principle.

Assessment

Desktop searches of the EPBC Act PMST, *NatureMap*, DBCA TPFL and WAHERB databases did not identify the presence or potential presence of any Threatened flora from the Study Area. No Threatened flora were recorded in the Proposal Area or Survey Area (GHD 2022).

The Proposal is not at variance to this Principle.

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Methodology

- GHD (2022)
- DAWE (2022)
- Government GIS Shapefiles:
 - Threatened and Priority Flora (WA Herbarium and TPFL).

(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.
Proposed clearing is not at variance to this Principle.**Assessment**

No TECs listed under the EPBC Act or BC Act or PECs listed by DBCA were identified within the GHD (2022) survey.

The recorded vegetation types does not represent occurrences of any significant vegetation communities.

Proposed clearing is not at variance to this Principle.

Methodology

- GHD (2022)
- Government GIS Shapefiles:
 - Threatened and Priority Ecological Communities.

(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.
Proposed clearing is not at variance to this Principle.**Assessment**

The Proposal Area is located within vegetation association no. 699 of which over 99% of the pre-European extent of this association is present at a State, IBRA bioregion (Dampierland), IBRA sub-region (Pindanland) and Local Government Area (Shire of Broome) scale.

Proposal clearing will not significantly reduce the mapped extent or percentage remaining of vegetation association no. 699.

Summary of DE's Mapped Pre-European Vegetation Associations

Pre-European Association(s)	Vegetation	Clearing Description	Vegetation Condition	Comments
Vegetation Association 699 described as a Shrublands, pindan; <i>Acacia eripoda</i> shrubland with scattered low bloodwood (<i>Eucalyptus dicromophloia</i>) & <i>E.</i>		Clearing of up to 25.1 ha native vegetation to accommodate the Proposal.	Degraded to Excellent (GHD 2022).	Vegetation description and condition determined from the GHD (2022) survey.

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setosa over soft & curly spinifex on sandplain (GoWA 2019).

Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 699	Statewide: WA	1,986,450.05	1,984,438.78	99.90	0.47
	IBRA Bioregion: Dampierland	1,976,313.50	1,974,958.06	99.93	0.48
	IBRA Sub-region: Pindanland	1,796,194.92	1,794,994.17	99.93	0.52
	LGA: Shire of Broome	1,628,642.72	1,626,791.54	99.89	0.58

Native vegetation clearing to accommodate the Proposal is well represented and is not significant as a remnant of native vegetation in an area subject to extensive clearing.

Proposed clearing is not at variance to this Principle.

Methodology

- Aerial photography
- GHD (2022)
- Beard (1975)
- Government GIS shapefiles:
 - Pre-European vegetation (Accessed June 2023)
 - DPIRD Remnant Vegetation (Accessed June 2023).
- Statewide Vegetation Statistics (Government of Western Australia 2019).

(f) 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 Proposal Area is not located within and does not intersect (GoWA 2023):

- RAMSAR or Nationally Important Wetlands
- A surface water area that is proclaimed under the RIWI Act
- Any rivers, major streamlines or tributaries.

The closest Ramsar wetlands are Eighty Mile Beach (located approximately 40 km south-west of the Survey Area) and Roebuck Bay (located approximately 55 km north-east of the Survey Area). Both of which are also Wetland of National Importance.

The nearest proclaimed Surface Water Area is the Pilbara Surface Water Area, located approximately 140 km south of the Survey Area. Sections of the Proposal Area are located adjacent

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to tidal marsh areas that can become seasonally inundated with water, however GHD (2022) did not identify any wetlands or swamps in the Proposal Area.

No riparian vegetation was mapped within the Survey Area or Proposal Area (GHD 2022). The Survey Area is part of a larger continuous area of *Corymbia* open woodland that extends throughout the surrounding area and intersects the edge of a drainage system habitat that extends to the west of the Survey Area to the coast. VT02 was recorded growing in association of a drainage flats but is not considered riparian vegetation.

The Proposal does not require clearing of native vegetation growing in association with a watercourse or wetland. Proposed clearing is not at variance to this Principle.

Methodology

- GHD (2022)
- Government GIS shapefiles:
 - Geomorphic Wetlands (Accessed June 2023)
 - Ramsar Wetlands (Accessed June 2023)
 - Important Wetlands (Accessed June 2023)
 - Watercourses (Accessed June 2023)
 - RIWI Act Rivers (Accessed June 2023).

(g) 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

The Survey Area is located within the Nita Sandplain Zone of the Canning Province. This zone is characterised by sandplains and dunes on Cretaceous Canning Basin sedimentary rocks. Soils include red deep sands with some red sandy earths (Tille 2006).

The Proposal Area is located within the Yeeda land System described as sandplain, deep red and yellow sands, pindan and tall woodlands (GoWA 2023). The underlying bedrock geology within the Proposal Area is described as fine to coarse grained sandstone and minor granule conglomerate (GoWA 2023).

Within the Proposal Area, two soil types occur (based on best available mapping, GoWA 2023):

- 117Ye – Red sandplains supporting pindan vegetation with dense acacia shrubs, scattered bloodwood and grey box trees and curly spinifex ribbon grass
- 113Ye - Red sandplains supporting pindan vegetation with dense acacia shrubs, scattered bloodwood and grey box trees and curly spinifex ribbon grass.

The Proposal is unlikely to alter drainage regimes or hydrology within the vicinity of the Proposal Area. Surface water management measures will be implemented as part of the Proposal design to maintain drainage and existing flow lines consistent with the existing Tip Access Road.

Given the linear nature of the clearing and that the road/s will be sealed upon completion, the proposed clearing is not likely to lead to an appreciable increase in land degradation, through erosion and sedimentation, to surrounding areas.

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Standard erosion and dust management control measures will be implemented during construction to reduce the incidence of erosion, sedimentation, flooding and the potential for land degradation.

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

Methodology

- GHD (2022)
- Government GIS Shapefiles:
 - Soil landscape Mapping – Systems
 - 1:500 000 State interpreted bedrock geology.

(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.

Proposed clearing is not at variance to this Principle.

Assessment

The Proposal Area is not located within any conservation reserves or DBCA managed lands. The nearest DBCA managed lands are Jinmarnkur Conservation Park (located approximately 43 km south-west of the survey area) and Yawuru Nagulagun / Roebuck Bay Marine Park (located approximately 45 km north-east of the Survey Area).

Given the distance from any nature reserves, no impact to conservation reserves or DBCA managed lands will occur as a result of the Proposal.

The proposed clearing is not at variance to this Principle.

Methodology

- GHD (2022)
- Government GIS Shapefiles:
 - DBCA Legislated Lands and Waters (Accessed June 2023)
 - DBCA Lands of Interest (Accessed June 2023).

(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.

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

Assessment

The Proposal Area is located within the Canning-Kimberley groundwater area which is proclaimed under the RIWI Act.

The Proposal Area is not located within any Public Drinking Water Source Areas (PDWSAs). The Proposal is unlikely to involve dewatering, drawing water from an existing bore or surface water body or installation of a new or alteration of an existing water bore.

The Proposal Area is not located within a surface water area proclaimed under the RIWI Act, nor does it intersect any watercourses. There are no notable inland water features within 50 km of the Proposal Area. The potential for contamination of surface water features to occur during clearing

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for the Proposal due to the accidental release of hazardous materials, runoff and from contaminated sediments or dust is negligible.

Clearing associated with the Proposal is unlikely to cause deterioration in the quality of surface and/or underground water.

The Proposal is not likely to be at variance to this Principle.

Methodology

- GHD (2022)
- Government GIS Shapefiles:
 - Public Drinking Water Source Areas (Accessed June 2023)
 - RIWI Act, Surface Water Areas and Irrigation Districts (Accessed June 2023)
 - RIWI Act, Groundwater Areas (Accessed June 2023)
 - Hydrography Linear (Hierarchy) (Accessed June 2023).

(j) 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 likely to be at variance to this Principle.

Assessment

The Tip Access Road is prone to flooding during the wet season, and so has a high risk of flooding and water erosion. Surface water management measures will be implemented as part of Proposal design to maintain existing drainage in the area and to avoid impact to adjacent native vegetation through waterlogging.

Road runoff and storm water will be managed via the Construction Environment Management Plan (CEMP) with the objective of maintaining local hydrological regimes through enabling infiltration close to the point of collection. Construction of the Proposal will be undertaken during the dry season to remove the risk of flooding and inundation.

Given that the proposed clearing constitutes removal of a linear strip of vegetation from the edges of substantially larger remnant patches, it is unlikely the clearing will result in any changes to the local incidence or intensity of flooding.

The proposed clearing is not likely to be at variance to this Principle.

Methodology

- Government GIS Shapefiles:
 - RIWI Act, Surface Water Areas and Irrigation Districts (Accessed June 2023)
 - RIWI Act, Groundwater Areas (Accessed June 2023).

6 VEGETATION MANAGEMENT

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided then this clearing is kept to a minimum.

7 REHABILITATION, REVEGETATION & OFFSETS

7.1 Revegetation and Rehabilitation

No temporary clearing will be undertaken as part of the Proposal activities.

7.2 Offset Proposal

No offset proposal is required as the proposed clearing will not result in significant residual impacts to native vegetation within the region.

8 STAKEHOLDER CONSULTATION

Main Roads has undertaken stakeholder consultation in accordance with CPS 818 Condition 8, with members of the Bidyadanga community and Shire of Broome regarding the Proposal. These stakeholders support the Proposal.

9 COMPLIANCE WITH CPS 818

Table 5 summarises what further pre-clearing impact assessment is required in accordance with CPS 818.

Table 5. Summary of Additional Management Actions Required by CPS 818

Impact of Clearing	Yes/No or NA	Further Action Required
1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.	No	No further action required.
2. Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality <u>or</u> (j) the incidence of flooding.	No	No further action required.
3. Clearing is at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality <u>and</u> (j) the incidence of flooding.	No	No further action required.
4. The Proposal involves clearing for temporary works (as defined by CPS 818).	No	No further action required.
5a. Proposal is within a Region that: - has rainfall greater than 400mm; and, - is South of the 26th parallel; and, - works are necessary in 'Other than dry conditions'; and, - works have potential for uninfested areas to be impacted.	No	Proceed with standard Vehicle and Plant management actions from PEMR's and Vehicle and Plant Hygiene Checklists
5b. Do the proposed works require clearing within or adjacent to DBCA managed lands in non-dry conditions?	No	No further action required.
6. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback.	No	No further action required.
7. Weeds are likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.	No	No further action required.
8. Did an environmental specialist conduct the survey or field assessment?	Yes	The Environmental Specialist undertaking the biological assessments was suitably qualified and had more than thirteen years' experience.

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Impact of Clearing	Yes/No or NA	Further Action Required
9. Did an environmental specialist prepare the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal?	Yes	The Environmental Specialist preparing the Assessment Report and any other associated documentation was suitably qualified and had more than three years' experience.

10 REFERENCES

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11 APPENDICES

Appendix 1: DBCA Threatened Flora and Fauna Database Searches

