# BHP NICKEL WEST
# KWINANA-BALDIVIS

## Strategic Native Vegetation Clearing Permit (NVCP) Application

## Supporting Information, October 2020

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# 1. Introduction

BHP Billiton Nickel West Pty Ltd (BHP NiW) is a fully integrated mine to market nickel business. All nickel operations, including open-cut and underground mines, concentrators, a smelter and a refinery, are located in Western Australia. Nickel concentrate from BHP NiW Northern Operations is transported to the Kalgoorlie smelter, which uses a flash furnace to smelt concentrate to produce nickel matte. The Kwinana Nickel Refinery then refines granulated nickel matte from the Kalgoorlie smelter into premium-grade nickel products, including powder and briquettes containing 99.8 per cent (%) nickel.

Nickel products are primarily exported to overseas markets via the Port of Fremantle. Over 75% of BHP NiW's nickel is now sold to global battery material suppliers. A nickel sulphate plant is currently under construction at the Kwinana Nickel Refinery that will produce nickel sulphate, a product used in the lithium-ion batteries that power electric vehicles.

Nickel West Kwinana (NKW) is located approximately 30 km south of Perth in the Kwinana Industrial Precinct (Figure 1). The site has been used as a nickel refinery since 1970. A number of intermediate products with commercial value, including copper sulphide, cobalt-nickel sulphide and ammonium sulphate are also produced. Prior to 1995, effluent/tailings material was also generated from the refining process and was piped to evaporation ponds at the nearby Baldivis tailings storage facility (TSF). The Baldivis site is currently undergoing rehabilitation.

NKW achieves effective environmental management across its operations through the implementation of an Environmental Management System (EMS) certified to ISO14001. The EMS provides the framework for ensuring NKW activities meet applicable legislative and other obligations and are conducted in a manner consistent with the BHP intent of Our Purpose and Charter, Our Approach, Our Requirements and with ISO14001.

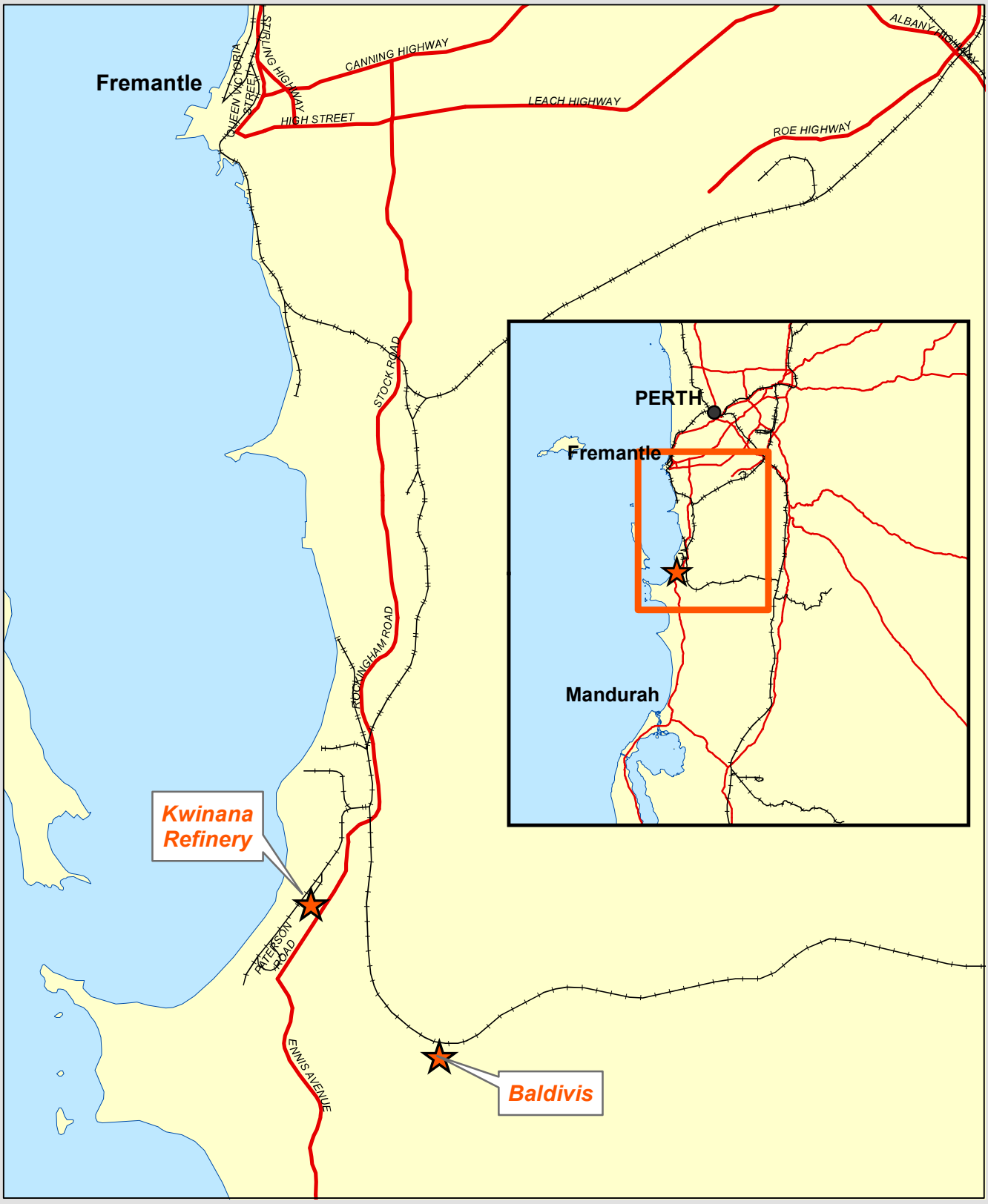
# 2. Purpose of Document

BHP NiW has identified value in obtaining a strategic Native Vegetation Clearing Permit (NVCP) to cover all future clearing activities across its Kwinana-Baldivis operations, rather than holding or applying for numerous NVCPs with varying conditions, compliance and reporting requirements, and durations. This proposed application area includes the NKW refinery site, Baldivis TSF, associated pipelines and recovery bores (Figure 2). Excluded is the suite of ground water monitoring bores within Leda Nature Reserve, as access and maintenance clearing is through arrangement with the land manager, the Department of Biodiversity, Conservation and Attractions (DBCA).

Almost the entire Strategic NVCP (SNVCP) application area is a mapped Environmentally Sensitive Area (ESA) (Department of Water and Environmental Regulation (DWER) 2020) (Figure 2) due to the mapped buffer area of threatened ecological communities (TECs) and wetlands (Lake Cooloongup). Therefore no clearing can be undertaken under clearing exemptions provisions of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. This means that even small and incidental clearing to respond to operational needs, or urgent clearing requirements cannot be undertaken under exemption and must go through the clearing permit application process, which adds significant timeframes to projects and/or operational needs. The preferred outcome for BHP NiW to hold one overarching clearing permit for its Kwinana-Baldivis operations to improve timeframes, reporting and compliance outcomes.

This document provides supporting information to accompany DWER Application Form *C2: Application for a clearing permit (purpose permit)* (Appendix 1).

A SNVCP (CPS 8877/1) has been lodged (with Department of Mines, Industry Regulation and Safety (DMIRS)) for BHP NiW's Northern Operations (Leinster, Mt Keith, and associated operations) and is currently under assessment. This Strategic NVCP application has been submitted to DWER as Kwinana-Baldivis operations are located on freehold and leasehold land, rather than mining tenure.

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Kilometres

Location Map


BHP

Kwinana Nickel Refinery
Nickel West

# Kwinana - Baldivis Strategic NVCP Location

Coordinate System: GDA 1994 MGA Zone 50

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# 3. Location and Tenure

The SNVCP area is 157.05 ha in total area and is provided as ArcGIS shape files (Appendix 2). The SNVCP application area consists of 46 land parcels, which includes both freehold land owned by BHP NiW or Lots under lease or access licence arrangements (Appendix 3).

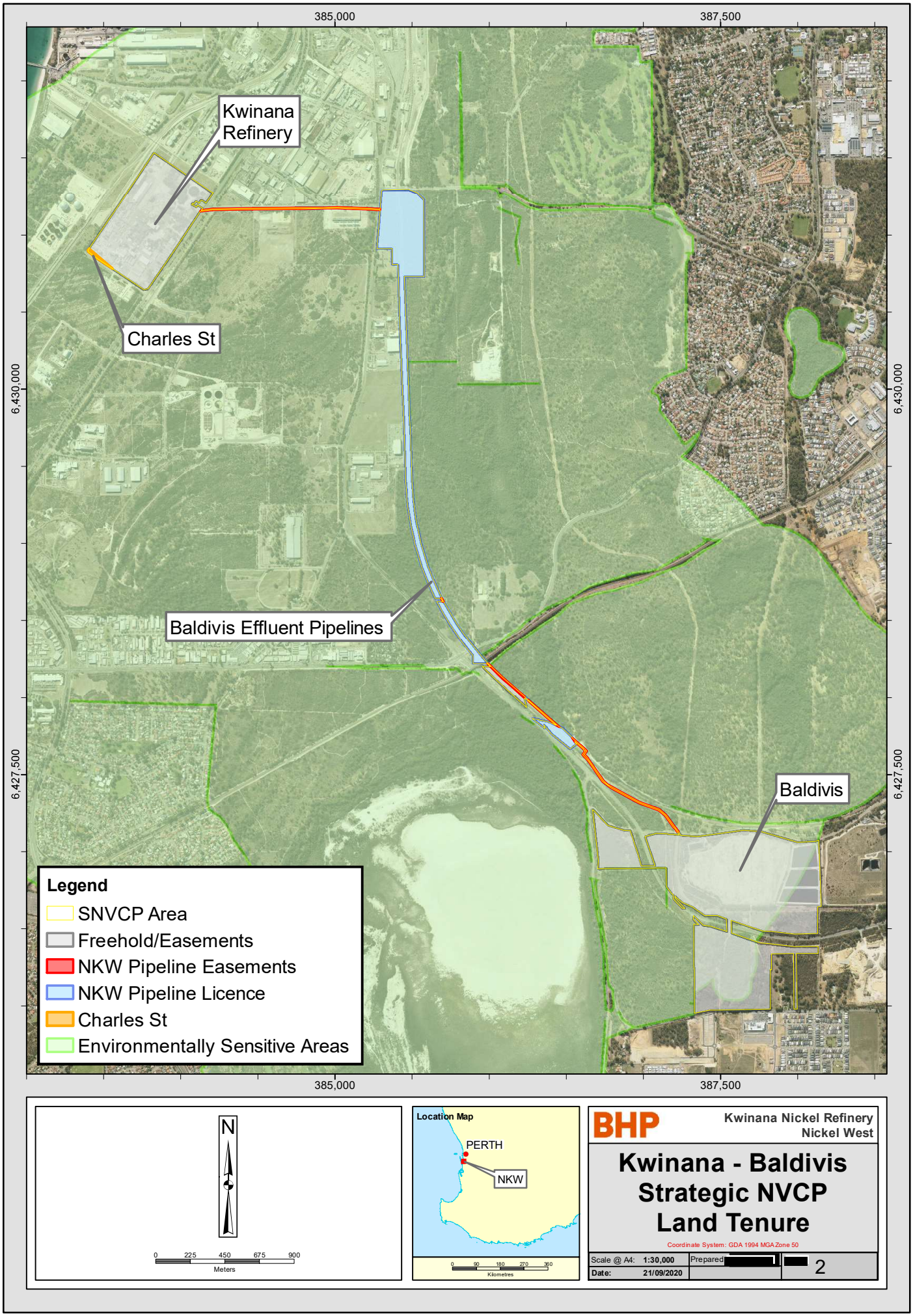
The application area includes the refinery site at 270 Patterson Road, East Rockingham (with the addition of the soon to be amalgamated Charles Street road reserve); the Baldivis TSF (Kulija Rd, Baldivis); and the associated pipelines and recovery bores (Figure 2) all within the administrative boundaries of the City of Rockingham and the City of Kwinana.

# 4. Proponent

The proponent for the SNVCP application is BHP Billiton Nickel West Pty Ltd, and the contact details are provided in Table 1.

**Table 1 BHP Nickel West Contact Details**

| Contact | Nickel West Details |
|---|---|
| **Address for Correspondence** | [redacted] |
| **Contact (Perth Office)** | |
| **Site Contact** | |

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# 5. Proposed Activities

The two areas under this application varying in current use and context. Kwinana is wholly within an industrial context and has only highly degraded (previously cleared) remnants of vegetation remaining, while Baldivis has lots that are either wholly cleared with remediated use (former tailings storage), or are intact remnant vegetation. Therefore the proposed clearing purpose (activities) include:

1) **Kwinana** - To facilitate processing, maintenance, access and associated facilities development within Kwinana and associated pipelines;

2) **Baldivis** - Maintenance for access and bores within Baldivis lots. No new project associated clearing is proposed.

The SNVCP application area is 157.05 ha; of which 52.55 ha is mapped as containing remnant vegetation (Department of Primary Industries and Regional Development 2020) in varying condition from degraded (pipelines for example) to excellent (Baldvis lots adjacent to Lake Cooloongup). The application is for clearing of up to 10 ha over a 20 year period.

## 5.1 Existing Clearing Permits

BHP NiW currently holds three NVCPs for NKW (Table 2); CPS 3704 and CPS 8285 are associated with pipelines that feed into the refinery, while CPS 8462 is within NKW itself and was a permit to develop new storage tanks. The intent is to surrender these permits once the SNVCP is approved.

**Table 2 Current Kwinana-Baldivis NVCPs**

| | CPS # and version | Purpose | Approved Clearing Area (ha) | Area Cleared (ha) | Remaining | Dates |
|---|---|---|---|---|---|---|
| 1 | 3704/2 | Pipeline replacement | 1.000 | >1 | NA | Recently expired |
| 2 | 8285/1 | Extension of Water Corporation scheme water network | 0.031 | >0.03 | NA | 18/3/2019 to 18/3/2024 |
| 3 | 8462/1 | Constructing effluent storage tanks, access and laydown areas | 2.500 | >0.5 | 2 | 9/7/2019 to 9/7/2021 |

A number of pipelines run into NKW Refinery and between NKW and the Baldivis TSF; these pipelines are either entirely devoid of native vegetation (pipelines entering NKW from the north) or contain patchy, degraded native vegetation (Department of Primary Industries and Regional Development 2020) that may require maintenance over the coming years for access and servicing of the pipeline.

## 5.2 Other Approvals

Ministerial Statement 377 for the Baldivis tailings pond rehabilitation project and effluent management system upgrade was approved 19 January 1995. Other approvals relevant to Kwinana and Baldivis are provided in Table 3.

**Table 3 Key relevant licences and approvals**

| Legislation | Approval # | Expiry | Details |
|---|---|---|---|
| *Environmental Protection Act 1986* (Part V) | W6117/2018/1 | 12/07/2021 | Works Approval authorising construction and commissioning of a Powder Leach Nickel Sulphate Plant on the southern portion of NKW Refinery |
| | W6275/2019/1 | 24/09/2025 | Works Approval authorising construction of debottlenecking project within NKW Refinery |
| | L8437/2010/3 | 30/10/2021 | Licence to undertake prescribed activities, i.e. Nickel Refining, with conditions regulating emissions and discharges from the NKW Refinery (includes Baldivis) |
| *Rights in Water and Irrigation Act 1914* (RIWI Act) Section 5C | GWL64889(6) | 20/03/2023 | Authorises groundwater recovery for environmental purposes from the Baldivis TSF. Maximum abstraction of up to 100,000 kL pa |
| | GWL95474(6) | 20/03/2023 | Authorises groundwater recovery for industrial purposes from the Refinery. |

| | | | |
|---|---|---|---|
| | | | Maximum abstraction of up to 100,000 kL pa |
| *Planning and Development Act 2005*. City of Rockingham Local Planning Scheme 2 | DAP/18/01362 | 30/05/2020 | Approval authorising extension of the Refinery, namely construction of the a Powder Leach Nickel Sulphate Plant |
| *Dangerous Goods Safety Act 2004* | DGS000169 | 31/03/2022 | Licence to store Dangerous Goods at the Refinery. Site is classed as a Major Hazard Facility |

# 6. Proposed NVCP Instruments

BHP NiW commits to undertake clearing activities in accordance with the content and commitments of Table 4.

The proposed SNVCP area is the extent of the tenure in Appendix 3, shown in Figure 2, and provided as spatial files in Appendix 2.

**Table 4 Proposed Strategic NVCP content and commitments**

| **Proposed Content** | |
|---|---|
| Authorising agency | Department of Water and Environmental Regulation |
| Permit title | BHP Nickel West Kwinana Strategic NVCP |
| Area of clearing | Up to 10 ha (over 10 year permit period) |
| Application area | 157.05 ha |
| Purpose of clearing | Minerals processing, site infrastructure, maintenance and associated activities |
| Tenure | Refer Appendices 2 and 3 |
| Duration of permit | 2020 - 2040 |
| Proposed annual reporting date | 30 June 2021 |
| Proposed final reporting date | 30 June 2041 |
| **Proposed Commitments** | |
| Any proposed ground disturbing activity | BHP NiW has an internal permit to disturb process " Environmental & Heritage Impact Assessment" (EHIA) that ensures all requisite approvals and surveys are in place prior to internal approval and activity to proceed |
| Native vegetation | Clearing is minimised at every occasion<br>The mitigation hierarchy (avoid, minimise, mitigate and revegetate) is utilised prior to any proposed clearing; biological survey information and data is complete for the site and will be utilised to inform any proposed clearing<br>Any clearing will be informed by pre-clearing biological surveys (within a 5 year period of clearing) to inform clearing area and refrain from clearing high value vegetation |
| Threatened/Priority flora | None presently known; pre-clearing surveys* to inform |
| TEC/PECs | None presently known; pre-clearing surveys* to inform |
| Conservation listed fauna | Mature trees present foraging habitat for threatened species of black cockatoos; no trees contain currently useable hollows; any utilisation of the SNVCP will seek to avoid tree removal unless necessary |
| Riparian vegetation | Not applicable, none present |
| Temporary clearing | All temporary areas of clearing are progressively rehabilitated within six months of that area no longer being required |
| Soil & land conservation | All topsoil as a result of clearing activities will be stockpiled and reused for landscaping/rehabilitation where practicable<br>Clearing and topsoil to be managed in accordance with BHP NiW Topsoil Stripping and Handling Procedure (NIW-HSEC-PRO-0035) |

| | |
|---|---|
| | Clearing will not occur more than two months ahead of planned ground disturbance/use |

**Pre-clearing surveys - denotes areas where biological survey has not been undertaken for that factor (flora, fauna, ecological communities) within the five (5) years prior to clearing.*

## 6.1 Legislative requirements and associated approvals

Clearing and associated activities at Kwinana-Baldivis will maintain compliance with State and Commonwealth legislation, including but not limited to:

- *Aboriginal Heritage Act 1972*
- *Biodiversity Conservation Act 2016*
- *Contaminated Sites Act 2003*
- *Environment and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act)
- *Environmental Protection Act 1986* (EP Act)
- *Planning and Development Act 2005*
- *Rights in Water Act 1914.*

Any proposed clearing within areas of intact vegetation (in particular, Baldivis Lots) will be reviewed against the EPBC Act Significant Impact Guidelines (Department of the Environment 2013) to understand the potential requirement for referral under the EPBC Act.

Any other relevant additional approvals will be sought as required. BHP NiW has environmental and heritage procedures (EHIA) and internal approvals are in place prior to any clearing and/or ground disturbance, illustrated in Figure 3.

# BHP Nickel West : Pre-Ground Disturbance Process Flow

Any change in proposed design or activity will trigger review of due diligence and recommencement of this process flow

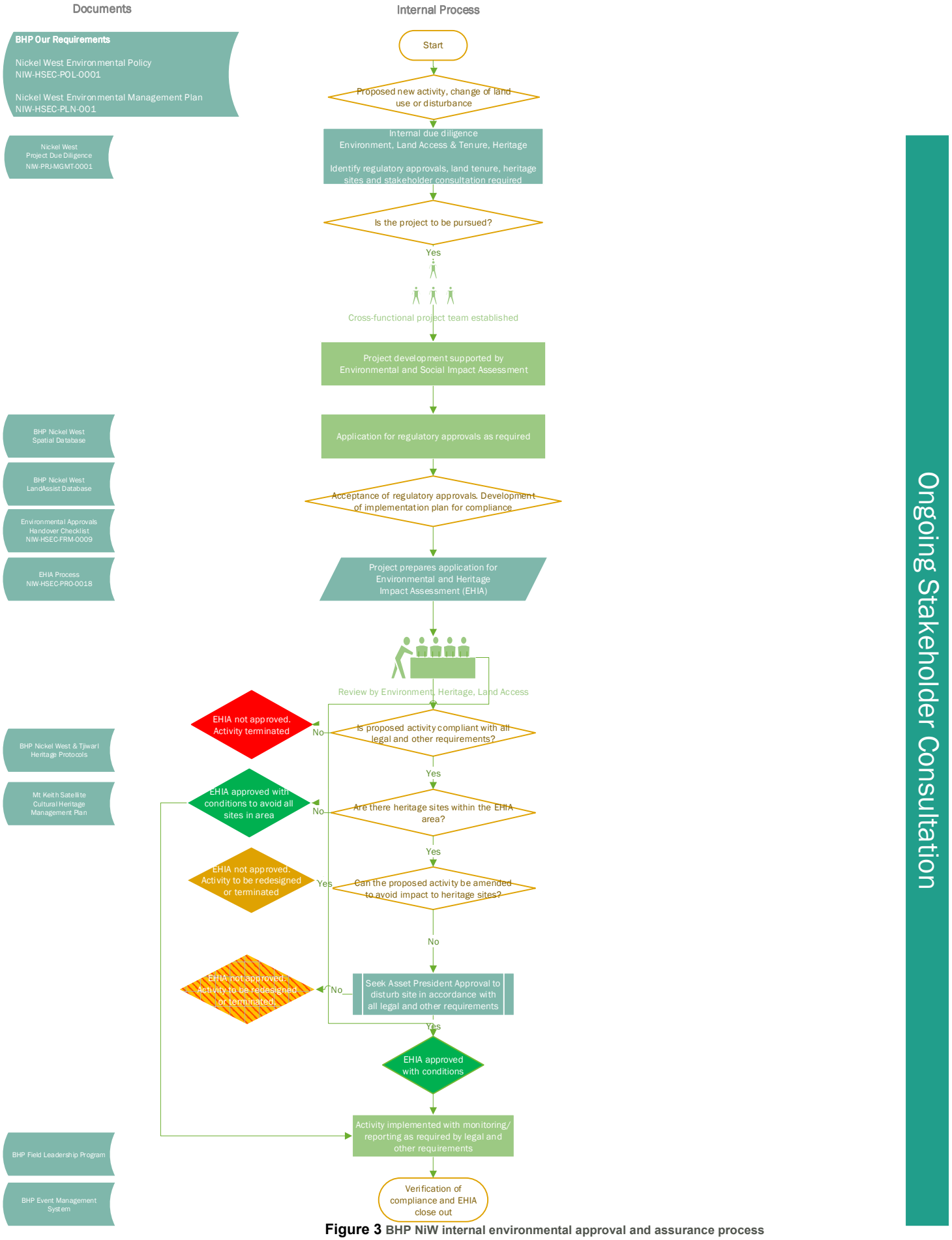



**Figure 3** BHP NiW internal environmental approval and assurance process

# 7. Existing Environment

## 7.1 Climate

The SNVCP application area is within the Towns of Rockingham and Kwinana with a Mediterranean climate of winter rainfall and warm summers. The long-term annual rainfall is ~600 millimetres (mm) per annum with the majority (approximately 76%) falling during the cooler months of May to September (Figure 4) (BoM, 2020). The hottest months occur between January and March with temperatures regularly exceeding 30°C. The coolest months occur between June and August, with temperatures consistently below 10°C (Figure 4) (Bureau of Meteorology (BoM) 2020).

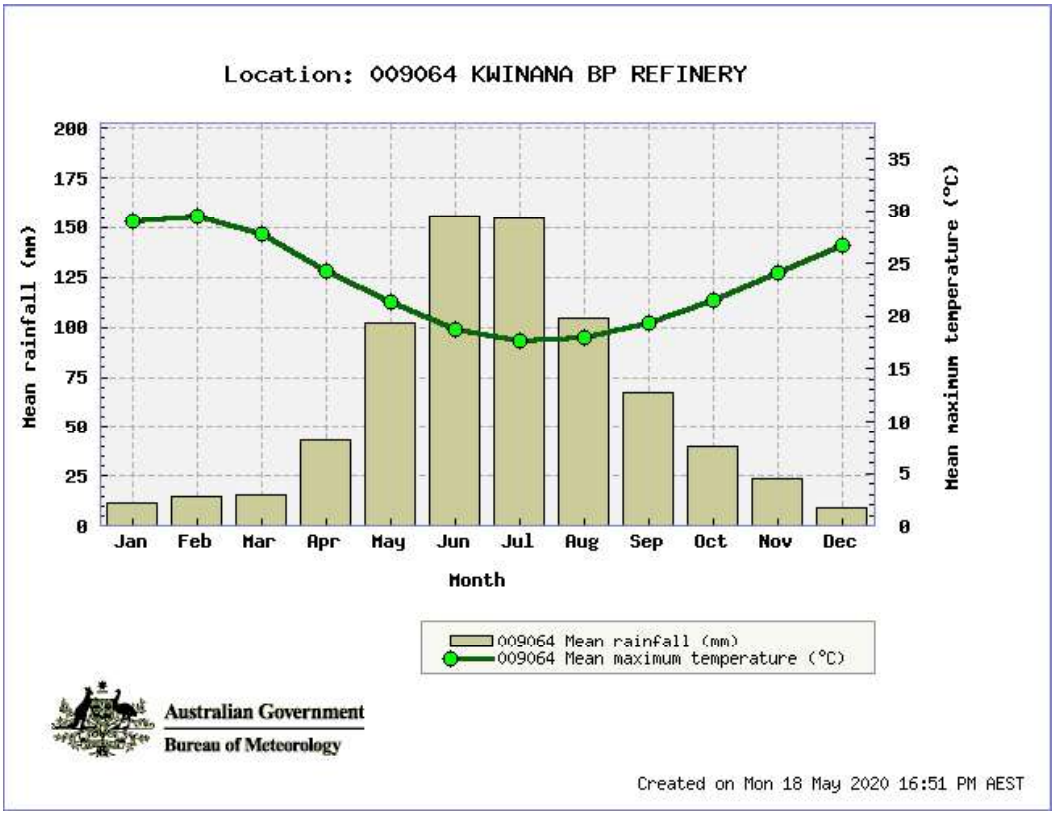
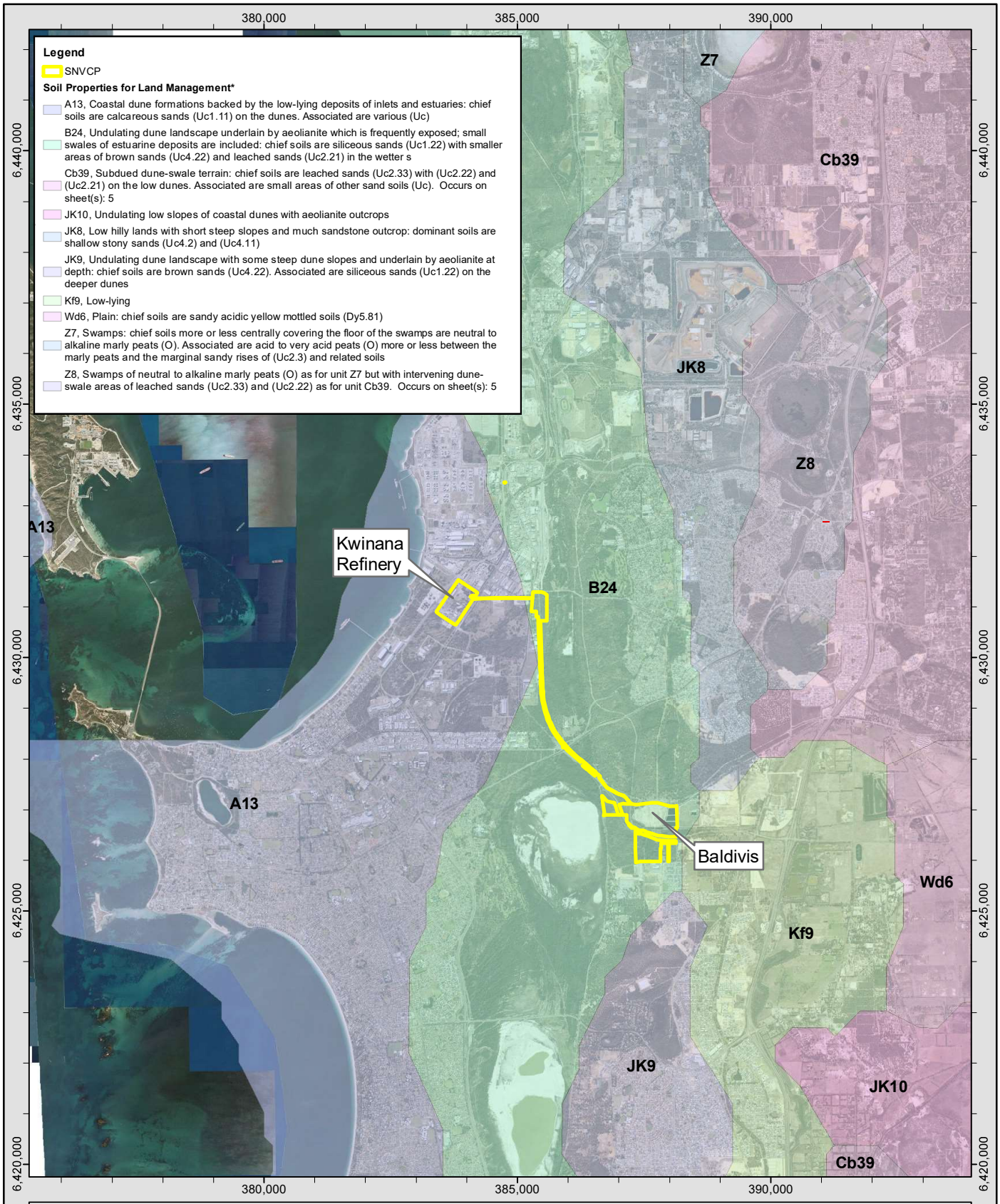



**Figure 4 Long term climate averages for Kwinana (BoM 2020)**

## 7.2 Landforms and soil types

The Swan Coastal Plain is divided into five primary geomorphic units; the Ridge Hill Shelf, the Pinjarra Plain, and three dune systems comprising of the Bassendean Dunes to the east, bordering the Pinjarra Plain, the Spearwood Dunes in the middle and the Quindalup Dunes adjacent to the coast in the west (McArthur & Bettenay 1974). NKW is located within the Quindalup Dunes landforms of the Swan Coastal Plain, which consists of calcareous sand, generally unconsolidated and often exhibiting a linear arrangement parallel to the present coastline (McArthur & Bettenay 1974).

One soil system (Figure 5) occurs across NKW described by the Atlas of Australian Soils (ASRIS) (Northcote et al, 1960-1968): coastal dune formations backed by the low-lying deposits of inlets and estuaries. The chief soils are calcareous sands on dunes.




* Soil data source: CSIRO Atlas of Soils (BRS 1999)

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Kilometres

Location Map

KALGOORLIE
PERTH
NKW

0 125 250 375 500
Kilometres

BHP

Kwinana Nickel Refinery
Nickel West

# Kwinana - Baldivis Strategic NVCP Soils

Coordinate System: GDA 1994 MGA Zone 50

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## 7.3 Surface and groundwater

### Hydrogeology

The groundwater aquifer located below Kwinana-Baldivis is a shallow aquifer of surficial sediments (DWER 2020b). The lithology consists of limestone and calcrete. The age of the geology is Quaternary and is not considered to be a confined aquifer. Depth to groundwater is approximately 3 m below the natural surface, with the base of the aquifer approximately 29 m below the natural surface (DWER 2020b).

### Wetlands

The Geomorphic Wetlands Swan Coastal Plain dataset displays the location, boundary, geomorphic classification (wetland type) and management category of wetlands on the SCP, mapped at a scale of 1:25,000 (originally captured by Hill et al., 1996). Three wetland management categories based on ecological, hydrological and geomorphological significant factors have been designated, these being:

- Conservation Category (CC) – wetlands that support a high level of ecological attributes and functions (generally having intact vegetation and natural hydrological processes), or that have a reasonable level of functionality and are representative of wetland types that are rare or poorly protected.
- Resource Enhancement (RE) – wetlands that have been modified (degraded) but still support substantial ecological attributes (wetland dependant vegetation covering more than 10%) and functions (hydrological properties that support wetland dependent vegetation and associated fauna), and have some potential to be restored to the Conservation management category. Typically, such wetlands still support some elements of the original native vegetation, and hydrological function.
- Multiple Use (MU) – wetlands that are assessed as possessing few remaining ecological attributes and functions. While such wetlands can still play an important role in regional or landscape ecosystem management, including water management, they are considered to have low intrinsic ecological value. Typically, they have very little or no native vegetation remaining (less than 10 %).

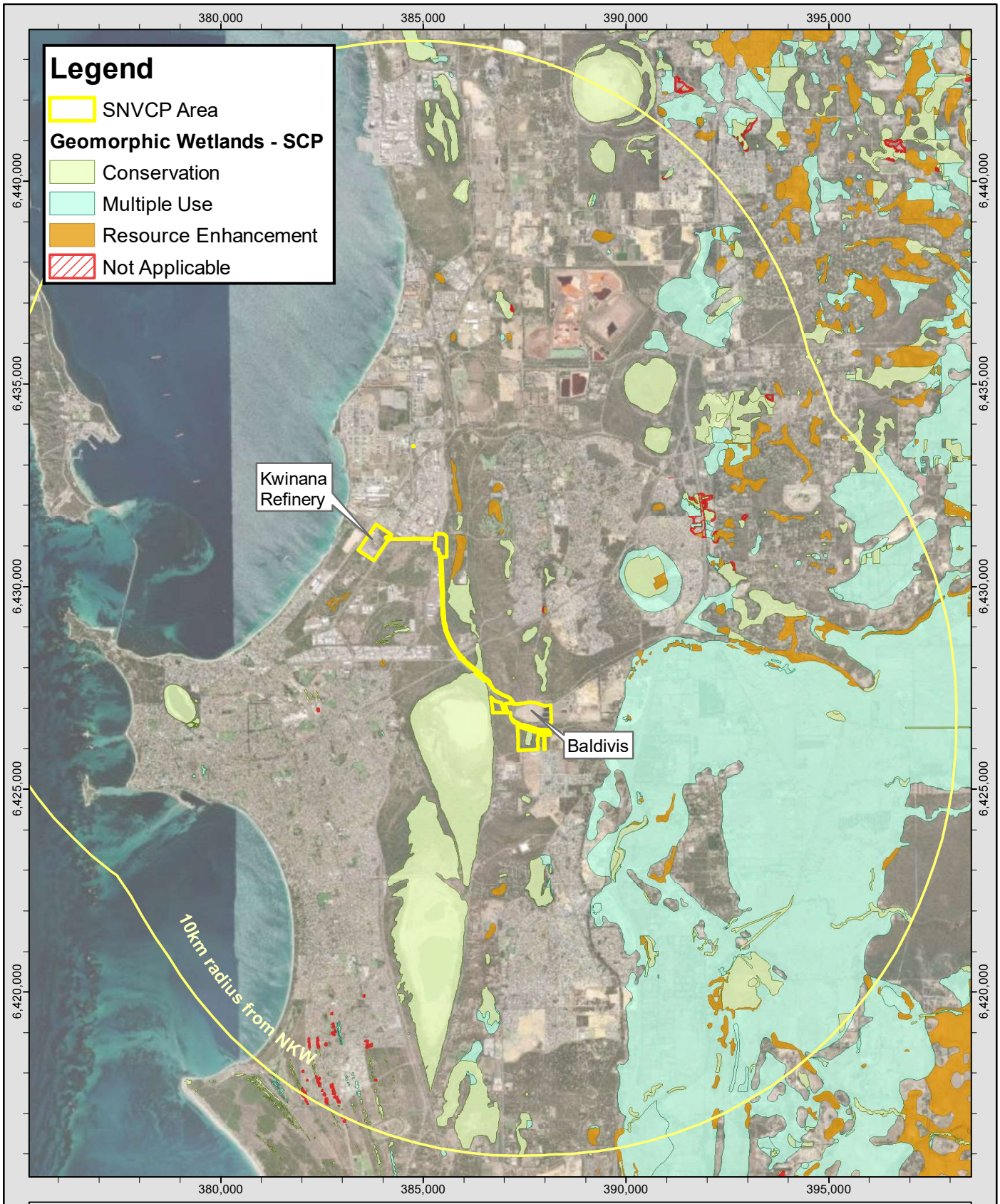
Two geomorphic wetlands occur within the proposed SNVCP area. The nearest wetlands occur 1 km to the south (Unique Feature Identifier (UFI) 6227, 6316, 6318 and 6317), while there are nine Conservation Category wetlands occurring within 2 km of the Study Area (UFI 6389, 6392, 6219, 6220, 6383, 6221, 6222, 6223 and 6224) (Figure 5).

## 7.4 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Minister for Environment under Section 51B of the EP Act to prevent incremental degradation of important environmental values such as threatened flora, threatened ecological communities (TEC) or significant wetlands.

The majority of the SNVCP application area occurs within mapped ESAs (DWER 2020a); however, the mapped ESAs are associated with buffers of local TECs located to the southeast of the refinery - TEC SCP19b (Woodlands over sedgelands in Holocene dune swales of the southern SCP). No representative vegetation associations were recorded during the 2019 biological survey (Biologic 2019) of the refinery site. Numerous other ESAs occur within the broader area, mostly associated with TECs and PECs occurring within the Rockingham Industrial Zone (Figure 2 includes ESA layer mapping) and Lake Cooloongup.

The Baldivis land parcels have not been surveyed but may contain plant species or communities that represent ESA values. No clearing will occur without biological surveys and assessment of clearing impact values. Consultation with DBCA and State and/or Commonwealth regulators may be required.




BHP

Kwinana Nickel Refinery
Nickel West

# Kwinana - Baldivis Strategic NVCP Hydrological Features

Coordinate System: GDA 1994 MGA Zone 50

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## 7.5 Contaminated sites

There are 12 contaminated sites known from a 1 km radius of the proposed Strategic NVCP area according to the Contaminated Site Database (DWER 2020c Accessed 9/6/2020) (Appendix 6). BHP NiW also undertake and manage potential site contaminants and any proposed clearing will follow a review of potential to interact with any contaminated sites.

## 7.6 Flora and vegetation

Broadscale pre-European vegetation (Beard et al 2013) for the SNVCP area is predominantly mapped as *Acacia* woodland; low shrubland to scrub-heath (12) with the easternmost extent mapped as *Eucalyptus* woodland or other woodland (17). The City of Rockingham and Kwinana both have over 30% vegetation representation remaining.

Vegetation complexes of the Swan Coastal Plain were mapped by Heddle et al. (1980) at a scale of 1:250,000. This assessment described and mapped Vegetation Complexes according to vegetation characteristics, the underlying soil profile of a specific landform unit, and climatic factors. One vegetation complex occurs; Quindalup Complex: coastal dune complex with a low closed forest and closed scrub. The Quindalup Complex is a coastal dune complex consisting mainly of two alliances - the strand and fore-dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of *Melaleuca lanceolata* (Rottnest Teatree) - *Callitris preissii* (Rottnest Island Pine), the closed scrub of *Acacia rostellifera* (Summer-scented Wattle) and the low closed *Agonis flexuosa* (Peppermint) forest of Geographe Bay to the south of the Study Area. Currently there is over 60% of the pre-European extent of the Quindalup complex remaining on the Swan Coastal Plain (Government of Western Australia, 2018).

A biological survey undertaken in 2019 (Biologic 2019) over the vegetated portion of the Kwinana refinery site found that the site had been previously cleared and that the small areas of regrowth vegetation are not representative of the mapped vegetation complex. The regrowth vegetation is primarily regrowth tuart trees with a weedy understory. There is a mix of planted trees and non-native vegetation around the refinery site facilities.

From *NatureMap* (Department of Biodiversity Conservation and Attractions (DBCA 2020b) Appendix 5)) database search results a number of threatened and priority flora are recorded within 10 km of the site. The 2019 survey (Biologic 2019) found no conservation significant flora and none are likely to occur based on historic clearing and the degraded condition of the vegetation. From the survey results only 50 flora species were recorded, of which over half were introduced (weed) species. Spatial data is provided in Appendix 2 and the full biological survey report in Appendix 4. The pipeline areas are similarly previously cleared with limited regrowth vegetation.

BHP NiW has undertaken project-specific biological surveys (Biologic 2019; Outback Ecology 2014; GHD 2010), which have been used for planning and understanding potential project clearing impacts. BHP NiW is committed to following the clearing mitigation hierarchy following biological surveys during project planning phases.

Landholdings at Baldivis are either cleared for facilities (TSF) or remain largely vegetated and will require survey should any activity (such as additional bores) be required over the next decade.

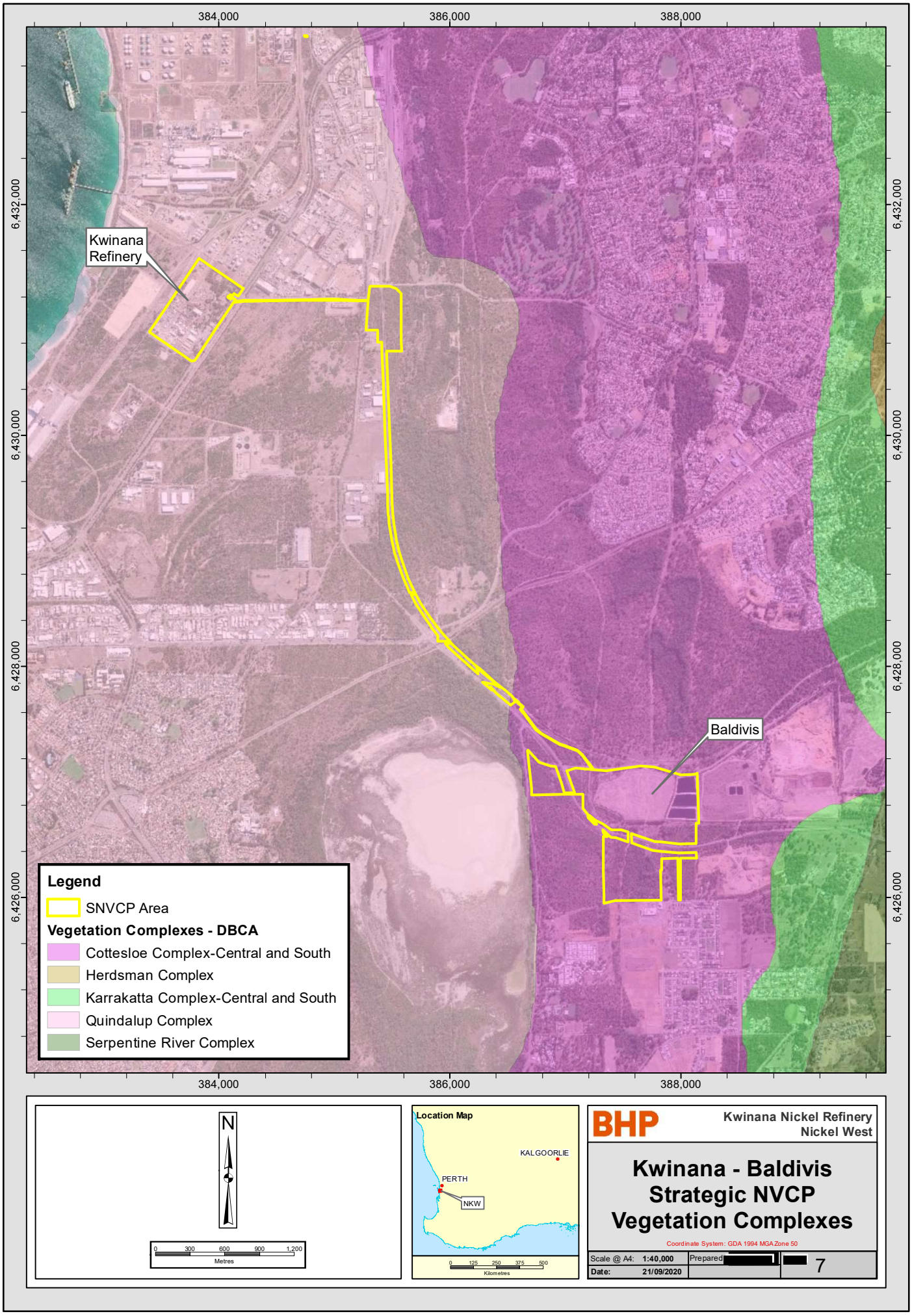
Any proposed clearing will only proceed where an area has been surveyed within the previous five years to ensure all vegetation values are known and high value flora, vegetation or habitat impacts are avoided.

## 7.7 Fauna and fauna habitats

The refinery site contains a single broad fauna habitat, which was recorded and mapped during the 2019 survey (Biologic 2019), which was rehabilitated woodland habitat, occupying approximately 10.55 ha (27.8% of the site). The habitat comprised a mosaic of scattered eucalypt species, predominantly Tuart (*Eucalyptus gomphocephala*), and Athel Tree (**Tamarix aphylla*) trees over mixed understory, often dominated by sparsely distributed patches of small to medium shrubs or low introduced grasses and herbs on sandy plain. Vegetation within the habitat appears to be dominated by rehabilitated areas, comprising of planted and/or introduce species, with little remnant vegetation present. The remainder of the site (~27.45 ha) comprised existing cleared areas and infrastructure for current operations at the site which was not considered fauna habitat.

Fauna habitat within the refinery site is heavily degraded as a result of historic and ongoing disturbances. Due to the degraded or completely degraded condition of native vegetation, abundance of non-native or naturalised flora species, evidence of introduced fauna, particularly foxes, and the fragmented nature of the site by existing infrastructure (i.e. roads and buildings), it is deemed to be of low significance (Biologic 2019). Fauna habitat is also considered to be isolated from surrounding habitats by a perimeter fence. The site contains low quality foraging habitat for threatened black cockatoo species and 48 potential breeding trees, none with currently usable hollows (Biologic 2019; Appendix 4).

The pipeline areas are only sparsely vegetated and contain limited habitat for fauna. The vegetated areas of the Baldivis facility provide habitat for a range of faunal groups and any clearing within these areas would be following a survey and an assessment to minimise clearing requirements (for future bores, access tracks etc).

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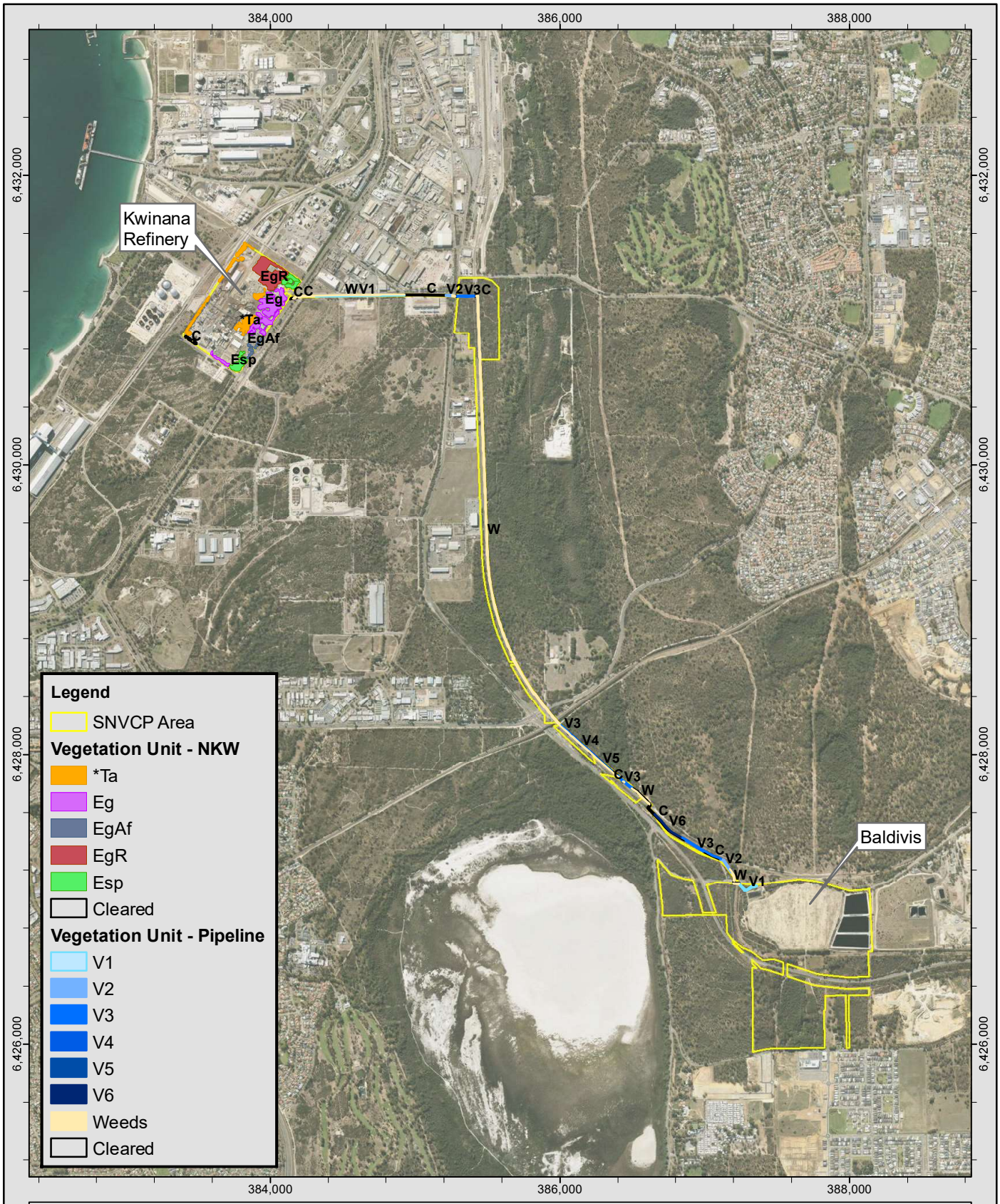


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Kilometres

Location Map

KALGOORLIE
PERTH
NKW

0 125 250 375 500
Kilometres

BHP

Kwinana Nickel Refinery
Nickel West

# Kwinana - Baldivis Strategic NVCP Vegetation Units

Coordinate System: GDA 1994 MGA Zone 50

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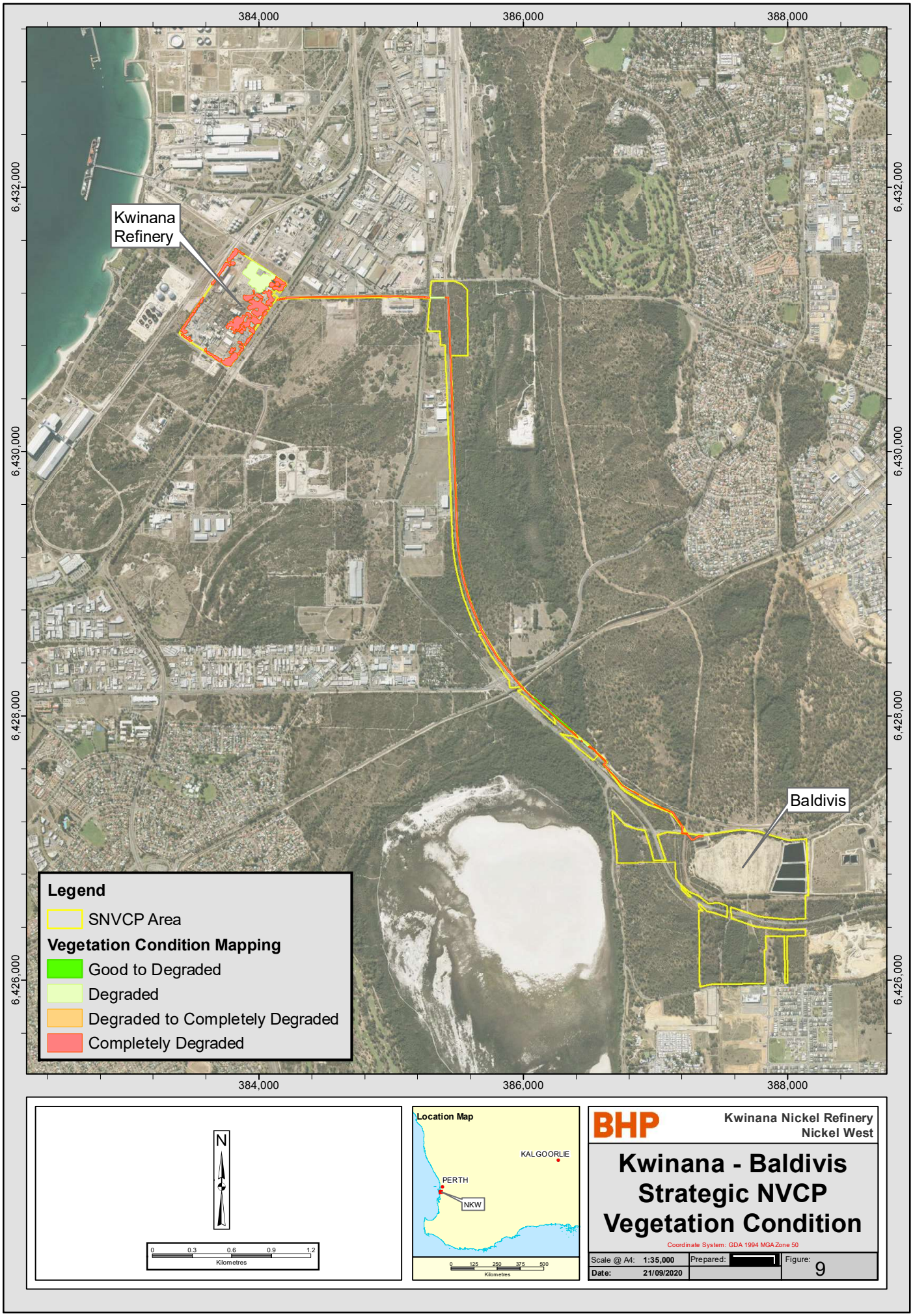


BHP

Kwinana Nickel Refinery
Nickel West

# Kwinana - Baldivis Strategic NVCP Vegetation Condition

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# 8. Environmental Management

## 8.1 Corporate Level Plans and Procedures

BHP's *Our Purpose* (BHP 2020a) and *Our Charter* (BHP 2020b) available on the BHP website, outlines BHP's purpose and values and provides measurements for success.

*Our Environment Approach* (BHP 2020c) also available on the BHP website, is based on the robust identification, assessment and control of material risks across all phases of our business, from exploration to development, operation and closure. *Our Requirements Environment and Climate Change* (BHP 2020d) outlines the minimum environmental management requirements for all our businesses.

BHP NiW manages the environment through the application of the BHP NiW Environmental Management System (EMS). The EMS provides the framework for compliance to legislative requirements, internal operating procedures and corporate standards, as appropriate to the nature and scale of the Nickel West Operations.

The EMS ensures BHP NiW activities meet applicable legislative and other obligations, are conducted in a manner consistent with the intent of Our Purpose and Charter, Our Approach, Our Requirements and broadly aligned with Australian/New Zealand Standards (AS:NZS) ISO14001:2015. Kwinana has an Environmental Management Plan (BHP NiW 2020d), which ensure activities that may impact on the environment are assessed and managed according to ISO certification processes and standards.

## 8.2 Site Specific Plans and Procedures

To support corporate level documents BHP NiW has an internal *Environment Approvals Handover Checklist* (NIW-HSEC-FRM-0009) and an *Environment and Heritage Impact Approval* process. The Form and Checklist are used to manage any potential environmental impacts of any proposal and to ensure compliance with regulatory requirements, environmental, Aboriginal heritage, land tenure and legal commitments are clearly communicated and understood prior to and during land disturbance. A risk register (BHP NiW 2020c) is also maintained for both NKW and Baldivis sites and all risks are assessed, recorded in the register and subject to regular review.

All personnel carrying out works associated with clearing activities are required to comply with BHP NiW's organisational level requirements, plans and policies, site level procedures; and any relevant legislative and licensing requirements.

## 8.3 Impact Assessment

The status and potential impacts to native vegetation, flora, fauna and ecological communities of conservation significance are summarised in Table 5. No significant impact to threatened or priority listed fauna, flora, or ecological communities is expected as a result of the staged and incremental nature of the proposed clearing.

Any clearing will only occur where there are current (less than 5 years old) flora, vegetation and fauna surveys over the area in question. The survey information will be used to apply the mitigation hierarchy for biological impacts to project planning.

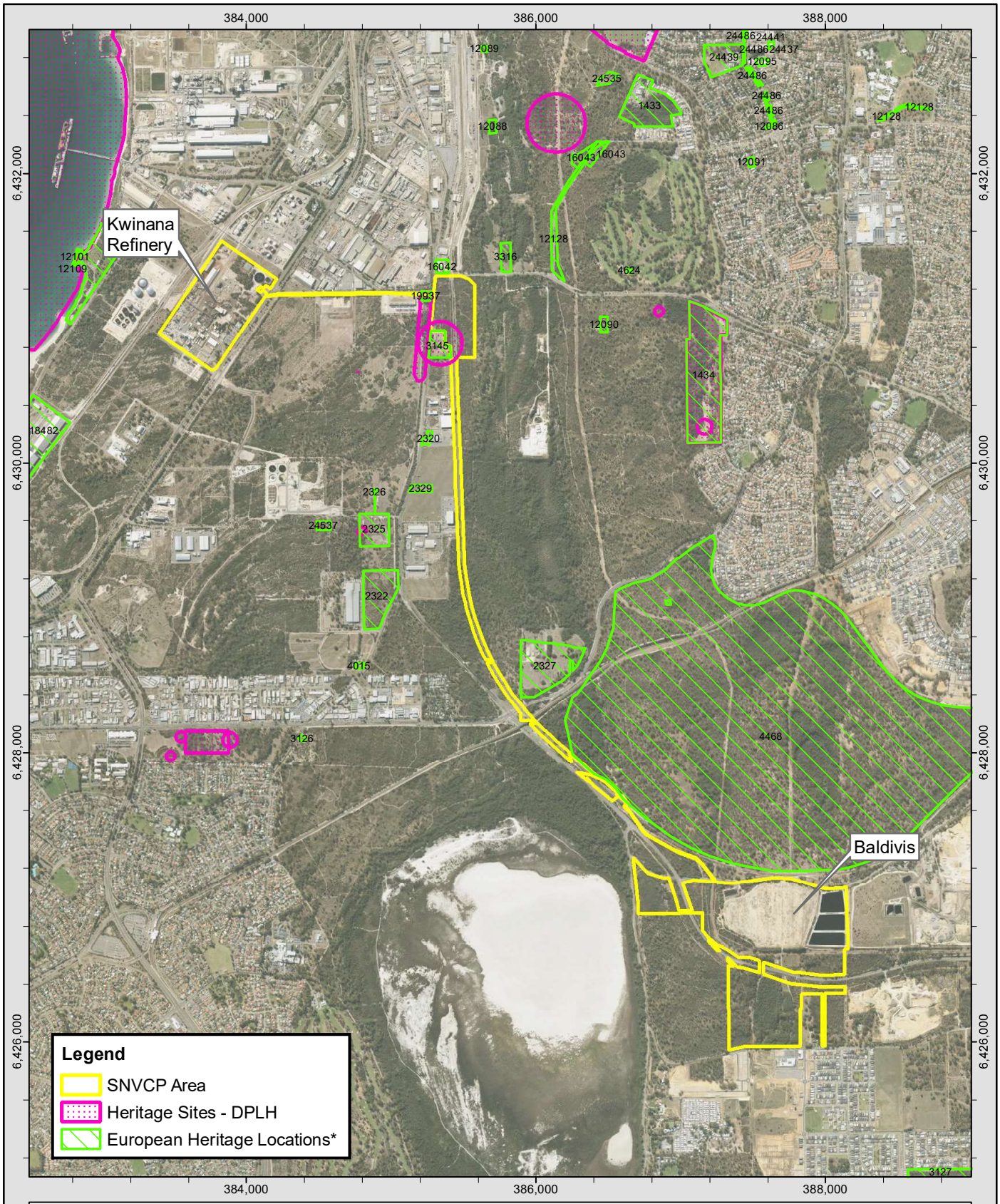
Should conservation-listed values be present, BHP NiW will liaise with DBCA Species and Communities Branch for advice where a significant impact may be inferred.

**Table 5 Strategic NVCP impact assessment**

| Environmental feature | Comment |
|---|---|
| Conservation significant flora | None currently known |
| Conservation significant fauna | None currently known |
| Conservation significant plant communities (TEC/PECs) | None currently known |
| Significant habitat | Mature trees which represent foraging value; future hollows, no hollows at current usable size, no roosting |
| Wetlands/riparian areas | None mapped |

## 8.4 Aboriginal and European Heritage

There are no known Aboriginal heritage sites within or immediately adjacent to the Strategic NVCP area (Figure 10). The closest listed Aboriginal heritage site (ID3711 & 3534) is ~3 km north-east of the NKW site (Department of Planning, Lands and Heritage (DPLH) 2020a). Ten sites of European heritage (DPLH 2020b) are found in the local area (Heritage Places 12101, 12109, 12089, 12088, 16042, 3316, 2327, 1434, 3806, 12090) with none of these likely to be impacted activities under this proposed SNVCP (Figure 10).




* European Heritage source: Heritage Council, WA.

N

0 250 500 750 1,000
Metres

Location Map

KALGOORLIE
PERTH
NKW

0 125 250 375 500
Kilometres

BHP

Kwinana Nickel Refinery
Nickel West

# Kwinana - Baldivis Strategic NVCP Aboriginal and European Heritage

Coordinate System: GDA 1994 MGA Zone 50

| | | | |
|---|---|---|---|
| Scale @ A4: | 1:35,000 | [redacted] | 10 |
| Date: | 21/09/2020 | | |

Document Path: Y:\Jobs\A501_A1000\A980\3Project\A980_014_NKW_Heritage_SNVCP_RevA.mxd

# 9. Assessment against the Ten Clearing Principles

An assessment of the application area, based on current desktop information and on biological survey information has found the proposed incremental clearing within the Kwinana-Baldivis Strategic NVCP area may be at variance to Principles a and h; but is not likely to be at variance to any of the remaining clearing principles.

**PRINCIPLE A Native vegetation should not be cleared if it comprises a high level of biological diversity**

*The proposed clearing may be at variance to this Principle.*

The proposed SNVCP application area is 157.057 ha of which ~53 ha is mapped (Department of Primary Industries and Regional Development 2020) as remnant native vegetation. The refinery site was previously entirely cleared and was historically used for grazing. Small areas of highly degraded native vegetation has regrown but contains little understorey and is weed infested (Biologic 2019). The site has a total recorded flora of 50 taxa, half of which are introduced (weed) species. No Priority flora or Threatened flora occur (Biologic 2019). It is not representative of an area with high biodiversity values and is within a wholly industrial context with high security perimeter fences adjacent to future development areas for industry. Similarly the pipeline areas were historically cleared and now are sparsely vegetated with some regrowth.

The Baldivis landholdings contain areas of native vegetation that remain in intact condition (Department of Primary Industries and Regional Development 2020); these areas will be avoided for clearing under the mitigation hierarchy applied by BHP NiW. Further, where survey shows any area of significant biodiversity value, DBCA will be contacted should a potential clearing impact be considered.

There are no TECs or PECs mapped for the Strategic NVCP area: however the site is within the mapped buffer TECs and is within a number of mapped ESAs.

Given that Baldivis land holdings retain areas of remnant vegetation that remains intact, the proposed clearing of any of these areas may be at variance to this Principle.

**PRINCIPLE 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**

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

NatureMap records (DBCA 2020a) (Section 7.7; Appendix 5) show 60 conservation significant fauna recorded in or within 10 km of the proposed SNVCP area. The majority of these are marine mammals or avifauna due to the proximity to the coast but not likely to be impacted by any clearing within the SNVCP area. There are a number of Swan Coastal Plain birds, reptiles, mammals and reptiles that may utilise the habitats of the Baldivis vegetated land parcels. The refinery site is almost entirely cleared and is wholly within an industrial precinct and offers low value habitat.

The small, incremental nature of the strategic application area means that none of these species will have critical habitat significantly reduced or the area of foraging and dispersal significantly altered or impacted by the proposed clearing. The incremental clearing will not result in significant habitat fragmentation or the removal of linkages as the immediate area.

NiW will ensure targeted survey is undertaken for areas not previously surveyed to complete gaps in information for conservation listed terrestrial and invertebrate fauna. All survey information and data will be provided to DBCA Species and Communities Branch to assist with species conservation.

Based on the small area of clearing requirements over the next 10 years, the proposed clearing is not likely to be at variance to this Principle.

**PRINCIPLE C Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora**

*This proposal is not likely to be at variance to this Principle.*

No flora listed under the Federal EPBC Act, nor gazetted as Threatened under the State *Biodiversity Conservation Act 2016* is known from, or recorded in the application area. The habitats of the Strategic NVCP area are not supporting habitat for Threatened flora. Therefore the proposed clearing will not directly nor indirectly impact on threatened flora.

**PRINCIPLE 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.**

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

The applied area is within an ESA the mapped buffer of a TEC. The Protected Matters Search Tool shows TECs including Tuart and Banksia Woodlands TECs, Sedgelands in Holocene dune swales and the Thombolite microbial communities of Lake Richmond are within a 10 km radius of the application area.

The vegetation within the applied area neither comprises (Biologic 2019) nor is necessary for the maintenance of a TEC with the refinery and pipeline alignments but further survey within the Baldivis land holdings will identify affinities with TEC. Areas of high value vegetation will be avoided and given the small areas of clearing for maintenance, access and future potential bores, the impacts of clearing are likely to be negligible once the mitigation hierarchy for internal assessment of clearing is applied.

Given the above, future clearing is not likely to significantly impact on any TEC, or its buffer and therefore the proposed clearing is not likely to be at variance to this Principle.

**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**

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

The SNVCP area is on the Swan Coastal Plain and the pre-European vegetation unit is Acacia and eucalypt woodlands. The habitats and vegetation within the application area are either highly degraded and not significant as a remnant (refinery, pipelines, and area around the tailings storage); or is remnant vegetation in BHP NiW land adjacent to Lake Cooloongup and Leda Nature Reserve and is contiguous with a large tract of intact vegetation associated with Rockingham Regional Park.

The southwest Vegetation Complex mapping (Mattiske et al 1998) is Quindalup and Cottesloe Central and South both of which are well represented within each Local Government Area (LGA) (Table 6)(Government of Western Australia 2020b). The City of Rockingham has over 30% native vegetation remaining; City of Kwinana has 34%; and over 30% of each of the mapped vegetation complexes remain in both LGAs.

**Table 6 Southwest vegetation complexes within the SNVCP area (Government of Western Australia 2020b)**

| Vegetation complex | Pre-European extent (ha) | Current extent | % Remaining |
|---|---|---|---|
| Quindalup | 53,560 | 33,012 | 61.63 |
| Cottesloe Central & South | 45,100 | 14,568 | 32.30 |

The application area is not within an extensively cleared LGA nor will the proposed SNVCP area (and the proposed clearing area within) contribute to a significantly decreased representation of local or regional vegetation types. Given the small areas of maintenance, access and potential clearing area, the proposed clearing is not likely to reduce the local or regional representation of any vegetation unit or complex and therefore the proposed small area of clearing over a 10-20 year timeframe is not likely to be at variance to this Principle.

**PRINCIPLE F Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland**

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

The application area is located between the Murray River and Peel Estuary/Serpentine River Catchments and the main hydrological features of the area are shown in Figure 6. Two mapped Conservation Category wetlands occur within the proposed Strategic NVCP area associated with Lake Cooloongup (ephemeral lake) occurring adjacent (<500 m). No clearing of riparian or wetland vegetation is proposed and therefore the proposed clearing is not likely to be at variance to this Principle.

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

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

Land degradation may include impacts such as erosion, changes to pH, water logging, salinisation or spread of weeds. The proposed clearing will be staged, clearing areas minimised and managed in accordance with infrastructure and site planning, which includes surface water management measures to ensure no off-site surface water impacts. Temporarily cleared areas will be progressively revegetated and management measures for dust suppression are standard operational activities. The relatively small area of proposed clearing, over a large area of land holdings, with management of topsoil, dust and clearing controls means that no appreciable land degradation would result.

All topsoil will be stockpiled and reused for landscaping/rehabilitation where practical. Clearing and topsoil to be managed in accordance with BHP NiW Topsoil Stripping and Handling Procedure (NIW-HSEC-PRO-0035).

Clearing will not occur more than two months ahead of planned ground disturbance/use; any temporarily cleared areas will be rehabilitated within two months of end of use.

**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**

*The proposed clearing may be at variance to this Principle.*

Leda Nature Reserve is a Class A Nature Reserve for the conservation of flora and fauna and is north of the Baldivis tailings storage (Figure 2) but is separated by a dual access road. Similarly the BHP-owned lots (refer Figure 2 and Appendix 3) between the tailings facility and Lake Cooloongup retain a vegetated buffer of remnant vegetation. Surface water flows, dust and other potential off-site impacts resulting from any potential clearing are not likely to directly nor indirectly impact Leda or Lake Cooloongup reserves, nor impact conservation or visitor values.

The vegetated areas adjacent to both reserves are recognised as potential buffers to the biodiversity values of both areas and any future clearing with be assessed as a potential impact to these values. Stakeholders such as DBCA will be contacted to discuss potential offsite impacts where bores, or other small scale clearing might be required operationally within BHP NiW's Baldivis land holdings. BHP NiW complete a DBCA Lawful Authority to Access Land and Regulation 4 permit for Leda Nature Reserve.

Due to the intact condition of some of the Baldivis lots and their proximity to conservation areas and wetlands, it is recognised that any clearing has potential to impact buffering of biodiversity values and therefore the proposed clearing may be at variance to this Principle.

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

The staged clearing over ten-twenty years will be managed so that no erosional activities or impacts to wetland or riparian zones within the larger catchment, result from the proposed clearing. The small area of clearing (up to 10 ha) and utilisation over a 10-20 year period means that groundwater will not be impacted nor will significant increases to surface or groundwater salinity levels result.

Surface water is a rare occurrence on highly porous sandy soils, which may only result after a significant rainfall event, usually immediately following summer thunderstorm activity and does not persist for extended periods. The staged and managed clearing is not likely to result in any deterioration of surface or groundwater quality and therefore is not likely to be at variance to this Principle.

**PRINCIPLE J Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding**

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

Surface water runoff and localised flooding occurs following intense rainfall events, usually as a result of summer thunderstorm following cyclonic events off the northwest coast of WA or during peak winter storms. The incidence or intensity of flooding is not likely to be significantly influenced by the proposed small area, staged and managed vegetation clearing. It is highly improbable that surface runoff generated from the cleared area could create sufficient concentrated water volumes to cause even a localised flood event. Any area required for clearing will not be left open unnecessarily and any temporary clearing will be revegetated. Therefore the proposed clearing is not likely to be at variance to this Principle.

## 9.1 Planning and other matters

BHP NiW will apply for any additional approvals that may be required for development applications by the City of Kwinana/Rockingham, or other relevant regulatory instruments. Where BHP NiW is not the land owner but requires either access or clearing, the relevant stakeholders will be contacted and the land owner/manager's written consent will be obtained for land which BHP NiW has licence or access agreements over (such as access to recovery bores).

## 9.2 Conclusion

BHP NiW will seek to avoid and minimise clearing within the application area such that proposed clearing is not likely to be at variance to any of the clearing principles. It is recognised that some of the Baldivis land holding contain intact vegetation which is in close proximity or adjacent to conservation areas and therefore clearing should be avoided or minimised to the fullest practicable extent.

Any and all clearing will be managed to ensure no direct or indirect significant residual impacts to biodiversity or resultant land degradation occurs. Commitments to ensure no negative residual impacts to biodiversity or soil and land conservation are outlined in Table 4.

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# APPENDIX 5: NatureMap Search Results & Protected Matters Search Results

NatureMap
Mapping Western Australia's biodiversity

# NatureMap Species Report - Cons Sig Fauna List

*Created By vanessa clarke on 28/07/2020*

**Kingdom** Animalia
**Conservation Status** Conservation Taxon (T, X, IA, S, P1-P5)
**Current Names Only** Yes
**Core Datasets Only** Yes
**Method** 'By Circle'
**Centre** 115° 47' 19" E,32° 16' 04" S
**Buffer** 10km
**Group By** Conservation Status

| Conservation Status | Species | Records |
|---|---|---|
| Other specially protected fauna | 2 | 8 |
| Priority 3 | 4 | 41 |
| Priority 4 | 8 | 251 |
| Protected under international agreement | 26 | 343 |
| Rare or likely to become extinct | 20 | 551 |
| **TOTAL** | **60** | **1194** |

| | Name ID | Species Name | Naturalised | Conservation Code | [1]Endemic To Query Area |
|---|---|---|---|---|---|
| **Rare or likely to become extinct** | | | | | |
| 1. | 24506 | *Anous tenuirostris subsp. melanops (Australian Lesser Noddy)* | | T | |
| 2. | 24784 | *Calidris ferruginea (Curlew Sandpiper)* | | T | |
| 3. | 24790 | *Calidris tenuirostris (Great Knot)* | | T | |
| 4. | 24731 | *Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)* | | T | |
| 5. | 24733 | *Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)* | | T | |
| 6. | 24734 | *Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)* | | T | |
| 7. | 48400 | *Calyptorhynchus sp. (white-tailed black cockatoo)* | | T | |
| 8. | 34031 | *Carcharodon carcharias (Great White Shark)* | | T | |
| 9. | 25335 | *Caretta caretta (Loggerhead Turtle)* | | T | |
| 10. | 25575 | *Charadrius leschenaultii (Greater Sand Plover)* | | T | |
| 11. | 25336 | *Chelonia mydas (Green Turtle)* | | T | |
| 12. | 24092 | *Dasyurus geoffroii (Chuditch, Western Quoll)* | | T | |
| 13. | 25346 | *Dermochelys coriacea (Leatherback Turtle)* | | T | |
| 14. | 24043 | *Eubalaena australis (Southern Right Whale)* | | T | |
| 15. | 25344 | *Natator depressus (Flatback Turtle)* | | T | |
| 16. | 24210 | *Neophoca cinerea (Australian Sea-lion)* | | T | |
| 17. | 24798 | *Numenius madagascariensis (Eastern Curlew)* | | T | |
| 18. | 48237 | *Rostratula australis (Australian Painted Snipe)* | | T | |
| 19. | 34007 | *Thalassarche chlororhynchos (Atlantic Yellow-nosed Albatross)* | | T | |
| 20. | 34113 | *Westralunio carteri (Carter's Freshwater Mussel)* | | T | |
| **Protected under international agreement** | | | | | |
| 21. | 41323 | *Actitis hypoleucos (Common Sandpiper)* | | IA | |
| 22. | 25554 | *Apus pacificus (Fork-tailed Swift, Pacific Swift)* | | IA | |
| 23. | 25736 | *Arenaria interpres (Ruddy Turnstone)* | | IA | |
| 24. | 24779 | *Calidris acuminata (Sharp-tailed Sandpiper)* | | IA | |
| 25. | 24780 | *Calidris alba (Sanderling)* | | IA | |
| 26. | 24786 | *Calidris melanotos (Pectoral Sandpiper)* | | IA | |
| 27. | 24788 | *Calidris ruficollis (Red-necked Stint)* | | IA | |
| 28. | 24789 | *Calidris subminuta (Long-toed Stint)* | | IA | |
| 29. | 41332 | *Chlidonias leucopterus (White-winged Black Tern, white-winged tern)* | | IA | |
| 30. | 48587 | *Hydroprogne caspia (Caspian Tern)* | | IA | |
| 31. | 30932 | *Limosa lapponica (Bar-tailed Godwit)* | | IA | |
| 32. | 25741 | *Limosa limosa (Black-tailed Godwit)* | | IA | |
| 33. | 24690 | *Macronectes giganteus (Southern Giant Petrel)* | | IA | |
| 34. | 24691 | *Macronectes halli (Northern Giant Petrel)* | | IA | |

| | Name ID | Species Name | Naturalised | Conservation Code | [1]Endemic To Query Area |
|---|---|---|---|---|---|
| | | | | IA | |
| 35. | 25742 | *Numenius phaeopus (Whimbrel)* | | IA | |
| 36. | 24497 | *Oceanites oceanicus (Wilson's Storm-petrel)* | | IA | |
| 37. | 41347 | *Onychoprion anaethetus (Bridled Tern)* | | IA | |
| 38. | 48591 | *Pandion cristatus (Osprey, Eastern Osprey)* | | IA | |
| 39. | 24843 | *Plegadis falcinellus (Glossy Ibis)* | | IA | |
| 40. | 24383 | *Pluvialis squatarola (Grey Plover)* | | IA | |
| 41. | 24517 | *Stercorarius parasiticus (Arctic jaeger, Arctic Skua)* | | IA | |
| 42. | 25640 | *Sterna dougallii (Roseate Tern)* | | IA | |
| 43. | 48597 | *Thalasseus bergii (Crested Tern)* | | IA | |
| 44. | 24806 | *Tringa glareola (Wood Sandpiper)* | | IA | |
| 45. | 24808 | *Tringa nebularia (Common Greenshank, greenshank)* | | IA | |
| 46. | 24809 | *Tringa stagnatilis (Marsh Sandpiper, little greenshank)* | | IA | |
| **Other specially protected fauna** | | | | | |
| 47. | 25624 | *Falco peregrinus (Peregrine Falcon)* | | S | |
| 48. | 48070 | *Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale, Wambenger)* | | S | |
| **Priority 3** | | | | | |
| 49. | 48935 | *Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)* | | P3 | |
| 50. | 25147 | *Lerista lineata (Perth Slider, Lined Skink)* | | P3 | |
| 51. | 25249 | *Neelaps calonotos (Black-striped Snake, black-striped burrowing snake)* | | P3 | |
| 52. | 25006 | *Pletholax gracilis subsp. edelensis (Keeled Legless Lizard (Shark Bay))* | | P3 | |
| **Priority 4** | | | | | |
| 53. | 24215 | *Hydromys chrysogaster (Water-rat, Rakali)* | | P4 | |
| 54. | 48588 | *Isoodon fusciventer (Quenda, southwestern brown bandicoot)* | | P4 | |
| 55. | 48022 | *Notamacropus irma (Western Brush Wallaby)* | | P4 | |
| 56. | 25196 | *Notoscincus butleri (lined soil-crevice skink (Dampier))* | | P4 | |
| 57. | 24328 | *Oxyura australis (Blue-billed Duck)* | | P4 | |
| 58. | 48116 | *Stercorarius antarcticus (Brown Skua)* | | P4 | |
| 59. | 33992 | *Synemon gratiosa (Graceful Sunmoth)* | | P4 | |
| 60. | 48135 | *Thinornis rubricollis (Hooded Plover, Hooded Dotterel)* | | P4 | |

**Conservation Codes**
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

# Consv Sig Fauna - Nil Records

Printed by vanessa clarke on 28/7/2020

**Query details :** Kingdom=Animalia; Conservation Status=Conservation Taxon (T, X, IA, S, P1-P5); Current Names Only=Yes; Core Datasets Only=Yes; Method='By Circle'; Centre=115° 47' 19" E,32° 16' 04" S; Buffer=10km;


**Search Results**

Selected
- Selected Species

All Results
- Other specially protected fauna
- Priority 3
- Priority 4
- Protected under international agreement
- Rare or likely to become extinct

**Reference Layers**

Major WA Towns

Major WA Towns

Major WA Towns

Roads
- Sealed
- Unsealed
- Other

State Borders

Conservation Tenure
- 5(1)(g) Reserve
- 5(1)(h) Reserve

NatureMap
Mapping Western Australia's biodiversity

# NatureMap Species Report - Cons Sig Flora List

*Created By vanessa clarke on 28/07/2020*

**Kingdom** Plantae
**Conservation Status** Conservation Taxon (T, X, IA, S, P1-P5)
**Current Names Only** Yes
**Core Datasets Only** Yes
**Method** 'By Circle'
**Centre** 115° 47' 19" E,32° 16' 04" S
**Buffer** 10km
**Group By** Conservation Status

| Conservation Status | Species | Records |
|---|---|---|
| Priority 1 | 3 | 3 |
| Priority 2 | 1 | 1 |
| Priority 3 | 5 | 8 |
| Priority 4 | 6 | 15 |
| Rare or likely to become extinct | 4 | 12 |
| **TOTAL** | **19** | **39** |

| | Name ID | Species Name | Naturalised | Conservation Code | [1]Endemic To Query Area |
|---|---|---|---|---|---|
| **Rare or likely to become extinct** | | | | | |
| 1. | 1596 | *Caladenia huegelii (Grand Spider Orchid)* | | T | |
| 2. | 12938 | *Diuris micrantha* | | T | |
| 3. | 1639 | *Drakaea elastica (Glossy-leaved Hammer Orchid)* | | T | |
| 4. | 28354 | *Synaphea sp. Serpentine (G.R. Brand 103)* | | T | |
| **Priority 1** | | | | | |
| 5. | 48762 | *Acacia sp. Binningup (G. Cockerton et al. WB 37784)* | | P1 | |
| 6. | 16633 | *Boronia juncea subsp. juncea* | | P1 | |
| 7. | 30334 | *Lachnagrostis nesomytica subsp. paralia* | | P1 | |
| **Priority 2** | | | | | |
| 8. | 35581 | *Tetraria sp. Chandala (G.J. Keighery 17055)* | | P2 | |
| **Priority 3** | | | | | |
| 9. | 35317 | *Austrostipa mundula* | | P3 | |
| 10. | 16245 | *Cyathochaeta teretifolia* | | P3 | |
| 11. | 20462 | *Jacksonia gracillima* | | P3 | |
| 12. | 5237 | *Pimelea calcicola* | | P3 | |
| 13. | 20348 | *Sphaerolobium calcicola* | | P3 | |
| **Priority 4** | | | | | |
| 14. | 141 | *Aponogeton hexatepalus (Stalked Water Ribbons)* | | P4 | |
| 15. | 4763 | *Dodonaea hackettiana (Hackett's Hopbush)* | | P4 | |
| 16. | 4027 | *Jacksonia sericea (Waldjumi)* | | P4 | |
| 17. | 17850 | *Stylidium ireneae* | | P4 | |
| 18. | 7756 | *Stylidium longitubum (Jumping Jacks)* | | P4 | |
| 19. | 7803 | *Stylidium striatum (Fan-leaved Triggerplant)* | | P4 | |

**Conservation Codes**
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

# Consv Sig Flora

Printed by vanessa clarke on 28/7/2020

**Query details :** Kingdom=Plantae; Conservation Status=Conservation Taxon (T, X, IA, S, P1-P5); Current Names Only=Yes; Core Datasets Only=Yes; Method='By Circle'; Centre=115° 47' 19" E,32° 16' 04" S; Buffer=10km;


**Search Results**

Selected
- Selected Species

All Results
- Priority 1
- Priority 2
- Priority 3
- Priority 4
- Rare or likely to become extinct

**Reference Layers**

Major WA Towns

Major WA Towns

Major WA Towns

Roads
- Sealed
- Unsealed
- Other

State Borders

Conservation Tenure
- 5(1)(g) Reserve
- 5(1)(h) Reserve

# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

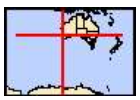
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 28/07/20 15:16:29






Coordinates
Buffer: 10.0Km



# Summary

## Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

| | |
|---|---|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance: | 3 |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | 4 |
| Listed Threatened Species: | 54 |
| Listed Migratory Species: | 51 |

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|---|---|
| Commonwealth Land: | 3 |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 87 |
| Whales and Other Cetaceans: | 12 |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |

## Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

| | |
|---|---|
| State and Territory Reserves: | 6 |
| Regional Forest Agreements: | None |
| Invasive Species: | 36 |
| Nationally Important Wetlands: | 1 |
| Key Ecological Features (Marine) | None |

# Details

## Matters of National Environmental Significance

### Wetlands of International Importance (Ramsar) [ Resource Information ]

| Name | Proximity |
|---|---|
| Becher point wetlands | Within 10km of Ramsar |
| Forrestdale and thomsons lakes | Within 10km of Ramsar |
| Peel-yalgorup system | 20 - 30km upstream |

### Listed Threatened Ecological Communities [ Resource Information ]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

| Name | Status | Type of Presence |
|---|---|---|
| Banksia Woodlands of the Swan Coastal Plain ecological community | Endangered | Community likely to occur within area |
| Sedgelands in Holocene dune swales of the southern Swan Coastal Plain | Endangered | Community known to occur within area |
| Thrombolite (microbial) community of coastal freshwater lakes of the Swan Coastal Plain (Lake Richmond) | Endangered | Community known to occur within area |
| Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community | Critically Endangered | Community likely to occur within area |

### Listed Threatened Species [ Resource Information ]

| Name | Status | Type of Presence |
|---|---|---|
| **Birds** | | |
| Anous tenuirostris  melanops<br>Australian Lesser Noddy [26000] | Vulnerable | Species or species habitat may occur within area |
| Botaurus poiciloptilus<br>Australasian Bittern [1001] | Endangered | Species or species habitat likely to occur within area |
| Calidris canutus<br>Red Knot, Knot [855] | Endangered | Species or species habitat known to occur within area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat known to occur within area |
| Calyptorhynchus banksii  naso<br>Forest Red-tailed Black-Cockatoo, Karrak [67034] | Vulnerable | Species or species habitat known to occur within area |
| Calyptorhynchus baudinii<br>Baudin's Cockatoo, Long-billed Black-Cockatoo [769] | Endangered | Species or species habitat likely to occur within area |
| Calyptorhynchus latirostris<br>Carnaby's Cockatoo,  Short-billed Black-Cockatoo [59523] | Endangered | Species or species habitat known to occur within area |
| Diomedea amsterdamensis<br>Amsterdam Albatross [64405] | Endangered | Species or species |

| Name | Status | Type of Presence |
|---|---|---|
| | | habitat may occur within area |
| Diomedea dabbenena<br>Tristan Albatross [66471] | Endangered | Species or species habitat may occur within area |
| Diomedea epomophora<br>Southern Royal Albatross [89221] | Vulnerable | Foraging, feeding or related behaviour likely to occur within area |
| Diomedea exulans<br>Wandering Albatross [89223] | Vulnerable | Foraging, feeding or related behaviour likely to occur within area |
| Diomedea sanfordi<br>Northern Royal Albatross [64456] | Endangered | Foraging, feeding or related behaviour likely to occur within area |
| Halobaena caerulea<br>Blue Petrel [1059] | Vulnerable | Species or species habitat may occur within area |
| Leipoa ocellata<br>Malleefowl [934] | Vulnerable | Species or species habitat likely to occur within area |
| Limosa lapponica baueri<br>Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380] | Vulnerable | Species or species habitat known to occur within area |
| Limosa lapponica menzbieri<br>Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432] | Critically Endangered | Species or species habitat may occur within area |
| Macronectes giganteus<br>Southern Giant-Petrel, Southern Giant Petrel [1060] | Endangered | Species or species habitat may occur within area |
| Macronectes halli<br>Northern Giant Petrel [1061] | Vulnerable | Species or species habitat may occur within area |
| Numenius madagascariensis<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat likely to occur within area |
| Pachyptila turtur subantarctica<br>Fairy Prion (southern) [64445] | Vulnerable | Species or species habitat likely to occur within area |
| Pterodroma mollis<br>Soft-plumaged Petrel [1036] | Vulnerable | Species or species habitat may occur within area |
| Rostratula australis<br>Australian Painted Snipe [77037] | Endangered | Species or species habitat known to occur within area |
| Sternula nereis nereis<br>Australian Fairy Tern [82950] | Vulnerable | Foraging, feeding or related behaviour known to occur within area |
| Thalassarche carteri<br>Indian Yellow-nosed Albatross [64464] | Vulnerable | Foraging, feeding or related behaviour may occur within area |
| Thalassarche cauta<br>Shy Albatross [89224] | Endangered | Foraging, feeding or related behaviour likely to occur within area |
| Thalassarche impavida<br>Campbell Albatross, Campbell Black-browed Albatross [64459] | Vulnerable | Species or species habitat may occur within |

| Name | Status | Type of Presence |
|---|---|---|
| | | area |
| Thalassarche melanophris<br>Black-browed Albatross [66472] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche steadi<br>White-capped Albatross [64462] | Vulnerable | Foraging, feeding or related behaviour likely to occur within area |
| Mammals | | |
| Balaenoptera musculus<br>Blue Whale [36] | Endangered | Species or species habitat likely to occur within area |
| Bettongia penicillata ogilbyi<br>Woylie [66844] | Endangered | Species or species habitat likely to occur within area |
| Dasyurus geoffroii<br>Chuditch, Western Quoll [330] | Vulnerable | Species or species habitat known to occur within area |
| Eubalaena australis<br>Southern Right Whale [40] | Endangered | Breeding known to occur within area |
| Megaptera novaeangliae<br>Humpback Whale [38] | Vulnerable | Species or species habitat known to occur within area |
| Neophoca cinerea<br>Australian Sea-lion, Australian Sea Lion [22] | Vulnerable | Species or species habitat known to occur within area |
| Pseudocheirus occidentalis<br>Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911] | Critically Endangered | Species or species habitat likely to occur within area |
| Other | | |
| Westralunio carteri<br>Carter's Freshwater Mussel, Freshwater Mussel [86266] | Vulnerable | Species or species habitat known to occur within area |
| Plants | | |
| Andersonia gracilis<br>Slender Andersonia [14470] | Endangered | Species or species habitat may occur within area |
| Caladenia huegelii<br>King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309] | Endangered | Species or species habitat likely to occur within area |
| Diuris drummondii<br>Tall Donkey Orchid [4365] | Vulnerable | Species or species habitat may occur within area |
| Diuris micrantha<br>Dwarf Bee-orchid [55082] | Vulnerable | Species or species habitat known to occur within area |
| Diuris purdiei<br>Purdie's Donkey-orchid [12950] | Endangered | Species or species habitat likely to occur within area |
| Drakaea elastica<br>Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753] | Endangered | Species or species habitat likely to occur within area |
| Drakaea micrantha<br>Dwarf Hammer-orchid [56755] | Vulnerable | Species or species habitat likely to occur within area |

| Name | Status | Type of Presence |
|---|---|---|
| Eleocharis keigheryi<br>Keighery's Eleocharis [64893] | Vulnerable | Species or species habitat may occur within area |
| Eucalyptus x balanites<br>Cadda Road Mallee, Cadda Mallee [87816] | Endangered | Species or species habitat may occur within area |
| Synaphea sp. Fairbridge Farm (D. Papenfus 696)<br>Selena's Synaphea [82881] | Critically Endangered | Species or species habitat likely to occur within area |
| Synaphea sp. Serpentine (G.R. Brand 103)<br>[86879] | Critically Endangered | Species or species habitat may occur within area |
| **Reptiles** | | |
| Caretta caretta<br>Loggerhead Turtle [1763] | Endangered | Foraging, feeding or related behaviour known to occur within area |
| Chelonia mydas<br>Green Turtle [1765] | Vulnerable | Foraging, feeding or related behaviour known to occur within area |
| Dermochelys coriacea<br>Leatherback Turtle, Leathery Turtle, Luth [1768] | Endangered | Foraging, feeding or related behaviour known to occur within area |
| Natator depressus<br>Flatback Turtle [59257] | Vulnerable | Foraging, feeding or related behaviour known to occur within area |
| **Sharks** | | |
| Carcharias taurus (west coast population)<br>Grey Nurse Shark (west coast population) [68752] | Vulnerable | Species or species habitat known to occur within area |
| Carcharodon carcharias<br>White Shark, Great White Shark [64470] | Vulnerable | Species or species habitat known to occur within area |
| Rhincodon typus<br>Whale Shark [66680] | Vulnerable | Species or species habitat may occur within area |

## Listed Migratory Species [ Resource Information ]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

| Name | Threatened | Type of Presence |
|---|---|---|
| **Migratory Marine Birds** | | |
| Anous stolidus<br>Common Noddy [825] | | Species or species habitat may occur within area |
| Apus pacificus<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Ardenna carneipes<br>Flesh-footed Shearwater, Fleshy-footed Shearwater [82404] | | Foraging, feeding or related behaviour likely to occur within area |
| Diomedea amsterdamensis<br>Amsterdam Albatross [64405] | Endangered | Species or species habitat may occur within area |
| Diomedea dabbenena<br>Tristan Albatross [66471] | Endangered | Species or species habitat may occur within area |

| Name | Threatened | Type of Presence |
|---|---|---|
| Diomedea epomophora<br>Southern Royal Albatross [89221] | Vulnerable | Foraging, feeding or related behaviour likely to occur within area |
| Diomedea exulans<br>Wandering Albatross [89223] | Vulnerable | Foraging, feeding or related behaviour likely to occur within area |
| Diomedea sanfordi<br>Northern Royal Albatross [64456] | Endangered | Foraging, feeding or related behaviour likely to occur within area |
| Hydroprogne caspia<br>Caspian Tern [808] | | Breeding known to occur within area |
| Macronectes giganteus<br>Southern Giant-Petrel, Southern Giant Petrel [1060] | Endangered | Species or species habitat may occur within area |
| Macronectes halli<br>Northern Giant Petrel [1061] | Vulnerable | Species or species habitat may occur within area |
| Onychoprion anaethetus<br>Bridled Tern [82845] | | Breeding known to occur within area |
| Sterna dougallii<br>Roseate Tern [817] | | Foraging, feeding or related behaviour likely to occur within area |
| Thalassarche carteri<br>Indian Yellow-nosed Albatross [64464] | Vulnerable | Foraging, feeding or related behaviour may occur within area |
| Thalassarche cauta<br>Shy Albatross [89224] | Endangered | Foraging, feeding or related behaviour likely to occur within area |
| Thalassarche impavida<br>Campbell Albatross, Campbell Black-browed Albatross [64459] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche melanophris<br>Black-browed Albatross [66472] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche steadi<br>White-capped Albatross [64462] | Vulnerable | Foraging, feeding or related behaviour likely to occur within area |
| Migratory Marine Species | | |
| Balaena glacialis australis<br>Southern Right Whale [75529] | Endangered* | Breeding known to occur within area |
| Balaenoptera edeni<br>Bryde's Whale [35] | | Species or species habitat may occur within area |
| Balaenoptera musculus<br>Blue Whale [36] | Endangered | Species or species habitat likely to occur within area |
| Caperea marginata<br>Pygmy Right Whale [39] | | Species or species habitat may occur within area |
| Carcharodon carcharias<br>White Shark, Great White Shark [64470] | Vulnerable | Species or species habitat known to occur within area |
| Caretta caretta<br>Loggerhead Turtle [1763] | Endangered | Foraging, feeding or related behaviour known |

| Name | Threatened | Type of Presence |
|---|---|---|
| | | to occur within area |
| Chelonia mydas<br>Green Turtle [1765] | Vulnerable | Foraging, feeding or related behaviour known to occur within area |
| Dermochelys coriacea<br>Leatherback Turtle, Leathery Turtle, Luth [1768] | Endangered | Foraging, feeding or related behaviour known to occur within area |
| Lamna nasus<br>Porbeagle, Mackerel Shark [83288] | | Species or species habitat may occur within area |
| Manta alfredi<br>Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994] | | Species or species habitat may occur within area |
| Manta birostris<br>Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995] | | Species or species habitat may occur within area |
| Megaptera novaeangliae<br>Humpback Whale [38] | Vulnerable | Species or species habitat known to occur within area |
| Natator depressus<br>Flatback Turtle [59257] | Vulnerable | Foraging, feeding or related behaviour known to occur within area |
| Orcinus orca<br>Killer Whale, Orca [46] | | Species or species habitat may occur within area |
| Rhincodon typus<br>Whale Shark [66680] | Vulnerable | Species or species habitat may occur within area |
| Migratory Terrestrial Species | | |
| Motacilla cinerea<br>Grey Wagtail [642] | | Species or species habitat may occur within area |
| Migratory Wetlands Species | | |
| Actitis hypoleucos<br>Common Sandpiper [59309] | | Species or species habitat known to occur within area |
| Calidris acuminata<br>Sharp-tailed Sandpiper [874] | | Species or species habitat known to occur within area |
| Calidris alba<br>Sanderling [875] | | Species or species habitat likely to occur within area |
| Calidris canutus<br>Red Knot, Knot [855] | Endangered | Species or species habitat known to occur within area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat known to occur within area |
| Calidris melanotos<br>Pectoral Sandpiper [858] | | Species or species habitat known to occur within area |
| Calidris ruficollis<br>Red-necked Stint [860] | | Species or species habitat known to occur within area |
| Calidris subminuta<br>Long-toed Stint [861] | | Species or species |

| Name | Threatened | Type of Presence |
|---|---|---|
| | | habitat known to occur within area |
| Charadrius dubius<br>Little Ringed Plover [896] | | Species or species habitat known to occur within area |
| Limosa lapponica<br>Bar-tailed Godwit [844] | | Species or species habitat known to occur within area |
| Limosa limosa<br>Black-tailed Godwit [845] | | Species or species habitat known to occur within area |
| Numenius madagascariensis<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat likely to occur within area |
| Pandion haliaetus<br>Osprey [952] | | Breeding known to occur within area |
| Philomachus pugnax<br>Ruff (Reeve) [850] | | Species or species habitat known to occur within area |
| Tringa glareola<br>Wood Sandpiper [829] | | Species or species habitat known to occur within area |
| Tringa nebularia<br>Common Greenshank, Greenshank [832] | | Species or species habitat known to occur within area |
| Tringa stagnatilis<br>Marsh Sandpiper, Little Greenshank [833] | | Species or species habitat known to occur within area |

## Other Matters Protected by the EPBC Act

### Commonwealth Land [ Resource Information ]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

| Name |
|---|
| Commonwealth Land - |
| Defence - HMAS STIRLING-ROCKINGHAM ;HMAS STIRLING - GARDEN ISLAND |
| Defence - ROCKINGHAM - NAVY CPSO |

### Listed Marine Species [ Resource Information ]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

| Name | Threatened | Type of Presence |
|---|---|---|
| Birds | | |
| Actitis hypoleucos<br>Common Sandpiper [59309] | | Species or species habitat known to occur within area |
| Anous stolidus<br>Common Noddy [825] | | Species or species habitat may occur within area |
| Anous tenuirostris melanops<br>Australian Lesser Noddy [26000] | Vulnerable | Species or species habitat may occur within area |
| Apus pacificus<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur |

| Name | Threatened | Type of Presence within area |
|---|---|---|
| Ardea alba<br>Great Egret, White Egret [59541] | | Breeding known to occur within area |
| Ardea ibis<br>Cattle Egret [59542] | | Species or species habitat may occur within area |
| Calidris acuminata<br>Sharp-tailed Sandpiper [874] | | Species or species habitat known to occur within area |
| Calidris alba<br>Sanderling [875] | | Species or species habitat likely to occur within area |
| Calidris canutus<br>Red Knot, Knot [855] | Endangered | Species or species habitat known to occur within area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat known to occur within area |
| Calidris melanotos<br>Pectoral Sandpiper [858] | | Species or species habitat known to occur within area |
| Calidris ruficollis<br>Red-necked Stint [860] | | Species or species habitat known to occur within area |
| Calidris subminuta<br>Long-toed Stint [861] | | Species or species habitat known to occur within area |
| Catharacta skua<br>Great Skua [59472] | | Species or species habitat may occur within area |
| Charadrius dubius<br>Little Ringed Plover [896] | | Species or species habitat known to occur within area |
| Charadrius ruficapillus<br>Red-capped Plover [881] | | Species or species habitat known to occur within area |
| Diomedea amsterdamensis<br>Amsterdam Albatross [64405] | Endangered | Species or species habitat may occur within area |
| Diomedea dabbenena<br>Tristan Albatross [66471] | Endangered | Species or species habitat may occur within area |
| Diomedea epomophora<br>Southern Royal Albatross [89221] | Vulnerable | Foraging, feeding or related behaviour likely to occur within area |
| Diomedea exulans<br>Wandering Albatross [89223] | Vulnerable | Foraging, feeding or related behaviour likely to occur within area |
| Diomedea sanfordi<br>Northern Royal Albatross [64456] | Endangered | Foraging, feeding or related behaviour likely to occur within area |
| Eudyptula minor<br>Little Penguin [1085] | | Breeding known to occur within area |
| Haliaeetus leucogaster<br>White-bellied Sea-Eagle [943] | | Species or species |

| Name | Threatened | Type of Presence |
|---|---|---|
| | | habitat known to occur within area |
| Halobaena caerulea<br>Blue Petrel [1059] | Vulnerable | Species or species habitat may occur within area |
| Himantopus himantopus<br>Pied Stilt, Black-winged Stilt [870] | | Species or species habitat known to occur within area |
| Larus novaehollandiae<br>Silver Gull [810] | | Breeding known to occur within area |
| Larus pacificus<br>Pacific Gull [811] | | Foraging, feeding or related behaviour may occur within area |
| Limosa lapponica<br>Bar-tailed Godwit [844] | | Species or species habitat known to occur within area |
| Limosa limosa<br>Black-tailed Godwit [845] | | Species or species habitat known to occur within area |
| Macronectes giganteus<br>Southern Giant-Petrel, Southern Giant Petrel [1060] | Endangered | Species or species habitat may occur within area |
| Macronectes halli<br>Northern Giant Petrel [1061] | Vulnerable | Species or species habitat may occur within area |
| Merops ornatus<br>Rainbow Bee-eater [670] | | Species or species habitat may occur within area |
| Motacilla cinerea<br>Grey Wagtail [642] | | Species or species habitat may occur within area |
| Numenius madagascariensis<br>Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat likely to occur within area |
| Pachyptila turtur<br>Fairy Prion [1066] | | Species or species habitat likely to occur within area |
| Pandion haliaetus<br>Osprey [952] | | Breeding known to occur within area |
| Pelagodroma marina<br>White-faced Storm-Petrel [1016] | | Breeding known to occur within area |
| Philomachus pugnax<br>Ruff (Reeve) [850] | | Species or species habitat known to occur within area |
| Pterodroma mollis<br>Soft-plumaged Petrel [1036] | Vulnerable | Species or species habitat may occur within area |
| Puffinus assimilis<br>Little Shearwater [59363] | | Foraging, feeding or related behaviour known to occur within area |
| Puffinus carneipes<br>Flesh-footed Shearwater, Fleshy-footed Shearwater [1043] | | Foraging, feeding or related behaviour likely to occur within area |
| Recurvirostra novaehollandiae<br>Red-necked Avocet [871] | | Species or species |

| Name | Threatened | Type of Presence |
|---|---|---|
| | | habitat known to occur within area |
| Rostratula benghalensis (sensu lato)<br>Painted Snipe [889] | Endangered* | Species or species habitat known to occur within area |
| Sterna anaethetus<br>Bridled Tern [814] | | Breeding known to occur within area |
| Sterna caspia<br>Caspian Tern [59467] | | Breeding known to occur within area |
| Sterna dougallii<br>Roseate Tern [817] | | Foraging, feeding or related behaviour likely to occur within area |
| Sterna fuscata<br>Sooty Tern [794] | | Breeding known to occur within area |
| Sterna nereis<br>Fairy Tern [796] | | Breeding known to occur within area |
| Thalassarche carteri<br>Indian Yellow-nosed Albatross [64464] | Vulnerable | Foraging, feeding or related behaviour may occur within area |
| Thalassarche cauta<br>Shy Albatross [89224] | Endangered | Foraging, feeding or related behaviour likely to occur within area |
| Thalassarche impavida<br>Campbell Albatross, Campbell Black-browed Albatross [64459] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche melanophris<br>Black-browed Albatross [66472] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche steadi<br>White-capped Albatross [64462] | Vulnerable | Foraging, feeding or related behaviour likely to occur within area |
| Thinornis rubricollis<br>Hooded Plover [59510] | | Species or species habitat known to occur within area |
| Tringa glareola<br>Wood Sandpiper [829] | | Species or species habitat known to occur within area |
| Tringa nebularia<br>Common Greenshank, Greenshank [832] | | Species or species habitat known to occur within area |
| Tringa stagnatilis<br>Marsh Sandpiper, Little Greenshank [833] | | Species or species habitat known to occur within area |
| Fish | | |
| Acentronura australe<br>Southern Pygmy Pipehorse [66185] | | Species or species habitat may occur within area |
| Campichthys galei<br>Gale's Pipefish [66191] | | Species or species habitat may occur within area |
| Heraldia nocturna<br>Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227] | | Species or species habitat may occur within area |
| Hippocampus angustus<br>Western Spiny Seahorse, Narrow-bellied Seahorse | | Species or species |

| Name | Threatened | Type of Presence |
| --- | --- | --- |
| [66234] | | habitat may occur within area |
| Hippocampus breviceps<br>Short-head Seahorse, Short-snouted Seahorse [66235] | | Species or species habitat may occur within area |
| Hippocampus subelongatus<br>West Australian Seahorse [66722] | | Species or species habitat may occur within area |
| Histiogamphelus cristatus<br>Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243] | | Species or species habitat may occur within area |
| Lissocampus caudalis<br>Australian Smooth Pipefish, Smooth Pipefish [66249] | | Species or species habitat may occur within area |
| Lissocampus fatiloquus<br>Prophet's Pipefish [66250] | | Species or species habitat may occur within area |
| Lissocampus runa<br>Javelin Pipefish [66251] | | Species or species habitat may occur within area |
| Maroubra perserrata<br>Sawtooth Pipefish [66252] | | Species or species habitat may occur within area |
| Mitotichthys meraculus<br>Western Crested Pipefish [66259] | | Species or species habitat may occur within area |
| Nannocampus subosseus<br>Bonyhead Pipefish, Bony-headed Pipefish [66264] | | Species or species habitat may occur within area |
| Phycodurus eques<br>Leafy Seadragon [66267] | | Species or species habitat may occur within area |
| Phyllopteryx taeniolatus<br>Common Seadragon, Weedy Seadragon [66268] | | Species or species habitat may occur within area |
| Pugnaso curtirostris<br>Pugnose Pipefish, Pug-nosed Pipefish [66269] | | Species or species habitat may occur within area |
| Solegnathus lettiensis<br>Gunther's Pipehorse, Indonesian Pipefish [66273] | | Species or species habitat may occur within area |
| Stigmatopora argus<br>Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276] | | Species or species habitat may occur within area |
| Stigmatopora nigra<br>Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277] | | Species or species habitat may occur within area |
| Urocampus carinirostris<br>Hairy Pipefish [66282] | | Species or species habitat may occur within area |
| Vanacampus margaritifer<br>Mother-of-pearl Pipefish [66283] | | Species or species habitat may occur within area |
| Vanacampus phillipi<br>Port Phillip Pipefish [66284] | | Species or species habitat may occur within |

| Name | Threatened | Type of Presence |
|---|---|---|
| | | area |
| Vanacampus poecilolaemus<br>Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285] | | Species or species habitat may occur within area |
| **Mammals** | | |
| Arctocephalus forsteri<br>Long-nosed Fur-seal, New Zealand Fur-seal [20] | | Species or species habitat may occur within area |
| Neophoca cinerea<br>Australian Sea-lion, Australian Sea Lion [22] | Vulnerable | Species or species habitat known to occur within area |
| **Reptiles** | | |
| Caretta caretta<br>Loggerhead Turtle [1763] | Endangered | Foraging, feeding or related behaviour known to occur within area |
| Chelonia mydas<br>Green Turtle [1765] | Vulnerable | Foraging, feeding or related behaviour known to occur within area |
| Dermochelys coriacea<br>Leatherback Turtle, Leathery Turtle, Luth [1768] | Endangered | Foraging, feeding or related behaviour known to occur within area |
| Disteira kingii<br>Spectacled Seasnake [1123] | | Species or species habitat may occur within area |
| Natator depressus<br>Flatback Turtle [59257] | Vulnerable | Foraging, feeding or related behaviour known to occur within area |

## Whales and other Cetaceans [ Resource Information ]

| Name | Status | Type of Presence |
|---|---|---|
| **Mammals** | | |
| Balaenoptera acutorostrata<br>Minke Whale [33] | | Species or species habitat may occur within area |
| Balaenoptera edeni<br>Bryde's Whale [35] | | Species or species habitat may occur within area |
| Balaenoptera musculus<br>Blue Whale [36] | Endangered | Species or species habitat likely to occur within area |
| Caperea marginata<br>Pygmy Right Whale [39] | | Species or species habitat may occur within area |
| Delphinus delphis<br>Common Dophin, Short-beaked Common Dolphin [60] | | Species or species habitat may occur within area |
| Eubalaena australis<br>Southern Right Whale [40] | Endangered | Breeding known to occur within area |
| Grampus griseus<br>Risso's Dolphin, Grampus [64] | | Species or species habitat may occur within area |
| Megaptera novaeangliae<br>Humpback Whale [38] | Vulnerable | Species or species habitat known to occur within area |
| Orcinus orca<br>Killer Whale, Orca [46] | | Species or species |

| Name | Status | Type of Presence |
|---|---|---|
| | | habitat may occur within area |
| Stenella attenuata<br>Spotted Dolphin, Pantropical Spotted Dolphin [51] | | Species or species habitat may occur within area |
| Tursiops aduncus<br>Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418] | | Species or species habitat likely to occur within area |
| Tursiops truncatus s. str.<br>Bottlenose Dolphin [68417] | | Species or species habitat may occur within area |

## Extra Information

### State and Territory Reserves [ Resource Information ]

| Name | State |
|---|---|
| Leda | WA |
| Unnamed WA39584 | WA |
| Unnamed WA39752 | WA |
| Unnamed WA43903 | WA |
| Unnamed WA48968 | WA |
| Unnamed WA51658 | WA |

### Invasive Species [ Resource Information ]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

| Name | Status | Type of Presence |
|---|---|---|
| Birds | | |
| Acridotheres tristis<br>Common Myna, Indian Myna [387] | | Species or species habitat likely to occur within area |
| Anas platyrhynchos<br>Mallard [974] | | Species or species habitat likely to occur within area |
| Carduelis carduelis<br>European Goldfinch [403] | | Species or species habitat likely to occur within area |
| Columba livia<br>Rock Pigeon, Rock Dove, Domestic Pigeon [803] | | Species or species habitat likely to occur within area |
| Passer domesticus<br>House Sparrow [405] | | Species or species habitat likely to occur within area |
| Passer montanus<br>Eurasian Tree Sparrow [406] | | Species or species habitat likely to occur within area |
| Streptopelia chinensis<br>Spotted Turtle-Dove [780] | | Species or species habitat likely to occur within area |
| Streptopelia senegalensis<br>Laughing Turtle-dove, Laughing Dove [781] | | Species or species habitat likely to occur within area |
| Sturnus vulgaris<br>Common Starling [389] | | Species or species |

| Name | Status | Type of Presence |
|---|---|---|
| | | habitat likely to occur within area |
| Turdus merula<br>Common Blackbird, Eurasian Blackbird [596] | | Species or species habitat likely to occur within area |
| **Mammals** | | |
| Bos taurus<br>Domestic Cattle [16] | | Species or species habitat likely to occur within area |
| Canis lupus familiaris<br>Domestic Dog [82654] | | Species or species habitat likely to occur within area |
| Felis catus<br>Cat, House Cat, Domestic Cat [19] | | Species or species habitat likely to occur within area |
| Funambulus pennantii<br>Northern Palm Squirrel, Five-striped Palm Squirrel [129] | | Species or species habitat likely to occur within area |
| Mus musculus<br>House Mouse [120] | | Species or species habitat likely to occur within area |
| Oryctolagus cuniculus<br>Rabbit, European Rabbit [128] | | Species or species habitat likely to occur within area |
| Rattus norvegicus<br>Brown Rat, Norway Rat [83] | | Species or species habitat likely to occur within area |
| Rattus rattus<br>Black Rat, Ship Rat [84] | | Species or species habitat likely to occur within area |
| Vulpes vulpes<br>Red Fox, Fox [18] | | Species or species habitat likely to occur within area |
| **Plants** | | |
| Asparagus asparagoides<br>Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473] | | Species or species habitat likely to occur within area |
| Brachiaria mutica<br>Para Grass [5879] | | Species or species habitat may occur within area |
| Cenchrus ciliaris<br>Buffel-grass, Black Buffel-grass [20213] | | Species or species habitat may occur within area |
| Chrysanthemoides monilifera<br>Bitou Bush, Boneseed [18983] | | Species or species habitat may occur within area |
| Chrysanthemoides monilifera subsp. monilifera<br>Boneseed [16905] | | Species or species habitat likely to occur within area |
| Genista linifolia<br>Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800] | | Species or species habitat likely to occur within area |
| Genista sp. X Genista monspessulana<br>Broom [67538] | | Species or species habitat may occur within area |

| Name | Status | Type of Presence |
|---|---|---|
| Lantana camara<br>Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] | | Species or species habitat likely to occur within area |
| Lycium ferocissimum<br>African Boxthorn, Boxthorn [19235] | | Species or species habitat likely to occur within area |
| Olea europaea<br>Olive, Common Olive [9160] | | Species or species habitat may occur within area |
| Opuntia spp.<br>Prickly Pears [82753] | | Species or species habitat likely to occur within area |
| Pinus radiata<br>Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780] | | Species or species habitat may occur within area |
| Rubus fruticosus aggregate<br>Blackberry, European Blackberry [68406] | | Species or species habitat likely to occur within area |
| Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii<br>Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497] | | Species or species habitat likely to occur within area |
| Salvinia molesta<br>Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665] | | Species or species habitat likely to occur within area |
| Tamarix aphylla<br>Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018] | | Species or species habitat likely to occur within area |
| Reptiles | | |
| Hemidactylus frenatus<br>Asian House Gecko [1708] | | Species or species habitat likely to occur within area |

## Nationally Important Wetlands [ Resource Information ]

| Name | State |
|---|---|
| Spectacles Swamp | WA |

# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

# Coordinates

-32.26956 115.78151

# APPENDIX 6: Contaminated Sites Information (DWER 2020)