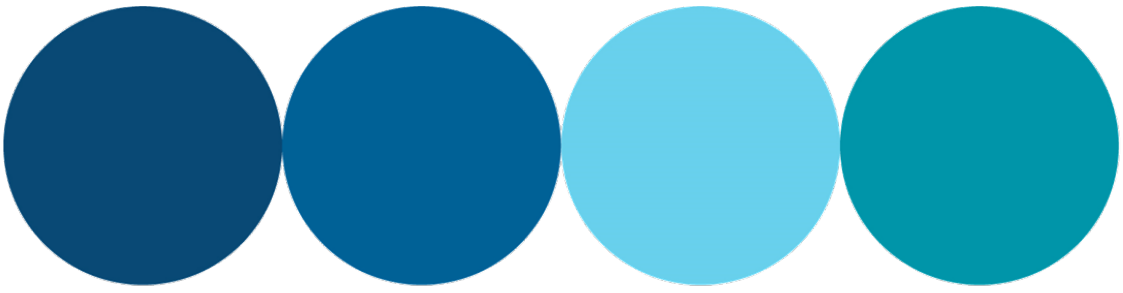
# CW03474 Alkimos Seawater Desalination Plant

## Terrestrial Construction Environment Management Plan

October 2023



WATER CORPORATION

# Document Information

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|---|---|
| **Title** | Terrestrial Construction Environmental Management Plan (TCEMP): Alkimos Seawater Desalination Plant (ASDP) |
| **Reference** | Nexus document # 99334269 |

| Rev No | Date | Author | Reviewer | Key Changes |
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| 0 | 22 June 2020 | Daniel Roocke | Melissa Younger | Initial Draft. |
| 1 | 12 Nov 2022 | Barrett Moulds | Paul Zahra | Enabling Earthworks scope. |
| 2 | 19 Dec 2022 | Gemma Tribbick | Aaron Thorburn<br>Paul Zahra<br>Tung Nguyen<br>Raj Bhullar | Amalgamation of Alkimos Water Precinct EMP and updates in accordance with EPA and DBCA comments.<br>Site specific detail added to change the document from a framework to a plan.<br>Update of all figures to match footprint in s43 application. |
| 3 | 2 February 2023 | Paul Zahra | | Changes following DWER consult. |
| 4 | 13 April 2023 | Paul Zahra | | Removed management of Alkimos Water Precinct. |
| 5 | 4 Oct 2023 | Paul Zahra | | Minor changes for DCCEEW. |
| 6 | 27 Oct 2023 | Paul Zahra | | Update to List of commitments and requirements (Audit Table) and language in body of document |

# 1 Contents

## Acronyms and Abbreviations

| Abbreviation | Definition |
|---|---|
| ASDP | Alkimos Seawater Desalination Plant (the Project) |
| ASS | Acid Sulfate Soils |
| BoM | Bureau of Meteorology |
| CBD | Central Business District |
| CEMP | Construction Environmental Management Plan |
| DAS | Disturbance Approval Strategy |
| DAWE | Department of Agriculture, Water and the Environment |
| DBCA | Department of Biodiversity, Conservation and Attractions |
| DE | Development Envelope |
| DF | Disturbance Footprint |
| DoEE | Department of Environment and Energy |
| DoH | Department of Health |
| DPLH | Department of Planning, Lands and Heritage |
| DWER | Department of Water and Environmental Regulation |
| EHB | European House Borer |
| EMS | Environmental Management System |
| En | Endangered |
| EPA | Environmental Protection Authority |
| EP Act | *Environmental Protection Act 1986* |
| ERD | Environmental Review Document |
| ESA | Environmentally Sensitive Area |
| ESD | Environmental Scoping Document |
| FPC | Forest Products Commission |
| GWTP | Groundwater Treatment Plant |
| ha | Hectares |
| HSEAA | Health, Safety and Environment & Aboriginal Affairs |
| IWSS | Integrated Water Supply Scheme |
| km | Kilometres |
| m | Metres |
| MNES | Matters of National Environmental Significance |
| P | Priority |
| PASS | Potential Acid Sulfate Soils |
| PEC | Priority Ecological Community |
| RMZ | Restricted Movement Zone |
| SCADA | Supervisory Control And Data Acquisition |
| SDP | Seawater Desalination Plant component of the project |
| T | Threatened |
| TEC | Threatened Ecological Community |
| Vu | Vulnerable |
| WWTP | Wastewater Treatment Plant |

# 1 Summary

This document provides the plan to manage terrestrial environmental risks associated with the construction of the Alkimos Seawater Desalination Plant Project (ASDP) (the Project). A summary of the key project details is shown in Table 1.

**Table 1: Summary of Project Details**

| | |
|---|---|
| **Project Name** | Alkimos Seawater Desalination Plant |
| **Proponent name** | Water Corporation |
| **Purpose of the Construction Environment Management Plan** | The Plan sets the environmental performance objectives and minimum requirements for the project to prevent or minimise environmental impacts arising from the project works.<br>The Plan has been developed with consideration of environmental impact assessments associated with the project, in order to:<br>• Identify key environmental risks associated with the project works<br>• Set the overall environmental objectives and performance indicators for the project<br>• Provide the minimum environmental requirements to be implemented by the contractors. |
| **Key environmental factors and environmental risk aspects** | • Flora and vegetation<br>• Conservation Areas<br>• Weeds, pests and disease hygiene<br>• Terrestrial fauna<br>• Dust<br>• Noise and vibration<br>• Aboriginal heritage values<br>• Contamination<br>• Acid Sulfate Soils<br>• Dewatering<br>• Commissioning activities<br>• Chemical use<br>• Greenhouse gas emissions<br>• Waste management<br>• Reinstatement and revegetation.<br>• Fire. |
| **Proposed construction dates** | • ASDP site earthworks, from late 2023 to early 2025 (approx. 18 months).<br>• marine tunnel construction from 2025- 2027 (approx. 2 years)<br>• desal plant construction 2025 to 2027 (approx. 2 years).<br>• pipeline construction 2025-2027 |

# 2 Context, Scope and Rationale

## 2.1 Project Overview

Water Corporation is proposing to build and operate a Seawater Desalination Plant (SDP) and Groundwater Treatment Plant (GWTP) at Alkimos and an associated 23.93 km integration pipeline connecting the desalination plant to Wanneroo Reservoir. Collectively, these elements form the Alkimos Seawater Desalination Plant (ASDP) (the 'Project').

Perth has seen a rapid drying of climate over the past 40 years with an even greater reduction in streamflow to metropolitan dams and recharge to aquifers. For this reason, Water Corporation has updated its long-term planning to reflect a future of reduced reliance on regular dam streamflow and is investigating climate-independent water sources.

Water Corporation is proposing to construct the SDP and GWTP adjacent to the existing Alkimos Wastewater Treatment Plant (WWTP), within the Alkimos Water Precinct (Lot 1050 Marmion Avenue). Additional construction includes marine infrastructure, and the integration pipeline required to transfer the drinking water produced to Wanneroo Reservoir and into the Integrated Water Supply Scheme (IWSS).

Alkimos is located approximately 40 km northwest of the Perth central business district (CBD) in the northwest corridor, north of Quinns Rock beach and south of Yanchep beach (Figure 1). The Project has a terrestrial development envelope (DE) of 130.1 ha, of which 69.66 ha is native vegetation. The SDP DE represents 31.75 ha and the pipeline DE covers an area of 98.35 ha (Figure 1).

The proposed ASDP was referred to the Western Australian Environmental Protection Authority (EPA) under the *Environment Protection Act 1986* (EP Act) on 12 April 2019. The EPA determined the project required assessment under Section 29 of the EP Act and set a level of assessment for Environmental Review Document (ERD). On 23 July 2019, it was referred to the Department of Agriculture, Water and the Environment (DAWE) and the project was determined to be a controlled action. Water Corporation prepared an Environmental Scoping Document (ESD) that was submitted to the EPA on 9 March 2020 and was endorsed on by the EPA and DAWE on 18 April 2020.

## 2.2 Site Setting and Tenure – Plant Site Only

### 2.2.1 Setting

The proposed desalination plant site comprises of undulating; occasionally steep sand dunes, and swales supporting coastal heathland vegetation.

The site contains a combination of relatively undisturbed land as well as areas which show signs of having been degraded for a long period of time through historical clearing and weed invasion.

Beyond a strip of intended residential land and a narrow coastal reserve, Lot 9001 adjoins the Indian Ocean to the west. Land adjoining to the north, east and south is zoned for future residential/urban development or for retention of bushland. Marmion Avenue adjoins the site to the east.

The desalination plant is proposed to be located on a cleared and levelled site, which is currently serviced by an access road, underground power, a wastewater pressure main and an ocean outlet pipeline (both underground) related to the Alkimos Wastewater Treatment Plant (WWTP). The existing WWTP is enclosed within a double security and safety fence.

Almost all of the bushland has been subjected to inappropriate use over many years, including fire-lighting, illegal rubbish dumping, vandalism, and trespassing.

### 2.2.2 Tenure

Lot 1012 and Lot 9001 are owned in freehold by the Water Corporation of Western Australia, and portions of each are subject to urban development. The lots have multiple land use zonings under the Metropolitan Region Scheme (MRS) including Urban, Urban Deferred, Public Purposes – Water Service and Public Purposes –

Protected and Managed for Conservation Purposes. Figure 4 shows the land use classification and future surrounding development.

## 2.3 Key Environmental Factors and Objectives, and Potential Impacts

Several environmental factors are potentially at risk of impact from the Project works, including:

- Flora and vegetation
- Terrestrial fauna
- Landforms
- Aboriginal heritage values (No European cultural heritage sites are located within the SDP or pipeline DEs.)
- Greenhouse gas emissions
- Conservation Areas

The activities involved in the Project that have the potential to impact the key environmental factors include:

- Excavations
- Land disturbance
- Dewatering
- Pipeline commissioning
- Chemical storage and use
- Generation of waste
- Transport of weeds, pests and hygiene management
- Generation of dust
- Noise and vibration
- Disturbance of contaminated sites and Acid Sulfate Soils (ASS) or Potential ASS (PASS)
- Reinstatement and revegetation.

This Construction Environmental Management Plan (CEMP) includes management measures and controls to ensure appropriate mitigation of impacts to the main environmental sensitivities relating to this project, including:

- Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs)
- Department of Biodiversity Conservation and Attractions (DBCA) managed lands: Neerabup National Park, and Gnangara-Moore River State Forest
- Areas zoned Public Purpose – Protected and Managed for Conservation Purposes under the MRS in accordance with MS722
- Nine Bush Forever sites: 136, 290, 293, 295, 324, 382, 383, 451, 471
- Environmentally Sensitive Areas (ESAs)
- Geomorphic Wetlands:
  - One Conservation Category Wetland (Lake Pinjar), three Resource Enhancement Wetlands and one Multiple Use Wetland
  - In close proximity to Carabooda Lake, Lake Adams and Jandabup Lake

- Terrestrial Matters of National Environmental Significance (MNES) – including Threatened Flora, TECs, Black Cockatoos and Migratory species
- ASS and three contaminated sites: CS70488, CS70489, CS12882.

## 2.4 Rationale and Approach

This CEMP provides a foundation to manage environmental risks and impacts associated with the construction of the ASDP. The Plan sets the environmental objectives and management measures for the project to prevent and minimise environmental impacts arising from the works.

The Plan has been developed with consideration of environmental impact assessments and regulatory conditions associated with the Project to:

- Identify key environmental risks associated with the Project
- Meet legal requirements related to vegetation clearing, dewatering and ASS
- Set the overall environmental objectives and performance indicators for the Project
- Provide the environmental requirements to be implemented by the Contractors.

This document applies to all contractors conducting work associated with the construction and commissioning phase of the ASDP, and implementation of the Project will be in accordance with Water Corporation's Environmental Policy (Attachment A).

## 2.5 Previous Survey Findings

Previous flora and vegetation assessments (AECOM 2018a, 2018b, Strategen 2017, 2018, Ecoscape 2018 and Stantec 2020a) and fauna assessments (Bamford 2017, AECOM 2018a, AECOM 2018b, Ecoscape 2018 and Stantec 2020b) were completed during the planning phase of the project.

These assessments noted features considered to be sensitive environmental receptors to the project. Survey results included conservation significant ecological communities, significant flora and fauna species, Declared Pests, Weeds of National Significance and 'very high' quality black cockatoo foraging habitat, along with breeding trees with hollows. Sections 4.1, 4.2 and 4.3 provide further detail on the results of these biological surveys, and the implications to the project.

An asbestos survey of the ASDP was conducted in 2017 by Jacobs Worley Parsons Joint Venture (2017). This identified a number of Asbestos Containing Materials (ACM), further discussed in Section 4.9.

# 3 System Requirements

Water Corporation has an Environmental Management System (EMS) which is externally certified to *ISO 14001*. This system has been developed to manage potential environmental impacts associated with the Water Corporation's activities.

Everyone that works for or on behalf of the Water Corporation must meet or exceed our Standards and Procedures. The following sections describe the minimum environmental requirements that must be met by contractors conducting work on this project.

The requirements of the following sections, and other sections where further detail from contractor is required, shall be documented in an addendum to the CEMP by the Contractor. The addendum is to be approved by the Water Corporation's Environmental Advisor prior to construction commencing.

## 3.1 Leadership and Planning

Water Corporation's EMS is guided by Water Corporation's Environmental Policy (Attachment A). This policy outlines Water Corporation's commitment to continually improving environmental performance, complying with environmental compliance obligations, preventing pollution, and minimising environmental harm.

The Contractor must:

- Have an environmental policy that aligns with the Water Corporation's Environmental Policy. Both policies must be displayed at the project site for the duration of the Project
- Document the key roles and responsibilities associated with environmental management of this Project
- Undertake work in accordance with this plan to meet the specific environmental objectives and performance indicators.

## 3.2 Risk Management

Water Corporation has undertaken an environmental risk assessment for the Project and identified the key environmental factors (Attachment B). The environmental objectives, performance indicators, and minimum requirements for key environmental factors have been documented in Section 4. The Contractor must:

- Develop and maintain a process to ensure environmental risks are identified, assessed and managed throughout the Project
- Establish and maintain a risk register for all stages of the Project
- Undertake all works in accordance with this CEMP including complying with the controls, monitoring requirements and reporting requirements listed for the key environmental factors
- Prepare any required sub-plans, including the documentation of any credible emergency events, with accompanying contingency actions and reporting requirements for the potential events. These sub-plans will need be approved by an Environmental Advisor from Water Corporation prior to construction.

## 3.3 Compliance

### 3.3.1 Legislation, regulations and approvals

The Projects activities must be undertaken in a manner that complies with the requirements of the following relevant legislation and guidelines:

- *Aboriginal Heritage Act 1972*
- *Aboriginal Heritage Regulations 1974*
- *Agriculture and Related Resources Protection (European House Borer) Regulations 2006*
- *AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites*
- *Biodiversity Conservation Act 2016*
- *Biosecurity and Agricultural Management Act 2007*
- *Bush Fires Act 1954*
- *Conservation and Land Management Act 1984*
- *Contaminated Sites Act 2003* (CS Act)
- *Dangerous Goods Safety Act 2004*
- *Department of Health (DoH): Guidelines for Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2005)*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environmental Protection Act 1986* (EP Act)
- *Environmental Protection Authority Factor Guideline: Greenhouse Gas Emissions (2020)*
- *Environmental Protection Authority Factor Guideline: Air Quality (2020)*
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*
- *Environmental Protection (Unauthorised Discharges) Regulations 2004* (Unauthorised Discharge Regulations)

- *Environmental Protection (Noise) Regulations 1997* (Noise Regulations)
- *National Greenhouse and Energy Reporting Act 2007*
- *Native Title Act 1993 (Commonwealth)*
- *Rights in Water & Irrigation Act 1914*
- *Waterways Conservation Act 1976*
- *Waterways Conservation Regulations 1984*
- *Water Services Act 2012.*

The following environmental approvals may apply to the works:

- Part V Works Approval
- Bed and Banks Permit
- 5C Licence to Take Water
- 26D Licence to Drill
- Disturbance Approval System (DAS), through DBCA applicable to works occurring within National Parks

### 3.3.2 Other Requirements

Management Sub-Plans required for the Project, that are to be prepared by the contractor and approved by Water Corporations Environmental Advisor, include:

- ASS and Dewatering Management Plan.
- Asbestos Management Plan / Hazardous Waste Management Plan.
- Traffic Management Plan.
- Contingency management plan – Emergency events and failure to meet outcomes.
- Dieback Management Plan (prepared in consultation with DBCA and submitted for approval to the Department of Climate Change, Energy, the Environment Water prior to commencement of on-ground works ).

The Contractor must:

- Document a process for ensuring that any communicated changes to compliance obligations are assessed and identify any changes to sub-plan documentation, controls or management practices.
- Retain records demonstrating compliance with all management actions and reporting requirements within the CEMP and sub-plans. Records at to be made available to Water Corporation upon request.
- Report and investigate any instances of a compliance obligation (from CEMP or Sub-plans) not being met (refer Section 3.8).

## 3.4 People Management

The Contractor must:

- Identify any roles/activities within the scope that require specific environmental training and document the training requirements
- Identify a method for ensuring that workers meet training requirements and records of training are retained
- Develop and implement induction material specific to the scope of works and the requirements of this CEMP. The material must include:
  - Information related to key environmental factors (as listed in Section 2.3 and detailed in Section 4) and any additional environmental factors identified in the CEMP.
  - Specific requirements for activities with potential high environmental risks
  - Incident management

  - General awareness of other environmental issues associated with the activities
- Ensure all workers complete the site induction. Short-term visitors such as couriers and delivery agents may receive a shortened or no induction, but should be escorted (or have a designated and marked safe area/zone)
- Provide a copy of induction material to Water Corporation for their comment prior to construction.

## 3.5 Stakeholders, Communication, and Consultation

The Contractor must:

- Document methods for communicating environmental information to workers and other internal stakeholders
- Document a process that details how external stakeholders raise concerns/queries on Project activities, and the method for recording and responding to these queries/concerns
- Document any regulatory agencies, landowners, and other rights holders who are required to be consulted during the Project and state when and how communication with them will occur.

## 3.6 Systems of Work

The Contractor must ensure that adequate systems of work are in place so that work is executed efficiently and in a manner that prevents impacts to the environment. The Contractor must:

- Comply with all controls, and monitoring and reporting requirements of this CEMP
- Comply with all controls, and monitoring and reporting requirements of approved Sub-plans (as listed in section 3.3.2)
- Retain records to demonstrate compliance with system of works procedures and monitoring requirements.

## 3.7 Land, Facilities, Plant and Equipment

The Contractor must:

- Identify any plant and equipment that is critical to meeting Health Safety and Environment & Aboriginal Affairs (HSEAA) requirements. This includes:
  - Plant and equipment that will be used to meet the requirements; or
  - Plant and equipment that, when used, may affect meeting HSEAA requirements
- Identify any compliance obligations, industry standards, performance criteria, or other parameters that this plant and equipment must meet
- Document how this plant and equipment will be inspected, monitored, and maintained to ensure performance criteria are being met
- Develop a site plan, provide it to Water Corporation and maintain a copy of the site plan in the site office, include it within the CEMP addendum and also have it included in induction material. At a minimum the plan must include:
  - the extent of the approved DE and DF
  - cadastral boundaries
  - site offices, facilities and amenities
  - laydown areas
  - material stockpiles, soil/spoil windrows
  - location of stormwater runoff control measures
  - ASS treatment locations
  - infiltration areas

- hygiene management points
- access points to areas of the project
- intended weed management activities.

## 3.8 Incident Management, Reporting and Investigation

The Contractor must:

- Document the process for responding to, investigating and reporting environmental incidents. This process must include the key roles, equipment and resources required
- Maintain a register of all fauna removals, deaths or injuries
- Report all actual or potential environmental incidents to Water Corporation within the following time periods:
  - For incidents involving wastewater: as soon as possible, not exceeding 30 minutes
  - For all other incidents: as soon as practical not exceeding 24 hours.

## 3.9 Performance Monitoring, Audit and Improvement

The Contractor must:

- Document how performance will be monitored against environmental objectives, performance criteria, and requirements – including development of a site environmental inspection checklist.
- Participate in inspections or audits conducted by Water Corporation or regulators. The minimum frequency of inspections and audits are outlined in Table 3.
- Document a process that:
  - Determines the cause of incidents and non-conformances / non-compliances
  - Identifies and implements corrective actions
  - Identifies actions required to prevent recurrence
  - Records changes in written procedures resulting from the corrective action.

**Table 3: Minimum inspection requirements**

| Party | Type | Frequency |
|---|---|---|
| Contractor | Site Environmental Inspection | Fortnightly |
| Water Corporation | Environmental Inspections | Ad hoc, but no more than monthly unless objectives are not being met |
| | Environmental Audit | Ad hoc, but no more than quarterly unless objectives are not being met |
| Regulator | Audit/Inspection | As requested by the Regulator |
| External Certification Agency | Audit of Water Corporation's Environmental Management System | As requested by the Water Corporation |

# 4 Environmental Management

An environmental risk assessment conducted on the project has identified the following key environmental factors and environmental risk aspects for the project:

- Flora and vegetation
- Weeds, pests and disease hygiene
- Terrestrial fauna
- Conservation Areas
- Dust
- Noise and vibration
- Fire
- Aboriginal heritage
- Contamination
- Acid Sulfate Soils
- Dewatering
- Commissioning activities (including flushing)
- Chemical use
- Greenhouse gas emissions
- Waste and hazardous substance management
- Reinstatement and revegetation.

The Environment Risk Assessment is available in Appendix B.

For each identified key environmental factor and environmental risk aspect, the following sections provide background information, objectives, performance criteria and the minimum requirements (controls, monitoring and reporting) for managing these environmental factors. For each factor, the contractor must:

- Adhere to all identified requirements within this CEMP along with any other requirements deemed necessary to meet the environmental objectives
- Identify any credible emergency events and document within the CEMP addendum the emergency response plan, any contingency actions and the reporting requirements to be implemented for such events.

A summary of the actions, monitoring and reporting requirements is included in Attachment E.

## 4.1 Flora and Vegetation

### 4.1.1 Background

Several flora and vegetation surveys have been undertaken in the DE (AECOM 2018a 2018b, Strategen 2017, 2018, Ecoscape 2018), which required consolidation by Stantec (2020a). The consolidation of the surveys identified significant species and vegetation communities and other environmental values that could be impacted by the construction of the ASDP.

Potential impacts to flora and vegetation from the construction of the ASDP that need to be considered include:

- Direct Impacts
  - Authorised planned clearing
  - Dieback and weed incursion
  - Unplanned interactions between mobile plant and uncleared vegetation

  - Disturbance to wetland communities and alteration to groundwater hydrology (in pipeline DE)
- Indirect Impacts
  - Edge effects, and the fragmentation of native vegetation and habitat
  - Secondary adverse effects of dewatering
  - Acid generation following the disturbance of ASS (in pipeline DE).

#### *4.1.1.1 Threatened Ecological Communities and Priority Ecological Communities*

Vegetation representing three TECs and four PECs were identified within the DE (Strategen 2017, AECOM 2018b, Ecoscape 2018, Stantec 2020a) (Figures 2-1 to 2-8) The presence of these significant ecological communities has been determined through either formal assessment according to Commonwealth Approved Conservation Advice criteria or through analysis to establish inferred Floristic Community Types.

Vegetation considered to be representative of two Commonwealth TECs, '*Banksia* Woodlands of the Swan Coastal Plain' (En) and 'Tuart (*Eucalyptus gomphocephala*) woodlands and forest of the Swan Coastal Plain' (Cr) and one State-listed TEC, '*Melaleuca huegelii-Melaleuca systena* shrublands on limestone ridges' (E), were recorded within the DE.

Vegetation considered analogous with four State-listed PECs has been recorded within the SDP and Pipeline DEs. The occurrence of these PECs was determined through Floristic Community Type analysis and detailed site observations:

- 'Tuart (*Eucalyptus gomphocephala*) woodlands and forest of the Swan Coastal Plain' (P3)
- '*Banksia* Dominated Woodlands of the Swan Coastal plain IBRA Region' (P3)
- 'Northern Spearwood shrublands and woodlands' (P3)
- '*Acacia* shrublands on taller dunes, Southern Swan Coastal Plain' (P3).

The TECs and PECs that will be impacted by the Project are known to occur across a large range and are well represented in conservation areas in the local and regional area. The Project is unlikely to alter the conservation status of any impacted vegetation communities.

#### *4.1.1.2 Constrained vegetation types (per cent (%) remaining since pre-European clearing)*

Four vegetation associations have been mapped over the SDP and pipeline DEs, based on Shepherd et al (2002). Three associations (949, 998 and 1007) have more than 30% of their pre-European extent remaining at both a State and local level and are therefore, considered to be of least concern. The remaining vegetation association (6) has less than 30% of its pre-European extent remaining at 23%. All are well above the 10% threshold for urban areas.

#### *4.1.1.3 Environmentally Sensitive Areas and Geomorphic Wetlands*

The Pipeline DE intersects with wetlands of conservation value (an ESA); including approximately a Conservation Category Wetland (Lake Pinjar (FID 4797, 1555) and several other multiple use and resource enhancement wetlands (Camel Swamp, Carabooda Lake, Lake Adams, Jandabup Lake, dampland and sumpland) (Figure 3).

#### *4.1.1.4 Significant Flora*

Eight significant flora species have been recorded in surveys for the Project, including:

- Rare/Threatened or Priority Flora: *Eucalyptus argutifolia* (T), *Baeckea* sp. Limestone (N. Gibson & N.M. Lyons 1425 (P1), *Banksia dallanneyi* subsp. *pollosta* (P3), *Conostylis bracteata* (P3), *Pimelea calcicola* (P3) and *Stylidium maritimum* (P3), *Conostylis pauciflora* subsp. *Euryrhipis* (P4) and *Jacksonia sericea* (P4).

Of these, *Banksia dallanneyi* subsp. *pollosta* (P3) and *Jacksonia sericea* (P4) occur within the pipeline DE. A total of 183 potential black cockatoo breeding trees (with a diameter at breast height (DBH) >500 mm, except for Eucalyptus wandoo (DBH >300 mm)) were identified in the pipeline DE, and 16 within the SDP DE (Figures 6-1 to 6-8) (Attachment D).

### 4.1.2 Objectives

Environmental objectives for managing flora and vegetation, and performance criteria to measure success against these objectives are outlined in Table 4.

**Table 4: Flora and vegetation management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Prevent impacts to native vegetation outside of the approved clearing area | • No clearing or damage to vegetation outside of the Approved Clearing Area. |
| Minimise impacts to native flora and vegetation within the approved clearing area | • Identify opportunities to reduce clearing area (ha)<br>• 100% compliance with controls listed in Section 4.1.3 and specific controls listed in the CEMP |
| Prevent indirect impacts to surrounding sensitive receptors (National Parks, State Forests, TECs, PECs, ESAs, Wetlands and Bush Forever sites) | • Identify opportunities to reduce clearing area (ha)<br>• All impacts to significant vegetation are contained to within the SDP and pipeline DEs, and managed as per the specified control actions (refer 4.1.3 and 4.4.3) |
| Prevent impacts to vegetation resulting from groundwater drawdown | • No decline in vegetation health resulting from groundwater drawdown<br>• No exceedance of groundwater drawdown limits<br>• 100% compliance with an approved Dewatering Management Plan |
| Prevent impacts to habitat trees | • 100% of Black Cockatoo habitat trees identified for retention to remain at the conclusion of works. |

### 4.1.3 Controls

The actions listed in Table 5 represent the minimum controls which are required to be implemented.

**Table 5: Flora and vegetation minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.1.3.1* | Prior to clearing all relevant permit and approvals shall be reviewed and any clearing requirements identified and communicated to Contractors. | Contractor/Water Corporation | Prior to clearing |
| *4.1.3.2* | Clearing area limit must be delineated by the use of pegs, fencing and/or continuous flagging tape by a qualified engineering surveyor. Ensure that the clearing area limit delineated is the approved clearing area limit. | Contractor | Prior to clearing |
| *4.1.3.3* | In areas adjacent to TEC/PECS, ESAs or Conservation areas hazard tape/flagging is to be used as a buffer at least 1 m inside the clearing area limit to avoid unauthorised clearing of material spoil outside of the approved area. The digital shapefiles are to be supplied to the Contractors by the Water Corporation to allow a qualified engineering surveyor to undertake this task. | Contractor | Prior to clearing |
| *4.1.3.4* | Inspect and identify native vegetation and habitat trees (DBH >500mm) that can be retained or protected, thereby reducing overall clearing required. Clearly identify and flag these areas prior to clearing | Contractor | Prior to Clearing |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.1.3.5* | The Contractor is to arrange a final inspection of the demarcation of approved clearing area within TECs/PECs, ESAs, Bush Forever sites by Water Corporation's Environmental Scientist. This is to occur at least five working days prior to clearing. | Contractor | Prior to Clearing |
| *4.1.3.6* | The Water Corporation is to provide approval of demarcated boundaries of approved clearing within TECs/PECs, ESAs, Bush Forever sites prior to clearing commencing | Water Corporation | Prior to Clearing |
| *4.1.3.7* | Photographic records and video recording (as appropriate) of land and vegetation conditions and features on or around the site, such as trees and shrubs, will be stored as a record that the approved clearing area limit was not breached. | Contractor | Prior to clearing |
| *4.1.3.8* | Construction staff to be educated during an initial induction that includes issues relating to clearing activities to ensure the requirements of this CEMP are understood by all parties involved. | Contractor | Prior to clearing |
| *4.1.3.9* | Maintain the integrity of barriers used to demarcate the approved clearing area, tree protection zones, and any areas of native vegetation to be retained. Barriers are to be inspected on a daily basis to confirm their integrity and any repairs undertaken prior to commencing ground disturbance. | Contractor | During clearing and construction |
| *4.1.3.10* | Clearing shall be conducted in a slow, progressive manner from one direction to the other (e.g. west to east) to allow fauna to move into adjacent native vegetation ahead of the clearing activity. | Contractor | During clearing |
| *4.1.3.11* | Required work areas and access tracks shall be identified prior to commencement of construction. Access tracks must not require clearing of native vegetation outside the approved clearing area. | Contractor | During clearing and construction |
| *4.1.3.12* | Vegetation earmarked for removal within the approved clearing area should be felled so that if falls within the DE, to avoid damage to surrounding vegetation intended for retention. | Contractor | During clearing |
| *4.1.3.13* | No dead, standing or fallen timber shall be removed unnecessarily; all logs resulting from land clearing shall be stockpiled in a previously cleared area and used to enhance fauna habitat or to restrict public access to certain areas, on advice of Water Corporation | Contractor | During clearing |
| *4.1.3.14* | Topsoil within areas of significant native vegetation (National Park, State Forest, TEC, PEC, ESA, Bush Forever sites and MRS conservation area 10b) (Attachment C) to be stripped to a depth of 100-150 mm and stockpiled separately. | Contractor | During clearing and construction |
| *4.1.3.15* | All topsoil from areas identified as weed infested and/or dieback infested shall be stripped separately and deposited in the nominated spoil sites for offsite removal. | Contractor | During clearing |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.1.3.16* | Topsoil must not be stockpiled at heights greater than 1.5 m. | Contractor | During Construction |
| *4.1.3.17* | Vegetation clearing logs are maintained and made available at the request of the Water Corporation | Contractor | During clearing |
| *4.1.3.18* | Adhere to information and instructions within a Dewatering Management Plan (DMP)during all applicable operations | Contractor | Prior to and during Construction |
| *4.1.3.19* | Appropriate handling of all pinewood within the DE; including correct movement, removal, destruction and treatment of pinewood (as per the *Agriculture and Related Resources Protection (European House Borer) Regulations 2006* | Contractor | Prior to and during clearing and construction |
| *4.1.3.20* | Within 2 weeks following the completion of clearing activities, the total cleared area must be determined by an engineering surveyor, mapped and reported to the Water Corporation (including start and end dates of clearing activities). | Contractor | Post clearing |
| *4.1.3.21* | Removal of all flagging tape post construction. | Contractor | Post clearing |
| *4.1.3.22* | Within 3 months of completion of works, ensure that any areas that are not required for continued maintenance to be backfilled and restored with top soil to pre-existing contours to promote the natural regeneration of native vegetation. | Contractor | Post clearing |

### 4.1.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 6 and Table 7).

**Table 6: Minimum flora and vegetation monitoring requirements**

| Reference | Monitoring Requirement | Frequency |
|---|---|---|
| *4.1.4.1* | Inspect all demarcated boundaries for damage or signs of encroachment. | Daily |
| *4.1.4.2* | Survey the actual extent of clearing undertaken. Include start and end clearing dates. Provide clearing log to Water Corporation | Monthly and within 2 weeks of the completion of the clearing |

**Table 7: Minimum flora and vegetation reporting requirements**

| Reference | Reporting Requirement | Frequency |
|---|---|---|
| *4.1.4.3* | Contractor to provide Water Corporation with georeferenced spatial data indicating the actual extent of clearing undertaken. | Within two weeks of the completion of the project or prior to the end of the financial year (whichever is sooner). |
| *4.1.4.4* | Contractor to take photographic evidence of proposed clearing area before and after clearing | Prior to, and after clearing, and within two weeks of revegetation/stabilisation works. |

## 4.2 Weeds, Pests and Disease Hygiene

### 4.2.1 Background

The purpose of this section is to outline the management of potential weed, pest and disease vectors so that they do not impact on or spread within or adjacent to the DEs. The CEMP addendum to be prepared by the contractor must identify site-specific weed, pest and disease hygiene risks and provide further detail on controls to be implemented. The works have the potential to spread disease, pests and weeds through the following activities:

- Vegetation clearance
- General movement of vehicles, equipment and mobile plant throughout the DEs
- Importation of road material and/or fill
- Drilling equipment used for the construction and installation of the pipeline
- Excavation and construction activities.

The diversity of introduced flora (weeds) recorded during previous surveys is considered high, with a total of 76 weed species identified. Two declared pest species listed under the *Biosecurity and Agriculture Management Act 2007* were identified during surveys; **Asparagus asparagoides* (Bridal Creeper) and **Solanum linnaenum* (Apple of Sodom). Both species were recorded at numerous locations. Bridal creeper is also listed as a Weed of National Significance considered one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts (DAWE 2020). Additionally, **Genista monspessulana* (Cape Broom) was recorded by two previous surveys and is also a Weed of National Significance. No declared pest species were observed within the ASDP during surveys (Strategen 2017; AECOM 2018a; Ecoscape 2018).

Declared plants (pest weeds) that occur at the Alkimos Water Precinct include Double-gee (*Rumex hypogaeus*) and Narrow Leaf Cotton Bush (*Gomphocarpus fruticosus*), both of which are subject to ongoing management.

The proposed works are located within some areas of native vegetation, which is highly susceptible to *Phytophthora* dieback and other diseases. Ecoscape (2018) did not record any dieback in the DEs, noting that the presence of calcareous soils and limestone meant that the likelihood of occurrence of dieback was considered very low. The AECOM (2018b) survey identified one dieback infestation, one uninterpretable area, and significant areas of uninfested vegetation. However, their exact locations in the current SDP and Pipeline DE could not be identified.

The European House Borer (EHB) (*Hylotrupes bajulus*) is a destructive pest of seasoned coniferous timber including pine, fir and spruce. If allowed to become established, it can cause major structural damage to buildings. In response to this, Restricted Movement Zones (RMZ) have been established surrounding areas in which EHB have been found. A substantial RMZ is mapped within the Swan Coastal Plain region, surrounding the north and east of the Perth metropolitan area (Commonwealth of Australia 2020). The majority of the Pipeline DE intersects with this RMZ; however, the SDP DE is located 2.9 km west of the RMZ. Given this, appropriate management of all pinewood within the DEs is required, as per the *Agriculture and Related Resources Protection (European House Borer) Regulations 2006.*

### 4.2.2 Objectives

Environmental objectives for managing weeds, pests and disease hygiene, and performance criteria to measure success against these objectives are outlined in Table 8.

**Table 8: Weeds, pests and disease hygiene management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| To prevent the introduction or spread of significant weeds or diseases as a result of construction works. | • No introduction or spread of significant weed species as a result of project activities<br>• No introduction or spread of dieback associated with construction works<br>• Full compliance with the *Agriculture and Related Resources Protection (European House Borer)* |

| Objective | Performance Criteria |
|---|---|
| | *Regulations 2006* regarding pinewood management. |

### 4.2.3 Controls

The actions listed in Table 9 represent the minimum controls which are required to be implemented.

**Table 9: Weeds pests and disease hygiene management minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.2.3.1* | Prepare a CEMP addendum identifying site-specific weed, pest and disease hygiene risks and provide further detail on controls to be implemented | Contractor | Prior to and during clearing and construction |
| *4.2.3.2* | Undertake pre-construction targeted weed mapping, within the proposed clearing area, and 15m in to adjacent Conservation areas, and a *Phytophthora* survey to inform weed and dieback management | Water Corporation | Prior to clearing |
| *4.2.3.3* | Undertake pre-construction *Phytophthora cinnamomi* survey of the proposed clearing area, and 25m in to adjacent Conservation areas, to inform dieback management | Water Corporation | Prior to clearing and earthworks |
| *4.2.3.4* | Weed control to be undertaken if Declared Pests or Weeds of National Significance are present in the area proposed to be disturbed | Contractor | Prior to clearing |
| *4.2.3.5* | Adhere to the Department of Parks and Wildlife (2015) corporate policy for the management of *Phytophthora* and the *Management Guidelines* (Department of Conservation and Land Management (2015) Plan | Contractor | Prior to and during clearing and construction |
| *4.2.3.6* | Develop a Dieback Management Plan (as an addendum to this CEMP), in consultation with DBCA and Water Corporation. | Contractor | Prior to and during clearing and construction |
| *4.2.3.7* | Implement approved Dieback Management Plan | Contractor | Prior to and during clearing and construction |
| *4.2.3.8* | All site personnel and construction staff will be educated during an initial induction that includes issues relating to hygiene control to ensure the project's approved Dieback Management Plan is understood by all parties involved | Contractor | Prior to and during clearing and construction |
| *4.2.3.9* | Clearly demarcate any hygiene management areas (with clear signage to differentiate infested and uninfested areas) and establish clean on entry and exit points with, as a minimum, brush down facility and a log of vehicles entering and exiting the area. | Contractor | Prior to and during clearing and construction |
| *4.2.3.10* | Inspect all plant and equipment to ensure it is free from soil and plant debris prior to commencement of work on site. | Contractor | Prior to and during clearing and construction |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.2.3.11* | Soil or mulch material not certified as weed-free or dieback-free must not be imported into the site, and all material must have WC approval | Contractor | During construction |
| *4.2.3.12* | Appropriate handling of all pinewood within the DEs; including correct movement, removal, destruction and treatment of pinewood (as per the *Agriculture and Related Resources Protection (European House Borer) Regulations 2006*) | Contractor | Prior to and during clearing and construction |
| *4.2.3.13* | After backfilling within National Park, State Forest, TEC, PEC, ESA and Bush Forever sites, the spreading of topsoil shall occur. Herbicide shall be strategically applied if weeds germinate (selected herbicide is to be approved by WC prior to use) (see Section 4.14) | Contractor | During and after construction |
| *4.2.3.14* | An on-going inspection and control program shall be implemented for Declared Pests and significant weeds within the DE | Contractor | During and after construction |
| *4.2.3.15* | The use of any pesticides or herbicides must comply with the Department of Health's *Circular No. PSC 88 Use of herbicides in water catchment areas* | Contractor | Prior to and during clearing and construction |

### 4.2.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 10 and Table 11).

**Table 10: Minimum weeds pests and disease hygiene management monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.2.4.1* | The Contractor must undertake regular monitoring of adherence to the Hygiene Management Controls within the CEMP as a part of routine environmental inspections | Daily |
| *4.2.4.2* | Log of vehicle hygiene for all vehicles, plant & equipment entering the site | Daily records (logbook) kept the site |
| *4.2.4.3* | The Contractor must undertake regular monitoring of compliance with pinewood management guidelines | To be determined by Contractor and documented in CEMP |

**Table 11: Minimum weeds pests and disease hygiene management reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.2.4.4* | Report inspection logs of vehicles/plants/machinery arriving on site and entering/exiting any dieback hygiene management points (clean on entry/exit) | On request from Water Corporation and at the completion of works |
| *4.2.4.5* | Confirmation of weed control in the form of records, photographs and other brief documentation, such as herbicide usage. | Prior to construction |
| *4.2.4.6* | Report the results and outcomes of the monitoring of pinewood management | As required |

## 4.3 Terrestrial Fauna

### 4.3.1 Background

The project is located within, and adjacent to a number of sites designated for conservation purposes, such as. Government-managed lands, Bush Forever sites, ESAs and Geomorphic Wetlands (Section 4.1.1). These sites support a diverse range of fauna, including locally and regionally significant species, some of which are protected under State and/or Federal legislation.

A small portion of the proposed plant site is also impacting an area (10b) designated for public purpose – conservation areas under an MRS amendment bound by Ministerial Statement 722 (refer Figure 4). It is a requirement of this MS that the connectivity of this conservation area be maintained for fauna movement. Whilst some clearing of native vegetation is proposed in this area, and additional area of vegetation adjacent to the southern extent will be allocated to conservation reserve and protected by fencing and the application of a conservation covenant to increase the area of fauna habitat and ensure greater areas for movement.

Several fauna surveys have been undertaken in the DEs, including (Bamford 2017, AECOM 2018a, 2018b, Ecoscape 2018). A number of additional surveys have been conducted in the vicinity of the DEs (some that cross the DE). Stantec (2020b) completed a consolidation of these surveys and undertook an associated desktop assessment, which identified:

- A total of 351 species of vertebrate fauna which have either been recorded, or are likely to occur according to database searches, within and surrounding the DE comprising:
  - 20 native mammals and 12 introduced mammals
  - 241 native birds and 12 introduced birds
  - 57 reptiles
  - Nine amphibians.
- Significant fauna species confirmed, or considered likely to, occur within the DE, based on the proximity of database results and habitat suitability include:
  - Carnaby's Cockatoo (En)
  - Forest Red-Tailed Black Cockatoo (Vu)
  - Peregrine Falcon (OS)
  - Quenda (P4)
  - Western Brush-wallaby (P4)
  - Osprey (Mi)
  - Fork-tailed Swift (Mi)
  - Black-striped Burrowing Snake (P3)
  - Graceful Sun Moth (P4)
  - Swan Coastal Plain Shield-Backed Trapdoor Spider (P3)
- Seven broad fauna habitat types have been recorded within the DE comprising Heath and shrubland, Woodlands, Scattered trees, Parkland, Planted vegetation and gardens, Pine plantation, Pine plantation regrowth, Wetlands and riparian vegetation, and Cleared.
- Within the DE, a significant portion was marked as Cleared, followed by Heath and shrublands (36.05 ha) and Woodlands (18.68 ha). Collectively, these habitats make up over 80% of the habitats that may be cleared for the Project.
- Carnaby's Black Cockatoo foraging habitat, consisting of mainly Eucalypt (Marri, Tuart and/or Jarrah) and Banksia woodlands, and Forest Red-tailed Black Cockatoo foraging habitat, generally consisting of Eucalypt woodlands with Marri, Jarrah and Sheoak has been identified in the DE (Figures **6**-1 to 6-8).
- A total of 183 potential black cockatoo breeding trees (with a diameter at breast height (DBH) >500 mm, except for *Eucalyptus wandoo* (DBH >300 mm)) were identified in the pipeline DE, and 16 within the SDP DE (Figures 6-1 to 6-8) (Attachment D).

Potential impacts to fauna species and significant habitat can occur from:

- Death, injury or destruction resulting from interactions with plant and machinery
- Death or injury resulting from entrapment in excavations
- Degradation or loss of foraging, breeding or roosting habitat, and impacts on fauna species dispersal
- Modifications to surface hydrology and wetlands.

### 4.3.2 Objectives

Environmental objectives for managing fauna, and performance criteria to measure success against these objectives are outlined in Table 12.

**Table 12: Terrestrial fauna management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Prevent impacts to native fauna resulting from project activities. | • No injury or death to fauna as a result of project activities.<br>• No native fauna are trapped in excavated trenches.<br>• All construction work and associated impacts must remain within the construction footprint. This includes access to and from the construction work site.<br>• No unauthorised vegetation clearing or vegetation disturbance beyond the approved clearing area limit<br>• No injury or harm to workers attributable to fauna interactions. |
| Ensure impacts on protected fauna (in particular black cockatoo habitat) are adequately minimised during construction. | • No clearing of black cockatoo habitat trees outside the approved clearing area.<br>• No damage to key protected fauna habitat outside the approved clearing areas during construction.<br>• No injury to or death of threatened fauna.<br>• No disturbance of breeding black cockatoos.<br>• No unapproved disturbance of black cockatoo habitat. |

### 4.3.3 Controls

The actions listed in Table 13 represent the minimum controls which are required to be implemented.

**Table 13: Terrestrial fauna minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.3.3.1* | Minimise vegetation clearing and the area of disturbance on the ground by utilising existing cleared areas where possible. | Contractor | Prior to clearing |
| *4.3.3.2* | Identify a person qualified under the Wildlife Conservation Act to undertake fauna handling (including relocation or removal) for the life of the project. | Contractor | Prior to clearing and during construction |
| *4.3.3.3* | All staff and Contractors involved in clearing activities will be inducted on the potential impacts to fauna (including vehicle strikes on | Contractor | Prior to clearing |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| | black cockatoo species) and advised to stop works in the vicinity of any injured or shocked animals that are encountered. | | |
| *4.3.3.4* | Prior to each day's clearing, the Contractor is to check underneath all logs, rocks, in trees and any other habitat that may be used by fauna, within the area that is about to be cleared, to allow the removal and relocation of any discovered fauna. Any person removing and relocating native fauna must hold a licence to take specially protected fauna in accordance with the Biodiversity Conservation Act 2016. | Contractor | Prior to clearing |
| *4.3.3.5* | Retention of potential black cockatoo habitat trees (particularly hollow-bearing trees), where the design and construction methodology allow. A pre-clearance survey will be undertaken to flag the potential black cockatoo trees within the project footprint (using distinctive flagging for those with hollows) to allow Contractors to see which trees shall be avoided, where the design and construction methodology allow. | Contractor | Prior to clearing |
| *4.3.3.6* | The project schedule will plan, for clearing to take place outside the typical breeding season for black cockatoos (i.e. when breeding birds and their young are not using hollows) (peak breeding season is August–January). Where the project schedule requires clearing during the typical breeding season, requirement 4.3.3.7 (below) must be implemented. | Contractor | Prior to clearing |
| *4.3.3.7* | If clearing is unavoidable during the typical breeding season of black cockatoos, a pre-clearing inspection of trees containing hollows to be cleared will be undertaken, by a black cockatoo specialist, to ensure there are no breeding activities present in the trees. If breeding activities are identified, clearing is to be avoided until such time nestlings have left the nest without human intervention. The contractor is to provide an accurate schedule of works at least 4 weeks in advance to the Water Corporation so that a specialist can be engaged to undertake the inspection. | Contractor | Prior to clearing |
| *4.3.3.8* | Clearing is to be undertaken in a directional manner that will ensure that native fauna can move into uncleared/larger areas of intact native vegetation and away from areas of hazard such as major roads, car parks, etc. | Contractor | During clearing |
| *4.3.3.9* | Traffic is to be controlled to prevent fauna collisions, such as the installation of Wildlife Warning Signs to warn drivers that wildlife may stray onto roads. This also includes the use of speed limits throughout the site to minimise risk of fauna strike (in particular when black cockatoos are present on site). | Contractor | During clearing |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.3.3.10* | Construct barriers at the ends of installed or stored pipes at the end of each working day to prevent access by fauna. | Contractor | During clearing |
| *4.3.3.11* | Fauna ladders or ramps must be installed where necessary within open excavations to allow fauna to exit. | Contractor | During clearing |
| *4.3.3.12* | Daily inspections of all open trenches and pipes must be undertaken prior to commencing work each day to ensure that there are no trapped fauna. Daily inspections will also monitor presence of seasonal / migratory bird species (e.g., black cockatoo). This information will feed into daily toolbox meetings to reiterate the importance of fauna management measures. | Contractor | During clearing |
| *4.3.3.13* | In the event of injury to any fauna, a suitable qualified person (e.g. veterinarian, DBCA ranger, trained snake catcher) must be contacted to provide appropriate treatment, including euthanasia, as necessary. If injured wildlife is found, call Wildcare Helpline on (08) 9474 9055 for advice on the nearest registered wildlife rehabilitator. Wildcare Helpline phone number is to be displayed in the site office. | Contractor | During clearing |
| *4.3.3.14* | Injured fauna will not be harmed or killed unless a decision to euthanase by approved methods by a suitably qualified person is made (e.g. a veterinarian). Relevant contact numbers for the authorised persons is to be documented within the approved CEMP. | Contractor | During clearing |
| *4.3.3.15* | Any fauna found within the construction footprint area will be removed by an approved fauna handler and relocated to a minimum of 50 m outside of the project area, but within vegetated areas. The fauna removed will be recorded in a fauna removal log that shall be retained at the site office. | Contractor | During clearing |
| *4.3.3.16* | Dead fauna will be removed to prevent attracting other fauna to source food and the dead fauna will be disposed of as putrescibles waste (to landfill). The details of the dead fauna will be recorded in a Fauna Removal Log that shall be retained at the site office. | Contractor | During clearing |
| *4.3.3.17* | Dogs, cats and other domesticated animals and firearms will not be allowed within the project site, other than those having business at the site. | Contractor | During clearing |
| *4.3.3.18* | Contractors to be instructed not to feed fauna. | Contractor | During clearing |

### 4.3.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 14 and Table 15).

**Table 14: Minimum terrestrial fauna monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.3.4.1* | The Contractor must inspect all open excavations for the presence of fauna | At the commencement of each working day<br>At the completion of each shift |
| *4.3.4.2* | The Contractor must maintain a register of all fauna removals, deaths or injuries. The register must identify:<br>• Date, time and location<br>• Type and number of fauna<br>• Status (e.g. dead/alive/injured)<br>• Method of removal<br>• Location of removal<br>• Details of person (name, contact registration/licence details) | At the end of each shift |

**Table 15: Minimum terrestrial fauna reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.3.4.3* | The Contractor must report the fauna register to the Water Corporation | On request<br>At the end of the project |

## 4.4 Conservation Areas

### 4.4.1 Background

There are a number of conservation areas within or adjacent to the project DE areas.

The key threats to environmental and conservation values of these surrounding conservation areas are the introduction and spread of weeds (see section 4.2), erosion, vegetation clearance, and high intensity fire (see section 4.7).

#### *4.4.1.1 MRS Zoned Public Purpose – Protected for Conservation Purpose*

The area within and surrounding the SDP DE was subject to a scheme amendment in 2006. As a result of this amendment there were new areas zoned as “Public purpose – protected for conservation purposes” as detailed in MS722. The SDP DE intersects one of these areas known as 10b (see Figure 4). This area is intended to be protected to conserve the integrity, function and environmental value of the bushland.

#### *4.4.1.2 National Parks, State Forests and DBCA Managed Tracks/Trails*

The Pipeline DE overlaps with delineated boundaries of the Neerabup National Park (an ESA) and Gnangara-Moore River State Forest, (Figure 4). Ongoing consultation with DBCA and FPC will be required.

The pipeline corridor also intercepts a number of existing DBCA management tracks/roads including the entry road(Orchid Rd) to the Gazetted Pinjar Off Road Vehicle area.

#### *4.4.1.3 Bush Forever Sites*

The Pipeline DE intersects eight Bush Forever sites totalling approximately 13.27ha, of which there is 9.83ha of native vegetation, and is adjacent to an additional Bush Forever site (Figure **5**). The SDP site does not intersect any Bush Forever sites. Not all of the Bush Forever sites that may be impacted contain native vegetation, with a large proportion already cleared or in completely degraded condition. Ongoing consultation with Department of Planning, Lands and Heritage (DPLH) (Bush Forever office) will be required, and further site-specific conditions may arise.

### 4.4.2 Objectives

Environmental objectives for managing impact to the conservation area 10b and performance criteria to measure success against these objectives are outlined in Table 16.

**Table 16: Conservation Area Management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Protect and maintain ecological value and function of conservation areas | • Minimised clearing as much as practicable<br>• No spread of weed into conservation areas (4.2)<br>• No spread of dieback into conservation areas (4.2)<br>• Maintained connectivity within conservation areas to provide native fauna corridors (4.14)<br>• Maintained firebreak access (4.7)<br>• Maintained fencing and prevention of access by trespassers |

### 4.4.3 Controls

The actions listed in Table 17 represent the minimum controls which are required to be implemented.

**Table 17: Conservation Area management minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.4.3.1* | Prior to any vegetation clearance and ground disturbance, DBCA, DPLH, Forest Products Commission (FCP) and Bush Forever are to be consulted to achieve landowner permission to undertake the work | Contractor | Prior to any works on site |
| *4.4.3.2* | Ensure applications to carry out disturbance on DBCA managed lands have been approved through the Disturbance Approval Strategy (DAS). | Contractor | Prior to Clearing |
| *4.4.3.3* | Vehicle movement to be minimised, and to remain on designated tracks. | Contractor | Construction |
| *4.4.3.4* | Clearing area boundaries adjacent to Conservation areas are to have temporary hard fencing installed to demarcate the DE and to restrict access. | Contractor | During clearing |
| *4.4.3.5* | Clearing area boundaries adjacent to Conservation areas are to have an additional demarcation layer using hazard tape/flagging as a buffer at least 1 m inside the approved clearing area limit to avoid unauthorised clearing. The digital shapefiles are to be supplied to the | Contractor | Prior to clearing |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| | Contractors by the Water Corporation to allow a qualified engineering surveyor to undertake this task. | | |
| *4.4.3.6* | Siltation fences or other suitable erosion control mechanisms to be installed at locations where adjacent Conservation areas are at risk of erosion impact from the construction works. | Contractor | Prior to clearing and earthworks |
| *4.4.3.7* | Targeted manual removal of eroded material from Conservation areas is to be undertaken in the event of inadvertent erosion events. | Contractor | During and Post Construction |
| *4.4.3.8* | "No Entry – Conservation Area" signage with wording to appropriate standard is to be placed at 500m spacing along all temporary fences/original fence lines indicating contact details and restriction to access of these areas. | Contractor | Prior to Clearing |
| *4.4.3.9* | Where DBCA tracks/trails intercept the pipeline corridor appropriate traffic management/signage is to be installed to advise the public of the construction works. | Contractor | Prior to construction |
| *4.4.3.10* | DBCA is to be contacted prior to construction in areas where a DBCA managed track/trail is to be impacted, to determine if temporary alternative access will need to be provided to potential users via DBCA's website and other local websites/advertising avenues. The contractor shall provide Water Corporation a schedule for works in these areas at least 4 weeks prior to proposed commencement. | Water Corporation | Prior to construction |

### 4.4.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 18 and Table 19).

**Table 18: Minimum Conservation Area management monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.4.4.1* | • Inspect fencing and signage.<br>• Repair and replace fencing and signage as recommended from the inspection. | Daily<br>As required |

**Table 19: Minimum Conservation Area management reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.4.4.2* | Maintain evidence of all consultation with DBCA, DPLH, Forest Products Commission (FCP) and Bush Forever | Once – upon receipt |
| *4.4.4.3* | Maintain a register of any public complaints and provide the register to Water Corporation | As required |

## 4.5 Dust

### 4.5.1 Background

The purpose of this section is to outline the management of potential airborne dust emissions so that they do not interfere with the amenity of surrounding landowners or users.

The surrounding areas of the project are urbanised residential environments and land set aside for public use and recreation. Some components of the Project are immediately adjacent to houses and public areas. The works may affect the amenity of these residents or users of these areas.

The proposed works involve the excavation and movement of soil, which will temporarily increase dust levels. Activities that have the potential to generate dust emissions from the DEs include:

- Movement of soils during the construction of the ASDP, including trenching, topsoil stripping and stockpiling, revegetation and general earthworks
- Wind action on disturbed areas of soil
- Vehicle movements on disturbed areas of soil, including light vehicles
- Emissions from plant and equipment
- Clearing of vegetation.

### 4.5.2 Objectives

Environmental objectives for managing dust and performance criteria to measure success against these objectives are outlined in Table 20.

**Table 20: Dust management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Ensure that activities do not unreasonably affect the amenity of surrounding landowners | • No visible dust plumes extending greater than 10 m from the boundary of the DEs<br>• No substantiated complaints relating to dust impacts. |

### 4.5.3 Controls

The actions listed in Table 21 represent the minimum controls which are required to be implemented.

**Table 21: Dust management minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.5.3.1* | Communication with local residents, providing specific information on construction activities which may impact the local area | Contractor | Prior to clearing and during construction |
| *4.5.3.2* | Identify specific dust control measures that will be available on site and document within the CEMP. These may include the use of water carts, sprinklers, soil binding agents and avoiding dust raising activity during periods of high winds. | Contractor | Prior to and during construction |
| *4.5.3.3* | Plan construction to minimise the potential for airborne dust | Contractor | Prior to construction |
| *4.5.3.4* | Vehicle movement to be minimised and to remain on designated tracks and maintain appropriate speed to minimise dust generation | Contractor | Construction |
| *4.5.3.5* | Stabilise soil stockpiles to prevent erosion and dust emission | Contractor | During clearing and construction |
| *4.5.3.6* | Dust producing activities to be suspended immediately if dust suppression measures prove ineffective | Contractor | During clearing and construction |

### 4.5.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 22 and Table 23).

**Table 22: Minimum dust management monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.5.4.1* | Monitor daily weather conditions prior to the commencement of work to determine the potential for dust generation | Daily |
| *4.5.4.2* | Visual inspections of dust suppression activities and soil stockpile stability | Weekly |
| *4.5.4.3* | Monitor airborne dust levels and evaluate control measure efficiency | As required |

**Table 23: Minimum dust management reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.5.4.4* | Maintain a register of any non-conformances or public complaints and provide the register to Water Corporation | As required |

## 4.6 Noise and Vibration

### 4.6.1 Background

The purpose of this section is to outline the management of potential noise emissions so that they do not interfere with the amenity of surrounding landowners or users.

The project falls under the definition of construction within the *Environmental Protection (Noise) Regulations 1997*. Under these regulations construction works are exempt from complying with the prescribed noise limits where:

- The works are carried out in accordance with environmental noise practices set out in section 4 of *AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites*
- The equipment used is the quietest that is reasonably available
- The work is carried out under an approved management plan (if one has been requested by the relevant authority).

The surrounding areas of the project are urbanised residential environments and lands set aside for public use and recreation. Some components of the project are immediately adjacent public use and recreational land. Activities that have the potential to generate noise emissions from the DEs include:

- Mobile earthmoving equipment
- Clearing of vegetation;
- Equipment used to conduct tunnelling and drilling when installing the pipes
- General construction equipment
- Piling of foundations
- Drainage installation (including, where required, measures to protect water quality and groundwater flows);
- Power connection; and
- Equipment fabrication and installation.

The noise intensity of works is dependent upon several factors, including the type of equipment used, location of construction activities relative to sensitive receiver, intervening terrain between source and sensitive receiver and prevailing weather conditions.

Works shall occur within 07:00 and 19:00 Monday to Saturday, however in some instances work may be required outside of these hours. Any work before or after these hours, or any time on a Sunday or Public holiday are deemed 'after-hours' and additional controls are required. Further guidance is provided within relevant sections of the Jacobs (2020) Environmental Approvals Inputs document.

### 4.6.2 Objectives

Environmental objectives for managing noise and vibration and performance criteria to measure success against these objectives are outlined Table 24.

**Table 24: Noise and vibration management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Ensure that activities do not unreasonably affect the amenity of surrounding landowners | • 100% compliance with Section 4 of AS 2436-2010<br>• Noise not exceeding guidelines stipulated in *Environmental Protection (Noise) Regulations 1997*<br>• Construction activities do not extend beyond stipulated and accepted work hours<br>• No substantiated noise related complaints |

### 4.6.3 Controls

The actions listed in Table 25 represent the minimum controls which are required to be implemented. The contractor must identify and document these actions in the CEMP, plus any additional actions that may be required to meet the performance objective and criteria. It will be necessary to include information on whether the works will occur either during construction hours only, or identify any after-hours work required.

**Table 25: Noise and vibration management minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.6.3.1* | Regular communication with local residents, providing specific information on construction activities which may impact the local area | Contractor | Prior to and during clearing and construction |
| *4.6.3.2* | Install signs that provide a contact number for complaints. | Contractor | Prior to and during clearing and construction |
| *4.6.3.3* | Nominate the equipment types and expected noise emissions for construction activities and how works will be conducted in accordance with Section 4 of *AS 2436-2010.* | Contractor | Prior to and during clearing and construction |
| *4.6.3.4* | Identify appropriate noise and vibration mitigation strategies to minimise impacts on residents and fauna. Document strategies within the CEMP, and implement them during works. | Contractor | Prior to and during clearing and construction |
| *4.6.3.5* | Any premises which is likely to receive emissions greater than the levels prescribed in the Environmental Protection (Noise) Regulations must be notified at least 24 hours before the commencement of works. | Water Corporation | Prior to clearing and construction |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.6.3.6* | Work is to be limited to between 0700 and 1900h Monday to Saturday. | Contractor | During clearing and construction |
| *4.6.3.7* | Where possible, no truck associated with the work should be left standing with its engine operating in a street adjacent to a residential area (some vehicles such as concrete trucks are required to leave engines running however, they should not be located in residential areas). | Contractor | During clearing and construction |
| *4.6.3.8* | All mechanical plant is to be silenced by the best practical means using current technology.<br>Mechanical plant, including noise-suppression devices, shall be maintained to the manufacturer's specifications. Internal combustion engines are to be fitted with a suitable muffler in good repair.<br>Fit all pneumatic tools operated near a residential area with an effective silencer on their air exhaust port.<br>Turn off plant when not being used. | Contractor | During clearing and construction |
| **After hours construction requirements (if applicable)** | | | |
| *4.6.3.9* | A noise management plan is to be developed detailing:<br>• The work that is required to be completed and the reason for the work to be completed outside of construction working hours<br>• Predicted noise levels associated with these works<br>• The types and duration of activities that may result in noise above the prescribed levels<br>• Controls measures to be implemented to minimise noise and vibration<br>• The monitoring requirements<br>• The complaint response procedure. | Contractor | Prior to after-hours construction |
| *4.6.3.10* | The noise management plan is to be submitted to the Water Corporation at least 30 days prior to the commencement of works. | Contractor | Prior to after-hours construction |
| *4.6.3.11* | The Noise Management Plan is to be submitted to the relevant authority to allow approval to be issued at least 7 days prior to the commencement of works. | Water Corporation | Prior to after-hours construction |
| *4.6.3.12* | Any premises which is likely to receive emissions greater than the levels prescribed in the Environmental Protection (Noise) Regulations must be notified at least 24 hours before the commencement of works. | Water Corporation | Prior to after-hours construction |

### 4.6.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented Table 26 and Table 27.

**Table 26: Noise and vibration management minimum monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.6.4.1* | Monitor noise and vibration emissions using appropriate equipment | As required |

**Table 27: Noise and vibration management minimum reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.6.4.2* | Maintain a register of any non-conformances or public complaints and provide the register to Water Corporation | As required |

## 4.7 Fire

### 4.7.1 Background

No bushfire history is available for the SDP or Pipeline DEs, but observation suggests that the SDP DE area has been burnt often in the past. This likely would have been by wildfires, as in the past there was no authority or landowner responsible for fire management over this land. The large tracts of bushland required to be "protected and managed for conservation purposes" pose a real and present threat of bushfires threatening both the Water Corporation assets on the site and surrounding urban and commercial development.

On June 29th 2022 Water Corporation Bushfire Mitigation Team (BMT) conducted a bushfire risk assessment of the SDP site. During the assessment the site vegetation was classified to be predominately coastal heath scrubland with fuel tonnages ranging from 20-25 tonnes per hectare. The overall bushfire risk of the fuel according to Department of Fire and Emergency Services Bushfire Risk Management System principles was classified as very high.

A formal risk assessment was undertaken by R1SK Consulting for the site in 2022. This risk assessment confirmed that the risk of Bushfire impacting on the proposed ASDP assets is High and the risk if bushfire impacting on the proposed works is Very High. (R1SK, 2022).

Existing firebreaks present on site are concentrated around the central and southern corridors of the site, bordering existing assets. These firebreaks are considered to be in adequate condition and offer strategic access to emergency personnel in the event of bushfire. It was the opinion of the BMT, that these internal firebreaks be cleaned prior to the construction of the desalination plant.

There are no established firebreaks in the Northern section of the site. There are the remnants of a track which roughly follows the northern perimeter of the site which the BMT are in the process of looking to re-establish.

When work proceeds, a Shire Fire Notice compliant firebreak will be installed across the breadth of the Northern section of the site, providing strategic access and an additional point of protection for development to the North of the site.

The primary actions for the management and mitigation of bushfires are to ensure access for "First Attack Fire Appliances" and manage fuel loads in the bushland areas to reduce intensity of outbreaks and provide a water source for firefighting appliances.

### 4.7.2 Objectives

Environmental objectives for managing potential impact from Fire and performance criteria to measure success against these objectives are outlined Table 28.

**Table 28: Fire management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Ensure that Fire risk is reduced as much as is reasonably practicable. | • No injuries or fatalities from fire<br>• No impact to infrastructure from fire |

### 4.7.3 Controls

The actions listed in Table 29 represent the minimum controls which are required to be implemented.

**Table 29: Fire management minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.7.3.1* | Upgrade all existing tracks at SDP site to a standard suitable for First Attack Fire Appliances | Water Corporation | Prior to construction |
| *4.7.3.2* | Maintain permanent safe access and egress from site SDP site | Contractor | Prior to and post construction |
| *4.7.3.3* | Maintain security grade lockable access gates where the fire tracks traverse the fence lines | Water Corporation | Prior to construction |
| *4.7.3.4* | Provide DFES with access to the gates | Contractor | Prior to construction |
| *4.7.3.5* | Temporary fencing on the boundary of Lot 3000 will be installed | Contractor | Prior to construction |
| *4.7.3.6* | Install temporary signage identifying private property, conservation areas and trespass prohibition of appropriate wording, size and standard at 500m spacing along the temporary fence lines of Lot 3000 | Contractor | Prior to construction |
| *4.7.3.7* | Install and maintain signage identifying construction works and contact details at 500m spacing along temporary hard fencing areas (as required in Section 4.4). | Contractor | Prior to construction |
| *4.7.3.8* | Have current fire danger signage at site office which is updated daily based on check of DFES website and communicated to contractors during daily pre-start meetings | Contractor | Prior to and during clearing and construction |
| *4.7.3.9* | Prepare a bushfire evacuation plan including a map showing assembly points, a list of fire wardens on site (or responsible staff in the event of a fire), and contact details for fire fighting services. | Contractor | Prior to and during clearing and construction |
| *4.7.3.10* | A Safety Officer will be designated for each construction area and it will be a part of their role to identify and rectify potential fire hazards. Construction staff will report potential fire hazards to the Safety Officer. | Contractor | Prior to and during clearing and construction |
| *4.7.3.11* | The lighting and smoking of cigarettes will be prohibited except in designated cleared areas and immediately outside of site buildings. | Contractor | Prior to and during clearing and construction |
| *4.7.3.12* | Cleared vegetation from the construction area will not be burned. | Contractor | Prior to and during clearing and construction |
| *4.7.3.13* | Dry chemical or carbon dioxide fire extinguishers will be located in close proximity to all cutting, grinding or welding (or any other spark generating activity). | Contractor | Prior to and during clearing and construction |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.7.3.14* | Dry chemical or carbon dioxide fire extinguishers will be located in close proximity to all cutting, grinding or welding (or any other spark generating activity). | Contractor | Prior to and during clearing and construction |
| *4.7.3.15* | A shroud will be installed if cutting, grinding or welding (or any other spark generating activity) occurs within 5m of vegetation/dry grasses. The shroud will be installed between the activity and the vegetation to capture sparks. | Contractor | Prior to and during clearing and construction |
| *4.7.3.16* | Flammable liquids and materials (including explosives) will only be stored in designated areas fitted with a dry chemical or carbon dioxide fire extinguisher. | Contractor | Prior to and during clearing and construction |
| *4.7.3.17* | On the advice of FESA, construction work that may present a high risk of ignition (e.g. cutting, grinding or welding) *may* be temporarily terminated on days declared to have a “very high” or “extreme” fire danger and if there are a number of fires in close proximity in order to avoid the potential for further depletion of fire fighting resources. | Contractor | Prior to and during clearing and construction |
| *4.7.3.18* | It will be ensured that all construction vehicles will be fitted with a dry chemical or carbon dioxide fire extinguisher1 | Contractor | Prior to and during clearing and construction |
| *4.7.3.19* | There will be daily inspections of all construction vehicles to remove combustible material from radiators, tracks, guards and undercarriages. | Contractor | Prior to and during clearing and construction |
| *4.7.3.20* | It will be ensured that construction vehicles are inspected and serviced to prevent or repair oil and fuel leaks prior to the start of construction works, and then inspected monthly. | Contractor | Prior to and during clearing and construction |

### 4.7.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented Table 30 and Table 31.

**Table 30: Fire management minimum monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.7.4.1* | Inspect and repair/replace all fences and signage quarterly; | Quarterly |
| *4.7.4.2* | Inspect and repair gates quarterly | Quarterly |
| *4.7.4.3* | Conduct ad hoc security patrols on the roads and tracks | Ad hoc |

**Table 31: Fire management minimum reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.7.4.4* | Report evidence of unauthorised access to Water Corporation within 24 hours of identification of incident | As required |
| *4.7.4.5* | Report and act upon damage to fences, signage and vegetation in conservation areas from such unauthorised access | As required |

## 4.8 Aboriginal Heritage

### 4.8.1 Background

The purpose of this section is to outline the requirements for the management of Aboriginal heritage during the construction process. The *Aboriginal Heritage Act 1972* registers and protects sites of importance to Aboriginal persons. It is an offence to interfere with a registered site without the consent of the Western Australian Minister for Aboriginal Affairs.

The Project runs adjacent to several lodged or registered Aboriginal heritage site along the pipeline DE (Figure 7). No European cultural heritage sites are located within the SDP or pipeline DEs.

If any sites are to be impacted following final design of the pipeline alignment, consent will be obtained from the Australian Minister for Aboriginal Affairs to interfere with those sites, through means of a Section 18 application, prior to construction.

### 4.8.2 Objectives

Environmental objectives for managing Aboriginal heritage and performance criteria to measure success against these objectives are outlined in Table 32.

**Table 32: Aboriginal Heritage management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Prevent impacts on items or places of heritage value | • No damage to heritage areas/items |

### 4.8.3 Controls

The actions listed in Table 33 represent the minimum controls which are required to be implemented.

**Table 33: Aboriginal Heritage minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.8.3.1* | A Cultural Monitor will be employed in consultation with the relevant Whadjuk Noongar business groups (as advised by Water Corporation) to monitor initial ground disturbing activities at any registered Aboriginal heritage site identified. The Cultural Monitor will be paid at a rate in accordance with The Water Corporations policies for Cultural Monitors. The Cultural Monitor will monitor initial ground disturbing activities to:<br>• detect the presence of archaeological material of heritage significance.<br>• detect human skeletal material.<br>• advise on minimisation of construction impacts on heritage values | Contractor | Prior to and during clearing and construction |
| *4.8.3.2* | Shade, water and personal protective equipment (hard hat, safety glasses, noise (ear) protection and high visibility vest) will be provided to the Cultural Monitor. The Cultural Monitor will be responsible for personal transport to the construction areas. | Contractor | Prior to and during clearing and construction |
| *4.8.3.3* | Construction works will be undertaken in the absence of the Cultural Monitor if for any reason the arranged Cultural Monitor does not attend the site. A replacement Cultural Monitor will be sort as soon as reasonably practicable following the absence if future attendance at the construction works by the Cultural Monitor is unlikely. | Contractor | Prior to and during clearing and construction |
| *4.8.3.4* | Construction works will cease as soon as practicable within a nominal 20 metres of any archaeological material (artefacts including hunting tools, scatters, scar trees) identified within the construction area. An archaeologist will be engaged to record the identified material and to advise the DPLH if the identified material is likely to be of Aboriginal heritage significance. Construction activities within 20 metres of the identified material will only recommence based on advice of the archaeologist or the DPLH. | Contractor | Prior to and during clearing and construction |
| *4.8.3.5* | Construction works will cease as soon as practicable within a nominal 20 metres of any skeletal material identified within the construction area. The Police (Phone 131 444) will be contacted to attend and determine a resolution of the matter. Construction activities will only recommence within 20 metres of the identified material on the direction of the Superintendent based on advice of the Police. | Contractor | Prior to and during clearing and construction |
| *4.8.3.6* | Any dispute between the Cultural Monitor and site construction personnel will be resolved on advice from the Water Corporation's Manager | Contractor/Water Corporation | Prior to and during clearing and construction |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| | of the Aboriginal Heritage and Native Title section. | | |

### 4.8.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 34 and Table 35).

**Table 34: Aboriginal Heritage management minimum monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.8.4.1* | Implement monitoring for heritage material, should sites be unexpectedly uncovered during construction activities | As required |

**Table 35: Aboriginal Heritage management minimum reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.8.4.2* | Notify the Water Corporation (Attention: Aboriginal Heritage and Native Title section) of the discovery any uncovered suspected human skeletal, cultural or archaeological material. | As soon as practicable |

## 4.9 Contaminated Sites, Acid Sulfate Soils and Dewatering

### 4.9.1 Background

The purpose of this section is to outline the requirements needed to manage contamination and hazardous materials, within soil and water, inside or adjacent the DEs (Figure **8**).

#### *4.9.1.1 Contaminated Sites*

A number of contaminated sites are applicable to the construction of the ASDP, including:

- Site CS70488 (alongside Marmion Avenue, adjacent to Pipeline DE)
- Site CS70489 (within Pipeline DE)
- Site CS12882 (adjacent to Pipeline DE).

These contaminated sites have been classified as ‘restricted use’; other than for analytical testing or remediation, groundwater abstraction is not permitted at this site because of the nature and extent of groundwater contamination.

Asbestos is an extremely hazardous material due to its fibrous nature and is a known carcinogen. Illegal disposal of rubbish has previously occurred within the SDP DE as reported by Jacobs-Worley Parsons during site survey in 2017. ACM was detected during the survey in fibrous cement sheeting and classified as posing a ‘moderate relative risk’. ACM was present in numerous fragments and partially buried. Asbestos was assumed to be within brake pads of abandoned car bodies and trailer which were also identified during the survey (Jacobs-Worley Parsons 2017).

The Jacobs-Worley Parsons report (2017) recommended remedial actions are undertaken prior to any ground disturbance in the vicinity of the hazardous waste, and that a management plan be developed to control and guide disposal of hazardous materials such as asbestos within the DEs. The guidance listed within the report shall be referred to during management plan development, along with Water Corporation Procedure ‘HSEAA-P-131 Working with Asbestos’.

#### *4.9.1.2 Acid Sulfate Soils*

Excavation, trenching and construction may disturb Potential Acid Sulfate Soils (PASS) or actual ASS, and in the process acidify groundwater. All management requirements for ASS shall be contained within a site-specific ASS and Dewatering Management Plan, which shall be submitted by Water Corporation to Department of Water and Environmental Regulation (DWER).

#### *4.9.1.3 Dewatering*

This section also outlines the requirements needed to manage the abstraction of groundwater for dewatering that will occur as a result of project activities, and subsequent disposal of the effluent. A number of sensitive environmental receptors can be adversely affected by groundwater drawdown or disposal of effluent. Alterations to the hydrological regimes of groundwater and surface water can impact upon aquifers, groundwater dependent vegetation and wetland ecosystems.

The contaminated sites and ASS will need to be considered and managed prior to dewatering. Furthermore, metals (aluminium, iron and manganese) and nutrients (ammonia, chloride, nitrogen and phosphorus) are present in groundwater, requiring further investigation before dewatering.

All management requirements, including groundwater drawdown limits and guidelines for dewatering shall be contained within a site-specific ASS and Dewatering Management Plan. This shall also include information such as the anticipated volume, rate, and duration of dewatering along with water quality and disposal/treatment methods.

Should dewatering occur near Geomorphic Wetlands, the Contractor shall ensure Water Corporation consults with DBCA prior to works commencing. Discharge options may be approved to include the stormwater or sewer system, alternative inland waters, infiltration ponds, settling tanks or aquifer re-injection if the water can be demonstrated to be of an appropriate quality.

A site-specific ASS and Dewatering Management Plan shall be developed by the contractor as an addendum to this CEMP, and be in accordance with DWER dewatering licence conditions.

Shallow groundwater (between 1-5 m) is expected along approximately 7.4 km of the total pipe route. Dewatering of this shallow groundwater will be required to facilitate installation of the pipeline. On average temporary (two to three weeks) groundwater drawdown from dewatering spears will be required, trench excavations in these areas are planned to be limited to 50m and will be open for two to three weeks to allow for installation and QA/QC inspections. Dewatering operations will dispose the treated groundwater by reinfiltration adjacent to the exposed excavation. Reinfiltration of treated groundwater is planned to be within 50 m of dewatering, where there are no engineering or site constraints (lack of suitable land to establish reinflation trenches or ponds). The location of reinfiltrated treated groundwater will also be dependent on the location of groundwater treatment infrastructure

### 4.9.2 Objectives

Environmental objectives for contamination management and performance criteria to measure success against these objectives are outlined in Table 36.

**Table 36: Contamination management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Prevent the spread of contaminants within the DEs | • No proliferation of contaminants as a result of any construction activity<br>• All contaminated soil treated or disposed of in accordance with best practice guidelines and an Asbestos Management Plan / Hazardous Waste Management Plan<br>• All soil suspected or identified to be ASS shall be treated and disposed of in accordance with best practice guidelines and an ASS Management Plan |
| Maximise beneficial re-use of soil to enable successful revegetation. | • 100% of native topsoil re-used |
| Prevent acidification of land or water resulting from the disturbance of ASS | • 100% compliance with Asbestos, ASS and Dewatering Management Plans<br>• All ASS or PASS identified and effectively treated prior to re-use |
| Obtain a Dewatering licence from DWER | • 100% compliance with the conditions of the licence |

| Objective | Performance Criteria |
|---|---|
| Prevent impacts to surrounding beneficial uses of ground/surface water | • No substantial interruption to supply or quality of nearby water sources |
| Prevent impacts to vegetation resulting from groundwater drawdown | • No decline in vegetation health resulting from groundwater drawdown<br>• No exceedance of groundwater drawdown limits |
| Prevent impacts to the quality of surface and groundwater | • No uncontrolled discharge<br>• No significant runoff or sedimentation into adjacent surface water attributed to clearing and construction activities |

### 4.9.3 Controls

The actions listed in Table 37 represent the minimum controls which are required to be implemented. The contractor must identify and document site-specific actions in the ASS and Dewatering Management Plan.

**Table 37: Contamination management minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.9.3.1* | Obtain a dewatering licence through DWER | Water Corporation | Prior to construction |
| *4.9.3.2* | Document conditions of dewatering licence within ASS and Dewatering Management Plan | Contractor | Prior to construction |
| *4.9.3.3* | Further develop and adhere to site-specific ASS and Dewatering Management Plan | Contractor | Prior to, and during clearing and construction |
| *4.9.3.4* | For the pipeline construction in shallow groundwater areas, excavation lengths are to be limited to 50m and are to be open for two to three weeks.<br>Disposal of treated groundwater shall be via irrigation within 50 m of the dewatering location, where there are no engineering or site constraints (lack of suitable land to establish reinflation trenches or ponds). | Contractor | During construction |
| *4.9.3.5* | Develop and adhere to Asbestos Management Plan | Contractor | Prior to, and during clearing and construction |
| *4.9.3.6* | All staff and Contractors involved in earthwork activities will be inducted on the potential impacts relating to ASS, dewatering and Contaminated Sites. | Contractor | Prior to and during clearing and construction |
| *4.9.3.7* | Contaminated sites to be identified within the DEs and clearly demarcated | Contractor | Prior to and during clearing construction |
| *4.9.3.8* | If suspected asbestos is observed during works, an 'Unexpected Finds Protocol' shall be enacted, as directed by the Asbestos Management Plan | Contractor | Clearing and construction |
| *4.9.3.9* | Accurate stockpiling of soil to distinguish contaminated soil from non-contaminated soil | Contractor | Clearing and construction |
| *4.9.3.10* | Clearly defined stockpiles will be created during excavation and earthworks | Contractor | Clearing and construction |
| *4.9.3.11* | Apply appropriate treatment or disposal techniques for contaminated soil | Contractor | Clearing and construction |
| *4.9.3.12* | Safely contain hazardous waste and prevent exposure of harmful substances (such as asbestos) to personnel or the public through correct handling and disposal | Contractor | During clearing, construction, post-construction |
| *4.9.3.13* | Minimise changes to groundwater levels by adopting construction methods that minimise impacts | Contractor | Prior to and during construction |
| *4.9.3.14* | Conduct testing of groundwater to determine levels of metals, nutrients and other components | Contractor | Prior to and during construction |

### 4.9.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 38 and Table 39).

**Table 38: Contamination management minimum monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.9.4.1* | Maintain records of treatment or disposal of contaminated soil | As required |
| *4.9.4.2* | Establish baseline water level and quality | Prior to construction |
| *4.9.4.3* | Conduct monitoring to confirm the effectiveness of the applied measures as detailed in the site-specific ASS and Dewatering Management Plan. Identify and implement contingency measures to restore groundwater to an acceptable level. | Post construction |

**Table 39: Contamination management minimum reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.9.4.4* | Report on the treatment or disposal of contaminated soil | As required |
| *4.9.4.5* | Results of ASS monitoring and analysis to be provided to Water Corporation for review then forwarded to DWER as per conditions of dewatering licence | As required |
| *4.9.4.6* | Report on the hydrology monitoring results, including water quality and the volume, rate, and duration of dewatering | As required |

## 4.10 Flushing

### 4.10.1 Background

The purpose of this section is to outline the requirements needed to manage discharges from site, including stormwater management and flushing. During the commissioning phase of the ASDP, the pipe network will require flushing with hyper-chlorinated water to clean the system prior to operations.

The sensitive environmental receptors of effluent from flushing may include National Park and State Forest land, TECs and PECs, Bush Forever sites, ESAs, surface waterways and wetlands.

Treatment of the hyper-chlorinated water prior to its discharge shall occur. If discharge is proposed in proximity to sensitive receptors, particularly Geomorphic Wetlands, DBCA will be consulted. Discharge towards these waterways may be approved only if the water can be demonstrated to be of an appropriate quality. Other discharge options may include to the stormwater or sewer system, alternative inland waters, or settling tanks.

### 4.10.2 Objectives

Environmental objectives for commissioning activities and performance criteria to measure success against these objectives are outlined in Table 40.

**Table 40: Flushing management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Prevent leaks of chlorinated water to land, surface water or ground water | • No uncontrolled spills of chlorinated water<br>• No disposal of hyper-chlorinated water without prior treatment |
| Prevent the contamination of water or soils as a result of commissioning works | • Chlorinated water to be discharged safely and as specified in a site-specific CEMP |

### 4.10.3 Controls

The actions listed in Table 41 represent the minimum controls which are required to be implemented. The contractor must identify and document these actions in the CEMP, plus any additional actions that may be required to meet the performance objective and criteria.

**Table 41: Flushing management minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.10.3.1* | Ensure all approvals and licences are obtained prior to the discharge of chlorinated water used in the flushing of pipes (including liaison with DBCA prior to disposal to any wetland areas) | Contractor | Prior to commissioning |
| *4.10.3.2* | All conditions of the dewatering licence shall be adhered to during the flushing process, including the implementation of a Dewatering Management Plan | Contractor | Prior to commissioning |
| *4.10.3.3* | Ensure discharge of chlorine-treated water is directed to an identified and approved discharge location/system | Contractor | Prior to commissioning |

### 4.10.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 42 and Table 43).

**Table 42: Flushing activities minimum monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.10.4.1* | Monitor chlorine concentration in water during flushing and discharge | Daily |

**Table 43: Flushing activities minimum reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.10.4.2* | Reporting of commissioning and monitoring results | As required |
| *4.10.4.3* | Reporting of discharge spills | As soon as practicable |

## 4.11 Chemical Use (or other activities that may cause contamination)

### 4.11.1 Background

The purpose of this section is to outline the management of chemicals stored and used during the construction process. The use of chemicals has the potential for spills which may contaminate soil, groundwater, or surface water. Particularly sensitive environmental receptors including the adjacent National Park and State Forest, Bush Forever Sites, ESAs and Wetlands.

Dangerous goods, hazardous substances and chemicals used during the construction works may be used for mobile plant and machinery, and drilling and tunnelling activities.

A list of the specific chemicals to be used during the construction works will need to be included in the Contractors CEMP. The volumes of chemicals are to be stored and licensed as required under the *Dangerous Goods Safety Act 2004* and associated regulations.

### 4.11.2 Objectives

Environmental objectives for chemical storage and use and performance criteria to measure success against these objectives are outlined in Table 44.

**Table 44: Chemical use objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Prevent impacts to land, surface water or ground water resulting from chemical storage or use. | • 100% adherence to Safety Data Sheet information for each chemical used<br>• No uncontrolled spills of dangerous goods or hazardous substances. |

### 4.11.3 Controls

The actions listed in Table 45 represent the minimum actions required to be implemented. The contractor must identify and document these actions in the CEMP, plus any additional actions that may be required to meet the performance objective and criteria.

**Table 45: Chemical use minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.11.3.1* | All chemicals are to be stored in accordance with relevant Australian standards, including:<br>• *AS1940: The Storage and Handling of Flammable and Combustible Liquids*<br>• *AS3780 The Storage and Handling of Corrosive Substances* | Contractor | During clearing and construction |
| *4.11.3.2* | Identify all additives that will be used and demonstrate their suitability and safe use procedures | Contractor | During clearing and construction |
| *4.11.3.3* | Each operator using a given chemical to read and fully understand the Safety Data Sheet | Contractor | During clearing and construction |
| *4.11.3.4* | Spill kits are to be readily available at chemical storage locations and during maintenance, refuelling or transfer of chemicals. | Contractor | During clearing and construction |
| *4.11.3.5* | All refuelling and servicing of plant, vehicles and equipment is to occur on a bunded area at least 100 m from any National Park, State Forest, TEC, PEC, Bush Forever Sites waterway or wetland | Contractor | During clearing and construction |
| *4.11.3.6* | All on-site maintenance of plant, equipment and vehicles must be in designated, bunded areas. | Contractor | During clearing and construction |
| *4.11.3.7* | No chemical storage, transfer or handling to occur in areas within 50 m of sensitive areas such as a National Park, State Forest, TEC, PEC, ESA, Bush Forever sites, or a surface water feature, including wetlands, damplands and drainage lines | Contractor | During clearing and construction |
| *4.11.3.8* | The contractor to record all spills and the management of the spill in a register maintained on site | Contractor | During and post clearing and construction |

### 4.11.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 46 and Table 47).

**Table 46: Chemical use monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.11.4.1* | Inspect project area for spills during clearing and construction | Daily |

**Table 47: Chemical use reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.11.4.2* | The contractor to report all spills within 24 hours to Water Corporation; and detail the spill response/management | On request from Water Corporation and at the completion of works |

## 4.12 Greenhouse Gas Emissions

### 4.12.1 Background

The Greenhouse Gas Management Plan (Revision 2 Dec 2022) outlines the management of greenhouse gases produced in the construction and operation phase.

Water Corporation also reports GHG under the *National Greenhouse and Energy Reporting Act 2007,* which is legislation to provide for the reporting and dissemination of information related to greenhouse gas emissions, greenhouse gas projects, energy production and energy consumption, and for other purposes.

### 4.12.2 Objectives

Environmental objectives for managing greenhouse gas emissions, and performance criteria to measure success against these objectives are outlined in Table 48.

**Table 48: Greenhouse gas emissions management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Maintain emissions and carbon footprint to as low as practically possible | • 100% compliance with the approved GHG Management Plan. |

### 4.12.3 Controls

The actions listed in Table 49 represent the minimum controls which are required to be implemented.

**Table 49: Greenhouse gas emissions management minimum action**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.12.3.1* | Competitive bid strategies will be used to design, build and operate the plant. This ensures world's best practice from international consortia bidding for the design and ongoing operations of the plant to maximise energy efficiency and therefore to minimise GHG emissions. | Water Corporation | Prior to clearing and construction |
| *4.12.3.2* | All personnel to read and implement the measures identified in the Greenhouse Gas Management Plan to reduce emissions | Contractor | Before and during clearing and construction |
| *4.12.3.3* | Implement sustainable design and construction methods | Contractor | Before and during construction |
| *4.12.3.4* | Improve energy efficiency and reduce fuel use where possible | Contractor | During clearing and construction |

### 4.12.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 50 and Table 51).

**Table 50: Greenhouse gas emissions reporting requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.12.4.1* | Monitor energy and fuel use | Monthly |

**Table 51: Greenhouse gas emissions monitoring requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.12.4.2* | Report energy and fuel use to Water Corporation | On request |

## 4.13 Waste Management

### 4.13.1 Background

The purpose of this section is to outline the management of waste used during the clearing and construction process. The generation of waste has the potential to consume unnecessary resources, and to contaminate land and waters.

Potential waste generating activities related to the construction includes, but is not limited to:

- Waste from maintenance of plant and equipment
- Waste from consumables and resources used during construction
- General waste and putrescibles from offices and amenities.

Additionally, historic illegally dumped waste has the potential to be uncovered during clearing and construction works. These may include hazardous or toxic materials such as asbestos or chemicals.

### 4.13.2 Objectives

Environmental objectives for managing waste and performance criteria to measure success against these objectives are outlined in Table 52.

**Table 52: Waste management objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| Prevent the contamination of land or soils as a result of waste disposal. | • No waste outside of DE.<br>• All waste removed from DE at the completion of works. |
| Prevent the spread of contaminated soils or substances | • All contaminated material treated or disposed in accordance with an appropriate Hazardous Waste Management Plan |
| Reduce the generation of waste/resource use of the project | • Per cent of waste reused or recycled |

### 4.13.3 Controls

The actions listed in Table 53 represent the minimum actions required to be implemented.

**Table 53: Waste management minimum actions**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.13.3.1* | Separate and clearly marked waste bins will be kept at the site office for all major waste streams including (but not limited to):<br>• General waste<br>• Recyclables<br>• Steel recycling<br>• Hydrocarbons | Contractor | Prior to, during and post construction |
| *4.13.3.2* | All waste bins on site will have securely fitted lids to prevent the attraction of fauna or movement of waste in wind/weather. | Contractor | Prior to, during and post construction |

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.13.3.3* | Provide secure toilet facilities located in an appropriate position which prevents any potential spills from being detrimental to the environment | Contractor | Prior to, during and post construction |
| *4.13.3.4* | Remove all general waste from site, and dispose of to suitable landfill facility, as often is required to prevent overflow of waste receptacles. | Contractor | Prior to, during and post construction |
| *4.13.3.5* | Safely contain hazardous/controlled waste and prevent exposure of harmful substances to personnel or the public through correct handling and disposal | Contractor | Prior to, during and post construction |
| *4.13.3.6* | Hydrocarbon waste to be disposed of to a Controlled Waste Contractor licensed under the *Environmental Protection (Controlled Waste) Regulations 2004* (WA); | Contractor | Prior to, during and post construction |
| *4.13.3.7* | Wastes, other than excess overburden excluding spoil) will not be buried on any construction site. | Contractor | Prior to, during and post construction |
| *4.13.3.8* | All wastes will be removed from all construction sites following the completion of construction works | Contractor | Post construction |
| *4.13.3.9* | Excess overburden produced from trench excavation will be disposed of to:<br>a. the excavated trench.<br>b. a suitable location agreed with the Landowner (the Landowner has first preference to retain excess overburden from their own property),<br>c. a suitable location agreed with adjacent landowners (with preference to Landowners on the pipeline route).<br>d. a local landfill as inert waste.<br>Other suitable sites for disposal of excess overburden may be identified by the contractor but shall be approved by Water Corporation. Disposal of soils affected by ASS will be treated as per the ASS DMP prior to disposal. | Contractor | Post construction |

### 4.13.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 54 and Table 55).

**Table 54: Waste management monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.13.4.1* | Schedule regular site waste inspections and clean ups | As required |
| *4.13.4.2* | Maintain a log of waste disposal (type, volume, disposal method and location) and all controlled waste disposal tracking records | As required |

**Table 55: Waste management reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.13.4.3* | Provide records of the disposal of all controlled wastes to Water Corporation | On request |

## 4.14 Reinstatement and Revegetation

### 4.14.1 Background

The purpose of this section is to outline the management actions and controls associated with reinstating and revegetating disturbed land as a result of construction activities. During construction, the Contractor will be responsible for managing weeds, pests and disease as per the requirements in Section 4.2 of this CEMF. Post-construction the Contractor will be responsible for restoring the disturbed soils to the pre-existing contours. On completion of construction, public open spaces will be reinstated by the Contractor as per the project-specific landscaping specifications, using a nominated subcontractor where specified.

Water Corporation will be responsible for the revegetation of areas of native vegetation that were temporarily cleared. A draft Revegetation Plan has been prepared by Tranen Revegetation Systems, on behalf of Jacobs, for the revegetation work that will be undertaken at the SDP site (Attachment F) specifically, however the same principles of this plan will be implemented across the pipeline site where appropriate. The Revegetation Plan includes a list of species to be used for revegetation.

### 4.14.2 Objectives

Environmental objectives for reinstatement and revegetation performance criteria to measure success against these objectives are outlined in Table 56.

**Table 56: Reinstatement and revegetation objectives and performance criteria**

| Objective | Performance Criteria |
|---|---|
| No change to pre-construction condition of landscape | • Achieve stabilisation and minimise erosion and sedimentation<br>• Support the pre-existing land use in areas not required to remain cleared<br>• Restore disturbed soil profiles and landforms to pre-existing contours |
| Revegetation of cleared areas of native vegetation (including dune vegetation) to a condition that supports a self-sustaining plant community with comparable density and diversity to the pre-existing vegetation. | • Revegetation of all temporarily cleared areas<br>• Success criteria in Revegetation Plan achieved |

### 4.14.3 Controls

The actions listed in Table 57 represent the minimum controls which are required to be implemented.

**Table 57: Reinstatement and revegetation controls**

| Reference | Action | Responsibility | Phase |
|---|---|---|---|
| *4.14.3.1* | Cleared vegetation from within Conservation areas (as listed in 4.4) to be mulched and stockpiled, and soil to be stockpiled separately | Contractor | During clearing |
| *4.14.3.2* | Areas to be revegetated shall be reshaped and compacted, following backfill of excavations, so that the gradient of the landscape is consistent with that of the surrounding landscape and to minimise erosion, with slopes not exceeding 10 degrees. | Contractor | During and post-construction |
| *4.14.3.3* | Compacted areas shall be ripped and scarified along the contour to alleviate soil compaction that may limit the growth of vegetation, to a depth of no greater than 300 – 500 mm or as determined to be suitable by the Contractor undertaking revegetation works | Contractor | During and post-construction |
| *4.14.3.4* | After backfilling, compacting and ripping, topsoil is to be spread over the area it was sourced from, followed by mulch. | Contractor | During and post-construction |
| *4.14.3.5* | Herbicide shall be strategically applied if weeds germinate within topsoil stockpiles or re-spread areas prior to implementation of revegetation (selected herbicide is to be approved by Water Corporation prior to use) | Contractor | During and post-construction |
| *4.14.3.6* | Any logs, branches and rocks that may be available shall be spread throughout the revegetation area in order to minimise erosion and increase availability of fauna habitat and provide microhabitats for seed lodgement and germination | Contractor | During and post-construction |
| *4.14.3.7* | Implementation of ongoing weed, pest and disease hygiene controls, as per Section 4.2. | Contractor | During and post-construction |
| *4.14.3.8* | Implementation of Tranen's Revegetation Plan for the SDP site, and pipeline where appropriate:<br>– Timing: Post autumn rain following completion of construction<br>– Method: Direct seeding and seedling planting | Water Corporation | Post construction |

### 4.14.4 Monitoring and Reporting

The following actions represent the minimum monitoring and reporting that is required to be implemented (Table 58 and Table 59).

**Table 58: Minimum reinstatement and revegetation monitoring requirements**

| | Monitoring Requirement | Frequency |
|---|---|---|
| *4.14.4.1* | Environmental inspections of revegetation works. | As required. |

**Table 59: Minimum reinstatement and revegetation reporting requirements**

| | Reporting Requirement | Frequency |
|---|---|---|
| *4.14.4.2* | Photographic evidence of proposed clearing area before and after clearing and revegetation. | Within two weeks of revegetation works. |

# 5 Adaptive Management and Review

## 5.1 Adaptive Management

The WC will implement adaptive management to respond to issues identified in the implementation of the actions in section 4. If, identified through site inspection, audit or general observation, the management actions are not practicable or not achieving the objectives they will be reviewed and updated accordingly.

## 5.2 Review of this CEMP

Any changes to this CEMP will be communicated to DWER and detail the changes in a table as per Table 60 below.

**Table 60: CEMP Change Table Template**

| **Complexity of changes** | | | **Minor Revisions ☐** | **Moderate Revisions ☐** | **Major Revisions ☐** |
|---|---|---|---|---|---|
| **Number of key environmental factors** | | | **One ☐** | **2-3 ☐** | **>3 ☐** |
| **Date revision submitted to EPA: DD/MM/YYYY** | | | | | |
| **Proponent's operational requirement timeframe for approval of revision** | | | **<1 month ☐** | **<6months ☐** | **>6months ☐** | **None ☐** |
| **Reason for Timeframe:** | | | | | |
| **Item No.** | **EMP Section No.** | **EMP Page No.** | **Summary of Change** | **Reason for Change** | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

# 6 Stakeholder Consultation

Consultation with stakeholders has been undertaken at various stages throughout the development of the Alkimos Seawater Desalination Plant proposal.

Key stakeholders are shown in Table 61 below

**Table 61: Key Stakeholders**

| **Stakeholder group** |
|---|
| **State and Commonwealth Government** |
| Department of Agriculture, Water, and the Environment. |
| Department of Planning, Lands and Heritage. |
| Department of the Premier and Cabinet (Ministers for Water and Environment). |
| Department of Water and Environmental Regulation - Environmental Protection Authority services. |

| Stakeholder group |
|---|
| Department of Water and Environmental Regulation. |
| Department of Aboriginal Affairs. |
| Department of Biodiversity, Conservation and Attractions. |
| Department of Primary Industries and Regional Development. |
| Department of Health. |
| Department of Treasury, Western Australia. |
| National Native Title Tribunal. |
| **Local Government and key organisations** |
| CoW (including Elected Members). |
| Western Australian Planning Commission (WAPC). |
| Main Roads Western Australia. |
| Development WA (previously LandCorp). |
| Public Transport Authority – Metronet. |
| Local Members of Parliament. |
| **Aboriginal groups** |
| Ballaruk (Whadjuk Noongar TO). |
| South West Aboriginal Land and Sea Council. |
| **Non-government organisations.** |
| Surrounding landholders, land users, businesses, and interest groups. |
| Lendlease. |
| WA Fishing Industry Council. |
| Recfishwest. |
| Western Rock Lobster Council. |
| Alkimos Beach Surf Lifesaving Association. |
| Alkimos Beach Progress Association. |
| Alkimos Eglinton Landowners Group. |
| Urban Bushland Council. |
| Local residents and community members. |
| Conservation Council of Western Australia. |

Stakeholder and community engagement for the Proposal commenced in 2017 and has been conducted in several formats, including face to face meetings with state and local government agencies, corporations, and public interest groups; participation in community events; and drop-in sessions in public spaces to promote general awareness and stimulate public feedback.

Through this consultation the following comments relevant to the preparation of this CEMP were received (Table 62).

**Table 62: Stakeholder Comments Relative to CEMP**

| Stakeholder group | Key concern / issue | Management strategy | Where addressed in this CEMP |
|---|---|---|---|
| TO, Aboriginal stakeholders and representative groups | Disturbance of heritage sites or values | Review and analysis of heritage information, engagement with relevant stakeholders (Stakeholder Engagement Plan), inclusion of heritage management plan in the CEMP and OEMP. | Section 4.8 |
| TO, Aboriginal stakeholders and representative groups. | Eglinton Groundwater Scheme: Effect of groundwater abstraction on the water table and vegetation/landscape in the vicinity of bores E10, E40 and E50. | WC to monitor landscape within the drawdown cone of the bores for detrimental effects from groundwater abstraction. | Will be addressed in ASS and Dewatering Management Plan |
| TO, Aboriginal stakeholders and representative groups. | Waste minimisation. TOs do not consider excavated material to be waste. TOs would like excavated marine tunnel material and surplus dune sediments to be put to beneficial use proximal to the location of excavation rather than disposed of at a landfill facility. | Some dune material to be used to construct visual barrier around ASDP and as fill in proposed housing development. | 4.13 |
| TO, Aboriginal stakeholders and representative groups. | Impacts of site office and equipment laydown area on Lake Adams. | Site of office and laydown area to be fenced and containment drains to be constructed to keep runoff from the limestone pad away from Lake Adams. | Bunding and storage requirements of hazardous goods detailed in 4.11<br>Limestone pad construction will be detailed in ASS and Dewatering Management Plan |
| Marine stakeholders, Local Residents, CoW, Local Interest Groups | Impacts to Alkimos Beach access and brine impacts on the marine environment, impacts on access to marine area, including exclusion zones. | Completion of noise assessment for ultimate site planning to understand likely noise and inform noise management. Provide information to stakeholders as it becomes available. | 4.6 |

| Stakeholder group | Key concern / issue | Management strategy | Where addressed in this CEMP |
|---|---|---|---|
| Local Residents, CoW, and Local Interest Groups | General construction impacts (noise, dust, vibration, light, increased traffic) | Approved management plans to mitigation impacts including noise, light, dust, and vibrations. Review of traffic movements and potential mitigations to reduce impact on road network and the community. | 4.5 dust, and 4.6 noise and vibration<br>A Traffic Management Plan is to be prepared by the contractor as an addendum to this CEMP. |

Through the EPA's Approval Process the stakeholders above also had an opportunity to review this plan. Comments received that were associated with this CEMP are shown in Table 63 below.

**Table 63: Stakeholder Consultation and Responses from EPA Process**

| Stakeholder | Comment | Response |
|---|---|---|
| Environmental Protection Authority WA | 10.<br>i. Consider whether any additional indirect impacts to 10b have been identified and provide details of any mitigation, monitoring/management as part of the Alkimos Water Precinct Environmental Management Plan.<br><br>11. Alkimos Water Precinct Environmental Management Plan (Appendix Q)<br>It is noted that the Alkimos Water Precinct Environmental Management Plan (AEMP) has been prepared to satisfy the requirements of condition 2-1 of Attachment 1 of MS 722.<br>a. As the EPA needs to consider the adequacy of the AEMP as part of this assessment, it is recommended that the AEMP be revised to follow the EPA's Guidance on How to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans for an objective-based management plan.<br>b. The AEMP must also meet the requirements of MS 722 for Environmental Management Plans. Ensure a table is included within the AEMP setting out the requirements of the relevant conditions of MS 722, and include reference to which section of the AEMP they are addressed.<br>c. For any proposed restoration associated with mitigating impacts of this proposal to the conservation areas, include (at a minimum) the proposed | The updated TCEMP has now separated the Terrestrial Construction Environmental Management Framework and the Alkimos Water Precinct Terrestrial Environmental Management Plan.<br>There are now two plans:<br>– The TCEMP covers construction activities<br>– The Alkimos Water Precinct Environmental Management Plan addresses the management of areas that are not impacted as part of the proposal that require management as part of MS 722.<br><br>10 i) Section 4.4 has been added to specifically address the conservation of these areas. The other sections of this CEMP also all apply to the management of environmental factors within this area.<br><br>11<br>a) This plan has been written and updated to ensure it is in accordance with the EPA's Guidance on How to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans.<br>b) The table outlining the requirements of MS722 is included in Section 3.3.<br>c) Additional revegetation management measures have been included in this plan in Section 4.1 |

| Stakeholder | Comment | Response |
|---|---|---|
| | timeframe for the restoration, the restoration techniques/methodology including evidence of previous success, and whether and how the areas would be restored to pre-disturbance levels or better.<br>d. Provide further explanation in the AEMP to justify how the proposed infrastructure within conservation area 10b can be considered minor infrastructure for the purposes of MS 722. | d) A response to this is included in the greater Environmental Review Document response to submissions. |
| DBCA | Comment 13) The ''Alkimos Seawater Desalination Plant – Terrestrial Construction Environment Management Framework (Water Corporation, 2020) (TCEMF) was prepared to ensure appropriate mitigation of environmental impacts arising from project works. The document is considered generic in nature and does not include specific information regarding the sections of the pipeline corridor that contain or abut conservation significant values or conservation estate. Specific mitigation actions and operational requirements may be required within these areas and this should be detailed in the subsequent Construction Environmental Management Plan. | The updated TCEMP has now separated the Terrestrial Construction Environmental Management Framework and the Alkimos Water Precinct Terrestrial Environmental Management Plan.<br>There are now two plans:<br>– The TCEMP covers construction activities<br>– The Alkimos Water Precinct Environmental Management Plan addresses the management of areas that are not impacted as part of the proposal that require management as part of MS 722.<br><br>Consultation with Michael Roberts from DBCA was undertaken during the preparation of this CEMP (his comments are included in Attachment G). |
| DCCEEW | 1. Weed Management<br>Section 4.2 of the CEMP states the CEMP addendum to be prepared by the contractor should identify site-specific weed, pest and disease hygiene risks and provide further detail on controls to be implemented<br>Please revise this to state … the CEMP addendum to be prepared by the contractor must identify site-specific weed, pest and disease hygiene risks and provide further detail on controls to be implemented.<br>Please also revise the associated table at 4.2.3 to require the development of these measures by the contractor prior to the commencement of works and their implementation prior to and during construction.<br>Please also revise section 3.7 (where the CEMP addendum is introduced) to | The requested changes have been included in Revision 5 of the document. |

| Stakeholder | Comment | Response |
|---|---|---|
| | include “intended weed management activities”.<br><br>2. Hydrological change<br>The State Assessment Report cites the following commitments made by WaterCorp when considering actions to manage risks of degradation to vegetation due to hydrological change:<br><br>• As part of the pipeline construction program, excavation lengths are planned to be limited to 50m and will be open for two to three weeks to allow for installation and QA/QC inspections.<br>• Reinfiltration of treated groundwater is planned to be within 50 m of the de-watering location.<br><br>We consider this information important.<br>Please include in section 4.9 of the CEMP: section 5.3.2 of the RTS (April 2023) or a suitable variation thereof<br>Please also include in the table at 4.9.3 of the CEMP: the specific commitments from the RTS (April 2023) to undertake pipeline excavations in 50m sections, and to reinfiltrate water extracted from each section within a 50 m radius of the dewatering site.<br><br>3. Update the table entry at 4.2.3.5. to remove the implied option of not developing a dieback management plan. At this stage we want to refer to the CEMP when conditioning an approval decision package for the delegate so there can be no contradictory mistakes (perhaps do a word search of phytothera and make sure you get them all) | |

It is believed that all comments from stakeholders, pertaining to this TCEMP, have been adequately addressed.

# 7 Reference list


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# 8 Definitions

**Table 64: Definition**

| Terms | Definitions |
|---|---|
| Approved Clearing Area | The area in which clearing of native vegetation is approved to occur as defined in a Native Vegetation Clearing Form (NVCF) issued by the Water Corporation.<br>Note: this area may be different to the Development Envelope |
| Clearing | The killing, destruction, removal, severing or ringbarking of trunks and stems; or doing of any substantial damage to some or all the native vegetation in an area.<br>This includes the draining or flooding land, the burning of vegetation, the grazing of stock, or any other act or activity that causes the above.<br>An example of clearing includes trampling, driving over, stockpiling spoil on top of, severing of roots that comprises the survivability of some or all the native vegetation in an area. |
| Construction Environmental Management Plan (CEMP) | A site or project specific plan developed to meet the requirements and objectives of the Construction Environment Management Plan and ensure that appropriate environmental management practices are followed during the construction phase of the project. |
| Contractor | A company or person that has contracted with the Corporation to provide goods and/or services including Suppliers, Consultants and Vendors. The term includes direct employees of the contractor, subcontractors engaged by the contractor, and any other persons who have been engaged by the Contractor to perform work on behalf of the contractor. |
| Development Envelope (DE) | The authorised extent of disturbance for the project. The authorised extent includes any:<br>• Existing or proposed infrastructure (e.g. pipelines, waste water treatment plants, dams, weirs or Water Corporation assets, etc)<br>• Any equipment laydown areas<br>• Off-road access ways or access tracks and turnaround points for vehicles and machinery, tracking back to a gazetted road<br>• Any project requirements such as dewatering sumps, infiltration/discharge areas, hygiene control points, areas for spoils, temporary buildings and any other areas.<br>Note: this area may be different from the Approved Clearing Area. |
| Environmental Incident | means any event or impact on the environment involving the Water Corporation and/or its contractor's actions or assets that are capable of:<br>• Causing harm to the environment or any person or property<br>• Causing pollution; and/or<br>• Coming to the attention of an environmental regulatory agency.<br><br>An unplanned event that results in or has the potential to result in injury, harm to health, damage or loss to person (including members of the public), property or the environment. This includes injury/illness, near miss, property damage and traffic infringements, whether in a Water Corporation supplied, hired vehicle or privately owned vehicle.<br>It also includes any Public Safety Incidents and instances where a Regulatory Notice has been issued involving any Water Corporation worker, contractor, activity or workplace. |
| Fauna | Means native animals. |
| Flora | Means native plants. |

| Terms | Definitions |
|---|---|
| Native Vegetation | As defined in the Environmental Protection Act 1986 and Regulations (2004) is indigenous aquatic or terrestrial vegetation and includes dead vegetation but does not include vegetation that was intentionally sown, planted or propagated. |
| Water Corporation | Is the Water Corporation |
| Weeds | Introduced (non-native) flora |
| Worker | A person who carries out work in any capacity for or on behalf of the Water Corporation. A worker agrees to perform work at Water Corporation's direction, instruction or request (whether express, implied, oral or in writing).<br>These includes employees, contractor, subcontractors, employees of contractors and subcontractors, labour hire employees, apprentice and trainees, work experience student, outworker, or volunteer. |

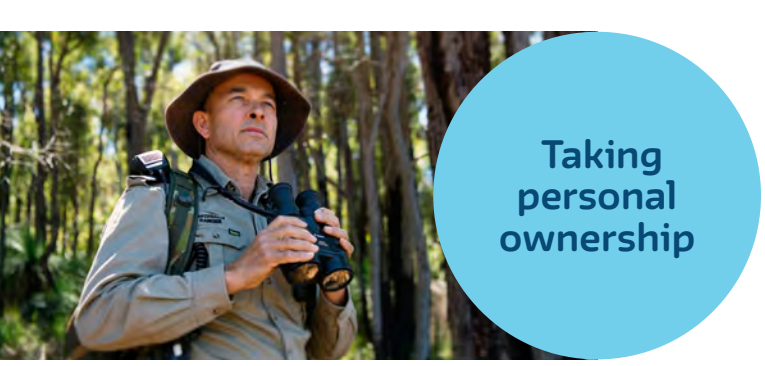
# Attachment A.  Environment Policy

# Environment Policy

**Environmental leadership and improvement**

Water Corporation provides essential water, wastewater and drainage services to our customers across Western Australia.  We take water from the environment and then return drainage water, treated wastewater and by-products to the environment.

We are committed to protecting and improving the environments in which we work or influence by complying with our environmental obligations, reducing our environmental impact and improving our environmental performance.



**Taking personal ownership**

We are all responsible for protecting the environment as well as understanding and meeting our environmental obligations while improving performance.

**Managing risks**

We identify, manage and eliminate risks to the environment. We seek to prevent pollution and enhance the environments in which we work.

**Governance and performance**

We have strong governance structures supporting our environmental objectives.

Our objectives include

- no net greenhouse gas emissions by 2050
- protecting the oceans and waterways we influence
- increasing reuse of treated wastewater
- reducing water use per capita to conserve resources
- sustainable use of resources with no net clearing of native vegetation.

We regularly review our environmental objectives and targets to ensure they remain relevant and reported internally and publicly to measure our performance.

**Pat Donovan**
Chief Executive Officer, Water Corporation

This policy applies to all Water Corporation workers and includes all activities and services we provide in accordance with our operating license. We will provide the necessary resources, systems, training and mechanisms to improve our environmental performance.

PCY230 Environment Policy
Date: January 2020
Next review: January 2023

WATER CORPORATION

# Attachment B. Environmental Risk Register

Risk criteria Table is in accordance with The DER (now DWER) Guidance Statement *Risk Assessments* February 2017

**Risk Ranking Matrix (DER 2017)**

| Likelihood | Consequence | | | | |
|---|---|---|---|---|---|
| | Slight | Minor | Moderate | Major | Severe |
| Almost Certain | Medium | High | High | Extreme | Extreme |
| Likely | Medium | Medium | High | High | Extreme |
| Possible | Low | Medium | Medium | High | Extreme |
| Unlikely | Low | Medium | Medium | Medium | High |
| Rare | Low | Low | Medium | Medium | High |

**Risk Treatment Table (DER 2017)**

| Rating of Risk Event | Acceptability | Treatment |
|---|---|---|
| Extreme | Unacceptable | Risk event will not be tolerated. DER may refuse application. |
| High | May be acceptable.<br>Subject to multiple regulatory controls | Risk event may be tolerated and may be subject ti multiple regulatory controls. This may include both outcomes-based and management conditions |
| Medium | Acceptable, generally subject to regulatory controls | Risk event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied |
| Low | Acceptable, generally not controlled | Risk event is acceptable and will generally not be subject to regulatory controls |

## Risk Assessment

| Primary Activity | Risks Issue/ Aspect | Potential Exposure Pathways | Potential Receptors | Criteria | Controls | Conseq. | Likelihood | Risk Rating (DWER) | Comment |
|---|---|---|---|---|---|---|---|---|---|
| **Construction** | | | | | | | | | |
| Clearing of Vegetation SDP Site (SDP DE) | Fragmentation of Vegetation / habitat | • Direct interaction by mobile plant | • Flora / Vegetation<br>• Fauna | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** The SDP DE is in an area which is subject to existing clearing and fragmentation. The site is located adjacent to the existing WWTP and utilises existing cleared areas and tracks to the extent possible.<br>**Consequence:** Fragmentation is expected to be highly localised. Proposal retains a north-south linkage of remnant vegetation between Marmion Avenue and the coast.<br>**Likelihood**: With controls in place additional vegetation fragmentation is unlikely to result in residual impact. |
| | Increase aeolian erosion | • Direct interaction by mobile plant<br>• Wind /Air dispersal | • Flora/ Vegetation<br>• Fauna Habitat | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, implementation of erosion controls / soil binding agents applied to SDP site following construction, CEMP.<br>**Monitoring** - CEMP | Minor | Unlikely | **Medium** | **Description:** Removal of vegetation from the dune systems<br>result in dune instability and the dunes become more susceptible to wind driven erosion processes<br>**Consequence:** Reduced dune stability and vegetation loss<br>**Likelihood:** By initiatig erosion control practices, significant additional impacts to the Quindalup Dunes system as a result of erosion are unlikely. |
| | Removal / disturbance of fauna habitat | • Direct interaction by mobile plant | • Fauna | • EPBC Act<br>• EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Direct loss of four habitat types identified within the SDP DE.<br>**Consequence:** Direct loss of Black Cockatoo foraging habitat, and habitat suitable for Quenda and Brush Wallaby. No conservation significant fauna species were recorded during the 2018 Fauna Assessment, no evidence of Black Cockatoos roosting or nesting observed. The potential impacts to fauna from the loss of fauna habitat within the SDP DE are considered to be minor.<br>**Likelihood**: With controls in place clearing is restricted to the 24 ha, likelihood of additional impact to fauna from habitat loss is unlikely. |
| | Vegetation Clearing - Removal or disturbance of flora and vegetation (TECs and PECs) | • Direct interaction by mobile plant | • Flora / vegetation- Southern Swan Coastal Plain PEC (Priority 3)<br>• Fauna | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Clearing of native vegetation will be required for the construction of the SDP which is representative of a PEC (Priority 3 Acacia shrublands on taller dunes – Southern Coastal Plan).<br>**Consequence:** The SDP DE is surrounded by native vegetation which is considered to be similar in nature and conditions, significant portions of which are reserved in conservation areas.<br>**Likelihood**: With controls in place clearing is restricted, the PEC is not restricted in extent given its known range, conservation status unlikely to be impacted. |
| | Land disturbance – reduced health or loss of flora and vegetation | • Direct interaction by mobile plant | • Flora / vegetation- Southern Swan Coastal Plain PEC (Priority 3)<br>• | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Vegetation health effects and loss of vegetation from land disturbance<br>**Consequence:** Reduced vegetation health leading to loss of vegetation<br>**Likelihood:** By having clearing control practices, significant additional impacts or vegetation loss from health stressors are unlikely |
| | Land Disturbance - Fauna habitat degradation | • Direct interaction by mobile plant | • Fauna | • EPBC Act<br>• EP Act 1986 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP | Moderate | Unlikely | **Medium** | **Description: Clearing** activities have potential to degrade fauna habitat |

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|---|---|---|---|---|---|---|---|---|---|
| | | • Air dispersion (noise/vibration) | | • Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Monitoring** - CEMP | | | | **Consequence:** Habitat can become eroded, impacted by dust deposition, noise, and impacted through the spread of weeds and dieback, leading to uninhabitable areas.<br>**Likelihood**: With controls in place impact to fauna from habitat degradation is considered unlikely. |
| | Land Disturbance – changes to vegetation communities | • Direct interaction by mobile plant | • Flora and Vegetation | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Clearing of native vegetation will be required for the construction of the SDP DE which is representative of a PEC (Priority 3 Acacia shrublands on taller dunes – Southern Coastal Plan).<br>**Consequence:** The SDP DE is surrounded by native vegetation which is considered to be similar in nature and conditions, significant portions of which are reserved in conservation areas.<br>**Likelihood**: With controls in place clearing is restricted, the PEC is not restricted in extent given its known range, changes to the vegetation community is unlikely. |
| | Fauna injury / mortality | • Unplanned fauna interactions - Direct Interaction with machinery/vehicles | • Fauna | • EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, prestart checks of vegetation for fauna and fauna relocation, CEMP<br>**Monitoring** - CEMP | Minor | Rare | **Low** | **Description:** Fauna death as a result of clearing activities, impact with plant and machinery.<br>**Consequence:** Reduction in fauna numbers, loss of biodiversity.<br>**Likelihood**: with clearing requirements and specified actions the likelihood of fauna death from clearing activities is considered rare. |
| | Compaction of land from clearing | • Direct interaction by mobile plant /construction activities | • Landform /Dune system and soils | • EP Act 1986<br>• EPBC Act<br>• Conservation and Land Management Act 1984 (CALM Act | **Specified Action –** CEMP | Minor | Rare | **Low** | **Description:** Clearing activities may compact the landforms and soils<br>**Consequence:** Detrimental soil health leading to accelerated erosion<br>**Likelihood:** By initiating erosion and dust control practices, significant additional impacts to the Dunes system as a result of compaction are rare |
| | Loss of Landforms | • Direct interaction by mobile plant<br>• Wind /Air dispersal | • Dune system | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• Conservation and Land Management Act 1984 (CALM Act | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, erosion controls, CEMP | Moderate | Unlikely | **Medium** | **Description:** SDP DE is within a network of parabolic and nested parabolic dunes of the Quindalup Dunes, as well as Cottesloe unit of the Spearwood Dunes.<br>**Consequence: Loss of dune system and conservation areas**<br>**Likelihood**: By initiating erosion control practices, significant additional impacts to the Quindalup Dunes system as a result of erosion are unlikely. |
| | Transport of weeds/pests | • Wind / Air dispersal and<br>• Direct interaction by mobile plant | • Flora / Vegetation - Southern Swan Coastal Plain PEC (Priority 3) | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• Biosecurity and Agriculture Management Act 2007<br>• Agriculture and Related Resources Protection (European House Borer) Regulations 2006 | **Specified Action** – Hygiene management controls prior to clearing activities, appropriate handling of all pinewood within the DE; including correct movement, removal, destruction and treatment of pinewood, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Spread of invasive species during clearing activities.<br>**Consequence: Increase weed populations, introduction of new weeds, competition of resources and reduction in vegetation quality.**<br>**Likelihood:** No declared pest species were identified in the SDP site. **By implementing hygiene management plan the risk of spreading weeds is heavily** reduced. |
| | Land disturbance - Introduction / spread of Dieback | • Wind / Air dispersal and Direct interaction by mobile plant | • Flora / Vegetation- Southern Swan Coastal Plain PEC (Priority 3) | • EP Act 1986<br>• Dieback Risk Rating<br>• DBCA Corporate Policy State no. 3 – Management of Phytophthora Disease<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016 | **Specified Action** – Hygiene management controls. Dieback survey will be undertaken within one year prior to construction and a/Dieback Management plan will be developed prior to clearing activities, CEMP<br>**Monitoring** - CEMP | Major | Unlikely | **Medium** | **Description:** Dieback assessments have been inconclusive in relation to the presence of dieback. The potential remains for the spread of dieback from infested to uninfested areas from clearing activities<br>**Consequence:** Introduce/Increase occurrence of dieback through the reserve, reduced vegetation quality.<br>**Likelihood:** Implementation of a dieback management actions, will heavily reduce the risk of dieback spreading. Additionally, given the calcareous nature of soils within the SDP DE the likelihood of dieback occurrence is considered very low, therefore risk of spread is unlikely. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | • BC (Exemptions) Order 2019 | | | | |
| | Generation of particulates (vehicle and machinery movement) | • Wind /Air dispersal | • Social surroundings -residents<br>• Fauna<br>• Flora/ Vegetation | • EP Act 1986<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Generation of particulates (vehicle movement)<br>**Consequence:** Reduced presence of fauna species and habitat availability, impacting amenity.<br>**Likelihood:** With controls in place, minimal dust will be generated during clearing works |
| | Generation of noise and vibration (vehicle and machinery movement) | • Air dispersal | • Social surroundings -residents<br>• Fauna | • Environmental Protection (Noise) Regulations 1997<br>• AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Generation of noise/vibration (increased traffic/vehicle movement)<br>**Consequence:** Changes in fauna behaviours, impact to visual amenity/residents<br>**Likelihood:** Controls in place will limit noise/vibration during clearing activities, unlikely to impact fauna |
| | Atmospheric emission - Increased light | • Air dispersal | • Social surroundings -residents | • EP Act 1986<br>• EPBC Act<br>• | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Increased light from clearing activities<br>**Consequence:** Impact to visual amenity/residents<br>**Likelihood:** Controls in place will additional light during clearing activities, unlikely to impact residents |
| | Generation of greenhouse gas emissions | • Energy emissions | • GHG (air quality) | • National Greenhouse and Energy Reporting Act 2007 (NGER Act)<br>• Environmental Protection Authority Factor Guideline: Greenhouse Gas Emissions (2020) | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Indirect consumption of an energy commodity, generation of greenhouse gases.<br>**Consequence:** The generation of greenhouse gases has the potential to pollute the local area.<br>**Likelihood**: Significant impacts to air quality (greenhouse gas emissions) from the operation of the Proposal are unlikely to occur. |
| | Physical presence – increased road traffic | • Interaction with vehicles, physical presence | • Social surrounds | • Environmental Protection (Noise) Regulations 1997<br>• | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Increased road traffic from clearing activities<br>**Consequence:** Local nuisance to residents with traffic congestion<br>**Likelihood:** Increase traffic is unlikely have an impact on residents |
| | Land disturbance - Damage to heritage values | • Direct Interaction with machinery/vehicles | • Social surrounds - heritage | • Aboriginal Heritage Act 1972<br>• Aboriginal Heritage Regulations 1974<br>• Native Title Act 1993 (Commonwealth) | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP, demarcating heritage site to ensure avoidance<br>**Monitoring** - CEMP | Moderate | Rare | **Medium** | **Description:** No Aboriginal heritage sites have been identified that directly intersects with the SDP DE<br>**Consequence:** Heritage sites may be impacted if clearing aspects are not adequately managed.<br>**Likelihood**: Rare |
| Clearing of Vegetation SDP Integrated Pipeline (Pipeline DE) | Fragmentation of Vegetation / habitat | • Direct interaction by mobile plant | • Flora / Vegetation<br>• Fauna (Black Cockatoos, Quenda and Brush Wallaby) | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Fragmentation caused by linear clearing of vegetation.<br>**Consequence:** Fragmentation caused by linear clearing of vegetation can lead to the increased risk of 'edge effects' such as weed invasion, disease spread, fire, dust and erosion.<br>**Likelihood**: With controls in place additional vegetation fragmentation is likely to be highly localised and unlikely to result in residual impact. |

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|---|---|---|---|---|---|---|---|---|---|
| | Increase aeolian erosion | • Direct interaction by mobile plant<br>• Wind /Air dispersal | • Flora/ Vegetation<br>• Fauna Habitat | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, implementation of erosion controls, CEMP.<br>**Monitoring** - CEMP | Minor | Unlikely | **Medium** | **Description:** Removal of vegetation from the dune systems result in erosion across the DE<br>**Consequence:** Reduced dune stability and vegetation loss<br>**Likelihood:** By initiating erosion and dust control practices, significant additional impacts to the Quindalup Dunes system as a result of erosion are unlikely |
| | Removal / disturbance of Fauna habitat | • Direct interaction by mobile plant | • Fauna | • EPBC Act<br>• EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Direct loss of seven habitat types identified within the Pipeline DE.<br>**Consequence:** Pipeline DE contains fauna habitat, including potential breeding trees and suitable breeding hollows. Clearing of up to 104 breeding trees. Reduction in area of occupancy for significant species at a local level. Cockatoos are highly mobile, no activity or evidence of previous activity in the hollows during the survey. Vegetation containing good quality Black Cockatoo habitat is retained in nearby reserves within a 4 km radius of the Pipeline DE.<br>**Likelihood**: With controls in place clearing is restricted, likelihood of impact to fauna from habitat loss is unlikely. |
| | Vegetation Clearing - Removal or disturbance of flora and vegetation (TECs & PECs) | • Direct interaction by mobile plant | • Flora / vegetation- PECs & TECs- Banksia Woodlands of the Swan Coastal Plan and *Melaleuca huegelii – melaleuca acerosa* shrublands on the Limsteon Ridges / Northern Spearwood Shrublands and Woodlands | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** The DE contains TECs and PECs of which may be impacted by clearing. The TECs and PECs that will be impacted are known to occur across a large range and are well represented in conservation areas in the local and regional area.<br>Consequence: Potential loss of TECs and PECs.<br>Likelihood: With controls in place to restrict clearing, over clearing is likely to be unlikely |
| | Land disturbance – reduced health or loss of flora and vegetation | • Direct interaction by mobile plant | • Flora / vegetation- Southern Swan Coastal Plain PEC (Priority 3) | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Vegetation health effects and loss of vegetation from land disturbance<br>**Consequence:** Reduced vegetation health leading to loss of vegetation<br>**Likelihood:** By having clearing control practices, significant additional impacts or vegetation loss from health stressors are unlikely |
| | Land Disturbance – changes to vegetation communities | • Direct interaction by mobile plant | • Flora and Vegetation | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | | **Description:** The DE contains TECs and PECs of which may be impacted by clearing. The TECs and PECs that will be impacted are known to occur across a large range and are well represented in conservation areas in the local and regional area.<br>**Consequence:** Potential changes to vegetation communities.<br>**Likelihood**: With controls in place changes to vegetation communities is considered unlikely. |
| | Removal or disturbance of vegetation within *Bush Forever* sites | • Direct interaction by mobile plant | • Flora/ Vegetation - Bush Forever Sites | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP, Bush Forever boundaries to have temporary fencing | Moderate | Unlikely | **Medium** | **Description:** The DE intersects 13.27 ha of *Bush Forever* sites which may be impacted, with approximately 9.38 ha likely to be disturbed.<br>**Consequence:** Potential loss of *Bush Forever* Sites<br>**Likelihood**: Conservation status is unlikely to be impacted following control measures and specific actions. . |

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| | | | | • EPBC Act 1999<br>• Conservation and Land Management Act 1984 (CALM Act) | installed to demarcate the DE and to restrict access, CEMP.<br>**Monitoring** - CEMP | | | | |
| | Removal or disturbance of vegetation within State Forest/Nature Reserves | • Direct interaction by mobile plant | • Flora/ Vegetation<br>• Fauna Habitat – State Forest (Black Cockatoos, Quenda and Brush Wallaby) | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Conservation and Land Management Act 1984 (CALM Act) | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, Consultation with DPLH and Forest Products Commission, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** The DE intersects State Forest/Nature Reserves which may be impacted / disturbed.<br>**Consequence:** Potential loss of habitat for conservation significant species – reduction in occupancy area for Black Cockatoo, Quenda and Brush Wallaby<br>**Likelihood**: Habitat area/occupancy area unlikely to be impacted following control measures and specific actions. . |
| | Reduce health of wetlands within Conservation Category Wetland (CCW) and Resource enhancement wetlands | • Direct interaction by mobile plant | • Flora / vegetation – | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• EPBC Act<br>• Waterways Conservation Act 1976<br>• Waterways Conservation Regulations 1984<br>• Water Services Act 2012.<br>• | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP, Consultation with DBCA<br>**Monitoring** - CEMP | Minor | Unlikely | **Medium** | **Description:** The pipeline DE intersects a CCW, which may be impacted by clearing. The corridor also intersects five wetlands which may be impacted by clearing.<br>**Consequence:** By constructing the pipeline along the boundaries of wetlands, groundwater fed wetlands, sumplands and damplands, flows into them can be restricted. A reduction of flow into the wetlands will put stress on these groundwater expression systems<br>**Likelihood**:. Clearing and installation of the pipe in these areas should not impact water flows/health of wetlands in the near surface ensuring control measures are implements. |
| | Land Disturbance - Fauna habitat degradation | • Direct interaction by mobile plant<br>• Air dispersion (noise/vibration) | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description: Clearing** activities have potential to degrade fauna habitat<br>**Consequence:** Habitat can become eroded, impacted by dust deposition, noise, and impacted through the spread of weeds and dieback, leading to uninhabitable areas.<br>**Likelihood**: With controls in place impact to fauna from habitat degradation is considered unlikely. |
| | Fauna injury / mortality | • Unplanned fauna interactions - Direct Interaction with machinery/vehicles | • Fauna | • EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, prestart checks of vegetation for fauna and fauna relocation, CEMP | Minor | Rare | **Low** | **Description:** Fauna death as a result of clearing activities, impact with plant and machinery.<br>**Consequence:** Reduction in fauna numbers, loss of biodiversity.<br>**Likelihood**: with clearing requirements and specified actions the likelihood of fauna death from clearing activities is considered rare. |
| | Compaction of land from clearing | • Direct interaction by mobile plant /construction activities | • Landform /Dune system and soils | • EP Act 1986<br>• EPBC Act<br>• EP (clearing of Native Vegetation) Regulations 2004 | **Specified Action –** CEMP | Minor | Rare | **Low** | **Description:** Clearing activities may compact the landforms and soils<br>**Consequence:** Detrimental soil health leading to accelerated erosion<br>**Likelihood:** By initiating erosion and dust control practices, significant additional impacts to the Dunes system as a result of compaction are rare |
| | Disturbance/exposure of acid sulfate or potential acid sulfate soils | • Discharge to land/groundwater | • Terrestrial Environmental Quality (Soil/groundwater)<br>• Landforms | • EPBC Act<br>• EP Act 1986<br>• Contaminated Sites Act 2003 | **Specified Action –** CEMP, ASS Management Plan,<br>**Emission Limits** - ASS Management Plan,<br>**Monitoring** – CEMP, ASS Management Plan, | Moderate | Unlikely | **Medium** | **Description:** Clearing may disturb **Potential** Acid Sulfate Soils (PASS) or ASS Stockpiles will be created during excavation and earthworks.<br>**Consequence:** soil/ land contamination<br>**Likelihood:** with localised management measures implemented, likelihood of contamination to the land from acid sulfate soils is unlikely. |

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| | Transport of weeds/pests (European House Borer – Restrictive movement zone) | • Wind / Air dispersal and Direct interaction by mobile plant | • Flora / Vegetation – PEC/TECs | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• Biosecurity and Agriculture Management Act 2007<br>• Agriculture and Related Resources Protection (European House Borer) Regulations 2006 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP, Bush Forever boundaries to have temporary fencing installed to demarcate the DE and to restrict access, CEMP.<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Spread of weeds during clearing activities. Two Declared pest species were identified in the pipeline DE.<br>**Consequence:** Increase weed populations, introduction of new weeds, competition of resources and reduction in vegetation quality**.**<br>**Likelihood:** By implementing hygiene management plan the risk of spreading weeds is heavily **reduced.** |
| | Land disturbance - Introduction / spread of Dieback | • Wind / Air dispersal and Direct interaction by mobile plant | • Flora / Vegetation- PECs/TECs | • EP Act 1986<br>• Dieback Risk Rating<br>• DBCA Corporate Policy State no. 3 – Management of Phytophthora Disease<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Hygiene management controls, Dieback survey will be undertaken within one year prior to construction. A Dieback Management plan will be developed prior to clearing activities, CEMP<br>**Monitoring** - CEMP | Major | Unlikely | **Medium** | **Description:** Dieback assessments have been inconclusive in relation to the presence of dieback. The potential remains for the spread of dieback from infested to uninfested areas from clearing activities<br>**Consequence:** Introduce/Increase occurrence of dieback through the reserve, reduced vegetation quality.<br>**Likelihood:** Implementation of a dieback management actions, will heavily reduce the risk of dieback spreading. Additionally, **given** the calcareous nature of soils within the pipeline DE the likelihood of dieback occurrence is considered very low, therefore risk of spread is unlikely. |
| | Generation of particulates (vehicle and machinery movement) | • Wind /Air dispersal | • Social surroundings -residents<br>• Fauna<br>• Flora/ Vegetation | • EP Act 1986<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Generation of particulates (vehicle movement)<br>**Consequence:** Reduced presence of fauna species and habitat availability, impacting amenity.<br>**Likelihood:** With controls in place, minimal dust will be generated during clearing works |
| | Generation of noise and vibration (vehicle and machinery movement) | • Wind / Air dispersal | • Social surroundings -residents<br>• Fauna | • Environmental Protection (Noise) Regulations 1997<br>• AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Generation of noise/vibration (increased traffic/vehicle movement)<br>**Consequence:** Changes in fauna behaviours, impact to visual amenity/residents<br>**Likelihood:** Controls in place will limit noise/vibration during clearing activities, unlikely to impact fauna |
| | Atmospheric emission - Increased light | • Air dispersal | • Social surroundings -residents | • EP Act 1986<br>• EPBC Act | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Increased light from clearing activities<br>**Consequence:** Impact to visual amenity/residents<br>**Likelihood:** Controls in place will additional light during clearing activities, unlikely to impact residents |
| | Generation of greenhouse gas emissions | • Energy emissions | • GHG (air quality) | • National Greenhouse and Energy Reporting Act 2007 (NGER Act)<br>• Environmental Protection Authority Factor Guideline: Greenhouse Gas Emissions (2020) | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Indirect consumption of an energy commodity, generation of greenhouse gases.<br>**Consequence:** The generation of greenhouse gases has the potential to pollute.<br>**Likelihood**: Significant impacts to air quality (greenhouse gas emissions) from the operation of the Proposal are unlikely to occur. |
| | Physical presence – increased road traffic | • Interaction with vehicles, physical presence | • Social surrounds | • Environmental Protection (Noise) Regulations 1997 | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description**: Increased road traffic from construction activities<br>**Consequence:** Local nuisance to residents with traffic congestion |

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| | | | | • | | | | | **Likelihood:** Increase traffic is unlikely have an impact on residents |
| | Physical presence – increased road traffic | • Interaction with vehicles, physical presence | • Social surrounds | • Environmental Protection (Noise) Regulations 1997<br>• | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Increased road traffic from clearing activities<br>**Consequence:** Local nuisance to residents with traffic congestion<br>**Likelihood:** Increase traffic is unlikely have an impact on residents. |
| | Land disturbance - Damage to heritage values | • Direct Interaction with machinery/vehicles | • Social surrounds - heritage | • Aboriginal Heritage Act 1972<br>• Aboriginal Heritage Regulations 1974<br>• Native Title Act 1993 (Commonwealth) | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP, demarcating heritage site to ensure avoidance<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** one Aboriginal heritage site has been identified that directly intersects with the pipeline (site ID 3503)<br>**Consequence:** Honey possum site of mythological value may be impacted if construction aspects are not adequately managed.<br>**Likelihood**: With clearing requirements and specified actions disturbance of heritage sites from clearing activities are unlikely. |
| Construction of SDP Site (includes commissioning) | Land Disturbance - Fauna habitat degradation | • Direct interaction by mobile plant<br>• Air dispersion (noise/vibration) | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Construction activities have potential to degrade fauna habitat<br>**Consequence:** Habitat can become eroded, impacted by dust deposition, noise, and impacted through the spread of weeds and dieback, leading to uninhabitable areas.<br>**Likelihood**: With controls in place impact to fauna from habitat degradation is considered unlikely. |
| | Land Disturbance – changes to vegetation communities | • Direct interaction by mobile plant | • Flora and Vegetation | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | | **Description:** Clearing of native vegetation will be required for the construction of the SDP, some of which is representative of a PEC (Priority 3 Acacia shrublands on taller dunes – Southern Coastal Plan).<br>**Consequence:** The SDP site is surrounded by native vegetation which is considered to be similar in nature and conditions, significant portions of which are reserved in conservation areas.<br>**Likelihood**: With controls in place clearing is restricted. The PEC is not restricted in extent given its known range, changes to the vegetation community is unlikely. |
| | Land disturbance – reduced health or loss of flora and vegetation | • Direct interaction by mobile plant | • Flora / vegetation- Southern Swan Coastal Plain PEC (Priority 3)<br>• | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Vegetation health effects and loss of vegetation from land disturbance<br>**Consequence:** Reduced vegetation health leading to loss of vegetation<br>**Likelihood:** By having clearing control practices, significant additional impacts or vegetation loss from health stressors are unlikely |
| | Unplanned release to land/inland waters (chemical spills) – changes to fauna communities | • Discharges to land - | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Slight | Unlikely | **Low** | **Description:** Chemical spills from construction activities<br>**Consequence:** changes to fauna communities<br>**Likelihood:** Implement Controls in DMP and CEMP, the likelihood of changes to fauna communities from potential spills is unlikely. |
| | Unplanned release to land/inland waters (chemical spills) – reduced health and | • Discharges to land - | • Flora and Vegetation | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016 | **Specified Action –** CEMP<br>**Monitoring** – CEM | Slight | Unlikely | **Low** | **Description:** Chemical spills from construction activities<br>**Consequence:** changes to flora and vegetation health or loss<br>**Likelihood:** Implement Controls in CEMP, the likelihood of changes to flora and vegetation health from potential spills is unlikely. |

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| | loss of flora and vegetation | | | • BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | | | | | |
| | Unplanned release to land (chemical spills) land contamination and reduced environmental value | • Discharges to land - | • Landforms | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP<br>**Monitoring** – CEM | Slight | Unlikely | Low | **Description:** Chemical spills from construction activities<br>**Consequence:** land contamination and reduced environmental value<br>**Likelihood:** Implement Controls in CEMP, the likelihood of **land** contamination and reduced environmental value from potential spills is unlikely. |
| | Release to land/inland waters– dewatering effluent, stress/toxic effect on fauna | • Discharges to land | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Moderate | Unlikely | Medium | **Description:** Dewatering effluent, potentially contaminated<br>**Consequence:** Stress/toxic effect on fauna<br>**Likelihood:** Implement Controls in DMP and CEMP, the likelihood of toxic effect from dewatering effluent is unlikely. |
| | Release to land/inland waters– dewatering effluent – changes to fauna communities | • Discharges to land - | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Moderate | Unlikely | Medium | **Description:** Dewatering effluent, potentially contaminated<br>**Consequence:** changes to fauna communities<br>**Likelihood:** Controls in DMP and CEMP, the likelihood of **changes to fauna communities** from dewatering effluent is unlikely. |
| | Fauna injury / mortality | • Unplanned fauna interactions - Direct Interaction with machinery/vehicles / Entrapment in excavations and trenches | • Fauna | • EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, prestart checks of vegetation for fauna and fauna relocation, CEMP<br>**Monitoring** - CEMP | Minor | Rare | Low | **Description:** Fauna death as a result of construction activities, impact with plant and machinery, entrapment in excavations and trenches<br>**Consequence:** Reduction in fauna numbers, loss of biodiversity.<br>**Likelihood**: with construction requirements and specified actions the likelihood of fauna death from construction activities is considered rare. |
| | Compaction of land from construction | • Direct interaction by mobile plant /construction activities | • Landform /Dune system and soils | • EP Act 1986<br>• EPBC Act | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, erosion controls, CEMP | Minor | Unlikely | Medium | **Description: Construction activities may compact the landforms and soils**<br>**Consequence:** Detrimental soil health leading to accelerated erosion<br>**Likelihood:** By initiating erosion and dust control practices, significant additional impacts to the Dunes system as a result of compaction are unlikely |
| | Loss of Landforms | • Direct interaction by mobile plant<br>• Wind /Air dispersal | • Landforms / Dune system | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, erosion controls, CEMP | Moderate | Unlikely | Medium | **Description: SDP DE is within a** network of parabolic and nested parabolic dunes of the Quindalup Dunes, as well as Cottesloe unit of the Spearwood Dunes.<br>**Consequence: potential Loss of dune system** due to earthworks, impact to dune values. |

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| | | | | | | | | | **Likelihood**: By initiating erosion and dust control practices, significant additional impacts to the Quindalup Dunes system as a result of erosion are unlikely. |
| | Transport of weeds/pests (European House Borer – Restrictive movement zone) | • Wind / Air dispersal and Direct interaction by mobile plant | • Flora / Vegetation – PEC/TECs | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• Biosecurity and Agriculture Management Act 2007<br>• Agriculture and Related Resources Protection (European House Borer) Regulations 2006 | **Specified Action** – Hygiene management plan prior to clearing activities, appropriate handling of all pinewood within the DE; including correct movement, removal, destruction and treatment of pinewood in accordance with CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Spread of weeds and declared pests during construction activities.<br>**Consequence: spread of declared pests** impacts on the biodiversity values, including competition with native flora and the prevention of seedling recruitment. **new weeds, competition of resources and reduction in vegetation quality.**<br>**Likelihood:** No declared pest species were identified in the SDP DE. **By implementing hygiene management plan the risk of spreading weeds is heavily** reduced. SDP DE is not within European House Borer Restricted movement Zone. |
| | Land disturbance - Introduction / spread of Dieback | • Wind / Air dispersal and Direct interaction by mobile plant | • Flora / Vegetation- PECs/TECs | • EP Act 1986<br>• Dieback Risk Rating<br>• DBCA Corporate Policy State no. 3 – Management of Phytophthora Disease<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Hygiene management controls Dieback survey will be undertaken within one year prior to construction. A Dieback Management plan will be developed prior to clearing activities, CEMP<br>**Monitoring** - CEMP | Major | Unlikely | **Medium** | **Description:** presence of both infested areas and significant areas of uninfested vegetation, there is a risk of the pathogen being vectored within the landscape during ground disturbance activities.<br>**Consequence: Spread Of dieback from infested to uninfected areas from construction activities, reducing vegetation quality.**<br>**Likelihood: Implementation of a dieback management plan, will reduce the risk of dieback spreading through the SDP DE.** |
| | Dewatering activities impacting GDEs and reduce availability of groundwater for flora and vegetation | • Groundwater drawdown | • Flora / Vegetation | • EP Act<br>• EP Regulations 1987 | **Specified Action –** CEMP, DMP | Minor | Unlikely | **Medium** | **Description: D**ewatering activities for construction may impact groundwater flow and level impacting vegetation dependent on it. (Low potential Terrestrial GDE within the SDP DE)<br>**Consequence:** Changes to groundwater level or flow from construction activities may impacting GDEs by reducing health or complete loss of GDE.<br>**Likelihood: Unlikely once controls are implemented** |
| | Release to land– dewatering effluent – stressor/toxic effect on flora and vegetation | • Discharges to land/groundwater | • Flora / Vegetation | • Environmental Protection (Controlled waste) Regulations 2004<br>• EP Act<br>• EP Regulations 1987 Contaminated Sites Act 2003<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Minor | Unlikely | **Medium** | **Description: Dewatering effluent, potentially contaminated**<br>**Consequence: Stressor/toxic effect on flora and vegetation. Reduction in vegetation quality, soil / groundwater contamination if contaminated effluent releases to the environment**<br>**Likelihood: Implement Controls in DMP and CEMP, the likelihood of land contamination from dewatering effluent is unlikely.** |
| | Release to land– dewatering effluent – reduced health of loss of flora and vegetation | • Discharges to land/groundwater | • Flora / Vegetation | • Environmental Protection (Controlled waste) Regulations 2004<br>• EP Act<br>• EP Regulations 1987 Contaminated Sites Act 2003<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Minor | Unlikely | **Medium** | **Description: Dewatering effluent, potentially contaminated**<br>**Consequence: Recued health and loss flora and vegetation. Reduction in vegetation quality, soil / groundwater contamination if contaminated effluent releases to the environment**<br>**Likelihood: Implement Controls in DMP and CEMP, the likelihood of reduced health and loss of vegetation from dewatering effluent is unlikely.** |
| | Release to land– dewatering effluent – land contamination, | • Discharges to land/groundwater | • Landforms | • Environmental Protection (Controlled waste) Regulations 2004 | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP | Minor | Unlikely | **Medium** | **Description: Dewatering effluent, potentially contaminated** |

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| | reduced environmental value | | | • EP Act<br>• EP Regulations 1987 Contaminated Sites Act 2003<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Monitoring** – CEMP, DMP | | | | **Consequence: Contamination impacting landforms and reducing environmental value if contaminated effluent releases to the environment**<br>**Likelihood: Implement Controls in CEMP, the likelihood of land contamination from dewatering effluent and reduced environmental value is unlikely.** |
| | Release to land– chlorine flushing – land contamination | • Discharges to land/groundwater | • Landforms | • Environmental Protection (Controlled waste) Regulations 2004<br>• EP Act<br>• EP Regulations 1987 Contaminated Sites Act 2003<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP<br>**Monitoring** – CEMP | Minor | Unlikely | **Medium** | **Description: Chlorine flushing, potentially contaminated**<br>**Consequence: Contamination from chlorine flushing impacting landforms if released to the environment**<br>**Likelihood: Implement Controls CEMP, the likelihood of land contamination impacting landforms from chlorine flushing is unlikely.** |
| | Land disturbance- Hazardous Substance Exposure | • Discharges to land/groundwater | • Fauna<br>• Flora / Vegetation<br>• Landforms<br>• Terrestrial Environmental Quality (Soil/groundwater) | • Dangerous Goods Safety Act 2004<br>• Environmental Protection (Controlled waste) Regulations 2004<br>• Contaminated Sites Act 2003<br>• EP Act<br>• EP Regulations 1987<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Moderate | Unlikely | **Medium** | **Description:** Hazardous substance stored and used during construction and commissioning activities.<br>**Consequence:** Reduction in vegetation quality, fauna injury or mortality if come in contact with hazardous substances, soil / groundwater contamination if stored/used incorrectly or illegally discharged to the environment<br>**Likelihood:** All hazardous goods stored/used during construction should be contained, secured (to prevent release or unauthorised access), transported and used lawfully, so the likelihood of discharges to the environment is unlikely. |
| | Waste management | • Disposal to land | • Fauna<br>• Flora / vegetation<br>• Terrestrial Environmental Quality (Soil/groundwater) | • Environmental Protection (Controlled waste) Regulations 2004<br>• EP Act<br>• EP Regulations 1987<br>• Contaminated Sites Act 2003 | **Specified Action –** CEMP | Minor | Rare | **Low** | **Description:** Waste generated during construction activities.<br>**Consequence**: Increased waste onsite, feral animal attractants, reduction in vegetation quality.<br>**Likelihood:** All waste generated during construction should be contained, secured (to prevent release or unauthorised access), transported and disposed of lawfully, so the likelihood of increased waste onsite is rare. |
| | Generation of particulates (vehicle and machinery movement) | • Wind /Air dispersal | • Social surroundings -residents<br>• Fauna<br>• Flora/ Vegetation | • EP Act 1986<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Generation of particulates (vehicle movement)<br>**Consequence:** Reduced presence of fauna species and habitat availability, impacting amenity.<br>**Likelihood:** With controls in place, minimal dust will be generated during construction works |
| | Generation of noise and vibration (vehicle and machinery movement) | • Air dispersal | • Social surroundings -residents<br>• Fauna | • Environmental Protection (Noise) Regulations 1997<br>• AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Generation of noise and vibration (increased traffic/vehicle movement)<br>**Consequence:** Changes in fauna behaviours, impact to visual amenity/residents<br>**Likelihood:** Controls in place will limit noise and vibration during clearing activities |
| | Atmospheric emission - Increased light | • Air dispersal | • Social surroundings -residents | • EP Act 1986<br>• EPBC Act<br>• | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Increased light from construction activities<br>**Consequence:** Impact to visual amenity/residents<br>**Likelihood:** Controls in place will additional light during clearing activities, unlikely to impact residents |

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| | Generation of greenhouse gas emissions | • Energy emissions (air quality) | • GHG | • National Greenhouse and Energy Reporting Act 2007 (NGER Act)<br>• Environmental Protection Authority Factor Guideline: Greenhouse Gas Emissions (2020) | **Specified Action** – CEMP | Slight | Unlikely | Low | **Description:** Indirect consumption of an energy commodity, generation of greenhouse gases.<br>**Consequence:** The generation of greenhouse gases has the potential to pollute the local area.<br>**Likelihood**: Significant impacts to air quality (greenhouse gas emissions) from the operation of the Proposal are unlikely to occur. |
| | Physical presence – increased road traffic | • Interaction with vehicles, physical presence | • Social surrounds | • Environmental Protection (Noise) Regulations 1997<br>• | **Specified Action** – CEMP | Slight | Unlikely | Low | **Description: Increased road traffic from construction activities**<br>**Consequence:** Local nuisance to residents with traffic congestion<br>**Likelihood:** Increase traffic is unlikely have an impact on residents |
| | Land disturbance - Damage to heritage values | • Direct Interaction with machinery/vehicles | • Social surrounds - heritage | • Aboriginal Heritage Act 1972<br>• Aboriginal Heritage Regulations 1974<br>• Native Title Act 1993 (Commonwealth) | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP, demarcating heritage site to ensure avoidance<br>**Monitoring** - CEMP | Moderate | Rare | Medium | **Description:** No Aboriginal heritage sites have been identified that directly intersects with the SDP Site<br>**Consequence:** Heritage sites may be impacted if construction aspects are not adequately managed.<br>**Likelihood**: Rare |
| Construction of ASDP Integrated Pipeline (includes commissioning) | Land Disturbance - Fauna habitat degradation | • Direct interaction by mobile plant<br>• Air dispersion (noise/vibration) | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | Medium | **Description:** Construction activities have potential to degrade fauna habitat<br>**Consequence:** Habitat can become eroded, impacted by dust deposition, noise, and impacted through the spread of weeds and dieback, leading to uninhabitable areas.<br>**Likelihood**: With controls in place impact to fauna from habitat degradation is considered unlikely. |
| | Land Disturbance – changes to vegetation communities | • Direct interaction by mobile plant | • Flora and Vegetation | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | | **Description:** The DE contains TECs and PECs which may be impacted. The TECs and PECs that will be impacted are known to occur across a large range and are well represented in conservation areas in the local and regional area.<br>**Consequence:** Potential changes to vegetation communities.<br>**Likelihood**: With controls in place changes to vegetation communities is considered unlikely. |
| | Land disturbance – reduced health or loss of flora and vegetation | • Direct interaction by mobile plant | • Flora / vegetation- Southern Swan Coastal Plain PEC (Priority 3)<br>• | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP<br>**Monitoring** - CEMP | Moderate | Unlikely | Medium | **Description:** Vegetation health effects and loss of vegetation from land disturbance<br>**Consequence:** Reduced vegetation health leading to loss of vegetation<br>**Likelihood:** By having clearing control practices, significant additional impacts or vegetation loss from health stressors are unlikely |
| | Unplanned release to land/inland waters (chemical spills) – changes to fauna communities | • Discharges to land - | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP<br>**Monitoring** – CEMP | Slight | Unlikely | Low | **Description:** Chemical spills from construction activities<br>**Consequence:** changes to fauna communities<br>**Likelihood:** Implement Controls in CEMP, the likelihood of changes to fauna communities from potential spills is unlikely. |

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| | Unplanned release to land/inland waters (chemical spills) – reduced health and loss of flora and vegetation | • Discharges to land - | • Flora and Vegetation | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP<br>**Monitoring** – CEMP | Slight | Unlikely | **Low** | **Description:** Chemical spills from construction activities<br>**Consequence:** changes to flora and vegetation health or loss<br>**Likelihood:** Implement Controls in CEMP, the likelihood of changes to flora and vegetation health from potential spills is unlikely. |
| | Release to land/inland waters– dewatering effluent - Stress/toxic effect on fauna | • Discharges to land - | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Moderate | Unlikely | **Medium** | **Description:** Dewatering effluent, potentially contaminated<br>**Consequence:** Stress/toxic effect on fauna<br>**Likelihood:** Implement Controls in DMP and CEMP, the likelihood of toxic effect from dewatering effluent is unlikely. |
| | Release to land/inland waters– dewatering effluent – changes to fauna communities | • Discharges to land - | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Moderate | Unlikely | **Medium** | **Description:** Dewatering effluent, potentially contaminated<br>**Consequence:** changes to fauna communities<br>**Likelihood:** Controls in DMP and CEMP, the likelihood of **changes to fauna communities** from dewatering effluent is unlikely. |
| | Release to land/inland waters– chlorine flushing - Stress/toxic effect on fauna | • Discharges to land | • Fauna | • EPBC Act<br>• EP Act 1986<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP<br>**Monitoring** – CEM | Moderate | Unlikely | **Medium** | **Description**: Chlorine from pipeline flushing entering the environment<br>**Consequence:** Stress/toxic effect on fauna<br>**Likelihood:** Implement Controls in CEMP, the likelihood of **tress/toxic effect on fauna** is unlikely. |
| | Fauna injury / mortality | • Unplanned fauna interactions - Direct Interaction with machinery/vehicles / Entrapment in excavations and trenches | • Fauna | • EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, prestart checks of vegetation for fauna and fauna relocation, CEMP<br>**Monitoring** - CEMP | Minor | Rare | **Low** | **Description:** Fauna death as a result of construction activities, impact with plant and machinery, entrapment in excavations and trenches<br>**Consequence:** Reduction in fauna numbers, loss of biodiversity.<br>**Likelihood**: with construction requirements and specified actions the likelihood of fauna death from construction activities is considered rare. |
| | Compaction of land from construction | • Direct interaction by mobile plant /construction activities | • Landform /Dune system and soils | • EP Act 1986<br>• EPBC Act | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, erosion controls, CEMP | Minor | Unlikely | **Medium** | **Description:** Construction activities may compact the landforms and soils<br>**Consequence:** Detrimental soil health leading to accelerated erosion<br>**Likelihood:** By initiating erosion and dust control practices, significant additional impacts to the Dunes system as a result of compaction are unlikely |

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| | Disturbance/exposure of acid sulfate or potential acid sulfate soils | • Discharge to land/groundwater | • Terrestrial Environmental Quality (Soil/groundwater)<br>• Landforms | • EPBC Act<br>• EP Act 1986<br>• Contaminated Sites Act 2003<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 (Unauthorised Discharge Regulations) | **Specified Action –** CEMP, ASS Management Plan, DMP<br>**Emission Limits** - ASS Management Plan, DMP<br>**Monitoring** – CEMP, ASS Management Plan, DMP | Moderate | Unlikely | **Medium** | **Description: Construction/ excavation and trenching may disturb**<br>Potential Acid Sulfate Soils (PASS) or actual ASS. Stockpiles will be created during excavation and earthworks.<br>**Consequence:** soil/ land contamination<br>**Likelihood:** with localised management measures implemented, likelihood of contamination to the land from acid sulfate soils is unlikely. |
| | Transport of weeds/pests (European House Borer – Restrictive movement zone) | • Wind / Air dispersal and<br>• Direct interaction by mobile plant | • Flora / Vegetation – PEC/TECs | • EP Act 1986<br>• EP (clearing of Native Vegetation) Regulations 2004<br>• EPBC Act 1999<br>• Biosecurity and Agriculture Management Act 2007<br>• Agriculture and Related Resources Protection (European House Borer) Regulations 2006<br>• | **Specified Action** – Hygiene management plan prior to clearing activities, appropriate handling of all pinewood within the DE; including correct movement, removal, destruction and treatment of pinewood<br>**Monitoring** - CEMP | Moderate | Unlikely | **Medium** | **Description:** Spread of weeds during clearing activities. Two declared pest species were recorded at numerous locations within the DE<br>**Consequence:** spread of declared pests impacts on the biodiversity values, including competition with native flora and the prevention of seedling<br>recruitment.new weeds, competition of resources and reduction in vegetation quality.<br>**Likelihood:** By implementing hygiene management plan the risk of spreading weeds is heavily reduced. |
| | Land disturbance - Introduction / spread of Dieback | • Wind / Air dispersal and<br>• Direct interaction by mobile plant | • Flora / Vegetation- PECs/TECs | • EP Act 1986<br>• Dieback Risk Rating<br>• DBCA Corporate Policy State no. 3 – Management of Phytophthora Disease<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016<br>• BC (Exemptions) Order 2019 | **Specified Action** – Hygiene management controls /Dieback survey will be undertaken within one year prior to construction. A Dieback Management plan will be developedprior to clearing activities, CEMP<br>**Monitoring** - CEMP | Major | Unlikely | **Medium** | **Description:** presence of both infested areas and significant areas of uninfested vegetation, there is a risk of the pathogen being vectored within the landscape during ground disturbance activities.<br>**Consequence:** Spread Of dieback from infested to uninfected areas from clearing activities, reducing vegetation quality.<br>**Likelihood:** Implementation of a dieback management plan, will reduce the risk of dieback spreading through the pipeline DE. |
| | Dewatering activities impacting GDEs, and reduce availability of groundwater for flora and vegetation | • Groundwater drawdown | • Flora / Vegetation | • EP Act 1986<br>• EPBC Act | **Specified Action –** CEMP, DMP | Minor | Unlikely | **Medium** | **Description: D**ewatering activities for construction may impact groundwater flow and level impacting vegetation dependent on it. (five GDEs within the SDP pipeline route)<br>**Consequence:** Changes to groundwater level or flow from construction activities may impacting GDEs, reducing health and/or complete loss of GDEs.<br>**Likelihood: Unlikely once controls are implemented** |
| | Reduced health, loss of wetlands within Conservation Category Wetland (CCW) and Resource enhancement wetlands | • Groundwater drawdown | • Flora / vegetation | • EP Act 1986<br>• EPBC Act 1999<br>• Waterways Conservation Act 1976<br>• Waterways Conservation Regulations 1984<br>• Water Services Act 2012. | **Specified Action –** CEMP, DMP, Consult DBCA<br>**Monitoring** – CEMP, DMP | Moderate | Unlikely | **Medium** | **Description: D**ewatering activities for construction may impact groundwater flow and level impacting nearby Wetlands. Pipeline corridor intersects five wetlands which may be impacted by the construction of the pipeline through groundwater.<br>**Consequence:** Changes to groundwater level or flow from construction activities may impacting wetlands, reducing health and/or complete loss of wetland.<br>**Likelihood: Unlikely** |
| | Release to land – dewatering effluent - stressor/toxic effect on flora and vegetation | • Discharges to land/groundwater | • Flora / Vegetation<br>• Terrestrial Environmental Quality (Soil/groundwater) | • Environmental Protection (Controlled waste) Regulations 2004<br>• EP Act<br>• EP Regulations 1987 Contaminated Sites Act 2003<br>• Environmental Protection (Unauthorised | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Minor | Unlikely | **Medium** | **Description: Dewatering effluent, potentially contaminated**<br>**Consequence:** Stressor / toxic effect on flora and vegetation. Reduction in vegetation quality, soil / groundwater contamination if contaminated effluent releases to the environment<br>**Likelihood:** Implement Controls in DMP and CEMP, the likelihood of land contamination from dewatering effluent is unlikely. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Discharges) Regulations 2004 | | | | |
| | Release to land– dewatering effluent – reduced health of loss of flora and vegetation | • Discharges to land/groundwater | • Flora / Vegetation | • Environmental Protection (Controlled waste) Regulations 2004<br>• EP Act<br>• EP Regulations 1987 Contaminated Sites Act 2003<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP, DMP<br>**Emission Limits** – DMP<br>**Monitoring** – CEMP, DMP | Minor | Unlikely | **Medium** | **Description:** Dewatering effluent, potentially contaminated<br>**Consequence:** Reduced health and loss flora and vegetation. Reduction in vegetation quality, soil / groundwater contamination if contaminated effluent releases to the environment<br>**Likelihood:** Implement Controls in DMP and CEMP, the likelihood of reduced health and loss of vegetation from dewatering effluent is unlikely. |
| | Release to land/inland waters– chlorine flushing - Stress/toxic effect on flora and vegetation and reduced health | • Discharges to land | • Flora and vegetation | • EPBC Act<br>• EP Act 1986<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP<br>**Monitoring** – CEM | Moderate | Unlikely | **Medium** | **Description:** Chlorine from pipeline flushing entering the environment<br>**Consequence:** Stress/toxic effect on flora and vegetation<br>**Likelihood:** Implement Controls in CEMP, the likelihood of tress/toxic effect on flora and vegetation **is unlikely.** |
| | Dewatering activities within area identified as contaminated, restricted use | • Discharge to land/groundwater | • Landforms<br>• Terrestrial Environmental Quality (Soil/groundwater) | • EPBC Act<br>• EP Act 1986<br>• Contaminated Sites Act 2003<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action** – CEMP, DMP, Contaminated Site Management Plan<br>**Emission Limits** – DMP, Contaminated Site Management Plan<br>**Monitoring** – CEMP, DMP, Contaminated Site Management Plan | Moderate | Unlikely | **Medium** | **Description**: Dewatering effluent, potentially contaminated<br>**Consequence:** Reduction in vegetation quality, soil / groundwater contamination if contaminated effluent releases to the environment<br>**Likelihood:** Implement Controls in DMP and CEMP, the likelihood of land contamination from dewatering effluent is unlikely. |
| | Land disturbance - Hazardous Substance Exposure | • Discharges to land/groundwater | • Fauna<br>• Flora / Vegetation<br>• Landforms<br>• Terrestrial Environmental Quality (Soil/groundwater) | • Dangerous Goods Safety Act 2004<br>• Environmental Protection (Controlled waste) Regulations 2004<br>• Contaminated Sites Act 2003<br>• EP Act<br>• EP Regulations 1987<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP<br>**Emission Limits** – DMP,<br>**Monitoring** – CEMP, DMP | Moderate | Unlikely | **Medium** | **Description:** Hazardous substance stored and used during construction and commissioning activities.<br>**Consequence:** Reduction in vegetation quality, fauna injury or mortality if contact with hazardous substances, soil / groundwater contamination if stored/used incorrectly or illegally discharged to the environment<br>**Likelihood:** All hazardous goods stored/used during construction should be contained, secured (to prevent release or unauthorised access), transported and used lawfully, so the likelihood of discharges to the environment is unlikely. |
| | Waste management | • Disposal to land | • Fauna<br>• Flora / vegetation<br>• Terrestrial Environmental Quality (Soil/groundwater) | • Environmental Protection (Controlled waste) Regulations 2004<br>• EP Act<br>• EP Regulations 1987<br>• Contaminated Sites Act 2003<br>• Environmental Protection (Unauthorised Discharges) Regulations 2004 | **Specified Action –** CEMP | Minor | Rare | **Low** | **Description:** Waste generated during construction activities**.**<br>**Consequence:** Increased waste onsite, feral animal attractants, reduction in vegetation quality.<br>**Likelihood:** All waste generated during construction should be contained, secured (to prevent release or unauthorised access), transported and disposed of lawfully, so the likelihood of increased waste onsite is rare. |
| | Generation of particulates (vehicle and machinery movement) | • Wind /Air dispersal | • Social surroundings -residents<br>• Fauna | • EP Act 1986<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016 | **Specified Action** – CEMP | Slight | Unlikely | **Low** | **Description:** Generation of particulates (vehicle movement)<br>**Consequence:** Reduced presence of fauna species and habitat availability, impacting amenity.<br>**Likelihood:** With controls in place, minimal dust will be generated during construction works. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | • Flora/ Vegetation | • BC (Exemptions) Order 2019 | | | | | |
| | Generation of noise and vibration (vehicle and machinery movement) | • Wind/Air dispersal | • Social surroundings -residents<br>• Fauna | • Environmental Protection (Noise) Regulations 1997<br>• AS 2436-2010 Guide to noise and vibration control on construction, maintenance and demolition sites | **Specified Action** – CEMP | Slight | Unlikely | Low | **Description:** Generation of noise and vibration (increased traffic/vehicle movement)<br>**Consequence:** Changes in fauna behaviours, impact to visual amenity<br>**Likelihood:** Controls in place will limit noise and vibration during clearing activities. |
| | Atmospheric emission - Increased light | • Air dispersal | • Social surroundings -residents | • EP Act 1986<br>• EPBC Act<br>• | **Specified Action** – CEMP | Slight | Unlikely | Low | **Description:** Increased light from construction activities<br>**Consequence:** Impact to visual amenity/residents<br>**Likelihood:** Controls in place will additional light during clearing activities, unlikely to impact residents |
| | Generation of greenhouse gas emissions | • Energy emissions | • GHG (Air quality) | • National Greenhouse and Energy Reporting Act 2007 (NGER Act)<br>• Environmental Protection Authority Factor Guideline: Greenhouse Gas Emissions (2020) | **Specified Action** – CEMP | Slight | Unlikely | Low | **Description:** Indirect consumption of an energy commodity, generation of greenhouse gases.<br>**Consequence:** The generation of greenhouse gases has the potential to pollute the local area.<br>**Likelihood**: Significant impacts to air quality (greenhouse gas emissions) from the operation of the Proposal are unlikely to occur. |
| | Land disturbance - Damage to heritage values | • Direct Interaction with machinery/vehicles | • Social surrounds - heritage | • Aboriginal Heritage Act 1972<br>• Aboriginal Heritage Regulations 1974<br>• Native Title Act 1993 (Commonwealth) | **Specified Action** – Clearing Permit, survey and demarcation of approved clearing area, CEMP, demarcating heritage site to ensure avoidance<br>**Monitoring** - CEMP | Moderate | Unlikely | Low | **Description:** the proposed route avoids all Aboriginal heritage sites identified in the vicinity of the DE, for example the Honey Possum site (ID 3503).<br>**Consequence:** Aboriginal Heritage sites of value may be impacted if construction aspects are not adequately managed.<br>**Likelihood**: With clearing requirements and specified actions disturbance of heritage sites from clearing activities are unlikely. |
| | Dewatering leading to loss of subterranean fauna habitat | • Groundwater drawdown | • Subterranean fauna | • EP Act 1986<br>• EPBC Act<br>• Biodiversity Conservation Regulations 2018<br>• BC Act 2016 | **Specified Action** – CEMP, DMP<br>**Monitoring** – CEMP. DMP | Minor | Rare | Low | **Description:** Groundwater drawdown reduces available habitat for subterranean fauna.<br>**Consequence:** Temporary reduction in habitat due to dewatering, loss of potential subterranean habitat.<br>**Likelihood**: No subterranean fauna has been reported in the area. . |

# Attachment C. Figures


**LEGEND**

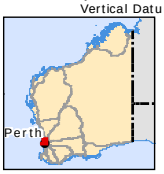
- Development Envelope - SDP
- Development Envelope - Pipeline
- Main Roads

1:95,000 at A4

0 940 1880 2820

Metres

Coordinate System: GDA 1994 MGA Zone 50
Vertical Datum: AHD




DATE: 16/12/2022
AUTHOR: LEONARJ0

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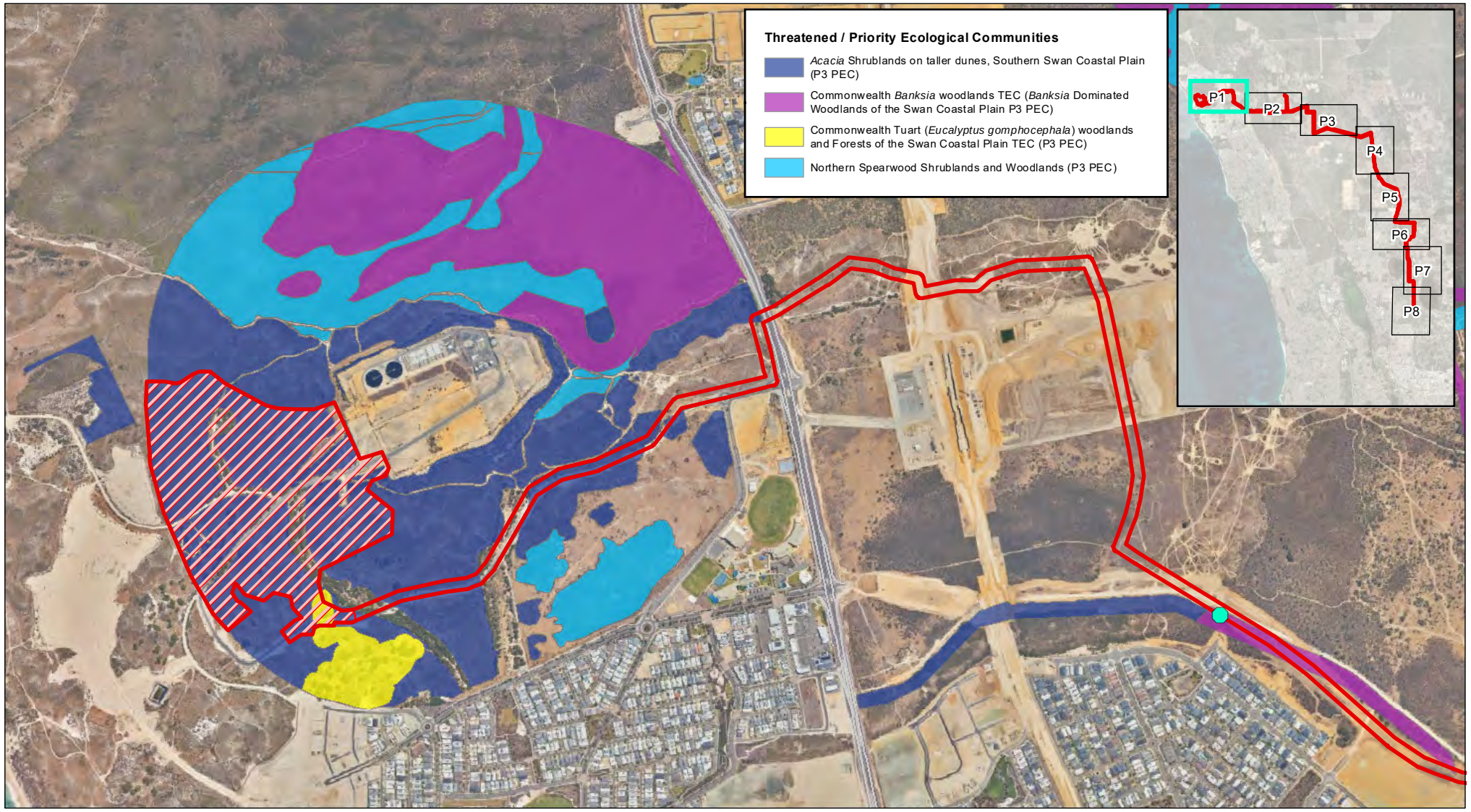
WATER CORPORATION

# Alkimos Desalination Plant - Proposed Development Envelope Location



File: \\svntjt1-38\environ\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig1_CW03474_Overview_20221209.mxd

Figure 1




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

**Threatened and Priority Flora**

*Banksia dallanneyi* subsp. *pollosta* (P3)

1:15,000 at A4

0 140 280 420

Metres

Coordinate System:
GDA 1994 MGA Zone 50
Vertical Datum: AHD

DATE: 21/12/2022
AUTHOR: LEONARJO

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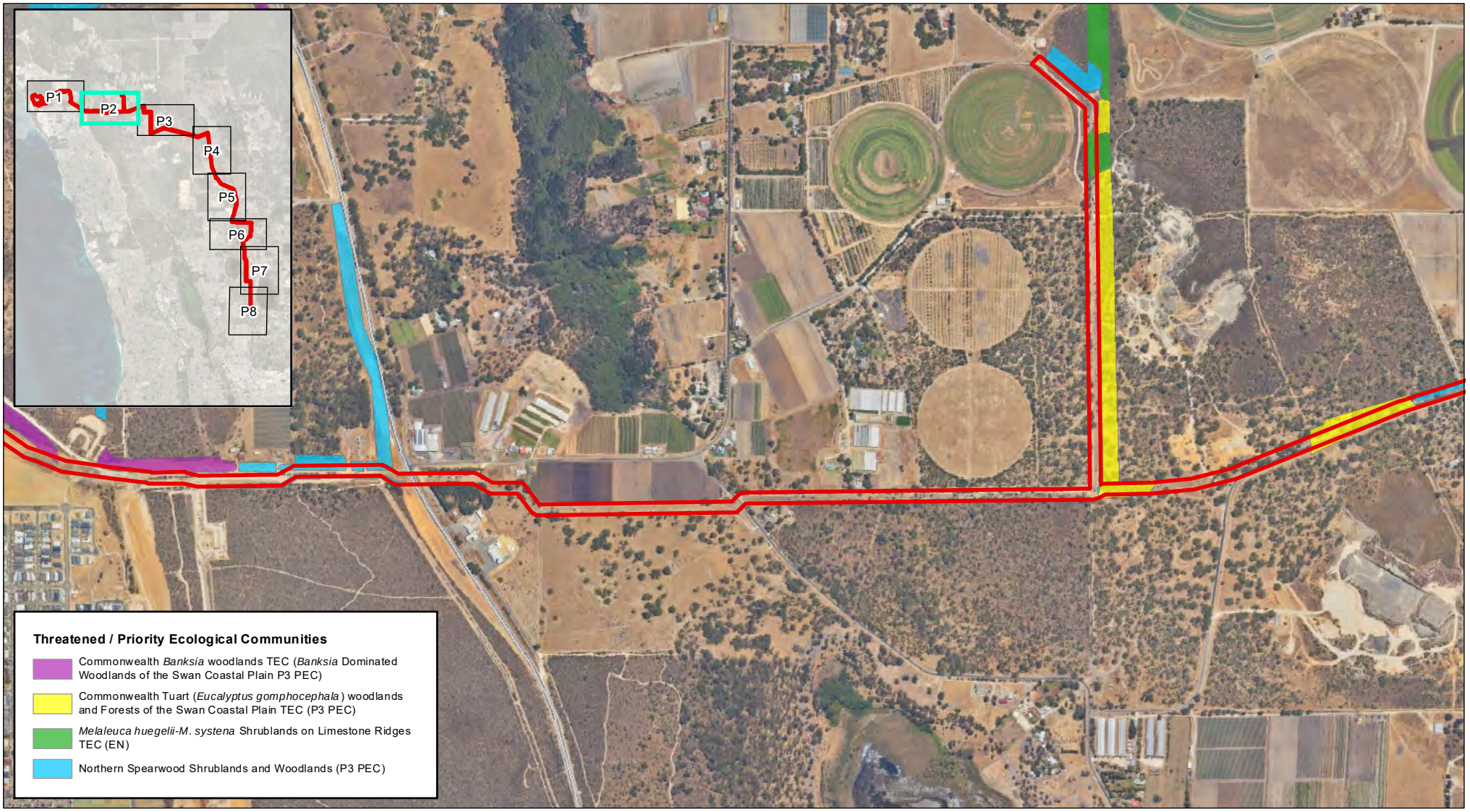
# Alkimos Desalination Plant - Threatened and Priority Ecological Communities and Declared Rare Flora



Figure 2.1

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig2_CW03474_TecPecPF_20221215_Landscape.mxd




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 140 280 420

Metres

Coordinate System:
GDA 1994 MGA Zone 50
Vertical Datum: AHD

DATE: 21/12/2022
AUTHOR: LEONARJ0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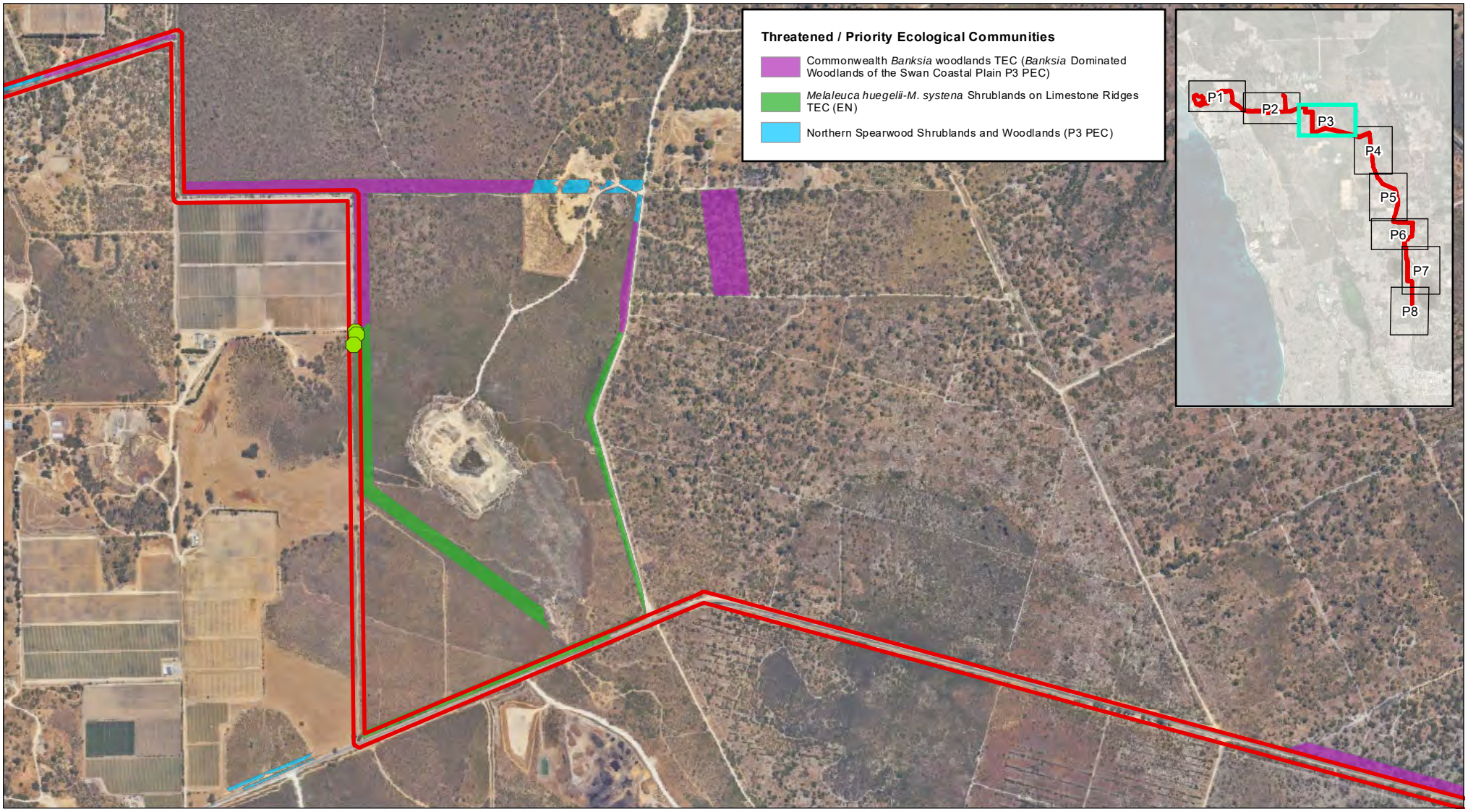
# Alkimos Desalination Plant - Threatened and Priority Ecological Communities and Declared Rare Flora



Figure 2.2

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig2_CW03474_TecPecPF_20221215_Landscape.mxd




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

**Threatened and Priority Flora**

*Jacksonia sericea* (P4)

1:15,000 at A4

0 140 280 420

Metres

Coordinate System:
GDA 1994 MGA Zone 50
Vertical Datum: AHD

DATE: 21/12/2022
AUTHOR: LEONARJO

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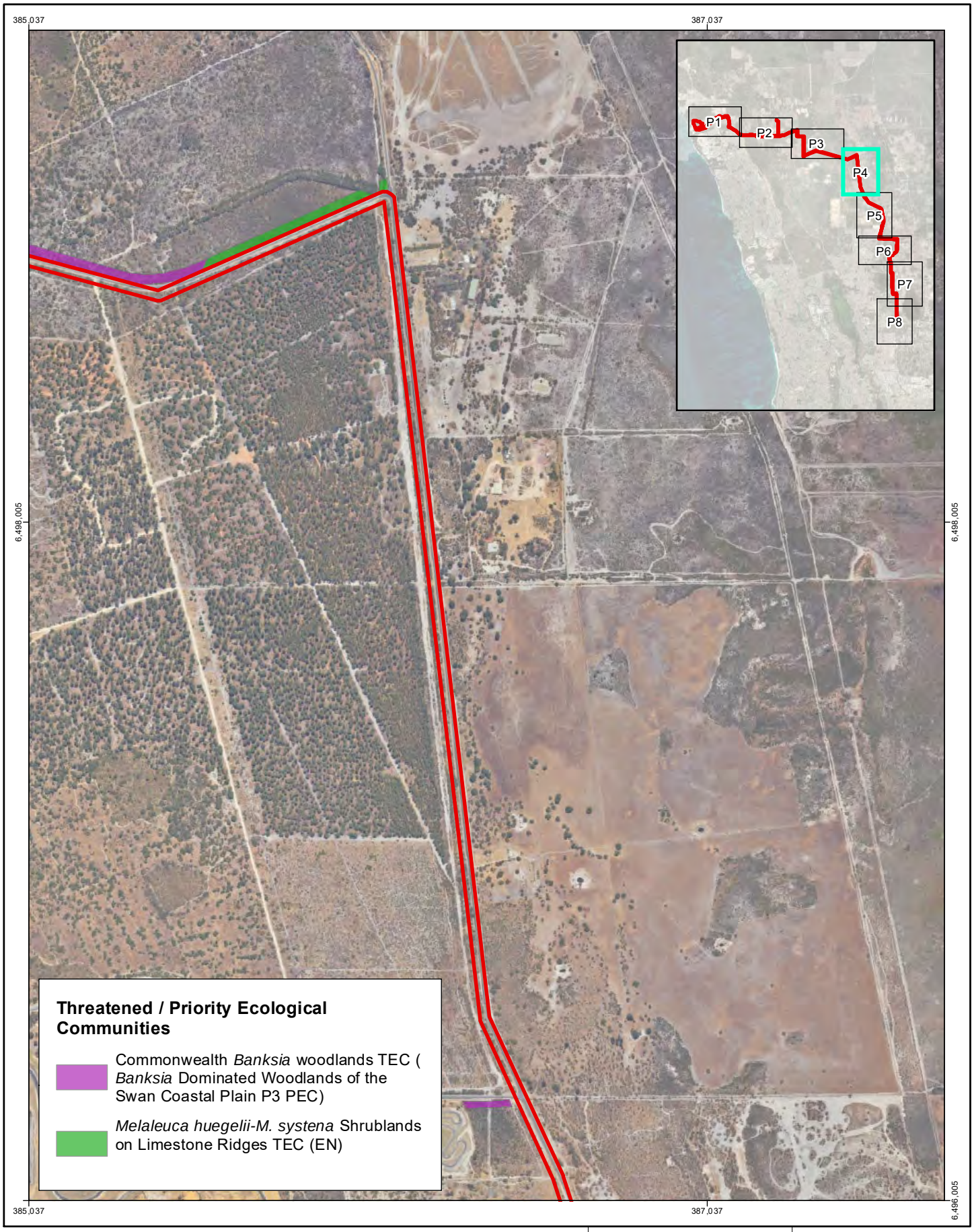
# Alkimos Desalination Plant - Threatened and Priority Ecological Communities and Declared Rare Flora



Figure 2.3

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig2_CW03474_TecPecPF_20221215_Landscape.mxd




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 150 300 450

Metres

Coordinate System: GDA 1994 MGA Zone 50

Vertical Datum: AHD


DATE: 21/12/2022

AUTHOR: LEONARJ0

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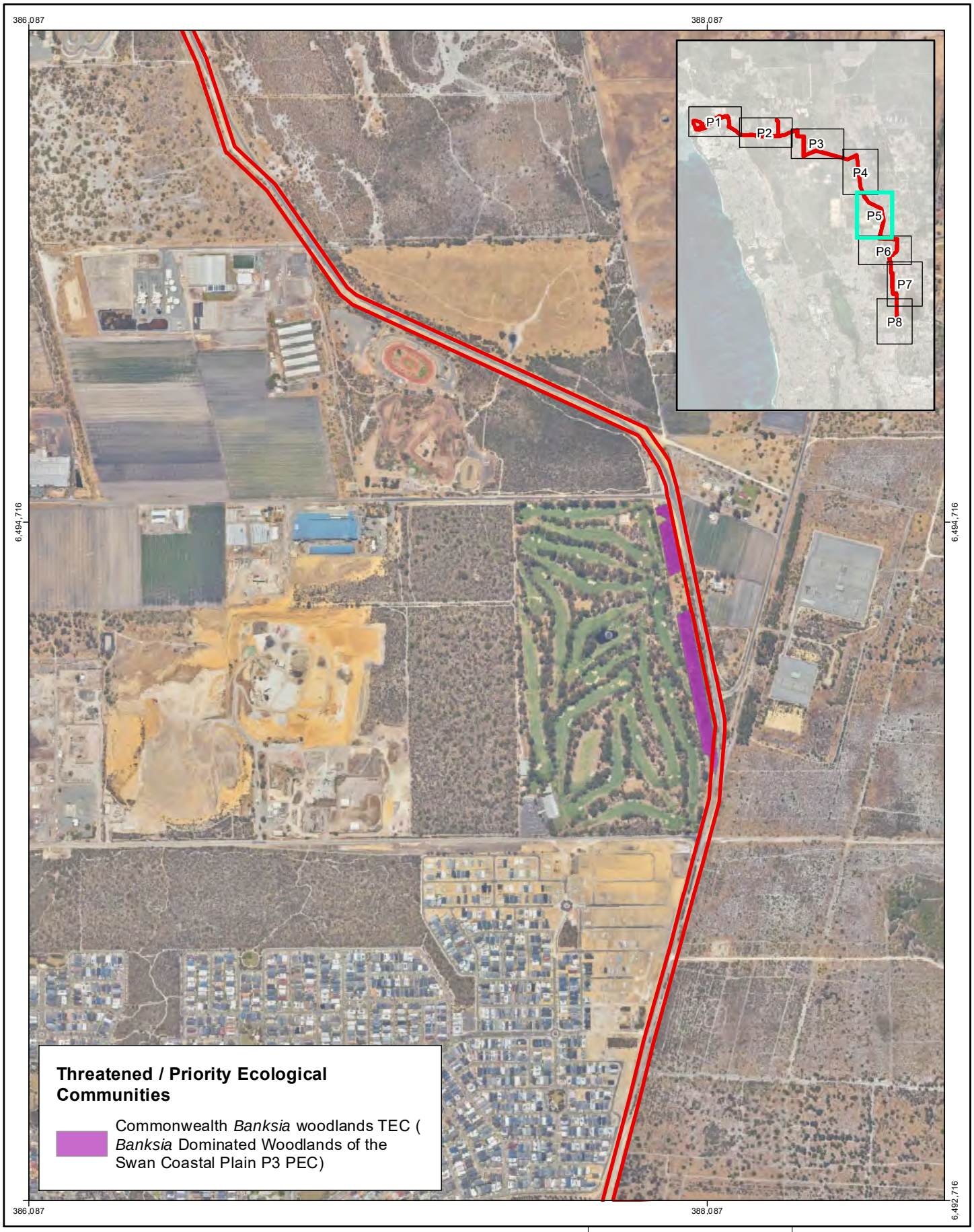
# Alkimos Desalination Plant - Threatened and Priority Ecological Communities and Declared Rare Flora



File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig2_CW03474_TecPecPF_20221215.mxd

Figure 2.4




**LEGEND**

- Development Envelope - SDP
- Development Envelope - Pipeline

1:15,000 at A4

0 150 300 450

Metres

Coordinate System: GDA 1994 MGA Zone 50
Vertical Datum: AHD


DATE: 21/12/2022
AUTHOR: LEONARJ0

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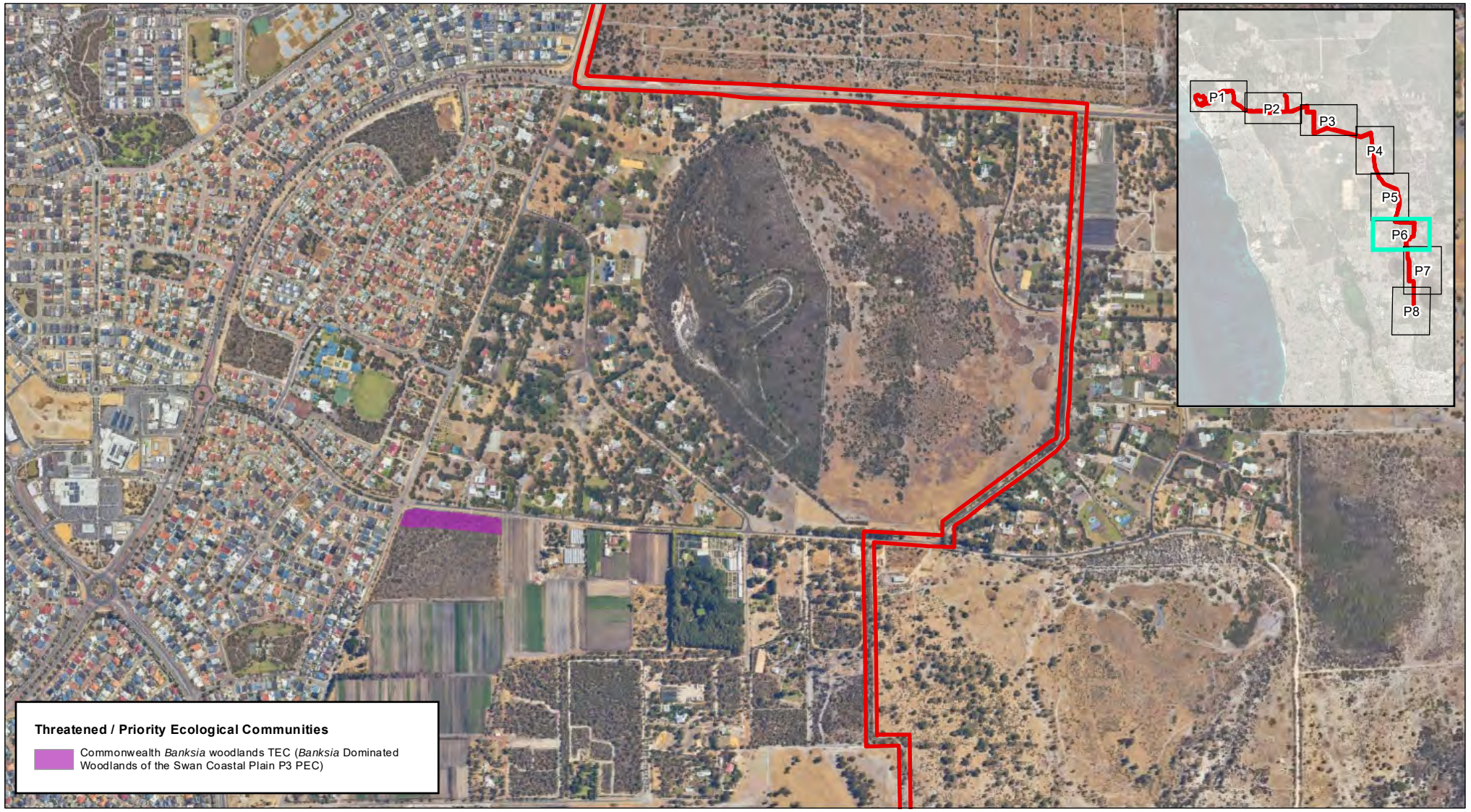
# Alkimos Desalination Plant - Threatened and Priority Ecological Communities and Declared Rare Flora



Figure 2.5

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig2_CW03474_TecPecPF_20221215.mxd




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 140 280 420

Metres

Coordinate System:
GDA 1994 MGA Zone 50
Vertical Datum: AHD

DATE: 21/12/2022
AUTHOR: LEONARJ0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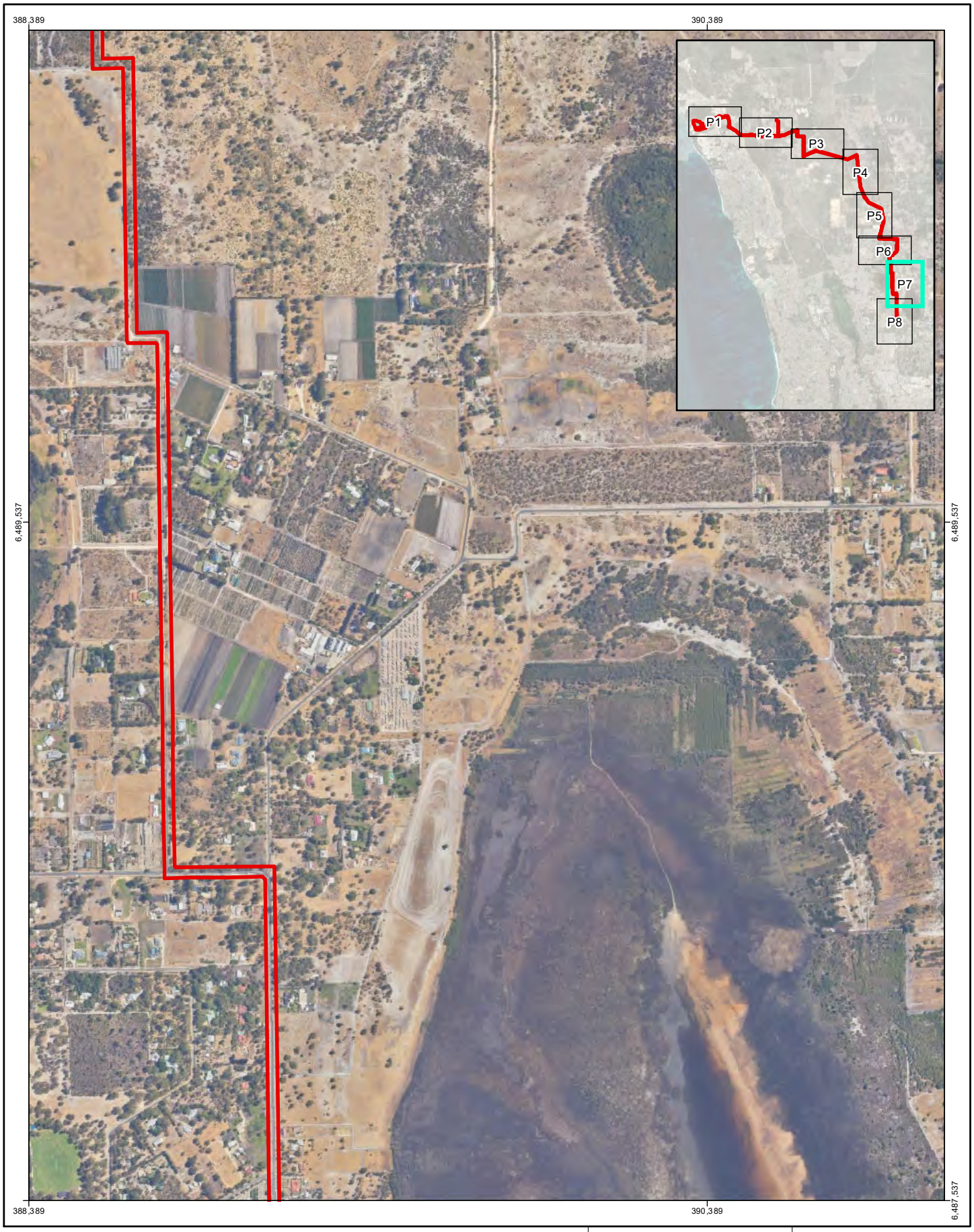
# Alkimos Desalination Plant - Threatened and Priority Ecological Communities and Declared Rare Flora



Figure 2.6

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig2_CW03474_TecPecPF_20221215_Landscape.mxd




**LEGEND**

- Development Envelope - SDP
- Development Envelope - Pipeline

1:15,000 at A4

0 150 300 450

Metres

Coordinate System: GDA 1994 MGA Zone 50
Vertical Datum: AHD


DATE: 21/12/2022

AUTHOR: LEONARJ0

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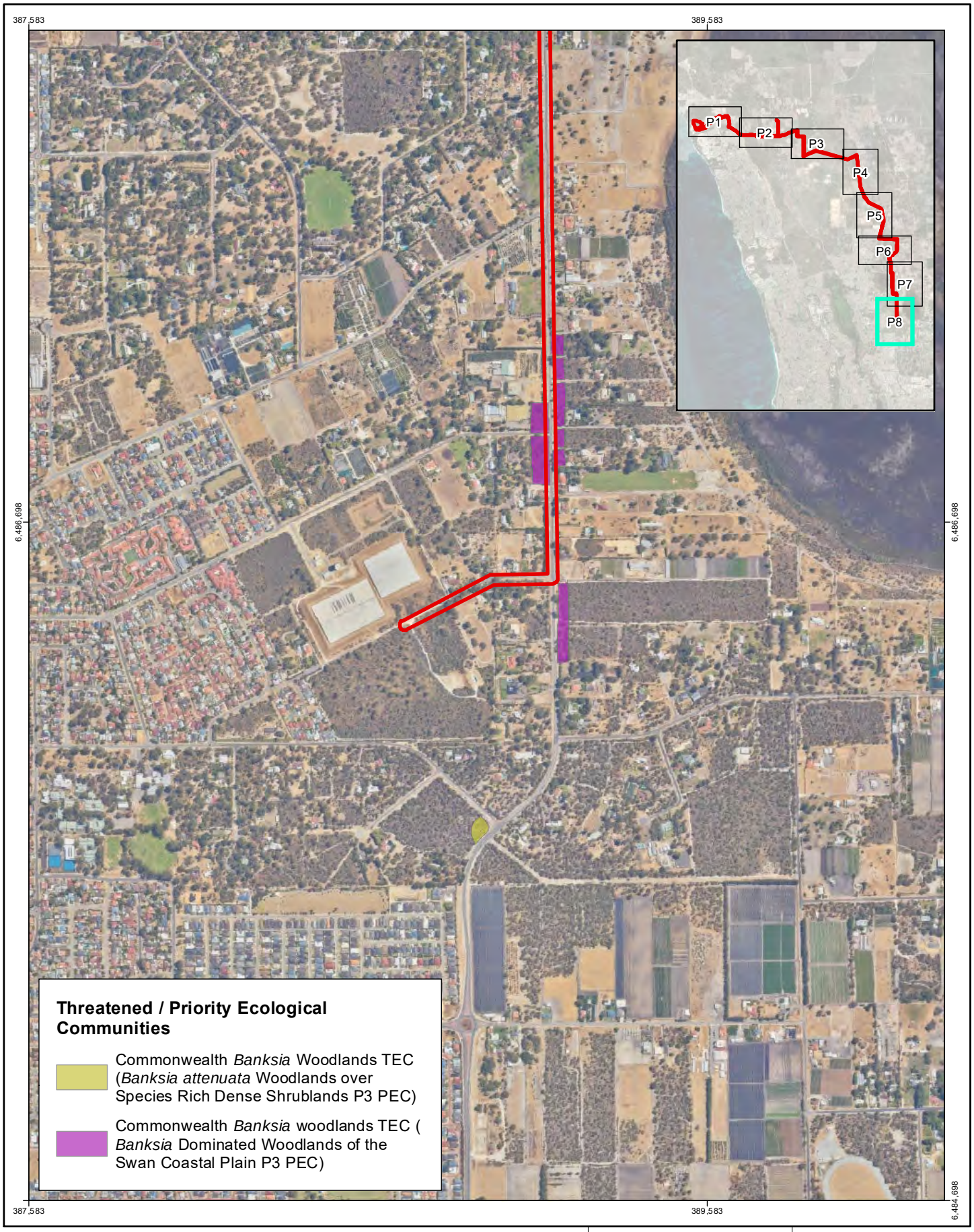
Alkimos Desalination Plant - Threatened and Priority Ecological Communities and Declared Rare Flora



File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig2_CW03474_TecPecPF_20221215.mxd

Figure 2.7




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 150 300 450

Metres

Coordinate System: GDA 1994 MGA Zone 50
Vertical Datum: AHD


DATE: 21/12/2022

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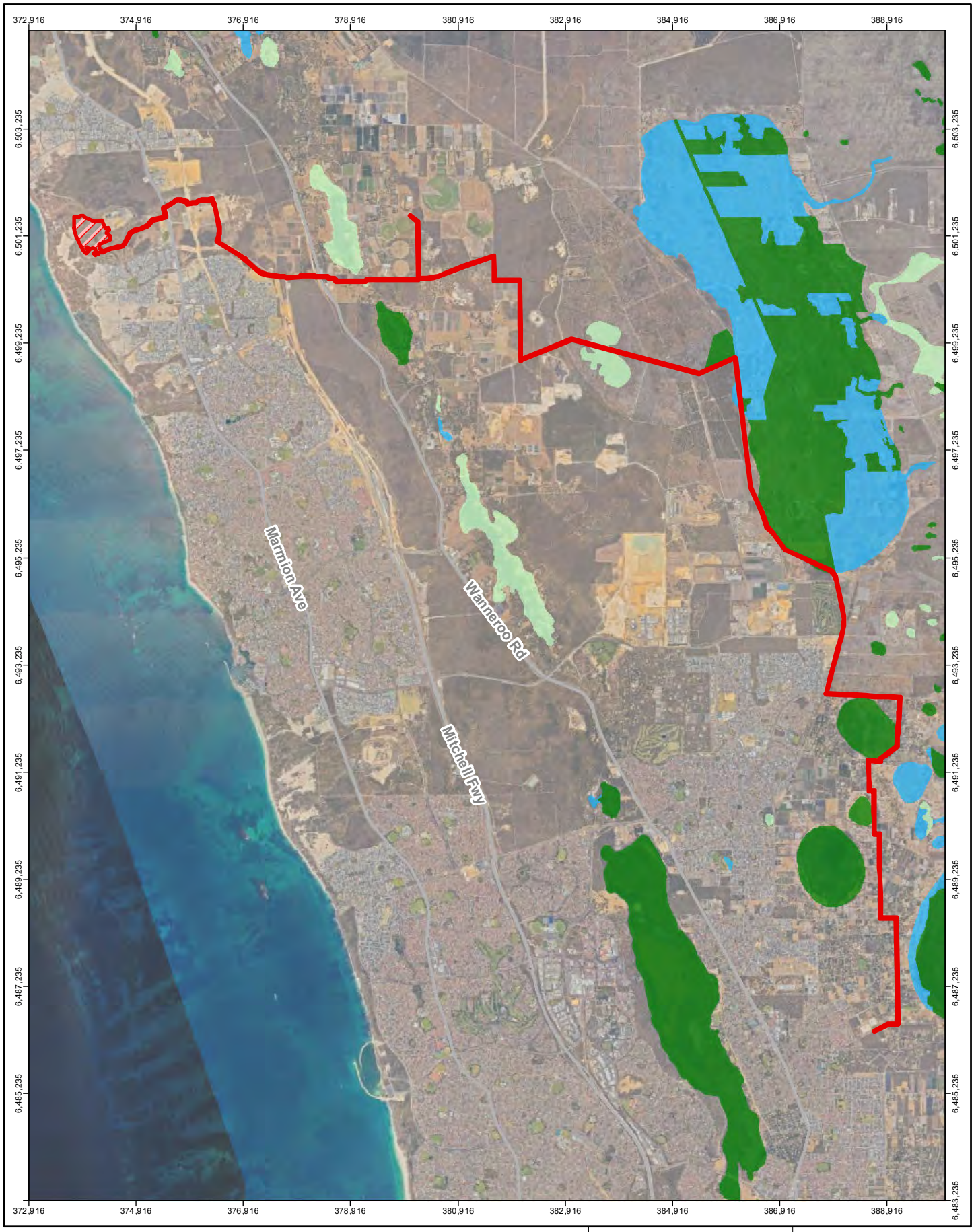
# Alkimos Desalination Plant - Threatened and Priority Ecological Communities and Declared Rare Flora



File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig2_CW03474_TecPecPF_20221215.mxd

Figure 2.8




**LEGEND**

- Development Envelope - SDP
- Development Envelope - Pipeline
- Main Roads

**Geomorphic Wetlands Swan Coastal Plain**

- Conservation
- Multiple Use
- Not Applicable
- Resource Enhancement

1:95,000 at A4

0 940 1880 2820

Metres

Coordinate System: GDA 1994 MGA Zone 50
Vertical Datum: AHD


DATE: 16/12/2022
AUTHOR: LEONARJ0

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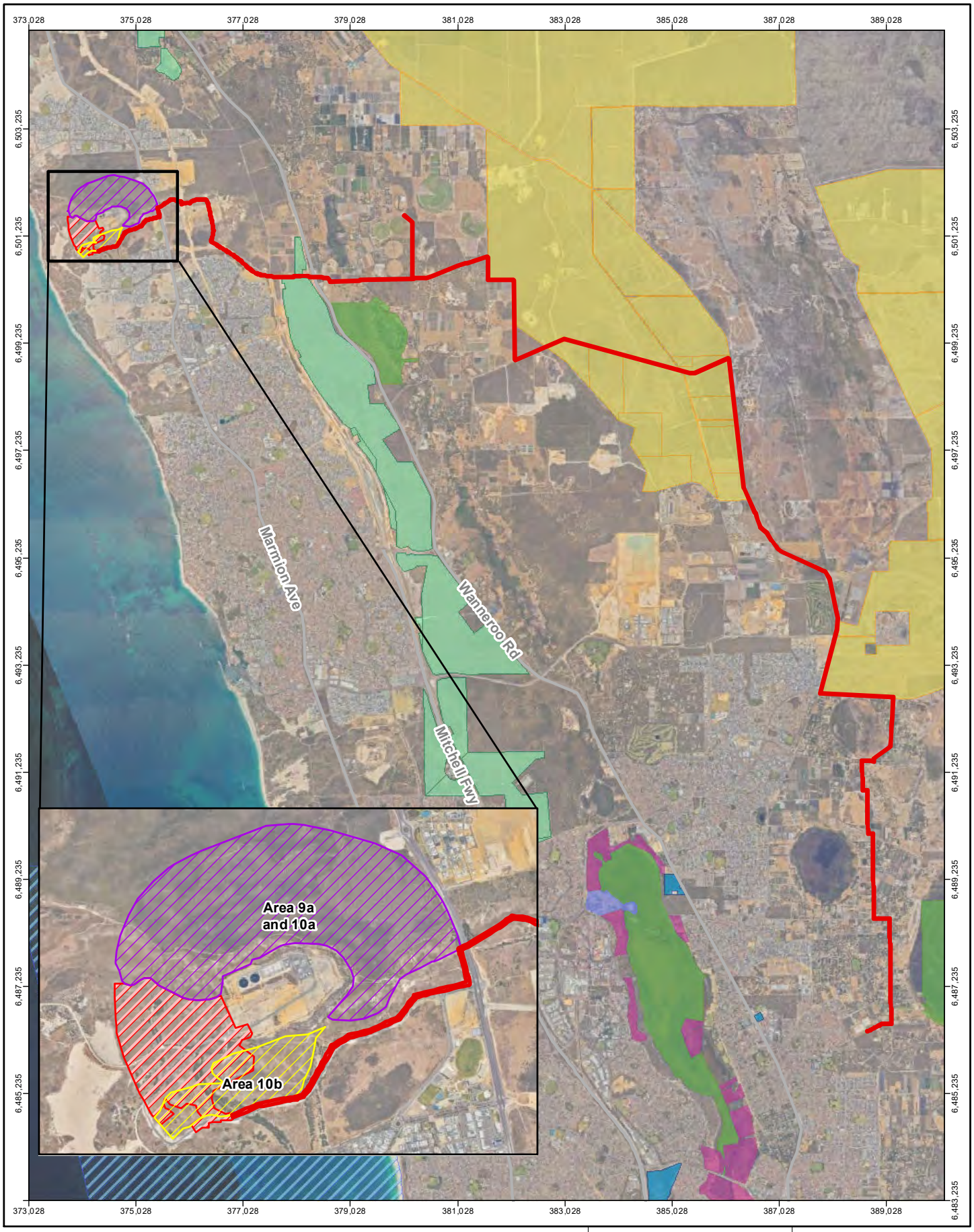
Alkimos Desalination Plant - Geomorphic Wetlands of the Swan Coastal Plain



File: \\svntjt1-38\environ\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig3_CW03474_GeoWetlands_20221215.mxd

Figure 3




**LEGEND**

- Development Envelope
- Development Envelope - Pipeline
- Main Roads

**DBCA Managed Lands**

- National Park
- Nature Reserve
- Conservation Park
- Section 5(1)(h) Reserve
- State Forest
- Marine Park
- Crown Freehold - Dept Managed

**Public Purpose Reserve (For Conservation)**

- Area 10b
- Area 9a and 10a

1:95,000 at A4

0 940 1880 2820

Metres

Coordinate System: GDA 1994 MGA Zone 50
Vertical Datum: AHD


DATE: 22/12/2022
AUTHOR: LEONARJ0

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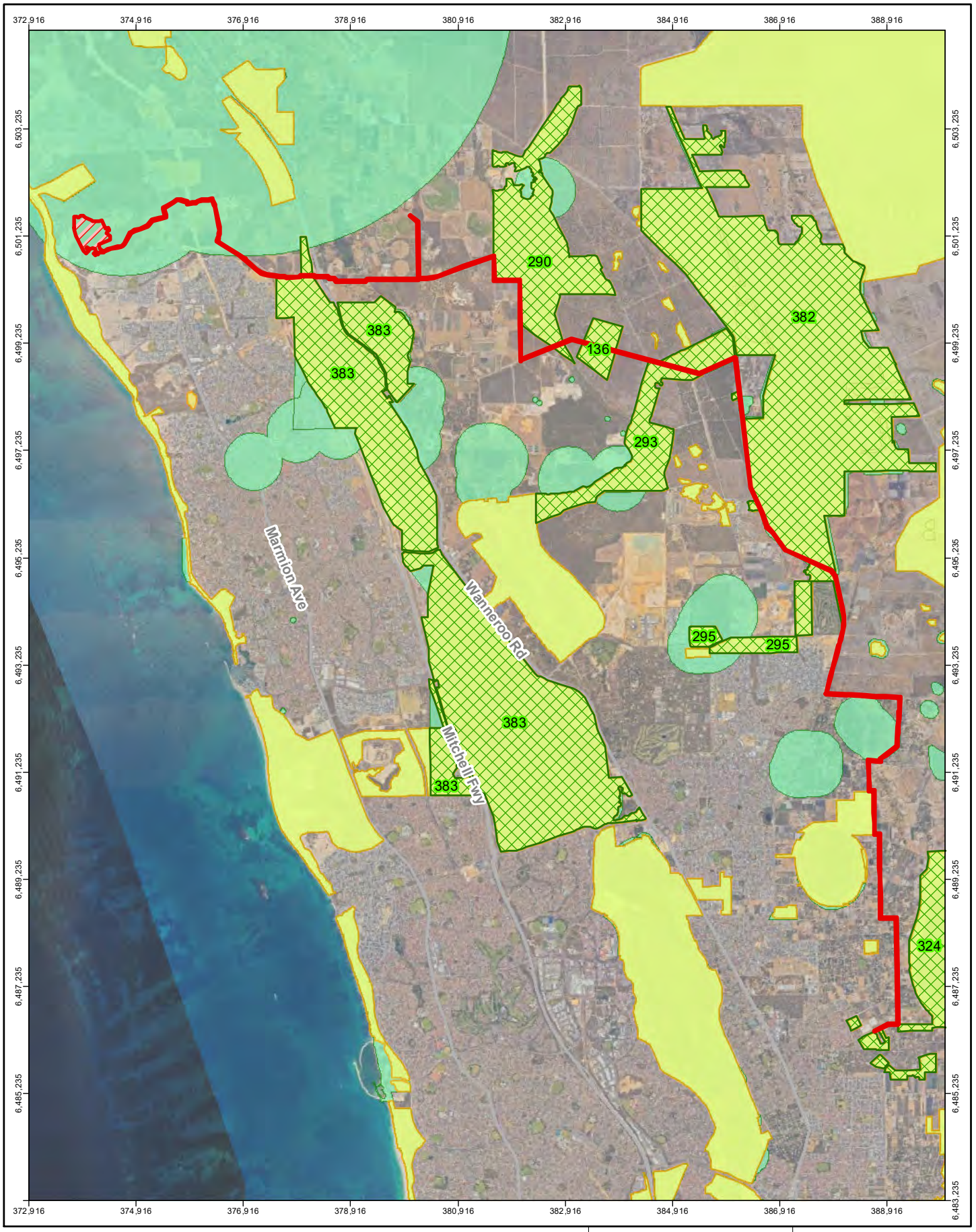
Alkimos Desalination Plant - Conservation Areas


File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig4_CW03474_ConsLand_20221215.mxd

Figure 4




**LEGEND**

- Development Envelope - SDP
- Development Envelope - Pipeline
- Main Roads
- Environmentally Sensitive Area (ESA)
- Bush Forever Sites
- Bush Forever Sites (potential impacts)

1:95,000 at A4

0 940 1880 2820

Metres

Coordinate System: GDA 1994 MGA Zone 50
Vertical Datum: AHD


DATE: 16/12/2022
AUTHOR: LEONARJ0

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Alkimos Desalination Plant - Environmentally Sensitve Areas and Bush Forever Sites



File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig5_CW03474_BushFor_20221215.mxd

Figure 5


**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 140 280 420

Metres

Coordinate System:
GDA 1994 MGA Zone 50
Vertical Datum: AHD

DATE: 21/12/2022
AUTHOR: LEONARJO

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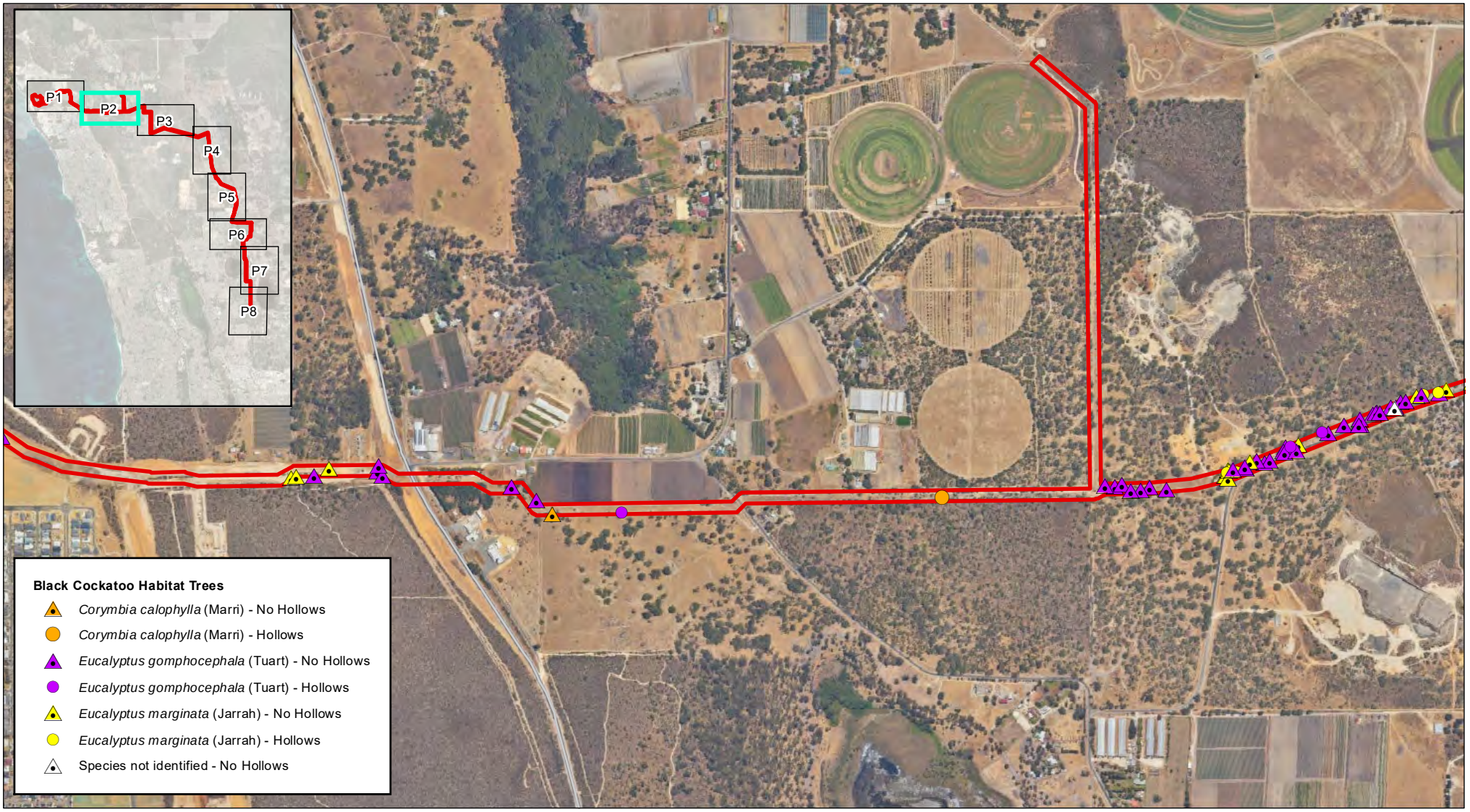
# Alkimos Desalination Plant - Black Cockatoo Habitiat trees



Figure 6.1

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig6_CW03474_BC_20221221_landscape.mxd




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 140 280 420

Metres

Coordinate System:
GDA 1994 MGA Zone 50
Vertical Datum: AHD

DATE: 21/12/2022
AUTHOR: LEONARJ0

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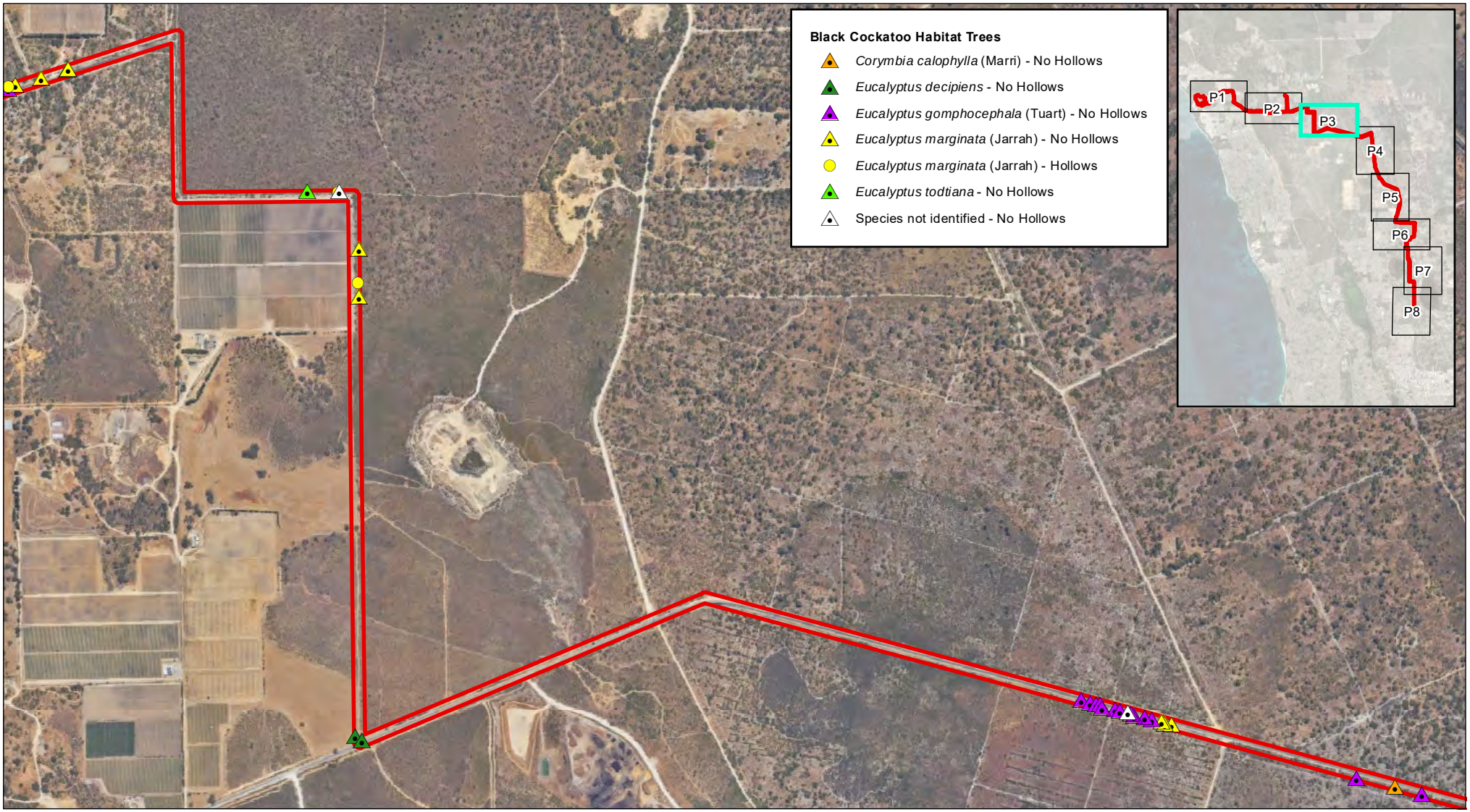
# Alkimos Desalination Plant - Black Cockatoo Habitiat trees



Figure 6.2

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig6_CW03474_BC_20221221_landscape.mxd




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 140 280 420

Metres

Coordinate System:
GDA 1994 MGA Zone 50
Vertical Datum: AHD

DATE: 21/12/2022
AUTHOR: LEONARJ0

Perth

N

WATER CORPORATION

# Alkimos Desalination Plant - Black Cockatoo Habitiat trees



Figure 6.3

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig6_CW03474_BC_20221221_landscape.mxd


**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 150 300 450

Metres

Coordinate System: GDA 1994 MGA Zone 50

Vertical Datum: AHD


DATE: 21/12/2022

AUTHOR: LEONARJ0

N

WATER CORPORATION

Alkimos Desalination Plant - Black Cockatoo Habitiat trees



File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig6_CW03474_BC_20221221_portrait.mxd

Figure 6.4


**LEGEND**

- Development Envelope - SDP
- Development Envelope - Pipeline
- Main Roads

1:15,000 at A4

0 150 300 450

Metres

Coordinate System: GDA 1994 MGA Zone 50
Vertical Datum: AHD


DATE: 21/12/2022
AUTHOR: LEONARJ0

N

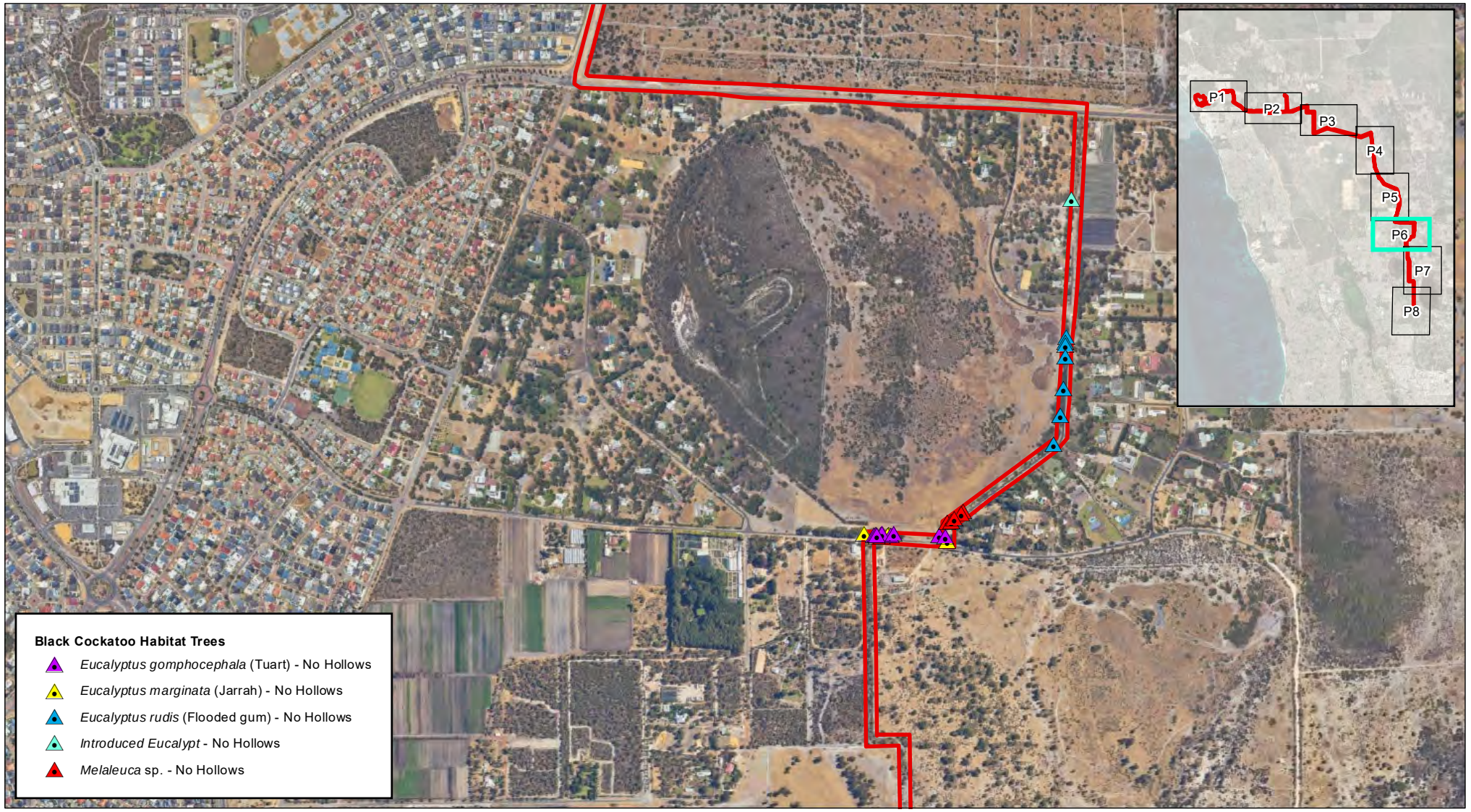
WATER CORPORATION

Alkimos Desalination Plant - Black Cockatoo Habitiat trees



Figure 6.5

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig6_CW03474_BC_20221221_portrait.mxd




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 140 280 420

Metres

Coordinate System:
GDA 1994 MGA Zone 50
Vertical Datum: AHD

DATE: 21/12/2022
AUTHOR: LEONARJ0


N

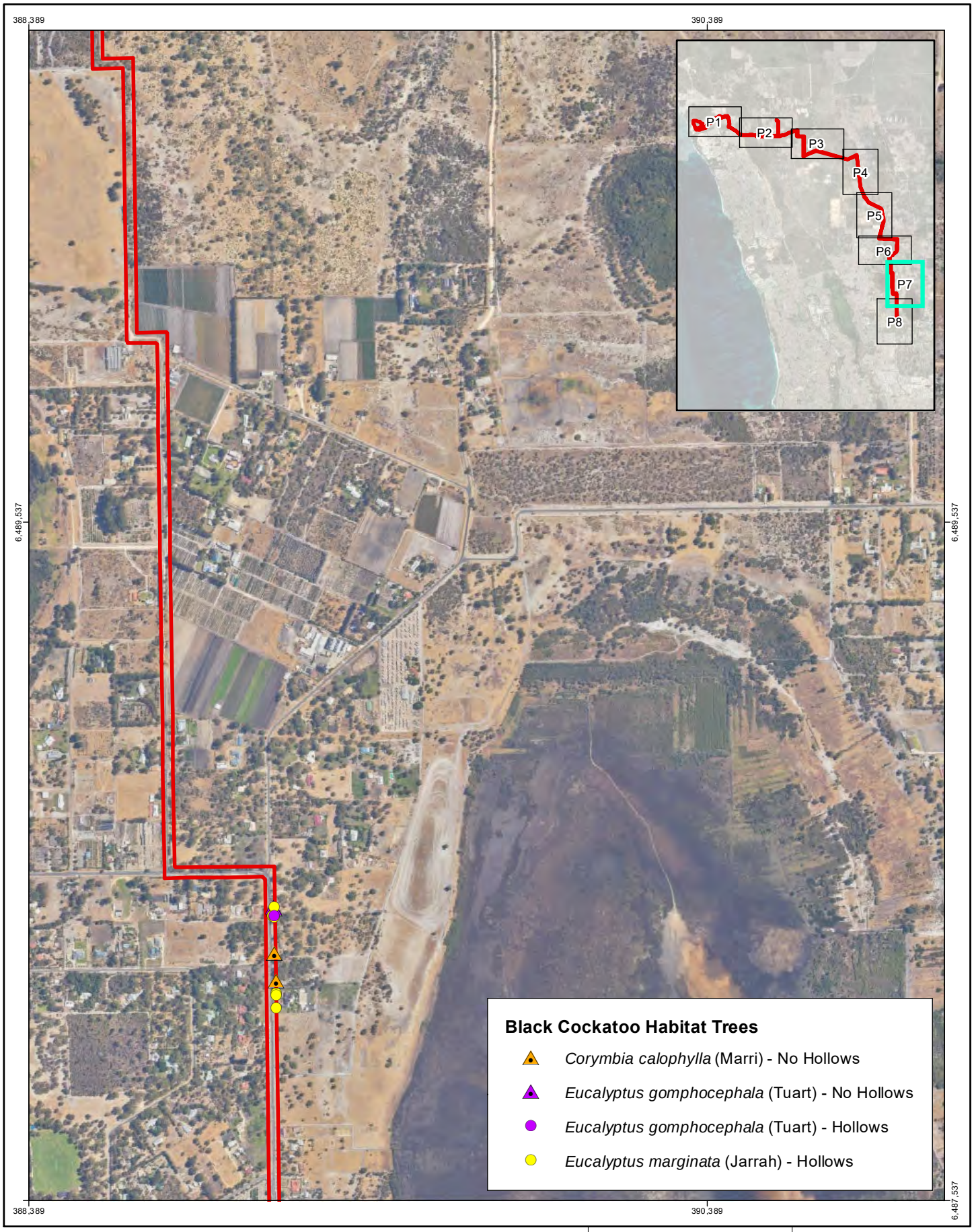
WATER CORPORATION

# Alkimos Desalination Plant - Black Cockatoo Habitiat trees



Figure 6.6

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig6_CW03474_BC_20221221_landscape.mxd




**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 150 300 450

Metres

Coordinate System: GDA 1994 MGA Zone 50

Vertical Datum: AHD


DATE: 21/12/2022

AUTHOR: LEONARJ0

N

WATER CORPORATION

Alkimos Desalination Plant - Black Cockatoo Habitiat trees



File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig6_CW03474_BC_20221221_portrait.mxd

Figure 6.7


**LEGEND**

Development Envelope - SDP

Development Envelope - Pipeline

1:15,000 at A4

0 150 300 450

Metres

Coordinate System: GDA 1994 MGA Zone 50

Vertical Datum: AHD


DATE: 21/12/2022

AUTHOR: LEONARJ0

N

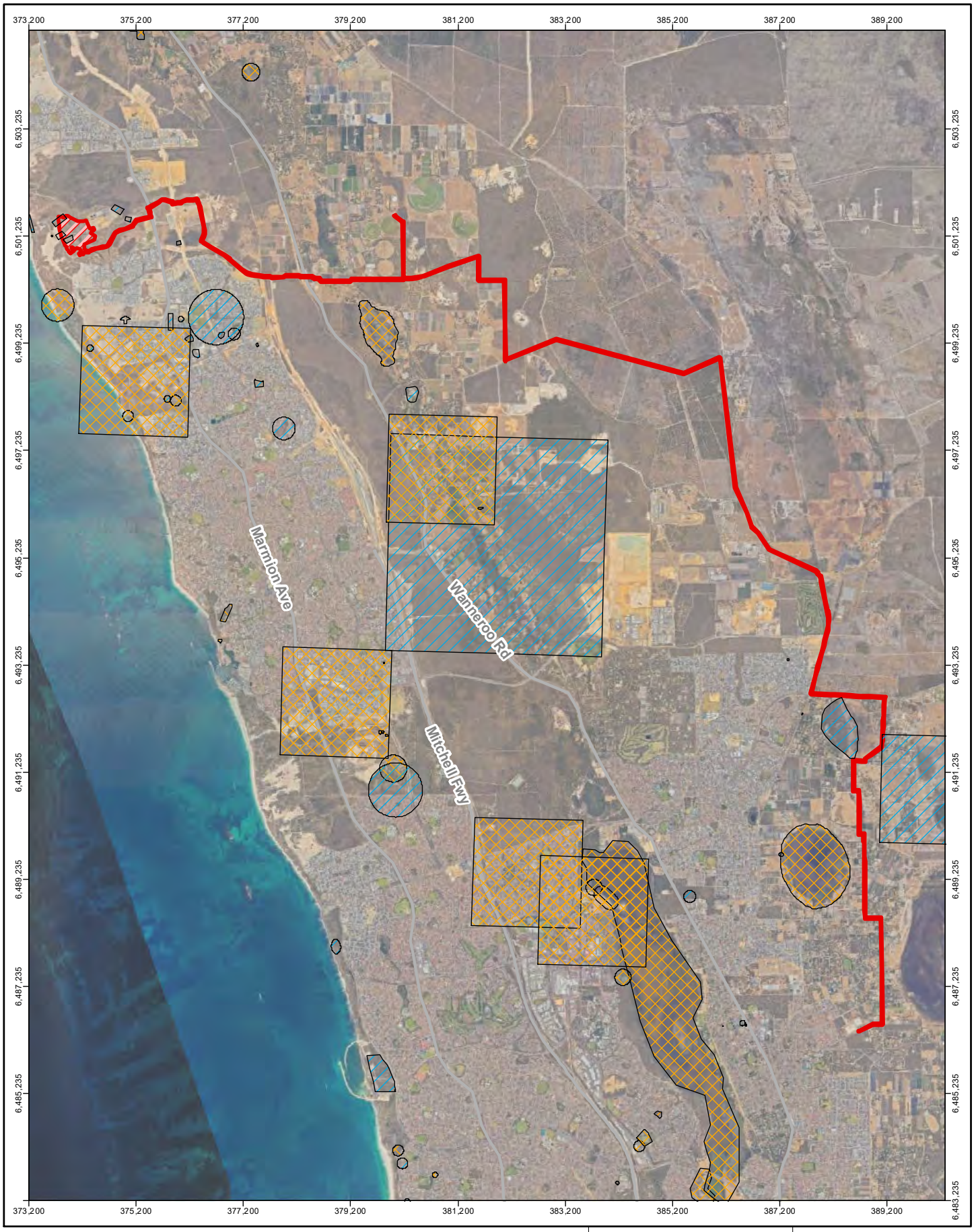
WATER CORPORATION

Alkimos Desalination Plant - Black Cockatoo Habitiat trees



Figure 6.8

File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig6_CW03474_BC_20221221_portrait.mxd




**LEGEND**

- Development Envelope - SDP
- Development Envelope - Pipeline
- Main Roads

**Aboriginal Heritage Sites**

- Registered Site
- Other Site

1:95,000 at A4

0 940 1880 2820

Metres

Coordinate System: GDA 1994 MGA Zone 50

Vertical Datum: AHD


DATE: 16/12/2022

AUTHOR: LEONARJ0

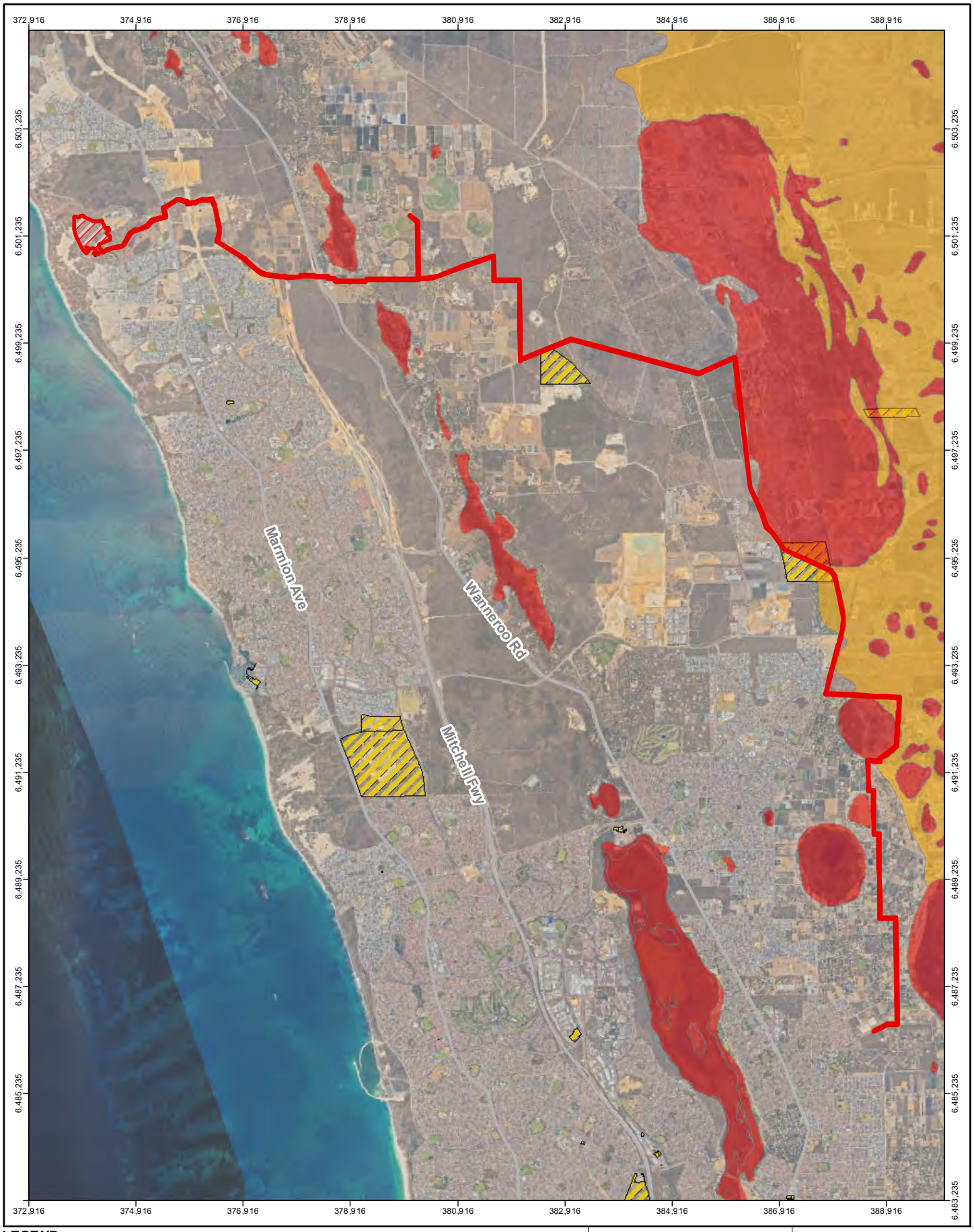
N

WATER CORPORATION

Alkimos Desalination Plant - Aboriginal Heritage



Figure 7




**LEGEND**

- Development Envelope - SDP
- Development Envelope - Pipeline
- Main Roads
- Contaminated Sites

**Acid Sulphate Soils WA**

- High to moderate ASS disturbance risk (<3m from surface)
- Moderate to low ASS disturbance risk (<3m from surface)

1:95,000 at A4

0 940 1880 2820

Metres

Coordinate System: GDA 1994 MGA Zone 50
Vertical Datum: AHD


DATE: 16/12/2022
AUTHOR: LEONARJ0

N

WATER CORPORATION

# Alkimos Desalination Plant - Contaminated and Acid Sulphate Soils



File: S:\AA_EIA_GIS\1_Projects\Capital\CW03474 - Alkimos Desalination Plant\ArcMap\Dec2022\TCEMP\mxd_Final\Fig8_CW03474_Contamination_20221215.mxd

Figure 8

# Attachment D. Black Cockatoo Trees

| WC ID | Tree Species | Hollow Present | Eastings | Northings |
|---|---|---|---|---|
| 45 | *Eucalyptus marginata* (Jarrah) | No | 115.713466 | -31.624356 |
| 46 | *Eucalyptus marginata* (Jarrah) | No | 115.713624 | -31.624333 |
| 47 | *Eucalyptus gomphocephala* (Tuart) | No | 115.714142 | -31.624315 |
| 49 | *Eucalyptus marginata* (Jarrah) | No | 115.714572 | -31.624141 |
| 50 | *Eucalyptus gomphocephala* (Tuart) | No | 115.715966 | -31.624231 |
| 51 | *Eucalyptus gomphocephala* (Tuart) | No | 115.716115 | -31.624339 |
| 52 | *Eucalyptus gomphocephala* (Tuart) | No | 115.716007 | -31.624097 |
| 409 | *Eucalyptus gomphocephala* (Tuart) | No | 115.829409 | -31.734454 |
| 410 | *Eucalyptus gomphocephala* (Tuart) | No | 115.82944 | -31.734487 |
| 413 | *Eucalyptus marginata* (Jarrah) | Yes | 115.829385 | -31.734659 |
| 415 | *Eucalyptus marginata* (Jarrah) | Yes | 115.829461 | -31.736731 |
| 422 | Corymbia calophylla (Marri) | No | 115.829414 | -31.73567 |
| 432 | *Eucalyptus marginata* (Jarrah) | No | 115.824584 | -31.706906 |
| 433 | *Eucalyptus marginata* (Jarrah) | No | 115.824613 | -31.706856 |
| 434 | *Eucalyptus marginata* (Jarrah) | No | 115.824796 | -31.70688 |
| 438 | *Eucalyptus marginata* (Jarrah) | No | 115.824768 | -31.706897 |
| 439 | *Eucalyptus marginata* (Jarrah) | No | 115.824079 | -31.706827 |
| 446 | *Eucalyptus gomphocephala* (Tuart) | No | 115.824445 | -31.706907 |
| 449 | *Eucalyptus gomphocephala* (Tuart) | No | 115.824347 | -31.70688 |
| 451 | *Eucalyptus gomphocephala* (Tuart) | No | 115.824555 | -31.706865 |
| 459 | *Eucalyptus gomphocephala* (Tuart) | No | 115.824406 | -31.706856 |
| 470 | *Eucalyptus gomphocephala* (Tuart) | No | 115.826254 | -31.706915 |
| 474 | *Eucalyptus gomphocephala* (Tuart) | No | 115.824843 | -31.706896 |
| 475 | *Eucalyptus gomphocephala* (Tuart) | No | 115.824599 | -31.706846 |
| 476 | *Eucalyptus gomphocephala* (Tuart) | No | 115.824936 | -31.706847 |
| 479 | *Eucalyptus gomphocephala* (Tuart) | No | 115.824433 | -31.706884 |
| 489 | *Eucalyptus marginata* (Jarrah) | No | 115.826487 | -31.70705 |
| 529 | *Eucalyptus gomphocephala* (Tuart) | No | 115.777466 | -31.638011 |
| 530 | *Eucalyptus gomphocephala* (Tuart) | No | 115.777721 | -31.638076 |
| 531 | *Eucalyptus gomphocephala* (Tuart) | No | 115.778429 | -31.638255 |
| 532 | *Eucalyptus gomphocephala* (Tuart) | No | 115.777903 | -31.638132 |
| 533 | *Eucalyptus gomphocephala* (Tuart) | No | 115.778583 | -31.638284 |
| 534 | *Eucalyptus gomphocephala* (Tuart) | No | 115.778017 | -31.638121 |
| 535 | *Eucalyptus gomphocephala* (Tuart) | No | 115.778055 | -31.63821 |
| 1283 | *Eucalyptus gomphocephala* (Tuart) | No | 115.746675 | -31.6226 |
| 1285 | *Eucalyptus marginata* (Jarrah) | No | 115.74688 | -31.622518 |
| 1286 | *Eucalyptus gomphocephala* (Tuart) | No | 115.738293 | -31.624843 |
| 1288 | *Eucalyptus marginata* (Jarrah) | Yes | 115.746241 | -31.622634 |
| 1289 | *Eucalyptus marginata* (Jarrah) | No | 115.74602 | -31.622682 |
| 1290 | *Eucalyptus marginata* (Jarrah) | No | 115.747632 | -31.62234 |
| 1291 | *Eucalyptus marginata* (Jarrah) | No | 115.740459 | -31.624574 |

| | | | | |
|---|---|---|---|---|
| 1293 | *Eucalyptus marginata* (Jarrah) | No | 115.740545 | -31.624433 |
| 1294 | *Eucalyptus marginata* (Jarrah) | Yes | 115.746674 | -31.62257 |
| 1295 | *Eucalyptus gomphocephala* (Tuart) | No | 115.738767 | -31.62491 |
| 1296 | *Eucalyptus todtiana* | No | 115.748397 | -31.622157 |
| 1297 | *Eucalyptus marginata* (Jarrah) | No | 115.740484 | -31.624583 |
| 1299 | *Eucalyptus marginata* (Jarrah) | No | 115.740545 | -31.624663 |
| 1300 | *Eucalyptus marginata* (Jarrah) | No | 115.740593 | -31.624463 |
| 1301 | *Eucalyptus marginata* (Jarrah) | Yes | 115.740518 | -31.624496 |
| 1302 | *Eucalyptus gomphocephala* (Tuart) | No | 115.74617 | -31.622644 |
| 1303 | Stag (old dead tree, unknown species) | Yes | 115.738821 | -31.624958 |
| 1304 | *Eucalyptus marginata* (Jarrah) | Yes | 115.740804 | -31.62448 |
| 1309 | *Eucalyptus gomphocephala* (Tuart) | No | 115.737265 | -31.624808 |
| 1312 | *Eucalyptus gomphocephala* (Tuart) | No | 115.743924 | -31.623365 |
| 1315 | *Eucalyptus gomphocephala* (Tuart) | No | 115.738035 | -31.624918 |
| 1316 | *Eucalyptus gomphocephala* (Tuart) | No | 115.737491 | -31.624776 |
| 1319 | *Eucalyptus gomphocephala* (Tuart) | No | 115.744747 | -31.623109 |
| 1320 | *Eucalyptus gomphocephala* (Tuart) | No | 115.742211 | -31.623894 |
| 1321 | *Eucalyptus gomphocephala* (Tuart) | No | 115.736996 | -31.624781 |
| 1322 | *Eucalyptus gomphocephala* (Tuart) | No | 115.745266 | -31.622941 |
| 1325 | *Eucalyptus gomphocephala* (Tuart) | No | 115.744868 | -31.623056 |
| 1326 | *Eucalyptus gomphocephala* (Tuart) | No | 115.741627 | -31.624271 |
| 1328 | Stag (old dead tree, unknown species) | No | 115.737727 | -31.624938 |
| 1329 | *Eucalyptus gomphocephala* (Tuart) | No | 115.744839 | -31.623072 |
| 1331 | *Eucalyptus gomphocephala* (Tuart) | Yes | 115.742348 | -31.623909 |
| 1334 | *Eucalyptus gomphocephala* (Tuart) | No | 115.744957 | -31.623072 |
| 1335 | *Eucalyptus gomphocephala* (Tuart) | No | 115.745426 | -31.622929 |
| 1337 | *Eucalyptus gomphocephala* (Tuart) | No | 115.737742 | -31.624913 |
| 1340 | *Eucalyptus gomphocephala* (Tuart) | No | 115.745421 | -31.622954 |
| 1344 | *Eucalyptus gomphocephala* (Tuart) | No | 115.745558 | -31.622802 |
| 1348 | *Eucalyptus gomphocephala* (Tuart) | No | 115.741764 | -31.624228 |
| 1351 | *Eucalyptus gomphocephala* (Tuart) | No | 115.741375 | -31.624211 |
| 1353 | *Eucalyptus gomphocephala* (Tuart) | No | 115.743464 | -31.623548 |
| 1356 | *Eucalyptus marginata* (Jarrah) | No | 115.742608 | -31.623841 |
| 1357 | *Eucalyptus gomphocephala* (Tuart) | No | 115.741079 | -31.624412 |
| 1359 | *Eucalyptus gomphocephala* (Tuart) | No | 115.744377 | -31.623324 |
| 1362 | *Eucalyptus gomphocephala* (Tuart) | No | 115.745723 | -31.622789 |
| 1363 | *Eucalyptus gomphocephala* (Tuart) | No | 115.742153 | -31.623973 |
| 1368 | *Eucalyptus marginata* (Jarrah) | No | 115.741177 | -31.624252 |
| 1369 | *Eucalyptus gomphocephala* (Tuart) | No | 115.742191 | -31.624037 |
| 1370 | Stag (old dead tree, unknown species) | Yes | 115.738828 | -31.624958 |
| 1372 | *Eucalyptus gomphocephala* (Tuart) | No | 115.74253 | -31.623979 |
| 1374 | *Eucalyptus gomphocephala* (Tuart) | No | 115.741029 | -31.624363 |

| | | | | |
|---|---|---|---|---|
| 1375 | *Eucalyptus gomphocephala* (Tuart) | No | 115.740705 | -31.62444 |
| 1377 | *Eucalyptus gomphocephala* (Tuart) | No | 115.744425 | -31.623375 |
| 1387 | *Eucalyptus gomphocephala* (Tuart) | No | 115.74438 | -31.623224 |
| 1388 | *Eucalyptus gomphocephala* (Tuart) | No | 115.744344 | -31.623374 |
| 1392 | *Eucalyptus todtiana* | No | 115.755289 | -31.625209 |
| 1404 | *Eucalyptus marginata* (Jarrah) | No | 115.756753 | -31.626669 |
| 1406 | *Eucalyptus decipiens* | No | 115.756494 | -31.638715 |
| 1417 | *Eucalyptus decipiens* | No | 115.756694 | -31.638818 |
| 1421 | *Eucalyptus marginata* (Jarrah) | No | 115.756742 | -31.627832 |
| 1424 | *Eucalyptus marginata* (Jarrah) | Yes | 115.756178 | -31.625251 |
| 1425 | *Eucalyptus marginata* (Jarrah) | Yes | 115.756711 | -31.62749 |
| 1453 | *Eucalyptus gomphocephala* (Tuart) | No | 115.827651 | -31.751337 |
| 1487 | *Eucalyptus gomphocephala* (Tuart) | No | 115.82638 | -31.751835 |
| 1492 | *Eucalyptus gomphocephala* (Tuart) | No | 115.67056 | -31.618344 |
| 1493 | *Eucalyptus gomphocephala* (Tuart) | No | 115.670747 | -31.618083 |
| 1494 | *Eucalyptus gomphocephala* (Tuart) | No | 115.670742 | -31.618029 |
| 1495 | *Eucalyptus gomphocephala* (Tuart) | No | 115.670648 | -31.61787 |
| 1496 | Stag (old dead tree, unknown species) | No | 115.670827 | -31.617887 |
| 1497 | *Eucalyptus gomphocephala* (Tuart) | No | 115.670903 | -31.617871 |
| 1498 | Corymbia calophylla (Marri) | No | 115.67118 | -31.617688 |
| 1499 | *Eucalyptus gomphocephala* (Tuart) | No | 115.671244 | -31.617774 |
| 1500 | *Eucalyptus gomphocephala* (Tuart) | No | 115.670383 | -31.618796 |
| 1506 | *Eucalyptus marginata* (Jarrah) | No | 115.702842 | -31.621609 |
| 1507 | *Eucalyptus gomphocephala* (Tuart) | No | 115.703597 | -31.621967 |
| 1510 | *Eucalyptus gomphocephala* (Tuart) | No | 115.703583 | -31.622214 |
| 1511 | *Eucalyptus gomphocephala* (Tuart) | No | 115.703952 | -31.622511 |
| 1512 | *Eucalyptus gomphocephala* (Tuart) | No | 115.704216 | -31.622634 |
| 1514 | *Eucalyptus gomphocephala* (Tuart) | No | 115.704514 | -31.622705 |
| 1515 | *Eucalyptus marginata* (Jarrah) | No | 115.704484 | -31.622849 |
| 1516 | *Eucalyptus marginata* (Jarrah) | No | 115.704548 | -31.622945 |
| 1517 | *Eucalyptus gomphocephala* (Tuart) | No | 115.704736 | -31.622873 |
| 1518 | *Eucalyptus gomphocephala* (Tuart) | No | 115.704789 | -31.622961 |
| 1519 | *Eucalyptus gomphocephala* (Tuart) | No | 115.705101 | -31.623268 |
| 1521 | *Eucalyptus gomphocephala* (Tuart) | No | 115.787279 | -31.64043 |
| 1522 | *Eucalyptus gomphocephala* (Tuart) | No | 115.785372 | -31.640007 |
| 1523 | *Eucalyptus marginata* (Jarrah) | No | 115.780065 | -31.638651 |
| 1524 | *Eucalyptus marginata* (Jarrah) | No | 115.77986 | -31.638615 |
| 1525 | *Eucalyptus marginata* (Jarrah) | No | 115.779777 | -31.638573 |
| 1526 | *Eucalyptus gomphocephala* (Tuart) | No | 115.779489 | -31.6385 |
| 1527 | *Eucalyptus gomphocephala* (Tuart) | No | 115.779304 | -31.638465 |
| 1528 | *Eucalyptus gomphocephala* (Tuart) | No | 115.778977 | -31.638408 |
| 1529 | *Eucalyptus gomphocephala* (Tuart) | No | 115.778898 | -31.638355 |

| | | | | |
|---|---|---|---|---|
| 1530 | Species not identified | No | 115.778794 | -31.638341 |
| 1531 | Species not identified | No | 115.670942 | -31.617929 |
| 1532 | *Eucalyptus gomphocephala* (Tuart) | No | 115.671408 | -31.617094 |
| 1533 | *Eucalyptus gomphocephala* (Tuart) | No | 115.671772 | -31.618138 |
| 1565 | *Eucalyptus gomphocephala* (Tuart) | No | 115.674195 | -31.619623 |
| 1566 | *Eucalyptus gomphocephala* (Tuart) | No | 115.67411 | -31.619637 |
| 1568 | Species not identified | No | 115.672356 | -31.618698 |
| 1570 | Species not identified | No | 115.756209 | -31.625218 |
| 1572 | Species not identified | No | 115.7454 | -31.622957 |
| 1573 | Species not identified | No | 115.801208 | -31.658013 |
| 1574 | Species not identified | No | 115.671186 | -31.61804 |
| 1575 | Species not identified | No | 115.794492 | -31.640479 |
| 1576 | Species not identified | No | 115.794292 | -31.640544 |
| 1577 | Species not identified | No | 115.794301 | -31.640552 |
| 1578 | Species not identified | No | 115.794307 | -31.640562 |
| 1579 | Species not identified | No | 115.794302 | -31.640534 |
| 1580 | Species not identified | No | 115.794254 | -31.640542 |
| 1582 | Species not identified | No | 115.794292 | -31.640527 |
| 1583 | Species not identified | No | 115.792312 | -31.641144 |
| 1591 | *Eucalyptus gomphocephala* (Tuart) | No | 115.719842 | -31.624643 |
| 1594 | *Eucalyptus gomphocephala* (Tuart) | No | 115.720548 | -31.624999 |
| 1595 | *Corymbia calophylla* (Marri) | No | 115.720999 | -31.625333 |
| 1596 | *Eucalyptus gomphocephala* (Tuart) | Yes | 115.723025 | -31.625308 |
| 1598 | *Corymbia calophylla* (Marri) | No | 115.829458 | -31.736404 |
| 1599 | *Eucalyptus marginata* (Jarrah) | Yes | 115.829442 | -31.734728 |
| 1601 | *Corymbia calophylla* (Marri) | Yes | 115.826518 | -31.751719 |
| 1603 | *Eucalyptus marginata* (Jarrah) | Yes | 115.829443 | -31.737118 |
| 1604 | *Eucalyptus marginata* (Jarrah) | Yes | 115.82945 | -31.736786 |
| 1605 | *Eucalyptus marginata* (Jarrah) | Yes | 115.829441 | -31.734453 |
| 1606 | *Eucalyptus gomphocephala* (Tuart) | Yes | 115.82943 | -31.734679 |
| 1614 | *Corymbia calophylla* (Marri) | No | 115.7865 | -31.640239 |
| 1620 | Stag (old dead tree, unknown species) | Yes | 115.756725 | -31.627451 |
| 1621 | Stag (old dead tree, unknown species) | No | 115.755313 | -31.625228 |
| 1622 | Stag (old dead tree, unknown species) | No | 115.7521 | -31.625219 |
| 1628 | *Corymbia calophylla* (Marri) | Yes | 115.732274 | -31.625027 |
| 1634 | Stag (old dead tree, unknown species) | Yes | 115.738825 | -31.624957 |
| 1635 | Stag (old dead tree, unknown species) | Yes | 115.740539 | -31.624472 |
| 1636 | *Eucalyptus gomphocephala* (Tuart) | Yes | 115.742374 | -31.623879 |
| 1637 | *Eucalyptus gomphocephala* (Tuart) | Yes | 115.743293 | -31.623538 |
| 1638 | Stag (old dead tree, unknown species) | Yes | 115.746203 | -31.62262 |
| 1639 | *Eucalyptus marginata* (Jarrah) | No | 115.748414 | -31.622123 |
| 1640 | *Eucalyptus gomphocephala* (Tuart) | Yes | 115.671596 | -31.61817 |

| | | | | |
|---|---|---|---|---|
| 1641 | *Eucalyptus gomphocephala* (Tuart) | Yes | 115.670739 | -31.618584 |
| 1652 | Introduced Eucalypt | No | 115.830185 | -31.698631 |
| 1656 | *Eucalyptus rudis* (Flooded gum) | No | 115.829995 | -31.702043 |
| 1657 | *Eucalyptus rudis* (Flooded gum) | No | 115.82995 | -31.70216 |
| 1658 | *Eucalyptus rudis* (Flooded gum) | No | 115.829959 | -31.702229 |
| 1659 | *Eucalyptus rudis* (Flooded gum) | No | 115.829947 | -31.702517 |
| 1660 | *Eucalyptus rudis* (Flooded gum) | No | 115.829879 | -31.703301 |
| 1661 | Stag (old dead tree, unknown species) | No | 115.829781 | -31.703937 |
| 1662 | *Eucalyptus rudis* (Flooded gum) | No | 115.829778 | -31.703966 |
| 1663 | *Eucalyptus rudis* (Flooded gum) | No | 115.82959 | -31.704682 |
| 1664 | *Melaleuca* sp. | No | 115.826935 | -31.706334 |
| 1665 | Melaleuca sp. | No | 115.826882 | -31.706378 |
| 1666 | *Eucalyptus gomphocephala* (Tuart) | No | 115.826427 | -31.706928 |
| 1667 | *Melaleuca* sp. | No | 115.826487 | -31.706585 |
| 1668 | Melaleuca sp. | No | 115.826587 | -31.706568 |
| 1669 | *Melaleuca* sp. | No | 115.826692 | -31.706484 |

# Attachment E. Commitments Table

## List of commitments and requirements (Audit Table)

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.1.3.1 | Prior to clearing all relevant permit and approvals shall be reviewed and any clearing requirements identified and communicated to Contractors. | Contractor/Water Corporation | Prior to clearing | | |
| 4.1.3.2 | Clearing area limit must be delineated by the use of pegs, fencing and/or continuous flagging tape by a qualified engineering surveyor. Ensure that the clearing area limit delineated is the approved clearing area limit. | Contractor | Prior to clearing | | |
| 4.1.3.3 | In areas adjacent to TEC/PES, ESAs or Conservation areas hazard tape/fencing/barricading is to be used as a buffer at least 1 m inside the approved clearing area limit to avoid unauthorised clearing. The digital shapefiles are to be supplied to the Contractors by the Water Corporation to allow a qualified engineering surveyor to undertake this task. | Contractor | Prior to clearing | | |
| 4.1.3.4 | Inspect and identify native vegetation and habitat trees (DBH >500mm) that can be retained or protected, thereby reducing overall clearing required. Clearly identify and flag these areas prior to clearing | Contractor | Prior to Clearing | | |
| 4.1.3.5 | The Contractor is to arrange a final inspection of the demarcation of approved clearing area within TECs/PECs, ESAs, Bush Forever sites by Water Corporation's | Contractor | Prior to Clearing | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | Environmental Scientist. This is to occur at least five working days prior to clearing. | | | | |
| 4.1.3.6 | The Water Corporation is to provide approval of demarcated boundaries of approved clearing within TECs/PECs, ESAs, Bush Forever sites prior to clearing commencing | Water Corporation | Prior to Clearing | | |
| 4.1.3.7 | Photographic records and video recording (as appropriate) of land and vegetation conditions and features on or around the site, such as trees and shrubs, will be stored as a record that the approved clearing area limit was not breached. | Contractor | Prior to clearing | | |
| 4.1.3.8 | Construction staff to be educated during an initial induction that includes issues relating to clearing activities to ensure the requirements of this CEMP are understood by all parties involved. | Contractor | Prior to clearing | | |
| 4.1.3.9 | Maintain the integrity of barriers used to demarcate the approved clearing area, tree protection zones, and any areas of native vegetation to be retained. | Contractor | During clearing and construction | | |
| 4.1.3.10 | Clearing shall be conducted in a slow, progressive manner from one direction to the other (e.g. west to east) to allow fauna to move into adjacent native vegetation ahead of the clearing activity. | Contractor | During clearing | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.1.3.11 | Required work areas and access tracks shall be identified prior to commencement of construction. Access tracks must not require clearing of native vegetation outside the approved clearing area. | Contractor | During clearing and construction | | |
| 4.1.3.12 | Vegetation earmarked for removal within the approved clearing area should be felled so that if falls within the DE, to avoid damage to surrounding vegetation intended for retention. | Contractor | During clearing | | |
| 4.1.3.13 | No dead, standing or fallen timber shall be removed unnecessarily; all logs resulting from land clearing shall be stockpiled in a previously cleared area and used to enhance fauna habitat or to restrict public access to certain areas, on advice of Water Corporation | Contractor | During clearing | | |
| 4.1.3.14 | Topsoil within areas of significant native vegetation (National Park, State Forest, TEC, PEC, ESA, Bush Forever sites and MRS conservation area 10b) (Figure 4) to be stripped to a depth of 100-150 mm and stockpiled separately. | Contractor | During clearing and construction | | |
| 4.1.3.15 | All topsoil from areas identified as weed infested and/or dieback infested shall be stripped separately and deposited in the nominated spoil sites for offsite removal. | Contractor | During clearing | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.1.3.16 | Topsoil must not be stockpiled at heights greater than 1.5 m. | Contractor | During Construction | | |
| 4.1.3.17 | Vegetation clearing logs are maintained and made available at the request of the Water Corporation | Contractor | During clearing | | |
| 4.1.3.18 | Adhere to information and instructions within a Dewatering Management Plan (DMP)during all applicable operations | Contractor | Prior to and during Construction | | |
| 4.1.3.19 | Appropriate handling of all pinewood within the DE; including correct movement, removal, destruction and treatment of pinewood (as per the *Agriculture and Related Resources Protection (European House Borer) Regulations 2006* | Contractor | Prior to and during clearing and construction | | |
| 4.1.3.20 | Within 2 weeks following the completion of clearing activities, the total cleared area must be determined by an engineering surveyor, mapped and reported to the Water Corporation (including start and end dates of clearing activities). | Contractor | Post clearing | | |
| 4.1.3.21 | Removal of all flagging tape post construction. | Contractor | Post clearing | | |
| 4.1.3.22 | Within 3 months of completion of works, ensure that any areas that are not required for continued maintenance to be backfilled and restored with top soil to pre-existing contours to promote the natural | Contractor | Post clearing | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | regeneration of native vegetation. | | | | |
| 4.1.4.1 | Inspect all demarcated boundaries for damage or signs of encroachment. | Contractor | Daily | | |
| 4.1.4.2 | Survey the actual extent of clearing undertaken. Include start and end clearing dates. Provide clearing log to Water Corporation | Contractor | Monthly and within 2 weeks of the completion of the clearing | | |
| 4.1.4.3 | Provide Water Corporation with georeferenced spatial data indicating the actual extent of clearing undertaken. | Contractor | Within two weeks of the completion of the project or prior to the end of the financial year (whichever is sooner). | | |
| 4.1.4.4 | Photographic evidence of proposed clearing area before and after clearing | Contractor | Prior to, and after clearing, and within two weeks of revegetation/stabilisation works. | | |
| 4.2.3.1 | Prepare a CEMP addendum identifying site-specific weed, pest and disease hygiene risks and provide further detail on controls to be implemented | Contractor | Prior to and during clearing and construction | | |
| 4.2.3.2 | Undertake pre-construction targeted weed mapping, within the proposed clearing area, and 15m in to adjacent Conservation areas, and a *Phytophthora* survey to inform weed and dieback management | Water Corporation | Prior to clearing | | |
| 4.2.3.3 | Undertake pre-construction *Phytophthora cinnamomi* survey of the proposed clearing area, and 25m in to adjacent | Water Corporation | Prior to clearing and earthworks | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | Conservation areas, to inform dieback management | | | | |
| 4.2.3.4 | Weed control to be undertaken if Declared Pests or Weeds of National Significance are present in the area proposed to be disturbed | Contractor | Prior to clearing | | |
| 4.2.3.5 | Adhere to the Department of Parks and Wildlife (2015) corporate policy for the management of *Phytophthora* and the *Management Guidelines* (Department of Conservation and Land Management (2015) Plan | Contractor | Prior to and during clearing and construction | | |
| 4.2.3.6 | Develop a Dieback Management Plan (as an addendum to this CEMP), in consultation with DBCA and Water Corporation.. | Contractor | Prior to and during clearing and construction | | |
| 4.2.3.7 | Implement approved Dieback Management Plan | Contractor | Prior to and during clearing and construction | | |
| 4.2.3.8 | All site personnel and construction staff will be educated during an initial induction that includes issues relating to hygiene control to ensure the project's approved Dieback Management Plan is understood by all parties involved | Contractor | Prior to and during clearing and construction | | |
| 4.2.3.9 | Clearly demarcate any hygiene management areas (with clear signage to differentiate infested and uninfested areas) and establish clean on entry and exit points with, as a minimum, brush | Contractor | Prior to and during clearing and construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | down facility and a log of vehicles entering and exiting the area. | | | | |
| 4.2.3.10 | Inspect all plant and equipment to ensure it is free from soil and plant debris prior to commencement of work on site. | Contractor | Prior to and during clearing and construction | | |
| 4.2.3.11 | Soil or mulch material not certified as weed-free or dieback-free must not be imported into the site, and all material must have WC approval | Contractor | During construction | | |
| 4.2.3.12 | Appropriate handling of all pinewood within the DEs; including correct movement, removal, destruction and treatment of pinewood (as per the *Agriculture and Related Resources Protection (European House Borer) Regulations 2006*) | Contractor | Prior to and during clearing and construction | | |
| 4.2.3.13 | After backfilling within National Park, State Forest, TEC, PEC, ESA and Bush Forever sites, the spreading of topsoil shall occur. Herbicide shall be strategically applied if weeds germinate (selected herbicide is to be approved by WC prior to use) (see Section 4.14) | Contractor | During and after construction | | |
| 4.2.3.14 | An on-going inspection and control program shall be implemented for Declared Pests and significant weeds within the DE | Contractor | During and after construction | | |
| 4.2.3.15 | The use of any pesticides or herbicides must comply with the Department of Health's *Circular* | Contractor | Prior to and during clearing and construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | *No. PSC 88 Use of herbicides in water catchment areas* | | | | |
| 4.2.4.1 | The Contractor must undertake regular monitoring of adherence to the Hygiene Management Controls within the CEMP as a part of routine environmental inspections | Contractor | Daily | | |
| 4.2.4.2 | Log of vehicle hygiene for all vehicles, plant & equipment entering the site | | Daily records (logbook) kept the site | | |
| 4.2.4.3 | The Contractor must undertake regular monitoring of compliance with pinewood management guidelines | | To be determined by Contractor and documented in CEMP | | |
| 4.2.4.4 | Report inspection logs of vehicles/plants/machinery arriving on site and entering/exiting any dieback hygiene management points (clean on entry/exit) | | On request from Water Corporation and at the completion of works | | |
| 4.2.4.5 | Confirmation of weed control in the form of records, photographs and other brief documentation, such as herbicide usage. | | Prior to construction | | |
| 4.2.4.6 | Report the results and outcomes of the monitoring of pinewood management | | As required | | |
| 4.3.3.1 | Minimise vegetation clearing and the area of disturbance on the ground by utilising existing cleared areas where possible. | Contractor | Prior to clearing | | |
| 4.3.3.2 | Identify a person qualified under the Wildlife Conservation Act to undertake fauna handling | Contractor | Prior to clearing and during construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | (including relocation or removal) for the life of the project. | | | | |
| 4.3.3.3 | All staff and Contractors involved in clearing activities will be inducted on the potential impacts to fauna (including vehicle strikes on black cockatoo species) and advised to stop works in the vicinity of any injured or shocked animals that are encountered. | Contractor | Prior to clearing | | |
| 4.3.3.4 | Prior to each day's clearing, the Contractor is to check underneath all logs, rocks, in trees and any other habitat/microhabitat that may be used by fauna within the project area to allow the removal and relocation of any discovered fauna. Any person removing and relocating native fauna must hold a licence to take specially protected fauna in accordance with the Biodiversity Conservation Act 2016. | Contractor | Prior to clearing | | |
| 4.3.3.5 | Retention of potential black cockatoo habitat trees (particularly hollow-bearing trees), where the design and construction methodology allow. A pre-clearance survey will be undertaken to flag the potential black cockatoo trees within the project footprint (using distinctive flagging for those with hollows) to allow Contractors to see which trees shall be avoided, where the | Contractor | Prior to clearing | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | design and construction methodology allow. | | | | |
| 4.3.3.6 | The project schedule will plan, for clearing to take place outside the typical breeding season for black cockatoos (i.e. when breeding birds and their young are not using hollows) (peak breeding season is August–January). Where the project schedule requires clearing during the typical breeding season, requirement 4.3.3.7 (below) must be implemented. | Contractor | Prior to clearing | | |
| 4.3.3.7 | If clearing is unavoidable during the typical breeding season of black cockatoos, a pre-clearing inspection of trees to be cleared will be undertaken, by a black cockatoo specialist, to ensure there are no breeding activities present in the trees. If breeding activities are identified, clearing is to be avoided until such time nestlings have left the nest without human intervention. The contractor is to provide an accurate schedule of works at least 4 weeks in advance to the Water Corporation so that a specialist can be engaged to undertake the inspection. | Contractor | Prior to clearing | | |
| 4.3.3.8 | Clearing is to be undertaken in a directional manner that will ensure that native fauna can move into uncleared/larger areas of intact native vegetation and away from areas of hazard | Contractor | During clearing | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | such as major roads, car parks, etc. | | | | |
| 4.3.3.9 | Traffic is to be controlled to prevent fauna collisions, such as the installation of Wildlife Warning Signs to warn drivers that wildlife may stray onto roads. This also includes the use of speed limits throughout the site to minimise risk of fauna strike (in particular when black cockatoos are present on site). | Contractor | During clearing | | |
| 4.3.3.10 | Construct barriers at the ends of installed or stored pipes at the end of each working day to prevent access by fauna. | Contractor | During clearing | | |
| 4.3.3.11 | Fauna ladders and ramps must be installed where necessary within open excavations to allow fauna to exit. | Contractor | During clearing | | |
| 4.3.3.12 | Daily inspections of all open trenches and pipes must be undertaken prior to commencing work and at the end of each day to ensure that there are no trapped fauna. Daily inspections will also monitor presence of seasonal / migratory bird species (e.g., black cockatoo). This information will feed into daily toolbox meetings to reiterate the importance of fauna management measures. | Contractor | During clearing | | |
| 4.3.3.13 | In the event of injury to any fauna, a suitable qualified person (e.g. veterinarian, DBCA ranger, trained snake catcher) must be contacted to provide | Contractor | During clearing | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | appropriate treatment, including euthanasia, as necessary. If injured wildlife is found, call Wildcare Helpline on (08) 9474 9055 for advice on the nearest registered wildlife rehabilitator. Wildcare Helpline phone number is to be displayed in the site office. | | | | |
| 4.3.3.14 | Injured fauna will not be harmed or killed unless a decision to euthanase by approved methods by a suitably qualified person is made (e.g. a veterinarian). Relevant contact numbers for the authorised persons is to be documented within the approved CEMP. | Contractor | During clearing | | |
| 4.3.3.15 | Any fauna found within the construction footprint area will be removed by an approved fauna handler and relocated to a minimum of 50 m outside of the project area, but within vegetated areas. The fauna removed will be recorded in a fauna removal log that shall be retained at the site office. | Contractor | During clearing | | |
| 4.3.3.16 | Dead fauna will be removed to prevent attracting other fauna to source food and the dead fauna will be disposed of as putrescibles waste (to landfill). The details of the dead fauna will be recorded in a Fauna Removal Log that shall be retained at the site office. | Contractor | During clearing | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.3.3.17 | Dogs, cats and other domesticated animals and firearms will not be allowed within the project site, other than those having business at the site. | Contractor | During clearing | | |
| 4.3.3.18 | Contractors to be instructed not to feed fauna. | Contractor | During clearing | | |
| 4.3.4.1 | The Contractor must inspect all open excavations for the presence of fauna | Contractor | At the commencement of each working day<br>At the completion of each shift | | |
| 4.3.4.2 | The Contractor must maintain a register of all fauna removals, deaths or injuries. The register must identify:<br>• Date, time and location<br>• Type and number of fauna<br>• Status (e.g. dead/alive/injured)<br>• Method of removal<br>• Location of removal<br>Details of person (name, contact registration/licence details) | Contractor | At the end of each shift | | |
| 4.3.4.3 | The Contractor must report the fauna register to the Water Corporation | Contractor | On request<br>At the end of the project | | |
| 4.4.3.1 | Prior to any vegetation clearance and ground disturbance, DBCA, DPLH, Forest Products Commission (FCP) and Bush Forever are to be consulted to achieve landowner permission to undertake the work | Contractor | Prior to any works on site | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | | | | | |
| 4.4.3.2 | Ensure applications to carry out disturbance on DBCA managed lands have been approved through the Disturbance Approval Strategy (DAS). | Contractor | Prior to Clearing | | |
| 4.4.3.3 | Vehicle movement to be minimisedand to remain on designated tracks. | Contractor | Construction | | |
| 4.4.3.4 | Clearing area boundaries adjacent to Conservation areas are to have temporary hard fencing installed to demarcate the DE and to restrict access. | Contractor | During clearing | | |
| 4.4.3.5 | Clearing area boundaries adjacent to Conservation areas are to have an additional demarcation layer using hazard tape/flagging as a buffer at least 1 m inside the approved clearing area limit to avoid unauthorised clearing. The digital shapefiles are to be supplied to the Contractors by the Water Corporation to allow a qualified engineering surveyor to undertake this task. | Contractor | Prior to clearing | | |
| 4.4.3.6 | Siltation fences or other suitable erosion control mechanisms to be installed at locations where adjacent Conservation areas are at risk of erosion impact from the construction works. Specifically where these areas are in low lying depressions. | Contractor | Prior to clearing and earthworks | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.4.3.7 | Targeted manual removal of eroded material from Conservation areas is to be undertaken in the event of inadvertent erosion events. | Contractor | During and Post Construction | | |
| 4.4.3.8 | "No Entry – Conservation Area" signage with wording to appropriate standard is to be placed at 500m spacing along all temporary fences/original fence lines indicating contact details and restriction to access of these areas. | Contractor | Prior to Clearing | | |
| 4.4.3.9 | Where DBCA tracks/trails intercept the pipeline corridor appropriate traffic management/signage is to be installed to advise the public of the construction works. | Contractor | Prior to construction | | |
| 4.4.3.10 | DBCA is to be contacted prior to construction in areas where a DBCA managed track/trail is to be impacted, to determine if temporary alternative access will need to be provided to potential users via DBCA's website and other local websites/advertising avenues. The contractor shall provide Water Corporation a schedule for works in these areas at least 4 weeks prior to proposed commencement. | Contractor | Prior to construction | | |
| 4.4.4.1 | • Inspect fencing and signage.<br>Repair and replace fencing and signage as recommended from the inspection. | | Daily<br>As required | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.4.4.2 | Maintain evidence of all consultation with DBCA, DPLH, Forest Products Commission (FCP) and Bush Forever | | Once – upon receipt | | |
| 4.4.4.3 | Maintain a register of any public complaints and provide the register to Water Corporation | | As required | | |
| 4.5.3.1 | Communication with local residents, providing specific information on construction activities which may impact the local area | Contractor | Prior to clearing and during construction | | |
| 4.5.3.2 | Identify specific dust control measures that will be available on site and document within the CEMP. These may include the use of water carts, sprinklers, soil binding agents and avoiding dust raising activity during periods of high winds. | Contractor | Prior to and during construction | | |
| 4.5.3.3 | Plan construction to minimise the potential for airborne dust | Contractor | Prior to construction | | |
| 4.5.3.4 | Vehicle movement to be minimised and to remain on designated tracks and maintain appropriate speed to minimise dust generation | Contractor | Construction | | |
| 4.5.3.5 | Stabilise soil stockpiles to prevent erosion and dust emission | Contractor | During clearing and construction | | |
| 4.5.3.6 | Dust producing activities to be suspended immediately if dust suppression measures prove ineffective | Contractor | During clearing and construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.5.4.1 | Monitor daily weather conditions prior to the commencement of work to determine the potential for dust generation | Contractor | Daily | | |
| 4.5.4.2 | Visual inspections of dust suppression activities and soil stockpile stability | Contractor | Weekly | | |
| 4.5.4.3 | Monitor airborne dust levels and evaluate control measure efficiency | Contractor | As required | | |
| 4.5.4.4 | Maintain a register of any non-conformances or public complaints and provide the register to Water Corporation | Contractor | As required | | |
| 4.6.3.1 | Regular communication with local residents, providing specific information on construction activities which may impact the local area | Contractor | Prior to and during clearing and construction | | |
| 4.6.3.2 | Install signs that provide a contact number for complaints. | Contractor | Prior to and during clearing and construction | | |
| 4.6.3.3 | Nominate the equipment types and expected noise emissions for construction activities and how works will be conducted in accordance with Section 4 of *AS 2436-2010.* | Contractor | Prior to and during clearing and construction | | |
| 4.6.3.4 | Identify appropriate noise and vibration mitigation strategies to minimise impacts on residents and fauna. Document strategies within the CEMP, and implement them during works. | Contractor | Prior to and during clearing and construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.6.3.5 | Any premises which is likely to receive emissions greater than the levels prescribed in the Environmental Protection (Noise) Regulations must be notified at least 24 hours before the commencement of works. | Water Corporation | Prior to clearing and construction | | |
| 4.6.3.6 | Work is to be limited to between 0700 and 1900h Monday to Saturday. | Contractor | During clearing and construction | | |
| 4.6.3.7 | Where possible, no truck associated with the work should be left standing with its engine operating in a street adjacent to a residential area (some vehicles such as concrete trucks are required to leave engines running however, they should not be located in residential areas). | Contractor | During clearing and construction | | |
| 4.6.3.8 | All mechanical plant is to be silenced by the best practical means using current technology.<br>Mechanical plant, including noise-suppression devices, shall be maintained to the manufacturer's specifications. Internal combustion engines are to be fitted with a suitable muffler in good repair.<br>Fit all pneumatic tools operated near a residential area with an effective silencer on their air exhaust port.<br>Turn off plant when not being used. | Contractor | During clearing and construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.6.3.9 | A noise management plan is to be developed detailing:<br>• The work that is required to be completed and the reason for the work to be completed outside of construction working hours<br>• Predicted noise levels associated with these works<br>• The types and duration of activities that may result in noise above the prescribed levels<br>• Controls measures to be implemented to minimise noise and vibration<br>• The monitoring requirements<br>The complaint response procedure. | Contractor | Prior to after-hours construction | | |
| 4.6.3.10 | The noise management plan is to be submitted to the Water Corporation at least 30 days prior to the commencement of works. | Contractor | Prior to after-hours construction | | |
| 4.6.3.11 | The Noise Management Plan is to be submitted to the relevant authority to allow approval to be issued at least 7 days prior to the commencement of works. | Water Corporation | Prior to after-hours construction | | |
| 4.6.3.12 | Any premises which is likely to receive emissions greater than the levels prescribed in the Environmental Protection (Noise) Regulations must be | Water Corporation | Prior to after-hours construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | notified at least 24 hours before the commencement of works. | | | | |
| 4.6.4.1 | Monitor noise and vibration emissions using appropriate equipment | Contractor | As required | | |
| 4.6.4.2 | Maintain a register of any non-conformances or public complaints and provide the register to Water Corporation | Contractor | As required | | |
| 4.7.3.1 | Upgrade all existing tracks at SDP site to a standard suitable for First Attack Fire Appliances | Contractor | Prior to construction | | |
| 4.7.3.2 | Maintain permanent sealed access road to SDP site | Contractor | Prior to and post construction | | |
| 4.7.3.3 | Maintain security grade lockable access gates where the fire tracks traverse the fence lines | Contractor | Prior to construction | | |
| 4.7.3.4 | Provide DFES with master keys for the gates | Contractor | Prior to construction | | |
| 4.7.3.5 | Install post and rail fencing on the boundary of Lot 3000 and provide a visual barrier in the areas of active public access from Marmion Avenue and the adjoining development on Lot 9001 | Contractor | Prior to construction | | |
| 4.7.3.6 | Install and maintain signage identifying private property, conservation areas and trespass prohibition of appropriate wording, size and standard at 500m spacing along the fence lines of Lot 3000 | Contractor | Prior to construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | | | | | |
| 4.7.3.7 | Install and maintain signage identifying construction works and contact details at 500m spacing along temporary hard fencing areas (as required in Section 4.4). | Contractor | Prior to construction | | |
| 4.7.3.8 | Have current fire danger signage at site office which is updated daily based on check of DFES website and communicated to contractors during daily pre-start meetings | Contractor | Prior to and during clearing and construction | | |
| 4.7.3.9 | Prepare a bushfire evacuation plan including a map showing assembly points, a list of fire wardens on site (or responsible staff in the event of a fire), and contact details for fire fighting services. | Contractor | Prior to and during clearing and construction | | |
| 4.7.4.1 | Inspect and repair/replace all fences and signage quarterly; | Contractor | Quarterly | | |
| 4.7.4.2 | Inspect and repair gates quarterly | Contractor | Quarterly | | |
| 4.7.4.3 | Conduct ad hoc security patrols on the roads and tracks | Contractor | Ad hoc | | |
| 4.7.4.4 | Report evidence of unauthorised access to Water Corporation within 24 hours of identification of incident | Contractor | As required | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.7.4.5 | Report and act upon damage to fences, signage and vegetation in conservation areas from such unauthorised access | Contractor | As required | | |
| 4.8.3.1 | A Cultural Monitor will be employed in consultation with the relevant Whadjuk Noongar business groups (as advised by Water Corporation) to monitor initial ground disturbing activities at any registered Aboriginal heritage site identified. The Cultural Monitor will be paid at a rate in accordance with The Water Corporations policies for Cultural Monitors. The Cultural Monitor will monitor initial ground disturbing activities to:<br>• detect the presence of archaeological material of heritage significance.<br>• detect human skeletal material.<br>advise on minimisation of construction impacts on heritage values | Contractor | Prior to and during clearing and construction | | |
| 4.8.3.2 | Shade, water and personal protective equipment (hard hat, safety glasses, noise (ear) protection and high visibility vest) will be provided to the Cultural Monitor. The Cultural Monitor will be responsible for personal transport to the construction areas. | Contractor | Prior to and during clearing and construction | | |
| 4.8.3.3 | Construction works will be undertaken in the absence of the Cultural Monitor if for any reason the arranged Cultural Monitor | Contractor | Prior to and during clearing and construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | does not attend the site. A replacement Cultural Monitor will be sort as soon as reasonably practicable following the absence if future attendance at the construction works by the Cultural Monitor is unlikely. | | | | |
| 4.8.3.4 | Construction works will cease as soon as practicable within a nominal 20 metres of any archaeological material (artefacts including hunting tools, scatters, scar trees) identified within the construction area. An archaeologist will be engaged to record the identified material and to advise the DPLH if the identified material is likely to be of Aboriginal heritage significance. Construction activities within 20 metres of the identified material will only recommence based on advice of the archaeologist or the DPLH. | Contractor | Prior to and during clearing and construction | | |
| 4.8.3.5 | Construction works will cease as soon as practicable within a nominal 20 metres of any skeletal material identified within the construction area. The Police (Phone 131 444) will be contacted to attend and determine a resolution of the matter. Construction activities will only recommence within 20 metres of the identified material on the direction of the Superintendent based on advice of the Police. | Contractor | Prior to and during clearing and construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.8.3.6 | Any dispute between the Cultural Monitor and site construction personnel will be resolved on advice from the Water Corporation's Manager of the Aboriginal Heritage and Native Title section. | Contractor/Water Corporation | Prior to and during clearing and construction | | |
| 4.8.4.1 | Implement monitoring for heritage material, should sites be unexpectedly uncovered during construction activities | Contractor | As required | | |
| 4.8.4.2 | Notify the Water Corporation (Attention: Aboriginal Heritage and Native Title section) of the discovery any uncovered suspected human skeletal, cultural or archaeological material. | Contractor | As soon as practicable | | |
| 4.9.3.1 | Obtain a dewatering licence through DWER | Water Corporation | Prior to construction | | |
| 4.9.3.2 | Document conditions of dewatering licence within ASS and Dewatering Management Plan | Contractor | Prior to construction | | |
| 4.9.3.3 | Further develop and adhere to site-specific ASS and Dewatering Management Plan | Contractor | Prior to, and during clearing and construction | | |
| 4.9.3.4 | For the pipeline construction in shallow groundwater areas, excavation lengths are to be limited to 50m and are to be open for two to three weeks.<br>Disposal of treated groundwater shall be via irrigation within 50 m of the dewatering location, where there are no engineering or site constraints (lack of | Contractor | During construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | suitable land to establish reinflation trenches or ponds). | | | | |
| 4.9.3.5 | Develop and adhere to Asbestos Management Plan | Contractor | Prior to, and during clearing and construction | | |
| 4.9.3.6 | All staff and Contractors involved in earthwork activities will be inducted on the potential impacts relating to ASS, dewatering and Contaminated Sites. | Contractor | Prior to and during clearing and construction | | |
| 4.9.3.7 | Contaminated sites to be identified within the DEs and clearly demarcated | Contractor | Prior to and during clearing construction | | |
| 4.9.3.8 | If suspected asbestos is observed during works, an 'Unexpected Finds Protocol' shall be enacted, as directed by the Asbestos Management Plan | Contractor | Clearing and construction | | |
| 4.9.3.9 | Accurate stockpiling of soil to distinguish contaminated soil from non-contaminated soil | Contractor | Clearing and construction | | |
| 4.9.3.10 | Clearly defined stockpiles will be created during excavation and earthworks | Contractor | Clearing and construction | | |
| 4.9.3.11 | Apply appropriate treatment or disposal techniques for contaminated soil | Contractor | Clearing and construction | | |
| 4.9.3.12 | Safely contain hazardous waste and prevent exposure of harmful substances (such as asbestos) to personnel or the public through correct handling and disposal | Contractor | During clearing, construction, post-construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.9.3.13 | Minimise changes to groundwater levels by adopting construction methods that minimise impacts | Contractor | Prior to and during construction | | |
| 4.9.3.14 | Conduct testing of groundwater to determine levels of metals, nutrients and other components | Contractor | Prior to and during construction | | |
| 4.9.4.1 | Maintain records of treatment or disposal of contaminated soil | Contractor | As required | | |
| 4.9.4.2 | Establish baseline water level and quality | Contractor | Prior to construction | | |
| 4.9.4.3 | Conduct monitoring to confirm the effectiveness of the applied measures as detailed in the site-specific ASS and Dewatering Management Plan. Identify and implement contingency measures to restore groundwater to an acceptable level. | Contractor | Post construction | | |
| 4.9.4.4 | Report on the treatment or disposal of contaminated soil | Contractor | As required | | |
| 4.9.4.5 | Results of ASS monitoring and analysis to be provided to Water Corporation for review then forwarded to DWER as per conditions of dewatering licence | Contractor | As required | | |
| 4.9.4.6 | Report on the hydrology monitoring results, including water quality and the volume, rate, and duration of dewatering | Contractor | As required | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.10.3.1 | Ensure all approvals and licences are obtained prior to the discharge of chlorinated water used in the flushing of pipes (including liaison with DBCA prior to disposal to any wetland areas) | Contractor | Prior to commissioning | | |
| 4.10.3.2 | All conditions of the dewatering licence shall be adhered to during the flushing process, including the implementation of a Dewatering Management Plan | Contractor | Prior to commissioning | | |
| 4.10.3.3 | Ensure discharge of chlorine-treated water is directed to an identified and approved discharge location/system | Contractor | Prior to commissioning | | |
| 4.10.4.1 | Monitor chlorine concentration in water during flushing and discharge | Contractor | Daily | | |
| 4.10.4.2 | Reporting of commissioning and monitoring results | Contractor | As required | | |
| 4.10.4.3 | Reporting of discharge spills | Contractor | As soon as practicable | | |
| 4.11.3.1 | All chemicals are to be stored in accordance with relevant Australian standards, including:<br>• *AS1940: The Storage and Handling of Flammable and Combustible Liquids*<br>*AS3780 The Storage and Handling of Corrosive Substances* | Contractor | During clearing and construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.11.3.2 | Identify all additives that will be used and demonstrate their suitability and safe use procedures | Contractor | During clearing and construction | | |
| 4.11.3.3 | Each operator using a given chemical to read and fully understand the Safety Data Sheet | Contractor | During clearing and construction | | |
| 4.11.3.4 | Spill kits are to be readily available at chemical storage locations and during maintenance, refuelling or transfer of chemicals. | Contractor | During clearing and construction | | |
| 4.11.3.5 | All refuelling and servicing of plant, vehicles and equipment is to occur on a bunded area at least 100 m from any National Park, State Forest, TEC, PEC, Bush Forever Sites waterway or wetland | Contractor | During clearing and construction | | |
| 4.11.3.6 | All on-site maintenance of plant, equipment and vehicles must be in designated, bunded areas. | Contractor | During clearing and construction | | |
| 4.11.3.7 | No chemical storage, transfer or handling to occur in areas within 50 m of sensitive areas such as a National Park, State Forest, TEC, PEC, ESA, Bush Forever sites, or a surface water feature, including wetlands, damplands and drainage lines | Contractor | During clearing and construction | | |
| 4.11.3.8 | The contractor to record all spills and the management of the spill in a register maintained on site | Contractor | During and post clearing and construction | | |
| 4.11.4.1 | Inspect project area for spills | Contractor | Daily during clearing and construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.11.4.2 | The contractor to report all spills within 24 hours to Water Corporation; and detail the spill response/management | Contractor | On request from Water Corporation and at the completion of works | | |
| 4.12.3.1 | Competitive bid strategies will be used to design, build and operate the plant. This ensures world's best practice from international consortia bidding for the design and ongoing operations of the plant to maximise energy efficiency and therefore to minimise GHG emissions. | Water Corporation | Prior to clearing and construction | | |
| 4.12.3.2 | All personnel to read and implement the measures identified in the Greenhouse Gas Management Plan to reduce emissions | Contractor | Before and during clearing and construction | | |
| 4.12.3.3 | Implement sustainable design and construction methods | Contractor | Before and during construction | | |
| 4.12.3.4 | Improve energy efficiency and reduce fuel use where possible | Contractor | During clearing and construction | | |
| 4.12.4.1 | Monitor energy and fuel use | Contractor | Monthly | | |
| 4.12.4.2 | Report energy and fuel use to Water Corporation | Contractor | On request | | |
| 4.13.3.1 | Separate and clearly marked waste bins will be kept at the site office for all major waste streams including (but not limited to):<br>• General waste | Contractor | Prior to, during and post construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | • Recyclables<br>• Steel recycling<br>Hydrocarbons | | | | |
| 4.13.3.2 | All waste bins on site will have securely fitted lids to prevent the attraction of fauna or movement of waste in wind/weather. | Contractor | Prior to, during and post construction | | |
| 4.13.3.3 | Provide secure toilet facilities located in an appropriate position which prevents any potential spills from being detrimental to the environment | Contractor | Prior to, during and post construction | | |
| 4.13.3.4 | Remove all general waste from site, and dispose of to suitable landfill facility, as often is required to prevent overflow of waste receptacles. | Contractor | Prior to, during and post construction | | |
| 4.13.3.5 | Safely contain hazardous/controlled waste and prevent exposure of harmful substances to personnel or the public through correct handling and disposal | Contractor | Prior to, during and post construction | | |
| 4.13.3.6 | Hydrocarbon waste to be disposed of to a Controlled Waste Contractor licensed under the<br>*Environmental Protection (Controlled Waste) Regulations 2004* (WA); | Contractor | Prior to, during and post construction | | |
| 4.13.3.7 | Wastes, other than excess overburden excluding spoil) will not be buried on any construction site. | Contractor | Prior to, during and post construction | | |
| 4.13.3.8 | All wastes will be removed from all construction sites following | Contractor | Post construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| | the completion of construction works | | | | |
| 4.13.3.9 | Excess overburden produced from trench excavation will be disposed of to:<br>a. the excavated trench.<br>b. a suitable location agreed with the Landowner (the Landowner has first preference to retain excess overburden from their own property),<br>c. a suitable location agreed with adjacent landowners (with preference to Landowners on the pipeline route).<br>d. a local landfill as inert waste.<br>Other suitable sites for disposal of excess overburden may be identified by the contractor but shall be approved by Water Corporation. Disposal of soils affected by ASS will be treated as per the ASS DMP prior to disposal. | Contractor | Post construction | | |
| 4.13.4.1 | Schedule regular site waste inspections and clean ups | Contractor | As required | | |
| 4.13.4.2 | Maintain a log of waste disposal (type, volume, disposal method and location) and all controlled waste disposal tracking records | Contractor | As required | | |
| 4.13.4.3 | Provide records of the disposal of all controlled wastes to Water Corporation | Contractor | On request | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.14.3.1 | Cleared vegetation from within Conservation areas (as listed in 4.4) to be mulched and stockpiled, and soil to be stockpiled separately | Contractor | During clearing | | |
| 4.14.3.2 | Areas to be revegetated shall be reshaped and compacted, following backfill of excavations, so that the gradient of the landscape is consistent with that of the surrounding landscape and to minimise erosion, with slopes not exceeding 10 degrees. | Contractor | During and post-construction | | |
| 4.14.3.3 | Compacted areas shall be ripped and scarified along the contour to alleviate soil compaction that may limit the growth of vegetation, to a depth of no greater than 300 – 500 mm or as determined to be suitable by the Contractor undertaking revegetation works | Contractor | During and post-construction | | |
| 4.14.3.4 | After backfilling, compacting and ripping, topsoil is to be spread over the area it was sourced from, followed by mulch. | Contractor | During and post-construction | | |
| 4.14.3.5 | Herbicide shall be strategically applied if weeds germinate within topsoil stockpiles or re-spread areas prior to implementation of revegetation (selected herbicide is to be approved by Water Corporation prior to use) | Contractor | During and post-construction | | |

| Reference | Action | Responsibility | Phase / When | Status | Evidence / Comment |
|---|---|---|---|---|---|
| 4.14.3.6 | Any logs, branches and rocks that may be available shall be spread throughout the revegetation area in order to minimise erosion and increase availability of fauna habitat and provide microhabitats for seed lodgement and germination | Contractor | During and post-construction | | |
| 4.14.3.7 | Implementation of ongoing weed, pest and disease hygiene controls, as per Section 4.2. | Contractor | During and post-construction | | |
| 4.14.3.8 | Implementation of Tranen's Revegetation Plan for the SDP site, and pipeline where appropriate:<br>– Timing: Post autumn rain following completion of construction<br>Method: Direct seeding and seedling planting | Water Corporation | Post construction | | |
| 4.14.4.1 | Environmental inspections of revegetation works | Contractor | As required. | | |
| 4.14.4.2 | Photographic evidence of proposed clearing area before and after clearing and revegetation | Contractor | Within two weeks of revegetation works | | |

Compliant (C) - The evidence provided indicates that a compliance obligation was not met, or sufficient evidence is not available to demonstrate that a compliance obligation has been met.

Noncompliant (NC) - Sufficient evidence is not available to demonstrate that management system requirements have been implemented, or evidence obtained during the audit raises sufficient doubt of the management systems ability to achieve: The environmental objectives of the organisation, or Compliance with the applicable compliance obligations.

Minor Non Conformance (minor-NCR) - Evidence indicates a weakness in the management system, which has not significantly impacted on the capability of the management system or put at risk the system deliverables, but needs to be addressed to assure the future capability of the system.

Opportunity for Improvement (OFI) - Observations and recommendations that, whilst not at variance with environmental objectives or compliance obligations, may improve environmental performance, compliance or the effectiveness of the system.

Not determined (ND) - The compliance obligation or management system requirement could not be audited. (E.g., the requirement was not yet applicable; the requirement was a site based condition that could not be verified in a desktop audit).

# Attachment F. Revegetation Plan (Tranen 2022)

tranen
revegetation systems


# Alkimos Seawater Desalination Plant
# Enabling Earthworks Revegetation Plan

**Jacobs**

**P940A-02**

**December 2022**

**PERTH**

11 Vincent Street
Bayswater WA 6053
p 9284 1399

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## Disclaimer

This report has been prepared by Tranen Revegetation Systems solely for the benefit and use of the client.

Tranen Revegetation Systems shall assume no liability or responsibility to any third party arising out of use of or reliance upon this document by any third party.



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| Document Control | | | | |
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| 0 | 16 Aug 21 | Initial draft | PJG | DG |
| 1 | 20 Aug 21 | Updated draft | PJG | DG |
| 2 | 30 Aug 21 | Issued for Jacobs review | PJG | GW/AR |
| 3 | 31 Aug 20 | Updated and issued for Water Corporation review | PJG | |
| 4 | 10 Sep 21 | Updated after Water Corporation review | PJG | BM |
| 5 | 19 May 22 | Updated after various scope changes | PJG | GW/AR, BM |
| 6 | 30 May 22 | Updated after comments on scope changes | PJG | |
| 7 | 3 Aug 22 | Updated for topsoil disposal in offset areas | PJG | |
| 8 | 27 Aug 22 | Updated PSP | PJG | GW |
| 9 | 9 Sep 22 | Minor refinements | PJG | |
| 10 | 9 Sep 22 | Updated for changes to entry road | PJG | GW |
| 11 | 13 Sep 22 | Updated and issued for Water Corporation review | PJG | BM |
| 12 | 29 Sep 22 | Updated after Water Corporation review | PJG | |
| 13 | 3 Dec 22 | Updated after changes to PSP etc | PJG | |

# Table of Contents

# 1 INTRODUCTION AND BACKGROUND

In April 2021 Tranen Revegetation Systems (Tranen) was commissioned by Jacobs to prepare a Revegetation Plan for the Enabling Earthworks for the Alkimos Seawater Desalination Plant (ASDP) Enabling Earthworks being designed for Water Corporation (WC).

## 1.1 Background

To mitigate against possible noise, stray light, and aesthetic impacts of the future construction of the ASDP on adjacent planned residential land developments the Enabling Earthworks are proposed to be undertaken in 2023, prior to the main desalination works.

Earthworks will be done under a separate civil works contract, which includes interim erosion protection measures across the site and excavated batter slopes.

This Revegetation Plan also covers two offset areas in parkland, cleared farmland on Water Corporation land to the southeast of the ASDP site including some provisions for a future pedestrian path. Control of doublegee (*Rumex hypogaeus*), narrowleaf cottonbush (*Gomphocarpus fruticosus*) and common prickly pear (*Opuntia stricta*), which are significant weeds identified all over the site, is being done by Tranen under a separate management plan until October 2023.

Additional native seeds were collected from around the site in 2021/22 for use in revegetation, to supplement remaining stocks from collections by Tranen in the region in previous years for WC. These are all held in Tranen's Bayswater temperature and humidity controlled facility.

Landscaping to the west of the new reconstituted block (limestone type) retaining wall facing the proposed Alkimos Coastal Node housing development has been carefully designed by a landscape architect and complies with fire protection requirements. It is important that in its implementation the revegetation contractor complies strictly with plant spacings and species selections to maintain compliance with the fire regulations. The same applies to seedlings planted immediately to the east as additional screening in a narrow strip along the top of the western berm at 5 metre centres.

Vegetation is to be maintained for three years post revegetation planting.

## 1.2 Documentation REFERENCE INFORMATION?

Tranen has worked closely with Jacobs civil engineering personnel on the preparation of this plan, including a site inspection on 23 Jul 21. It is also based on:

- WC Design Brief for Detailed Design of Alkimos SDP Enabling Earthworks, Project Number: CW03713 dated 4 Jun 20 and additional WC clarifications and requirements communicated by various emails.
- Alkimos Flora and Vegetation Survey – Spring 2016 prepared for WC by Strategen Environmental dated Nov 2017.
- Follow up site inspections on numerous occasions.
- Numerous Tranen site visits since then including when collecting seed and controlling weeds.
- Numerous subsequent email communications between Tranen, Jacobs, WC and Emerge personnel.

## 1.3 Objectives

The aim is to provide a plan for revegetation works to be carried out after the SDP Enabling Earthworks have been completed. So what about any reveg at completion of ASDP construction?

The main objectives of the plan are to:

- conceal the ASDP site from planned residential areas to the south,
- revegetate part of the existing WWTP access road that is to become redundant,
- stabilise excavated batter surfaces constructed as part of the Enabling Earthworks to accommodate the ASDP, and
- revegetate two offset sites, one including provisions for relocation of some *Xanthorrhoea preissii* (grass trees) from the ASDP site and for the future construction of a public shared path (PSP).

# 2 SITE DESCRIPTION

## 2.1 Site Location and Size

The site is located approximately 30 km north-northwest of the Perth CBD. A general location map and aerial photo showing the extent of the site is presented in Appendix 1.

## 2.2 Land Tenure

The land is owned by WC.

## 2.3 Landform and Soils

The site comprises undulating coastal dunes primarily of the Quindalup Complex soil type, characterised by white calcareous sand (Safety Bay Sand), with some Cottesloe Complex consisting of shallow brown / yellow sand (Tamala Sand) over Tamala Limestone.

## 2.4 Dieback Status

Although the Strategen Nov 2017 flora survey does not specifically mention dieback, the survey did find species that are susceptible to dieback, the presence of which would have been expected to be evident and worthy of comment. Tranen has seen no evidence of dieback on the site. A dieback survey conducted for Tranen in 2019 over a 5 ha area centred 500 m to the northeast of the site boundary and Marmion Ave, did not find any evidence of dieback.

## 2.5 Fauna

Kangaroos frequent the site, especially in the bushland. Recent housing developments in the region have forced them into smaller and smaller areas of remnant bushland. They and their scats were observed on recent inspections, as well as some scratchings thought to be made by rabbits. In the 5 ha Alkimos Vista Parks and Recreation Reserve revegetation site east of Marmion Avenue there are no rabbits due to the presence of foxes. Foxes do not normally

graze on native plants. Some quenda scratching were observed recently in the Alkimos Beach and Alkimos Vista PRR sites to the east and south.

# 3 MANAGEMENT STRATEGY

The overall site is to be broken up into two separate parcels each with its own management strategy (shown in the plan in Appendix 2)

Two strategies are to be employed in the stabilisation and revegetation of the site:

1. Batters and roads around the ASDP site – permanent revegetation with high visibility external batters to be approached differently to internal batters not readily visible from outside.
2. Offset areas – initially control of dominant weeds, relocation of grass trees from the ASDP site and then interim storage of topsoil and mulch from the plant site area pending partial return. Subsequently spread of unused topsoil over the whole areas and covering with unused mulch, to be incorporated into the surface. Revegetation is to follow that work by the civil contractor, with mainly mid to high level native species to minimise potential for future weed growth, except over existing and proposed future buried pipeline and cable routes where only lower growing species with shallower root systems are to be used. In the area nominated for the future PSP tuart trees are to be planted, offset at least seven metres from the centreline of the future path alignment to minimise the risk of large branches falling onto the future path fence while still providing shade to path users. Adjacent to the borefield site EG40, tuart trees are not to be planted within 20 m of the borefield boundary.
   Two small portions of these offset areas bordering the entrance road are to be impacted early on by changes to the road by the civil contractor, with coir netting applied. These areas are to be seeded as soon as is practical after completion of the roadworks.

The ultimate outcomes and considerations for each area differ considerably. The key elements have been considered in the design to provide what is believed to be the most cost-effective solution for the intended outcomes.

## 3.1 Batters and Roads – Permanent Revegetation

The civil contractor is to apply coir netting initially, followed by a 75 mm thickness of mulch to the batters to the west of a reconstituted block retaining wall closest to a future residential area. This mulched area is to be planted with seedlings of native species selected to screen the wall, with precise details shown on drawings MV08-17-24.3 and 4.

With the rerouting of the existing WWTP entrance road in the southwest corner redundant sections of the road will require rehabilitation. The bitumen seal and underlying capping material are to be removed by the civil contractor for reuse, and the site deep ripped.

On these sections of redundant road alignment and the other plant site batters the civil contractor is to incorporate a nominal 50 mm thickness of site or imported mulch into the surface after placement of topsoil. Two exceptions are the batters of the plant site infiltration basins, to which coir netting is to be affixed by the civil contractor.

Batter revegetation is to be done by a combination of direct seeding at 3 kg/ha and seedling planting at the rate of 1 plant/$m^2$ in areas where the mulch has been incorporated into the topsoil. Two exceptions are the infiltration basin batters, which are to be planted at a density of 1.6 plants.$m^2$ using groundcover species only.

## 3.2 Offset Areas

The offset areas are degraded and weedy, dominated primarily by dune onion weed (*Trachyandra divaricata*), as typified in Figure 1. While this species can be effectively controlled with herbicide, seeds remain viable in the soil for many years, and can germinate at any time of the year. Each plant is reported to produce up to 50,000 seeds per year. It will be unrealistic to expect to completely eliminate this weed from the site, but it can be sufficiently managed to facilitate native revegetation.


**Figure 1 Dune Onion Weed**

In the northern offset area there is also significant cover of rose pelargonium (*Pelargonium capitatum*) as typified in Figure 2. It reproduces from seed and root fragments. Again it is unrealistic to expect to completely eliminate this weed from the site, but it also can be sufficiently managed to facilitate native revegetation.


**Figure 2 Rose Pelargonium**

The revegetation strategy is to kill both of these and other weed species by blanket herbicide spraying by the civil contractor in winter / spring, prior to temporary storage of topsoil and mulch there in the southern offset area as shown on drawing MV08-17-1.2. WC's revegetation expert is to be present while the blanket spraying is being done to liaise with those spraying to ensure that no off-target damage occurs to the surrounding native vegetation.

After civil works on the access road have been completed the road batters that form part of the offset areas are to have coir netting installed by the civil contractor. These are to then be revegetated by direct seeding with low shrub native species after the first autumn rains and by early July.

After export of the temporarily stockpiled topsoil and mulch to be used elsewhere has ceased, the civil contractor is to spread the remaining topsoil evenly over the entire offset areas and then spread the remaining mulch evenly over the spread topsoil and incorporate it into the topsoil surface.

The site is then to be revegetated by direct seeding at 3 kg/ha and seedling planting at 1 stem/$m^2$. Details of species allocations are shown in Table 2 in Appendix 3.

No trees are to be established in services corridors to be established in both offset area for existing and future assets (e.g. incoming High Voltage power cable, future sewer mains etc). During revegetation these corridors are to be clearly marked with stakes and green flagging ribbon. In the services corridor only shrubs and bushes are acceptable so that it is not difficult to clear along service alignments in the future if there is ever a need to excavate to conduct repairs or for new installations, and to prevent plant roots from causing damage to buried services.

Where there are surface assets (e.g. manholes), revegetation within 3 m is to be limited to groundcover species only from within the specified species list so that it remains possible to open/access them without needing to prune or clear once the plants reach maturity. During construction these 3 m clear zones are to be clearly marked with stakes and black / yellow flagging ribbon.

A future 1.2 km long shared path for pedestrians is to eventually have fences on both sides. The civil contractor is to set out the future PSP corridor as detailed on Drawing MV08-17-24.6. Tuart tree seedlings are to be planted at five metre centres along the north side at least four metres from the future fenceline to in time provide an attractive tree-lined boulevard. This four metre setback is to ensure that any large branches that may be shed once the trees have grown substantially will not land on and damage the fence.

## 3.3 Fencing and Site Protection

The civil works contractor will install an inner security palisade fence around the ASDP perimeter to deter unauthorised pedestrian and vehicle access.

The civil contractor will also install an outer 1.2 m high ringlock fence to enclose the revegetation areas around the ASDP. The revegetation contractor is to attach rabbit skirting to this fence, and subsequently remove it after the vegetation has been established.

The revegetation contractor is to install fauna exclusion fencing to the offset areas.

Fencing of the pedestrian path is to be of permeable construction with multiple strands of plain wire to allow passage of wildlife while discouraging pedestrian movement off the path, and will be installed by others under a future contract after the ASDP construction has been completed.

## 3.4 Firebreaks and Fire Control Vehicle Access

The civil contract will incorporate appropriate firebreaks and provide for fire control vehicle access.

## 3.5 Aboriginal Involvement

WC advised that the revegetation establishment provides an opportunity for a substantial degree of Aboriginal involvement e.g. Aboriginal sub-contractors working together with a revegetation specialist, as was done in the 2021/22 seed collection. The proposed extent and method of Aboriginal involvement is to be detailed in quotations for implementation of this revegetation plan.

Some parts of the site are classified as Aboriginal heritage areas. WC is developing an Aboriginal Engagement Plan. Under this plan Aboriginal site monitors may be provided to monitor parts of the work under the revegetation contract for remnant Aboriginal artefacts.

# 4 IMPLEMENTATION METHODOLOGY

## 4.1 Timing

It is anticipated that the civil contractor will commence earthworks in about mid-2023.

The revegetation contractor is to arrange for propagation of seedlings from the WC seed bank in late 2023 in time for planting in winter 2024. Numbers and species for propagation for infill planting in subsequent years will be based on the results of spring monitorings.

Direct seeding is to be carried out in autumn 2024 after the first significant seasonal rainfall.

## 4.2 Weed Management

Appropriate weed management techniques are to be employed in the various areas to be revegetated, ranging from minimal in areas where extensive earthworks will result in physical removal of weeds to intensive in the offset area where weed density is high.

Weed control is to generally be by spot spraying with herbicide, with various products applicable to the species of weeds found on the site. In some cases blanket or boom spraying will be appropriate initially such as on large bare sites before planting and seeding commence.

However, for the offset areas initial weed control, to be carried out by the civil contractor prior to storage of topsoil there. Herbicides to be blanket sprayed are 5 g/ha of metsulfuron methyl plus 20 g/ha chlorsulfuron plus a suitable adjuvant.

All weed control must be carried out by personnel with appropriate licenses in accordance with Pest Management legislation and guidelines, and operators must be experienced in natural area weed control.

Doublegee weeds have been recorded in various locations across the site, as have many narrowleaf cotton bush, and a common prickly pear weed growing in the southern offset area. These are being controlled by Tranen under a separate contract until 31 Oct 2023.

## 4.3 Surface Preparation

Landform construction and surface preparation will be by the civil contractor in areas around the ASDP footprint area and offset areas.

## 4.4 Mulching

Mulching will be the responsibility of the civil contractor around the ASDP footprint area and offset areas. In the area west of the plant site and retaining wall mulch is to be simply placed on the surface after fitting of coir netting in some areas. But in all other areas mulch it is to be incorporated into the top of the topsoil after spreading.

## 4.5 Coir Netting

Coir netting to be installed by the civil contractor is to be 400 gsm lapped 100 mm at joints and secured with 300 mm long steel U pins at 3/$m^2$ (150 mm where the ground is too hard). ends are to be folded and pinned to prevent unravelling.

## 4.6 Species Selection

Seed for use in direct seeding and for seedling propagation is to generally come from the WC stocks held by Tranen detailed in Appendix 3. These stocks include seed collected from native plants in the surrounding area in 2021/22, referred to as SDP, and also between 2006 and 2011, referred to as WWTP. While the older seeds are expected to be still viable, it is recommended that where stocks are sufficient the SDP seeds are prioritised for seedling propagation, with the older seeds used in direct seeding. Some species may be propagated from plant cuttings.

Appropriate species from the seed bank have been allocated to the various revegetation areas. Priority has been given to species that are hardy, quick to establish, and will compete with weeds for nutrients and space once established, particularly in the offset area.

Species allocations are shown in Appendix 3 for the sites shown in Appendix 2.

The native orange wattle tree (*Acacia saligna*) is found in many parts of the site. Although it can establish relatively quickly, it is a relatively short-lived species with a lifespan of around five to ten years, and is subject to an unsightly rust fungus. (Figure 3). As well as the area shown in Figure 3, there is another large area at the eastern end of the site of the PSP where it is dominant, mostly dead, and looks very unsightly. Therefore this species will be used only sparingly, in direct seeding in offset areas.


**Figure 3 Orange Wattle (*Acacia saligna*)**

## 4.7 Seedling Propagation

Seedlings are to be generally propagated using seed from the bank by NIASA accredited nurseries. Orders by the revegetation contractor should be placed in spring of the year before

planting to allow sufficient time to grow them in forestry tubes or cell trays for planting in the next winter. Some species not normally successfully grown from seed may need to be propagated from cuttings taken from around the site. And in some cases if there are insufficient seed stocks to use for propagation it may be necessary to use seed from other Swan Coastal Plain sources. There is no seed in the bank for *Eucalyptus utilis* and *Melaleuca lanceolata*, which should be propagated from Swan Coastal Plain provenance seed.

There is ample seed in stock for the propagation of tuart trees (*Eucalyptus gomphocephala*) to be planted around the future pedestrian path.

## 4.8 Seedling Planting

Seedlings should be planted using Pottiputki planting tubes, with a 10 g native plant fertiliser tablet planted adjacent to each.

## 4.9 Direct Seeding

Direct seeding at 3 kg/ha is to be done with seed treated appropriately to promote germination and then bulked up to facilitate even distribution, with either clean washed sand or vermiculite. Broadcasting of seed should be by hand with multiple overlapping passes. No fertiliser is to be spread, as it is likely to lead to excessive weed growth.

## 4.10 Site Protection (Fencing)

As shown on drawing MV08-17-24.2 the civil contractor is to install an outer 1.2.m high fence around the plant earthworks perimeter. The revegetation contractor is to add a 0.9 m high rabbit proof skirting with a 90° bend, with the upper 600 mm clipped to the fence at 300 mm centres and the bottom 300 mm pinned flat on the ground on the outside of the fence to exclude rabbits. Fencing installed by the civil contractor along the top of retaining walls for fall prevention will not require such skirting. The revegetation contractor is to remove the rabbit proof skirting at the end of the revegetation contract to allow passage of native fauna after the native plants have become established.

The two offset revegetation sites are to be protected by approximately 2.8 km of 1.8 m high star picket and wire mesh fencing installed by the revegetation contractor to the extents shown on drawing MV08-17-24.6 after the civil contractor has completed the spread of topsoil and mulch over the sites. The fencing is to comprise of 2600 long 50 diameter corner posts rammed into the ground and appropriately braced with intermediate 2400 long galvanised star pickets driven into the ground at 4 m centres. The fence mesh is to be 16/180/15 (16 horizontal wires to a height of 180 cm and with vertical wires at 15 cm centres). Four 1800 mm high x 3000 mm wide chainmesh gates are to be installed at the locations shown with 3000 long RL5 pine logs wrapped in netting hanging underneath. A 1200 mm high rabbit net as detailed above is to be attached to the fence. The skirt is to be removed at the end of the revegetation contract, or earlier at the discretion of the revegetation contractor if deemed to have outlived its usefulness.

## 4.11 Watering

Provided that the revegetation work is undertaken at the correct time of year, no artificial watering should be necessary.

Watering seedlings after planting is not recommended because:

- It promotes shallow root development, which can impact long term plant survival;
- There is no guarantee that watering will ensure long-term seedling survival; and
- It can be expensive – it costs about the same to water one seedling over summer as it does to supply and plant a replacement.

## 4.12 Hygiene Management

Weed seeds can be spread a variety of ways, including on tools, equipment and footwear. The following procedures will be implemented to mitigate the spread of weed seed as a result of revegetation activities:

- ensure vehicle/equipment tyres/tracks are clean and free of weed seed when entering and exiting the site,
- ensure equipment, tools and footwear are clean and free of weed seed when entering and exiting the site,
- any weed material removed from site will be transported in a manner that prevents the spread of weed seed during transit, and
- any weed material removed from site will be disposed of at an appropriate green waste disposal facility.

Revegetation will typically involve movement of soil, which may lead to the spread of soil-borne diseases and pathogens. The unintentional movement of pathogen-infested soil by vehicles and machinery travelling from infested areas into healthy areas is by far the most common means of dispersal of the organism.

The risk of this is considered small provided that a ‘clean on entry/clean on exit approach’ is adopted.

Machinery and vehicles arriving on site are to be free of mud and soil. Mud and soil are to be removed from any machinery and vehicles prior to departure from site. The same applies to footwear, tools, and equipment.

## 4.13 Safety and Site Access

The revegetation contractor is to comply with all standard WC safety requirements. This will include obtaining Clearance to Work approvals, which are currently issued by the plant manager at Beenyup WWTP, who is also responsible for Alkimos WWTP. Clearance to Works are required to be renewed every three months. A site access key card will also need to be obtained from Beenyup WWTP. Issue and retention of key cards is conditional on having a valid Clearance to Work permit. All personnel working on the site must have completed WC contractor HSE training and have current Training Cards for HSE Induction – Intro and – Field and OHS Permits.

# 5 POST-INSTALLATION MANAGEMENT

## 5.1 Vegetation Monitoring and Performance Criteria

Monitoring is to be done each spring and autumn for three years after the commencement of seeding and planting and the results incorporated into formal reports with tables showing the results for each of the various areas against the completion criteria.

Monitoring quadrats are to be of 25 $m^2$ area, generally 5 m x 5 m square, except in narrow areas, with their corners and a photograph point marked by galvanised steel fence droppers, and locations recorded by GPS.

Final locations, to be determined on site, are to be representative of their surrounding revegetated areas and agreed with WC's revegetation expert. Numbers of quadrats are to be:

- two in the planting areas on Drawings MV08-17-24.3 and 4;
- on Drawing MV08-17-24.2 six in the medium revegetation areas, four in the small revegetation areas, one in the ground cover areas, with alive/dead counts only done of the fire-resisting medium shrubs; and
- On Drawing MV08-17-24.6 six in the offset areas with no size limits and two in the offset low shrub areas, with alive/dead counts only done on the planted tuart trees.

## 5.2 Site Maintenance

Site maintenance is to include weed control events up to four times annually, and infill planting as required to meet the completion criteria. Rabbit netting installed to prevent herbivory is to be removed by the revegetation contractor after three years, or earlier if deemed appropriate.

## 5.3 Completion Criteria and Success Targets

In the absence of formal completion criteria required by third parties, the following criteria have been nominated for achievement three years after initial planting, for all areas except the PSP. These are identical to those used in 2018 for a WC project at City Beach in a similar high-profile situation amongst similar somewhat degraded surrounding bushland with many similar weed species:

- ≥1 stem/$m^2$ of native species (or less where native cover exceeds 50%).
- ≥70% richness of species used, in and around each monitoring quadrat.
- ≥ 50% native species cover (or projected to be once plants mature).
- ≤ 20% weed cover, with no declared weed species present.

For the future pedestrian path the expected initial tuart tree survival rate is at least 70%, and any shortfall below 70% is to be made up by planting replacements in the following year in locations where trees were previously dead or missing. No infill planting is proposed in subsequent years.

## 5.4 Contingency Measures

Table 1 lists some possible unplanned impacts on the revegetation and proposed contingency measures. There have been some instances of vehicle entry to the site in the past as typified by the photograph in Figure 4 near the main entrance gate in 2020.


**Figure 4 Unauthorised Vehicle Entry**

**Table 1 Contingency Measures**

| Event/ Occurrence | Potential Impact on Site | Potential Contingency Actions |
|---|---|---|
| Fire | While fire may benefit native species recruitment from seed, it may also cause an increase in weed germination. If the fire passes through the site, it will result in the temporary decrease in foliar cover / species diversity. | • Monitor the site closely after fire and adjust weed control schedule accordingly<br>• Monitor native species germination to establish site response to fire<br>• Infill planting if required |
| Littering and rubbish dumping | While littering is unlikely to have any major impact on vegetation, dumping of significant quantities of rubbish may. | • Ongoing removal of minor litter<br>• Disposal of illegally dumped materials |
| Vandalism or vehicle/ motorcycle traffic | The site may be disturbed and seedlings may be uprooted or damaged. | • Reinstalment of disturbed areas to their original condition<br>• Infill planting if required |

Any recommended contingency actions will be discussed with WC and agreed upon prior to implementation as variations to the revegetation contract.

# Appendix 1 Site Location

# Appendix 2 Site Development Plans

# Appendix 3 Species List and Allocations

# Appendix 4 Cost Schedules

# Attachment G. DBCA Consultation

**From:** Michael Roberts
**To:** Gemma Tribbick
**Cc:** Paul Zahra
**Subject:** RE: Alkimos Desalination Plant Proposal - CEMP - query
**Date:** Thursday, 8 December 2022 10:54:36 AM
**Attachments:** image002.png

Hi Gemma
Thanks for making contact. Yes you are on the right track with your suggested focus areas that need further development in the CEMP.
I have detailed below some additional comments for each of these focus areas to assist in your preparation:

- Demarcation of site boundary – this could either be in the form of temporary cyclone mesh style fences or barrier mesh fences(photo below) to assist the contractor to delineate the site boundary and minimise risk of vehicles and inadvertent clearing of adjacent native vegetation within DBCA estate.


- Weed management- It is recommended that a pre-clearance linear corridor weed survey is undertaken to ascertain the current weed density and distribution within the clearance corridor and a nominal distance(15m) within the adjacent DBCA estate. This will give a good baseline of the current weed situation and therefore enable post-clearance monitoring of the corridor to determine if any additional weeds species have been introduced into the reserve by the construction works and therefore enable a more targeted approach by Water Corporation in regards to emerging weed problems that may have been created by the construction works.
- Dieback management- a linear dieback survey of the construction corridor and the adjacent DCBA estate (25m width) is required prior to construction commencing. This will inform the preparation of a site-specific dieback management plan, which will identify potential dieback cleaning stations and other hygiene measures etc.

- Interface management with DBCA estate/management activities – the pipeline corridor with intercept a number of existing DBCA management tracks/roads including the entry road(Orchid Rd) to the Gazetted Pinjar Off Road Vehicle area(https://trailswa.com.au/trails/trail-networks/pinjar-motorcycle-area?sortBy=highest-rated&ne=-31.632238469398892%2C115.80481498169121&sw=-31.650213960816686%2C115.77564597489317). Where these tracks intercept the pipeline corridor there will need to be appropriate traffic management/signage installed to advise the public of the construction works. Water Corporation will also need to liase closely with DBCA to determine if temporary alternative access will need to be provided so that users of the ORV area can still access the area whilst the pipeline is being installed along Wesco Road.
- Erosion control – Contingency management measures in the form of siltation fences etc may be required where there is a risk of erosion to the adjacent DBCA estate derived from trenching spoil/overburden washing onto adjacent native vegetation. This is more likely to occur in low lying depressions if they occur along the alignment. In the event of any inadvertent erosion events there will need to be appropriate remedial works being implemented to affected native vegetation i.e. targeted manual removal of eroded material and ongoing monitoring to ensure no long term impact to vegetation.

Regards

**Michael Roberts** | Planning Officer (Land Use) |

**Department of Biodiversity, Conservation and Attractions**
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**From:** Gemma Tribbick <Gemma.Tribbick@watercorporation.com.au>
**Sent:** Monday, 5 December 2022 2:13 PM
**To:** Michael Roberts <michael.roberts@dbca.wa.gov.au>
**Cc:** Paul Zahra <Paul.Zahra@watercorporation.com.au>
**Subject:** Alkimos Desalination Plant Proposal - CEMP - query



Hi Michael

I am currently working within the Alkimos Desalination team to help respond to comments that were received through the EPA Submissions period for the Environmental Review Document that was prepared for the proposed Alkimos Desalination Plant.

One of the comments received from DBCA was as follows:
"The ''Alkimos Seawater Desalination Plant – Terrestrial Construction Environment Management Framework (Water Corporation, 2020) (TCEMF) was prepared to ensure appropriate mitigation of environmental impacts arising from project works. The document is considered generic in nature and does not include specific information regarding the sections of the pipeline corridor that contain or abut conservation significant values or conservation estate. Specific mitigation actions and operational requirements may be required within these areas and this should be detailed in the subsequent Construction Environmental Management Plan."

And the DBCA recommendation was "A detailed construction environmental management plan is to be prepared, prior to the project commencing, to address specific mitigation and management of direct and indirect project attributable impacts. DBCA should be consulted in relation to the mitigation and management of BC Act values and conservation estate."

I am currently amending the CEMF to provide such level of detail that it would be suitable as a CEMP for the project.

Are you able to advise as to what sort of mitigation and management measures you would specifically like to see with regards to the above comments? My first thought is things like hard barriers during construction, weed management, dieback management, monitoring of other indirect impacts, dust monitoring, drawdown monitoring (if dewatering is likely to take place adjacent to these areas - I will need to confirm) etc.

Thanks

Gemma

**Gemma Tribbick**
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Water Corporation acknowledges the Traditional Owners throughout Western Australia and their continuing connection to the land, water and community. We pay our respects to all members of the Aboriginal communities and their cultures and to Elders past, present and emerging.

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