Toukley Desalination Water Treatment Plant (The Project)

Application Number: **03345** Commencement Date: **24/02/2026** Status: **Locked**

1. About the project

1.1 Project details

1.1.1 Project title *

Toukley Desalination Water Treatment Plant (The Project)

1.1.2 Project industry type *

Water Management and Use

1.1.3 Project industry sub-type

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1.1.4 Estimated start date *

01/01/2036

1.1.4 Estimated end date *

01/01/2136

1.2 Proposed Action details

1.2.1 Provide an overview of the proposed action, including all proposed activities. *

The Toukley Desalination Water Treatment Project (herein referred to as 'The Project') forms part of the NSW Central Coast Council's (the Proponent) commitment to be 'plan ready' in continuing to deliver safe and secure drinking water in response to potential extreme droughts in the future. A desalination plant at Toukley would provide an additional high quality water source that is not dependant on rainfall, and therefore more resilient to drought and climate change.

- Water storage levels in the Central Coast are relatively small or shallow so can fall quickly, causing this region to be vulnerable to droughts.
- During a 'design drought' scenario, there is 36 months between 45% storage levels and 15% storage levels.

Planning for extreme drought events is required because running out of water would have a significant impact on people and businesses in the region. In an extreme drought, the community still needs access to a safe and secure source of water—planning for this ensures that there is time to respond.

Further investigations, detailed design and construction are expected to be staged following project approval. The Project forms an important part of the Proponent's Central Coast Water Security Plan (CCWSP) (June 2023), which is critical to the long-term water security of the region.

As of current Project planning and design, the conservative commencement date for the Project would be in the year 2036. [BW1] [RR2] This start date aligns with the approach of the Central Coast Council who is seeking a 10 year approval term for the NSW Environmental Impact Statement, during which time further project stages may be instigated based on future water supply system modelling.

The procurement and construction of the Project, the latter of which is estimated to be completed over a 36 month period, would be initiated in line with the CCC's planning approach in the CCWSP (2023) which currently proposes a trigger point when raw water storage levels approach 45%. The actual timing to commence delivery of the desalination plant, alongside other CCWSP drought responses, depends on the lead time to construct them before reaching a critical storage level of 15%.

If implementation of the desalination plant is not triggered by the drought triggers – based on current forecasts in the CCWSP and based on population growth, water conservation rates and climate sensitive demand, the desalination plant will likely be required in the early 2040's.

The Project involves the construction and operation of a desalination plant adjacent to the existing Toukley Sewage Treatment Plant (STP), including a seawater intake tunnel, a connection to the existing water distribution network in Main Road, Noraville, and a power supply connection to an Ausgrid zone substation in Charmhaven. The desalination plant would be constructed with the capacity to produce up to 40 ML/d capacity in response to future demand.

The Project Area for the desalination plant and associated infrastructure would comprise approximately 41 hectares (ha), including:

- Approximately 36.1 ha for the construction and operation of the desalination plant, ancillary facilities, and power supply.
- Approximately 4.1 ha of underground tunnelling for construction and operation of the seawater intake.
- Approximately 1.1 ha for the offshore intake and outfall marine areas.

The Project's main components are described below and general locations shown in Attachment 1.

Site establishment:

- Setup of environmental mitigation measures (sediment and erosion controls).
- Mobilisation, including establishing construction compounds for laydown and storage areas and spoil areas.

- Vegetation clearing for the Project Area would likely occur at commencement of works and may be undertaken by a specialist contractor.

Desalination plant:

The desalination plant will be located adjacent to the existing Toukley STP and will utilise a reverse osmosis system. The new desalination plant would include:

- A carpark, workshop, and administration building.
- A seawater pump station and screening and handling facility. Intake screens will remove solids greater than 3 mm, with screenings collected and disposed of to landfill.
- A connection to the potable water network via a treated water pump station and pipeline. This will deliver the desalinated/treated water into the existing potable water network. Approximately 1.4 km of 600 mm diameter pipeline for treated water would be installed along Evans Road, from the desalination plant site to the potable watermain connection point in Main Road, Noraville. The treated water pipeline would be constructed using either open trenching, pipe jacking or horizontal directional drilling, or a combination of each.

Installation of underground piping would be required across the plant site to connect various components of the desalination process plant equipment. Approximately 180 m of pipeline would be installed from the desalination plantsite to the Toukley STP outfall tank, allowing for brine discharge via the existing Toukley STP Norah Head ocean outfall.

- A seawater buffer tank.
- Treatment process facilities (membrane ultra filtration, filtrate tank, reverse osmosis, permeate tanks, chemical dosing including acid, caustic, hypochlorite, carbon dioxide lime and fluoride) with the ability to produce up to 40 ML/d of potable water, with the potential to increase to 40 ML/d capacity in response to future demand.
- Contingency area for coagulant dosing and pre-treatment backwash management if required in the future.

Seawater intake:

- Caisson installation (seawater intake structure) (offshore): an intake tower with a velocity cap structure and low through-screen velocity to minimise impacts on marine species and habitat:
    - The intake structure comprises a tower structure consisting of concrete caisson rings of approximately 12 m diameter, a steel dome support frame and a glass reinforced polyester dome.
    - The intake tower is fitted with removable grills and an access hatch for maintainability, which would extend approximately 7 m above the sea floor. Rockfill is installed around the foot of the intake tower for scour protection.
    - The intake tower is configured to minimise impingement and entrainment of marine life, by sizing it such that the maximum approach velocity through the face of the structure is very low, and no more than 0.15 m/s.
- Seawater Intake tunnel installation:
    - Approximately 2.4 km tunnel, 2.5 m in diameter, extending from the desalination plant to an intermediate shaft and then to an intake structure approximately 1 km offshore of Jenny Dixon Beach
    - The tunnel will be constructed using micro-tunnelling/pipejacking.

Brine disposal:

The brine disposal mechanism involves a connection from the desalination plant to the existing STP. This allows brine to discharge via the existing Norah Head ocean outfall comingled with the existing treated effluent discharge. The brine production would increase as the capacity of the plant increases but would still be discharged via the existing STP and outfall.

No change to the existing Norah Head ocean outfall infrastructure will be required.

Power supply:

The Project's power supply will be provided through Ausgrid's existing Charmhaven Zone Substation and two new 11 kV feeders, approximately 8.5 km in length. Modifications within the zone substation will be required to accommodate these installations. The cable route will comprise a combination of aerial, trenchless and open trench construction methods, extending along Crowe Street, Wallarah Road, Main Road, Moss Avenue, Crossingham Street, and Evans Road. The works will also require the cable to cross Tuggerah Lake alongside the Toukley Bridge.

Ancillary components:

- Chemical storage and dosing: A number of chemicals would be required to be stored for use in the treatment processes. The storage area would be bunded and likely be placed on the southern side of the desalination plant site and would have a bunded unloading area draining to a sump emptied by a licensed contractor, as required.
- Hardstand: The desalination plant site would generally comprise an unsealed surface (gravel, crushed concrete or similar) with some areas of concrete bunding, and concrete pads for placement of treatment components.
- Stormwater and cross drainage: Stormwater run-off would be directed to a stormwater basin in the south-western corner of the site.
- Fencing, signage and lighting: It is proposed to provide chain wire fencing to the perimeter of the desalination plant site. The fencing would be about 2.4 m high and topped with barbed wire. Minimal signage would be provided to the site except as required for operational requirements. Lighting would be provided at the desalination plant, given that it would be operational on a continuous basis, as per AS 4282 – Control of the obtrusive effects of outdoor lighting.
- Access roads: Access to the desalination plant would be from the existing Central Coast Highway via the existing access to Toukley STP. Some areas may also be sealed in high trafficked areas, and around the perimeter access road. The final layout would be determined during detailed design.

Key operational activities:

Key operation and maintenance activities include:

- The seawater desalination plant would operate 24 hours a day, seven days a week.
- Ongoing maintenance activities such as regular equipment servicing, asset condition assessments, and calibration and servicing of electricals assets and online monitoring equipment as necessary throughout the operational lifecycle.

Key decommissioning activities:

The project would be decommissioned at the end of its design life. Operational lifespan of the TDWTP varies pending the item and ongoing maintenance activities. Estimated lifespan is 50-100 years. Decommissioning is expected to involve removal of project infrastructure and would be influenced by the intended future use of the land at that time, and the ongoing water supply needs of the region. A detailed decommissioning plan would be prepared prior to decommissioning.

1.2.2 Is the project action part of a staged development or related to other actions or proposals in the region?

No

1.2.6 What Commonwealth or state legislation, planning frameworks or policy documents are relevant to the proposed action, and how are they relevant? *

Commonwealth legislation:

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

This referral has been prepared due to potential significant impacts to MNES. The area being referred includes Project activities within the onshore and offshore environment.

Underwater Cultural Heritage Act 2018

Provides protection for underwater cultural heritage, including shipwrecks, aircraft and associated artefacts, some of which may be of Aboriginal origin or significance. The UCH Act establishes offences related to disturbing, removing, damaging or destroying protected underwater heritage without proper authorisation.

State legislation:

Environmental Planning and Assessment Act 1979 (EP&A Act)

Pursuant to section 5.12(2) of the EP&A Act the Project is being assessed as State Significant Infrastructure (SSI) and requires the preparation of an environmental impact statement (EIS) and approval from the NSW Minister for Planning in accordance with Part 5, Division 5.2 of the EP&A Act.

Pursuant to section 5.23(1) of the EP&A Act, and due to the Project being State Significant Infrastructure, some otherwise required legislative approvals do not reply to this Project.

Biodiversity Conservation Act 2016 (BC Act)

Under section 7.9 of the *BC Act*, SSI projects are required to prepare a Biodiversity Development Assessment Report (BDAR) to identify and assess biodiversity impacts under the provisions of the BC Act and offset those impacts by retiring biodiversity credits, determined using the Biodiversity Assessment Methodology (BAM).

National Parks and Wildlife Act (NPW Act)

Consideration of Wyrrabalong National Park, which is proximate to the Project.

NPW Act is the main law in NSW that protects Aboriginal culture and heritage. Part 6 of the NPW Act establishes legal protection for Aboriginal objects and declared Aboriginal places.

Contaminated Land Management Act 1997

If any contaminated land / notification is to the NSW Environmental Protection Authority (EPA) is required, it would occur in accordance with this Act.

Water Management Act 2000

Potential for a water access licence to be required, if groundwater or surface water is to be extracted.

State policy and strategies:

NSW Water Strategy 2021

Priority 4 of the Strategy is to ‘Increase resilience to changes in water availability (variability and climate change)’. Specifically, Action 4.3 is to improve drought planning, preparation and resilience.

Central Coast Regional Plan 2041

The Plan discusses the population growth, and associated services and infrastructure required. The Project aims to improve water supply services for a growing community.

Central Coast Strategic Conservation Plan 2025

Aims to support housing development while safeguarding the region's unique plants and animals. The Project would support urban development through implementing water security infrastructure for the region.

Local policy and strategies:

Central Coast Water Security Plan 2023

Is the long-term water strategic plan for the Central Coast region which aims to ensure sufficient water into the future. Drought response desalination is identified in the plan, as an option for the region that has been investigated since 2005.

Central Coast Council Sustainability and Climate Action Plan 2022 – 2025

The framework for sustainability planning, decision-making and action, to achieve improved environmental sustainability for the Central Coast LGA. The Project would address the priority area of water by providing a contingency measure for securing water supply during drought.

Central Coast Local Strategic Planning Statement 2020

Provides a land use vision that will guide sustainable growth and development across the region to 2036 and beyond, inclusive of water infrastructure requirements.

Community Strategic Plan 2025 – 2035

10-year roadmap developed through extensive community engagement, aimed to create an inclusive, prosperous, and sustainable Central Coast. This plan includes strategies for delivery and maintenance of water supply infrastructure.

Water and Sewer Community Engagement and Education Strategy 2023

Shares how Council will engage, communicate, educate, and continue to improve its services, while building trust with customers and the community. Proponent engagement with community will be in line with this strategy.

Central Coast Local Environment Plan 2022

The primary local statutory planning instrument governing land use and development within the Central Coast local government area.

1.2.7 Describe any public consultation that has been, is being or will be undertaken regarding the project area, including with Indigenous stakeholders. Attach any completed consultation documentations, if relevant. *

The Proponent prepared a detailed and project specific Community and Stakeholder Engagement Strategy for the Project with reference to *Undertaking Engagement: Guidelines for State Significant Projects* (NSW DPHI 2024) and guided by the Core Values and the Code of Ethics of the International Association for Public Participation (IAP2) – now the Engagement Institute.

These key consultation activities undertaken, which included targeted stakeholder specific consultation channels, have been provided below.

- Dedicated community consultation and meetings
- Notifications to residents in proximity to environmental investigations
- Media release, including subsequent 3rd party interviews and articles
- Flyer delivery
- Establishment of a dedicated project webpage on the Proponent's website:
  - ***https://www.centralcoast.nsw.gov.au/desalination-treatment-plant***
- Free call 1800 number
- Direct emails to relevant stakeholders with offers of briefings and further engagement
- Online survey
- Coreflute signs
- Social media advertising

The Aboriginal community was consulted regarding the heritage management of the project throughout its lifespan. Consultation has been undertaken as per the process outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a) (consultation requirements).

The appropriate government bodies were notified, and advertisements placed in the *Central Coast Community News* (10 July 2025). This resulted in a number of Aboriginal organisations registering their interest for the project (Registered Aboriginal Parties).

Upon registration, the Aboriginal parties were invited to provide their knowledge on the study area and on the proposal provided in the methodology. Responses from RAPs are included in the ACHAR.

Continued consultation with the RAPs and Darkinjung LALC is recommended to occur throughout the life of the project.

1.3.1 Identity: Referring party

Privacy Notice:

Personal information means information or an opinion about an identified individual, or an individual who is reasonably identifiable.

By completing and submitting this form, you consent to the collection of all personal information contained in this form. If you are providing the personal information of other individuals in this form, please ensure you have their consent before doing so.

The Department of Climate Change, Energy, the Environment and Water (the department) collects your personal information (as defined by the Privacy Act 1988) through this platform for the purposes of enabling the department to consider your submission and contact you in relation to your submission. If you fail to provide some or all of the personal information requested on this platform (name and email address), the department will be unable to contact you to seek further information (if required) and subsequently may impact the consideration given to your submission.

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Alternatively, email us at privacy@dcceew.gov.au.

☑ **Confirm that you have read and understand this Privacy Notice ***

1.3.1.1 Is Referring party an organisation or business? *

Yes

Referring party organisation details

ABN/ACN	39008488373
Organisation name	GHD PTY LTD
Organisation address	Level 3, 24 Honeysuckle Drive Newcastle 2000 NSW Australia

Referring party details

Name	Bernadette Wood
Job title	Senior Environmental Planner
Phone	+612 4979 9999
Email	bernadette.wood@ghd.com
Address	Level 1, 66 Lord Street, Port Macquarie NSW 2444 Australia

1.3.2 Identity: Person proposing to take the action

1.3.2.1 Are the Person proposing to take the action details the same as the Referring party details? *

No

1.3.2.2 Is Person proposing to take the action an organisation or business? *

Yes

Person proposing to take the action organisation details

ABN/ACN	73149644003
Organisation name	Central Coast Council
Organisation address	PO Box 20 Wyong, 2259 NSW Australia

Person proposing to take the action details

Name	Neil Dignam
Job title	Project Manager - Water resilience
Phone	02 4304 7217
Email	Neil.Dignam@centralcoast.nsw.gov.au
Address	PO Box 20 Wyong, New South Wales, 2259 Australia

1.3.2.14 Are you proposing the action as part of a Joint Venture? *

No

1.3.2.15 Are you proposing the action as part of a Trust? *

No

1.3.2.17 Describe the Person proposing the action's history of responsible environmental management including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Person proposing to take the action. *

The Proponent has been convicted of two offences relating to the discharge of raw sewage into Narara Creek in 2023 after pleading guilty in the Land and Environment Court. In a decision made public on 20/12/24, the Proponent was fined $105,600 and is has undertaken full restoration of both embankments of Narara Creek within the area of the break removing illegal structures and reinstating biodiversity via plantings and rubbish removal and constructing exclusion fencing.

Council has engaged Contractors to undertake a replacement of the offending sewer pipe over a length of 2.4kms at a cost of $32m starting February 2026.

1.3.2.18 If the person proposing to take the action is a corporation, provide details of the corporation's environmental policy and planning framework

Council's One Central Coast – Community Strategic Plan 2018-2028 includes the following.

Sustainability Statement: "*The Values of the Central Coast Community are strongly tied to our local natural environment, including our beaches, waterways, ridges, estuaries, lakes and valley floors, the parks, gardens and natural bushland contribute to the lifestyle, culture and beauty of the region*." (pg. 5 CSP 2018-28).

The Proponent's policy objective is *to effectively integrate the principles of ecological sustainability into Council and community functions so as to achieve a clean, healthy and ecologically sustainable environment for the Central Coast*. Council is committed to the following objectives:

1. Integrating the principles of ecological sustainability (including the precautionary principle; intergenerational equity; conservation of biological diversity and ecological integrity; and improved valuation, pricing and incentive mechanisms) into Council's policies, programs and services.
2. Achieving continuous improvements in environmental performance, over and above regulatory and legislative requirements.
3. Monitoring and reporting the environmental quality of the region and the environmental performance of the Council to the Councillors, the Chief Executive Officer and the community.
4. Working in partnership with government, organisations and the community to promote the ecological, social and economic health of the region, to achieve sustainable environmental outcomes.
5. Promoting ecological resilience and the conservation, rehabilitation and ecologically sustainable use of resources within Council and the community, as well as minimising environmental pollution and waste.
6. Applying cumulative impact assessment throughout Council and promoting the application of cumulative impact assessment by the community.
7. Raising the awareness of environmental issues within the Central Coast, facilitating the empowerment of individuals and groups to take an active role in managing their environment.

1.3.3 Identity: Proposed designated proponent

1.3.3.1 Are the Proposed designated proponent details the same as the Person proposing to take the action? *

Yes

Proposed designated proponent organisation details

ABN/ACN	73149644003
Organisation name	Central Coast Council
Organisation address	PO Box 20 Wyong, 2259 NSW Australia

Proposed designated proponent details

Name	Neil Dignam
Job title	Project Manager - Water resilience
Phone	02 4304 7217
Email	Neil.Dignam@centralcoast.nsw.gov.au
Address	PO Box 20 Wyong, New South Wales, 2259 Australia

1.3.4 Identity: Summary of allocation

Confirmed Referring party's identity

The Referring party is the person preparing the information in this referral.

ABN/ACN	39008488373
Organisation name	GHD PTY LTD
Organisation address	Level 3, 24 Honeysuckle Drive Newcastle 2000 NSW Australia
Representative's name	Bernadette Wood
Representative's job title	Senior Environmental Planner
Phone	+612 4979 9999
Email	bernadette.wood@ghd.com
Address	Level 1, 66 Lord Street, Port Macquarie NSW 2444 Australia

Confirmed Person proposing to take the action's identity

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	73149644003
Organisation name	Central Coast Council
Organisation address	PO Box 20 Wyong, 2259 NSW Australia
Representative's name	Neil Dignam
Representative's job title	Project Manager - Water resilience
Phone	02 4304 7217
Email	Neil.Dignam@centralcoast.nsw.gov.au
Address	PO Box 20 Wyong, New South Wales, 2259 Australia

Confirmed Proposed designated proponent's identity

The Person proposing to take the action is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

1.4 Payment details: Payment exemption and fee waiver

1.4.1 Do you qualify for an exemption from fees under EPBC Regulation 5.23 (1) (a)? *

No

1.4.3 Have you applied for or been granted a waiver for full or partial fees under Regulation 5.21A? *

No

1.4.5 Are you going to apply for a waiver of full or partial fees under EPBC Regulation 5.21A?

No

1.4.7 Has the department issued you with a credit note? *

No

1.4.9 Would you like to add a purchase order number to your invoice? *

Yes

1.4.10 Enter purchase order number *

12647302

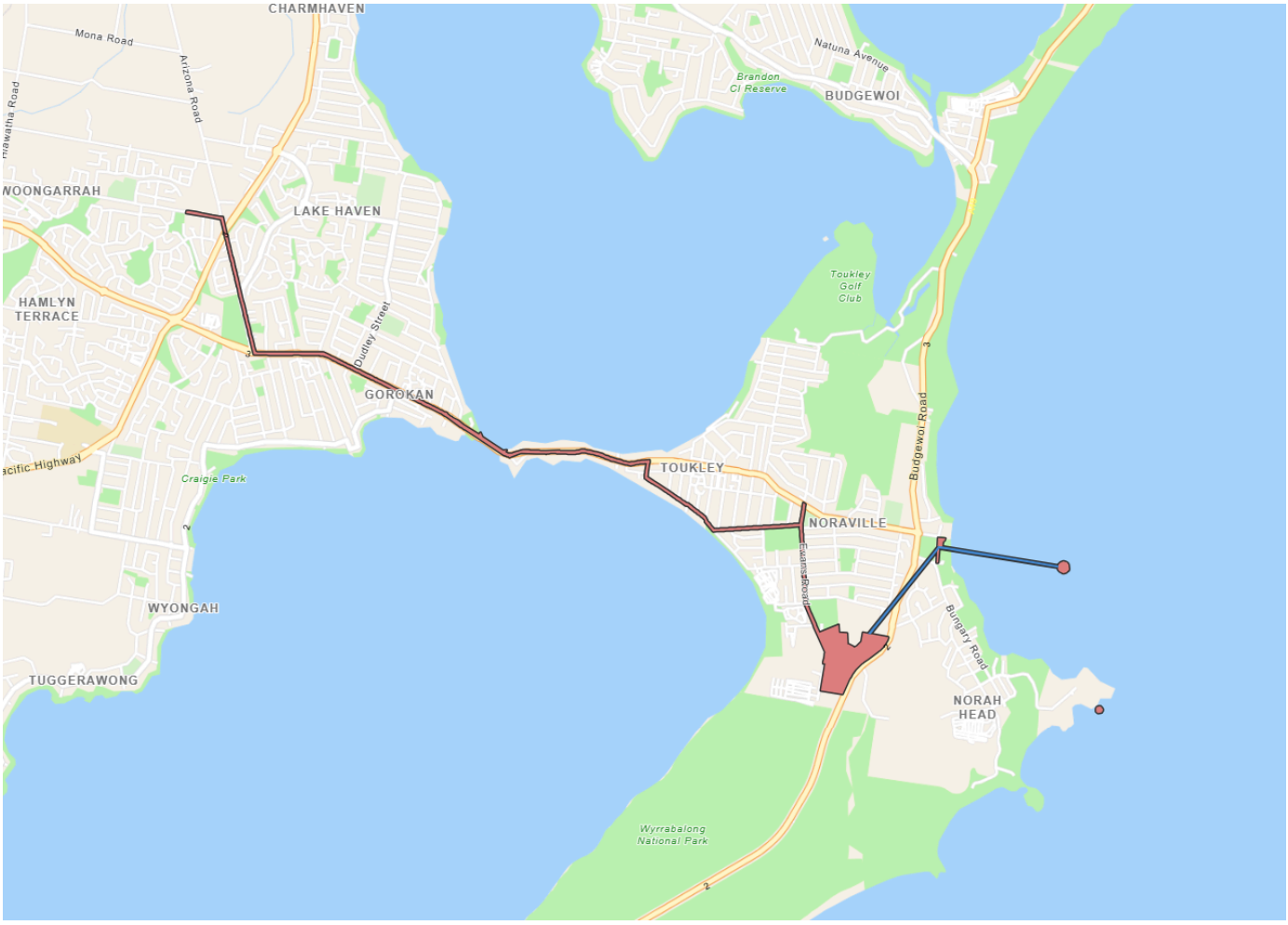
1.4 Payment details: Payment allocation

1.4.11 Who would you like to allocate as the entity responsible for payment? *

Referring party

2. Location

2.1 Project footprint



Project Area: 41.24 Ha **Disturbance Footprint:** 37.11 Ha **Avoidance Area:** 4.13 Ha

2.2 Footprint details

2.2.1 What is the address of the proposed action? *

35 Wilfred Barrett Drive, Noraville NSW 2263

2.2.2 Where is the primary jurisdiction of the proposed action? *

New South Wales

2.2.3 Is there a secondary jurisdiction for this proposed action? *

No

2.2.5 What is the tenure of the action area relevant to the project area? *

The Project Area occupies approximately 41 hectares of land, with the desalination plant and the main compound location within Central Coast Council owned land. Other land that is intersected by the Project is outlined below.

Lot details:

Lot 1 / DP758779

- NSW land zoning: C2, SP2
- Land Ownership: Crown Land, managed by Norah Head Recreation Reserve Trust
- Land use: Environmental conservation

Lot 7050 / DP1030859

- NSW land zoning: RE1, C2
- Land Ownership: Crown Land, managed by Norah Head Recreation Reserve Trust
- Land use: Public recreation, environmental conservation

Lot 7345 / DP1167795

- NSW land zoning: C2, SP2
- Land Ownership: Crown Land, managed by Norah Head Recreation Reserve Trust
- Land use: Environmental conservation

Lot 23 / DP43374

- NSW land zoning: RE1
- Land Ownership: Crown Land, managed by Central Coast Council
- Land use: Public recreation

Lot 7304 / DP1146150

- NSW land zoning: SP2 (Cemetery)
- Land Ownership: Crown Land, managed by Central Coast Council
- Land use: Noraville Cemetery

Lot 1 / DP859289

- NSW land zoning: SP2 (Sewerage System)
- Land Ownership: Freehold, owned by Central Coast Council
- Land use: Toukley STP

Lot 557 / DP44985

- NSW land zoning: SP2 (Sewerage System)
- Land Ownership: Freehold, owned by Central Coast Council
- Land use: Toukley STP

Lot 11 / DP632403

- NSW land zoning: SP2 (Sewerage System)
- Land Ownership: Freehold, owned by Central Coast Council
- Land use: Toukley STP

Lot 4 / DP 1249194

- NSW land zoning: C2
- Land Ownership: Freehold, owned by Darkinjung Local Aboriginal Land Council
- Land use: Environmental conservation

Lot 582 / DP728973

- NSW land zoning: C2
- Land Ownership: Freehold, owned by Darkinjung Local Aboriginal Land Council
- Land use: Environmental conservation

Central Coast Hwy

- NSW land zoning: SP2 (Classified Road)
- Land Ownership: Crown Land, managed by NSW Government
- Land use: Classified road

Pacific Hwy

- NSW land zoning: SP2 (Classified Road)
- Land Ownership: Crown Land, managed by NSW Government
- Land use: Classified road

Wallarah Rd

- NSW land zoning: SP2 (Classified Road)
- Land Ownership: Crown Land, managed by NSW Government
- Land use: Classified road

Mataram Rd, Crowe St, Lake Haven Dr, Main Rd, Dunleigh St, Moss Av, Beach Parade, Crossingham St, Evans Rd.

- NSW land zoning: SP2, C2, R2, RE1, R1, R3, SP3, E4
- Land Ownership: Freehold, owned by Central Coast Council
- Land use: Local road

Bungary Rd, Park st, Soldiers point Dr

- NSW land zoning: R2, RE1, C2, C3
- Land Ownership: Freehold, owned by Central Coast Council
- Land use: Local road

3. Existing environment

3.1 Physical description

3.1.1 Describe the current condition of the project area’s environment.

Attachments and assessments undertaken informing this section:

- Figures (Attachment 1)
- Terrestrial Biodiversity MNES Report (Attachment 2)
- Marine Desktop Assessment (Attachment 3)

Terrestrial

The Project is located at Noraville, on the Central Coast of NSW. The Project's seawater desalination plant would be located south of the Toukley Sewage Treatment Plant (STP), on the western side of the Central Coast Highway, approximately 650 m east of Tuggerah Lake and 2 km northwest of Norah Head. Large vehicle access to the site would be via the existing STP access road from Central Coast Highway. A new access track for the desalination plant site is required to provide two separate egress routes from the site. This new access track will be located on the western boundary of the site. New access tracks within the desalination plant site would be required for construction, with the final layout determined by the construction contractor. Some access tracks would be sealed, including in high trafficked areas.

The Project encompasses both terrestrial and marine environments and is largely comprised of previously disturbed areas and urbanised land. The terrestrial component consists mainly of previously disturbed and urbanised land including an old council landfill site which adjoins the active STP, road reserves, utility corridors, with some native vegetation near the existing STP.

The areas surrounding the existing STP and old landfill site are undeveloped patches of native vegetation in moderate to low condition with large patches of *Lantana camara* (Lanata) acting as a solid boundary to the native vegetation. The region is characterised by a mix of developed land uses and remnant vegetation patches, with proximity to Tuggerah Lake and the Pacific coastline. The terrestrial component of the Project would require approximately 41 hectares, of which 11.83 hectares of native vegetation is proposed to be removed (10 hectares in moderate condition, 0.29 in low and 1.54 in poor condition).

Terrestrial natural hazards history and risk

Flooding

The desalination plant site is located on land at or above 8.0 mAHD. The Tuggerah Lakes Flood Study completed in 1994 by Lawson and Treloar indicates the maximum flood levels in the Probable Maximum Flood (i.e. modelling for the most extreme flood theoretically possible) event is 3.04 mAHD. Therefore, the desalination plant site is not likely to be affected by flooding in the Tuggerah Lakes, as the elevated nature of the site results in no interaction with flood levels within Tuggerah Lake and/or Oceanic flooding.

Flood behaviour at the desalination plant site is governed by overland flow, as drainage within the catchment is discharged through the existing STP site and landfill area. Flooding behaviour at the site can generally be categorized as "flash flooding", with relatively shallow and slow velocity flows resulting in low hazard sheet flow throughout the site and locally deeper and more concentrated velocities occurring through the major overland flow routes through the site. Key flow pathways include flow via a culvert under Wilfred Barret Drive in a south-easterly direction, through the existing landfill site to the south of the site and towards Wyrrabalong National Park, and east towards Evans Road, which is an at grade road with no formal drainage.

Overall, there are no material changes in flood risk anticipated to arise as a result of the Project when compared to existing conditions, and the flood impact to the Project has been managed through setting of fill platform levels and implementation of flood mitigation strategies in design. It is considered unlikely that any social or economic impacts relating to flooding would occur as a result of the Project.

Bushfire

The area surrounding the Project to the east and the south (including the Wyrrabalong National Park) has extensive history of bushfires and prescribed burns, with large areas being re-burnt in subsequent fires. The closest fire to the Project Area was within 50 m east of the site and extending south, across Wilfred Barret Drive / Central Coast Highway. The bushfire occurred in 1991 and was approximately 723 ha in size. There have been frequent bushfires since this large bushfire (occurring every 1 – 3 years until 2006), the largest of which was a bushfire east of the site which re-burnt 140 ha in 2000. The most recent fire near the Project was a prescribed burn in 2024 which burnt approximately 22 ha. Prescribed burns have been conducted within Wyrrabalong National Park to protect the nearby aged care facilities.

Marine

The marine component of the Project consists of the seawater intake tunnel alignment within coastal waters at Jenny Dixon beach, and the existing outfall location at Nora Head.

Much of the coastline and marine environment of New South Wales is within the Commonwealth Temperate East Marine Region, classified as all waters out to Australia's Exclusive Economic Zone boundary. The Temperate East region is characterised by a narrow continental shelf, extensive variation in benthic features (including seamount chains and canyons), dynamic oceanography and a unique mix of tropical and cold-water reef systems. The region supports high species richness and diversity, particularly among corals, crustaceans, echinoderms, molluscs, sea sponges and fish.

At a state level Jenny Dixon beach sits within the Hawkesbury Shelf meso-scale bioregion, which in turn sits within the Central Eastern Shelf Province, a provincial-level bioregion in the Integrated Marine and Coastal Regionalisation of Australia system. The Jenny Dixon site is characterized by rocky outcrops and rocky platforms which provide benthic habitats for marine organisms. The rocky reefs at the Jenny Dixon site support a variety of benthic species including sponges, sea squirts and kelp.

3.1.2 Describe any existing or proposed uses for the project area.

Existing uses

The Toukley-Norah Head area supports a range of industries, such as construction, healthcare and social assistance, retail trade, accommodation and food services, and education and training. There is a vegetation strip on either side of Wilfred Barret Drive/Central Coast Highway which creates a buffer between the road reserve and residential properties. There are no sensitive receptors along the terrestrial works footprint of the Project.

Current uses adjacent to the Project Area include:

- The Project is located on former landfill site and adjacent to the STP.
- The proposed seawater intake tunnel runs underneath areas currently used as road corridor, parks, the Noraville cemetery and portions of the STP.
- The location of the construction shaft for the seawater intake tunnel is located at the Jenny Dixon Reserve which is mainly used as a park and for recreation.
- Proposed new power supply to be located within existing road reserves.
- Proposed indicative construction areas are undeveloped bushland, containing native and exotic species.
- Urban housing and other infrastructure.
- Wyrrabalong National Park to the south.
- Jenny Dixon Beach and Jenny Dixon Reserve for public recreational use.
- Ausgrid Noraville Substation.
- Remnant vegetation dominated by exotic species.

Proposed uses
The development of the Project will include site establishment, construction, civil works, maintenance, seawater intake infrastructure, treated water pipeline, plant and power upgrades which will modify the current land usage

At this time, there are no other proposed uses known.

3.1.3 Describe any outstanding natural features and/or any other important or unique values that applies to the project area.

National Parks and Reserves in proximity to the Project

The closest national park is Wyrrabalong National Park which commences approximately 500 m south of the Project Area. Other Commonwealth, State and Territory Reserves under the EPBC Act located nearby include:

- Munmorah State Conservation Area, approximately 4.4 km north of the Project area.
- Tuggerah State Conservation Area, approximately 8.8 km south-west of the Project area.
- Colongra Swamp Nature Reserve, approximately 6.5 km north of the Project area.
- Tuggerah Nature Reserve, approximately 9.8 km south-west of the Project area.
- Lake Macquarie State Conservation Area, approximately 10.8 km north of the Project area.
- Bird Island Nature Reserve, approximately 5.6 km north-east of the Project area.

Other key natural features in the Project surrounds include:

- Jenny Dixon Beach and Jenny Dixon Reserve which partially intersects the seawater intake tunnel.
- Norah Head Recreation Reserve is approximately 500 m south-east of the seawater intake tunnel.
- Toukley Recreation Reserve is approximately 400 north-west of the seawater intake tunnel.

Key ecological feature (KEF)

There are no KEFs within the Project area. The closest KEF to the seawater intake tunnel is the Canyons of the eastern continental slope, approximately 75 km east of the seawater intake tunnel.

Biologically Important Areas

The PMST search identified nine Biologically Important Areas (BIA) for protected marine species nearby (within 10 km) of the Project. However, only 6 of the 9 BIAs are in the vicinity (<2 km) of the seawater intake tunnel, these are for the species and their behaviours including the Humpback Whale, Sooty Shearwater, Wedge-tailed Shearwater, Short-tailed Shearwater, Indo-pacific/Spotted Bottlenose dolphin, and the Grey Nurse Shark.

- Humpback Whale (*Megaptera novaeangliae*) – The seawater intake tunnel overlaps with a Humpback Whale migration route (north and south).
- Sooty Shearwater (*Ardenna grisea*) – The seawater intake tunnel overlaps with a Sooty Shearwater foraging BIA.
- Short-tailed Shearwater (*Ardenna tenuirostris*)- The seawater intake tunnel overlaps with a Short-tailed Shearwater foraging BIA.
- Wedge-tailed Shearwater (*Ardenna pacifica*)- The seawater intake tunnel overlaps with a Wedge-tailed Shearwater foraging BIA.
- Indo-Pacific/Spotted bottlenose dolphin (*Tursiops aduncus*) – The seawater intake tunnel overlaps with a Indo-Pacific/Spotted bottlenose dolphin breeding BIA.
- Grey Nurse Shark (*Carcharias taurus*) – The seawater intake tunnel overlaps with a Grey Nurse Shark foraging and reproduction (October-November season) BIA.

Marine protected areas

There are no marine protected areas (Australian Marine Parks, marine and coastal parks, marine park or marine reserves) within the Project area. The nearest marine protected area is Port Stephens – Great Lakes Marine Park which is approximately 67 km north-east of the Project area.

Commonwealth fisheries

There are four identified Commonwealth fisheries that are nearby (within 10 km) of the marine component of the Project: Eastern Tuna and Billfish fishery, Skipjack Tuna Fishery, Southern Bluefin Tuna Fishery, and Southern Squid Jig Fishery.

3.1.4 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

In the terrestrial area surrounding the existing Toukley STP and the proposed desalination plant, the gradient slopes gently downwards (between 0 and 5 degrees), in the South and West directions. Other than this, the area is generally flat. For the intake tunnel and shaft laydown area the East facing gradient (down to sea level) is up to 20 degrees. This is the steepest gradient in the Project Area.

Construction (desalination plant and laydown areas):

- North, forest - Upslope / flat
- North-east, forest - 0 to 5 degrees downslope
- South-east, forest - Upslope / flat
- South, tall heath - 0 to 5 degrees downslope
- West, forest - 0 to 5 degrees downslope

Construction (intake tunnel shaft laydown area):

- East, forest - >20 degrees downslope
- West, forest - 0 to 5 degrees downslope

Operation (desalination plant):

- North, forest - Upslope / flat
- East, forest - Upslope / flat
- South-east, forest - Upslope / flat
- South, forest - 0 to 5 degrees downslope
- West, forest - 0 to 5 degrees downslope

The submerged offshore intake structure would be located approximately 1 km off the coastline at Jenny Dixon Beach, at a water depth of approximately 20 m.

The power supply corridor does have areas of higher elevation (approximately 50 m at the most elevated point).

3.2 Flora and fauna

3.2.1 Describe the flora and fauna within the affected area and attach any investigations of surveys if applicable.

Assessments undertaken informing this section:

- Terrestrial Biodiversity MNES Report (Attachment 2).
- Marine Desktop Assessment (Attachment 3).

A literature and database review was used to assist in the assessment of potential MNES. Four assessments of significance including MNES likelihood of occurrence were undertaken based on database searches within a 10 km buffer around the Project Area and outcomes of targeted surveys. There were no threatened flora or fauna records of MNES previously recorded within the Project Area.

Terrestrial fauna

The Protected Matters Search Tool (PMST) identified 125 threatened fauna values that had been recorded or predicted to occur within the locality (10 km). These included

- 79 birds (Of the 79 identified bird species, 57 were listed as migratory and 31 were migratory birds listed as threatened)
- 14 mammals
- Six reptiles
- 23 flora
- Three amphibians

Following the desktop review, targeted fauna surveys were conducted throughout the Project Area in August, September, November, December 2025 and January 2026, targeting potentially occurring EPBC Act listed species. In addition, targeted Koala surveys were also conducted during October, December 2025 and January 2026, including spotlighting, call playback and scat searches. No EPBC listed threatened or migratory fauna species were detected during these targeted surveys.

These assessments suggested that the following fauna species had the potential to occur within the Project Area based on nearby records and potentially suitable habitat. See Attachment 2 for Figures 3-1 and 3-2 for records of these species.

***Lathamus discolor* (Swift Parrot) – Critically Endangered**

Targeted surveys determined that there were no individuals or populations of these species within the Project Area.

The Project Area contains potential foraging habitat; however, it is not listed as critical habitat under the national recovery plan for the species. As suitable habitat of equal or greater quality is available throughout the locality, the Project Area vegetation is likely only to be used opportunistically for foraging.

***Phascolarctos cinereus* (Koala) – Endangered**

Targeted surveys determined that there were no individuals or populations of these species within the Project Area. The majority of the Project Area contains wet sclerophyll woodlands, with *Eucalyptus robusta*, *E. pilularis* and *E. tereticornis* present, of which are listed as either preferred or high use tree species for koalas in the central coast area.

The Project Area contains three canopy species that are listed under the Central Coast tree list for Koala use: *Eucalyptus robusta* (High preferred use), *Corymbia gummifera* (Significant use) and *Angophora costata* (Significant use). Although these species are abundant throughout the Project Area, suitable habitat of equal or greater quality is available within the locality.

Terrestrial flora

The PMST identified a total of 23 threatened flora species listed under the EPBC Act which have the potential to occur within the Project Area. Refer to Attachment 2, Table 3-5 for the likelihood of occurrence for these species. No threatened flora species were observed across the Project Area from any of the incidental or targeted flora surveys which were conducted in August-December 2025 and January 2026. This included eight vegetation integrity floristic plots within the Project Area and in accordance with the NSW Biodiversity Assessment Method.

Of these 23 threatened flora species, two were assessed as either a high or moderate likelihood of occurring within the Project Area. See Attachment 2 for Figures 3-3 and 3-4 for records of these species.

***Angophora inopina* (Charmhaven Apple)**

There are 2,637 previously recorded Charmhaven Apple individuals located within the 10 km locality. These are concentrated in a Council reserve to the north of the Project Area. Within the Project Area, PCT 3544 is an associated vegetation community of the species (see Attachment 2, Figure 2-1), however this is of low to moderate quality. While there are no known individuals within the Project Area, there is one individual within 50 m of the Project, and five others in the same property (Attachment 2 for Figures 3-3). They are located at the end of the power upgrades, within the easement of an existing transmission line on the corner of Mataram Road and the Pacific Highway.

***Syzygium paniculatum* (Magenta Lilly Pilly)**

There were 101 Magenta Lilly Pilly individuals previously recorded within the 10 km locality. Within the Project Area, PCT 3544 is an associated vegetation community of the species (Attachment 2, Figure 2-1), however this is of low to moderate quality. There is similar and higher quality habitat in the locality of the Project Area, including in nature reserves and national parks. While there are no known individuals within the Project Area, the closest individual appears to be planted in the Noraville Cemetery to the north of the Project Area.

Threatened ecological communities (TECs)

According to the PMST, five threatened ecological communities listed under the EPBC Act have the potential to occur within the Project Area (within a 10 km). However, during the ecological surveys, no EPBC Act listed TECs were observed to occur within the Project Area. One Plant Community Type (PCT) (NSW) was confirmed during the ecological surveys: PCT 3544 Coastal Sands Apple-Blackbutt Forest (Attachment 2, Figure 2-1).

Marine flora and fauna

The physical benthic environment at Norah Head, including where the outfall is located at Jenny Dixon beach, has a mix of sub tidal rocky bottom reefs and intertidal rock platform. The subtidal rocky reef habitat is dominated by algae including canopy forming algal assemblages dominated by golden kelp (*Ecklonia radiata*), red algae (*Lithothamnion)* and sessile invertebrate species including sponges and ascidians. Other benthic species found in the substratum include hydroids, polychaetes, molluscs and crustaceans. Norah Head's shallow subtidal community is typical of the temperate Australian east coast.

As part of the Marine Desktop Assessment, the PMST was used to identify protected MNES in a 10 km buffer around the proposed Jenny Dixon intake pipe. As the terrestrial MNES species have been noted above, this section will only pertain to marine species.

The following marine MNES were identified to occur within 10 km of the intake tunnel at Jenny Dixon Beach:

- One Commonwealth Marine Area
- Nine Biologically Important Areas
- 58 Listed Threatened Species
- 44 Listed Migratory Species
- 104 Listed Marine Species
- 15 Listed Cetaceans

The 102 listed threatened and migratory species include:

- 17 marine mammals
- Six marine reptiles
- Seven sharks
- Two rays
- 70 birds

There are no marine State and Territory reserves within 10 km of the Project. The closest Marine Park is the Port Stephens – Great Lakes Marine Park that is approximately 71 km north of Norah had and Jervis Bay Marine Park approximately 200 km away from Norah Head.

From a State perspective, the NSW Office of Environment and Heritage BioNet Atlas (licensed) for records of threatened species, populations and endangered ecological communities listed under the NSW *Biodiversity Conservation Act 2016* and *Fisheries Management Act 1994* was interrogated to identify records relevant to the Project (OEH, 2019). The majority of identified marine matters protected by State legislation relevant to the Project are also listed as MNES. An additional 11 bird species listed solely under State legislation were identified through the BioNet assessment as relevant to the Project. Nine bird species and three turtle species were listed under both the Commonwealth EPBC Act and the state acts. Two species identified within 10 km of the Project; the Black Rockcod (*Epinephelus daemelii*) and the Great White Shark (*Carcharodon carcharias*) are listed as Vulnerable under the NSW *Fisheries Management Act 2007*.

Other Matters Protected by the EPBC Act

The following MNES were potential predicted to occur within 10 km of the intake tunnel at Jenny Dixon Beach:

- Ten Commonwealth Lands
- 104 Listed Marine Species
- 15 whales and other cetaceans

3.2.2 Describe the vegetation (including the status of native vegetation and soil) within the project area.

The Project Area for the desalination plant and associated infrastructure would comprise approximately 41 hectares, of which is 11.83 hectares of native vegetation is proposed to be removed (10 hectares in moderate condition, 0.29 in low and 1.54 in poor condition).

Native vegetation

Vegetation surveys conducted for the Project have confirmed the presence of one Plant Community Type (PCT). This PCT is not an EPBC listed species or part of a Threatened Ecological Community. The PCT mapped within the Project Area is PCT 3544 Coastal Sands Apple-Blackbutt Forest. This PCT is found in three different condition zones: moderate, low and poor with regards to functional elements (hollows in trees, litter cover, length of logs and the stem sizes of trees present), species diversity and species composition.

Marine

As outlined in Section 3.2.1 the marine landscape is a mix of sand and rocky substrate reef. These rocky reefs support a variety of species in New South Wales including a variety of mosaic habitats such as kelp forest and urchin-grazed barrens as well as a variety of benthic species including sponges, sea squirts and kelp.

3.3 Heritage

3.3.1 Describe any Commonwealth Heritage Places Overseas or other places recognised as having heritage values that apply to the project area.

No areas of Commonwealth Heritage were identified by the PMST within 10 km of the Project.

The following heritage listings are in, or in the vicinity of the Project area:

- The Noraville Cemetery and Edward Hargraves' grave (Place ID: I180), within the Project area (no direct impact. seawater intake tunnel located below this item).
- Norah Head Light station Precinct (Place ID: I176), approximately 1.45 km east of the Project.
- Norah Head Reserve (Place ID: I177), approximately 1.45 km east of the Project.
- Noraville, house and garden (Place ID: I178), approximately 300 m north of the Project.
- Noraville General Store (Place ID: I179), approximately 450 m north-west of the Project.

The Project area is located within the boundaries of the Aboriginal Nominated Place 'Sydney Cultural Crescent Rock Art' (Place ID: 106369) on the National Heritage List. The nomination states: *This place could have outstanding heritage value to the nation due the place's significant density of rock art over an area of approximately 2 million hectares of eastern NSW. Rock art is described by Indigenous elders as their history books, with the largest sites being libraries, and provides a tangible record of the Aboriginal peoples' traditions, presence, cultural practices and knowledge systems.* No rock art is currently recorded within the Project area.

There are five known shipwrecks within 1.3 km of the Project area at Norah Head, including:

- Ceres, Speedwell, Gwydir, Tamar and Thomas H Walter.

These will not be impacted by the project.

3.3.2 Describe any Indigenous heritage values that apply to the project area.

A draft Aboriginal Cultural Heritage Assessment has been undertaken for the Project with the below findings.

A search conducted by the Office of the Registrar, *Aboriginal Land Rights Act 1983* listed no Aboriginal Owners with land within the Study Area. The Joint Management Coordinatory for the Worimi Conservation Lands and Darkinjung Local Aboriginal Land Council is underway.

A search of the Aboriginal Heritage Information Management System (AHIMS) database identified 74 Aboriginal sites within an 8 km radius of the Study Area. One registered site appears to be located within the Study Area. The assessment did not identify any tangible Aboriginal cultural heritage values and was assessed as having low archaeological potential due to existing disturbances within the Project Area.

3.4 Hydrology

3.4.1 Describe the hydrology characteristics that apply to the project area and attach any hydrological investigations or surveys if applicable. *

The site is located on the eastern coastline of the Tuggerah Lakes Catchment, which forms part of the broader Macquarie-Tuggerah catchment area. The Central Coast Council also draws from the region to provide the municipal water supply. The surface water system of the catchment consists of estuaries, controlled rivers, uncontrolled streams, and waterways affected by urban development. Tuggerah Lake is a major estuary located immediately west of the desalination plant site at Norah Head and connects to the ocean at The Entrance. The main river system in the southern section is the Wyong River, which runs south-east for approximately 48 km to meet Tuggerah Lake at Tacoma. Located south of Wyong River is Ourimbah Creek, which runs south-east for 31 km to meet Tuggerah Lake at Chittaway. Major tributaries of Ourimbah Creek include Elliots, Bumbles, Toobys, and Bangalow Creeks.

Marine sediment deposits are prominent along major watercourses, forming barrier beach systems around Tuggerah Lake and Lake Munmorah. Human activities have significantly impacted these waterways, contributing to both point source and diffuse pollution, and altering natural flow patterns. Changes in land use and vegetation cover have exacerbated water quality issues, leading to erosion and salinity risks. Most rivers and creeks in the catchment are unregulated and lack major storage infrastructure, making them particularly vulnerable during dry periods when natural flows are low and water demand is high.

The desalination plant site is located in the suburb of Norah Head which is bounded by Tuggerah Lake to the west, and the Pacific Ocean to the east. The site location is classified as area with waterways affected by urban development.

4. Impacts and mitigation

4.1 Impact details

Potential Matters of National Environmental Significance (MNES) relevant to your proposed action area.

EPBC Act section	Controlling provision	Impacted	Reviewed
S12	World Heritage	No	Yes
S15B	National Heritage	No	Yes
S16	Ramsar Wetland	No	Yes
S18	Threatened Species and Ecological Communities	Yes	Yes
S20	Migratory Species	Yes	Yes
S21	Nuclear	No	Yes
S23	Commonwealth Marine Area	No	Yes
S24B	Great Barrier Reef	No	Yes
S24D	Water resource in relation to large coal mining development or coal seam gas	No	Yes
S26	Commonwealth Land	No	Yes
S27B	Commonwealth Heritage Places Overseas	No	Yes
S28	Commonwealth or Commonwealth Agency	No	Yes

4.1.1 World Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.1.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.1.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No World Heritage Properties were identified by the PMST within 10 km of the project area. No direct or indirect impacts to World Heritage Properties are expected.

4.1.2 National Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.2.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.2.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No National Heritage places were identified by the PMST within 10 km of the project area. No direct or indirect impacts to National Heritage places are expected.

4.1.3 Ramsar Wetland

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.3.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.3.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No Ramsar wetlands were identified by the PMST within 10 km of the project area. No direct or indirect impacts to Ramsar wetlands are expected. The nearest Ramsar wetland is the Hunter Estuary Wetlands approximately 50 km north-east of the project area in Newcastle, NSW.

4.1.4 Threatened Species and Ecological Communities

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Threatened species

Direct impact	Indirect impact	Species	Common name
No	Yes	Angophora inopina	Charmhaven Apple
No	Yes	Balaenoptera borealis	Sei Whale
No	Yes	Balaenoptera musculus	Blue Whale
No	Yes	Balaenoptera physalus	Fin Whale
No	Yes	Carcharias taurus (east coast population)	Grey Nurse Shark (east coast population)
No	Yes	Carcharodon carcharias	White Shark, Great White Shark
No	Yes	Caretta caretta	Loggerhead Turtle
No	Yes	Chelonia mydas	Green Turtle
No	Yes	Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth
No	Yes	Epinephelus daemelii	Black Rockcod, Black Cod, Saddled Rockcod
No	Yes	Eretmochelys imbricata	Hawksbill Turtle
No	Yes	Eubalaena australis	Southern Right Whale
No	Yes	Hippocampus whitei	White's Seahorse, Crowned Seahorse, Sydney Seahorse
Yes	Yes	Lathamus discolor	Swift Parrot
No	Yes	Natator depressus	Flatback Turtle
Yes	Yes	Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)
No	Yes	Prototroctes maraena	Australian Grayling
No	Yes	Syzygium paniculatum	Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry

Ecological communities

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4.1.4.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

4.1.4.2 Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

Terrestrial

Direct impact pathways of the Project to terrestrial fauna and flora include:

- Direct loss of vegetation and fauna habitat:
  - Loss and disturbance of native vegetation and associated vegetation communities and listed threatened flora.
  - Loss, degradation and/or fragmentation of habitat for listed threatened fauna species.
  - Loss, degradation, barrier effects and/or fragmentation of terrestrial habitat.
- Direct loss of fauna:
  - Injury, mortality or displacement of fauna during construction or operation.
  - Physical effects to fauna populations, including breeding/roosting/foraging habitats from construction activities or unplanned events.

Indirect impact pathways of the Project to terrestrial fauna and flora include:

- Loss or degradation of vegetation and fauna habitat including ground disturbance, sedimentation and erosion, changes in surface water quality, hydrological and groundwater changes, dust and noise.
- Introduction and/or spread of weeds, pathogens and other pest plants and animals.
- Dewatering of groundwater during construction resulting in changes to groundwater dependent ecosystems.
- Ground disturbance increasing the risks of acid sulfate soils.

The Terrestrial Biodiversity MNES Report (Attachment 2, Section 3.3, p11) has identified 130 threatened values via PMST that have been recorded and/or predicted to occur within the locality (i.e. within 10 km of the Project. The assessment has considered the collective results from the desktop assessment and surveys conducted on site. There were no threatened flora or fauna records of MNES previously recorded within the Project Area.

The MNES Likelihood of Occurrence assessment used five categories of likelihoods ranging from None, Low, Moderate, High, and Known.

Of the 130 threatened species, three were categorised as having Moderate likelihood to occur within the Project Area and one was categorised as having High likelihood of occurrence within the Project Area. Assessments of Significance were undertaken for these four species, as direct or indirect impacts may occur.

The terrestrial species that may experience direct or indirect impacts include:

- Fauna:
  - Swift Parrot (*Lathamus discolor)* – Critically Endangered
  - Koala (*Phascolarctos cinereus*) – Endangered
- Flora:
  - Charmhaven Apple (*Angophora inopina*) – Vulnerable
  - Magenta Lilly Pilly (*Syzygium paniculatum*) – Vulnerable

While other species may conceivably occur in and around the Project, given the very low likelihood of occurrence, they are not expected to be directly or indirectly impacted by the Project.

Marine

Direct impact pathways of the Project to marine fauna and flora include:

- Underwater noise and vibration from Project. Activities such as initial blasting for pipe tunnelling, use of vessels, geophysical and geotechnical surveys, pipe laying and installation of intake infrastructure.

May result in behavioural avoidance/disturbance, temporary or permanent acoustic injuries to sensitive marine fauna.
- Vessel discharges to the marine environment. Vessel routine discharges such as sewage and waste oily water from Project vessels (installation, maintenance and support vessels). Discharge of waste to marine environment could induce toxic effects in marine organisms within surrounding area.
- Impingement and entrainment. Suction of seawater due to operation of intake pipe may result in entrainment of small organisms through the intake screens and into the intake system, and Impingement of fauna against the intake screen by the force of water flow and are unable to escape.
- Physical seabed disturbance. Caused by sediment sampling and geotechnical surveys, pipe jacking, segmentally lined tunnel using a tunnelling boring machine, horizonal directional drilling (HDD) and direct pipe, anchoring by vessels. May cause release of HDD fluids into water column in event of accidental breakthrough, localised increase in suspended sediment and potential smothering of sessile organisms during construction works of pipe burial/ploughing activities, damage/removal of benthic habitats (such as rocky reef) from anchoring and subsea infrastructure, suspension of sediments and increase in turbidity.
- Artificial lighting from Project vessels during night works and work barges safety lighting. May result in attraction of some species, attraction of prey species, and/or disorientation effects.
- Vessel strikes (unplanned) to marine fauna can cause physical injury or death.
- Dropped objects and waste from vessels (unplanned) can result in changes in water and sediment quality, impact health of flora and fauna, disturb benthic communities.
- Fuel/chemical spills/hydraulic spills (unplanned). Potential risk of release of drilling fluids during HDD construction activities, release of hydrocarbons due to vessel collision/fuel tank rupture, smothering of fauna, flora and ecological communities due to release of liquids.
- Brine discharge plume from existing outfall location with the potential risk of sudden exposure to very high salinity to marine fauna.

Indirect impact pathways of the Project to marine fauna and flora include:

- Physical presence of infrastructure below water may result in changes to benthic habitats that may change prey availability or alter the spatial distribution of biological productivity in the water column which may indirectly impact marine fauna.
- Underwater noise and vibration may result in behavioural disturbances which may indirectly result in the reduction in prey species.
- Unplanned introduction of invasive marine species (IMS) may cause significant disruption to existing marine communities, ecosystem health, biodiversity, fisheries and aquaculture, and introduction of new hard substrate may provide settling habitat for fauna and flora atypical to the region.

From these, the key marine environmental impact pathways identified include:

- Seabed disturbance and associated turbidity and water quality impacts
- Impingement and entrainment
- Artificial noise emissions
- Interactions with marine fauna
- Biosecurity

The 14 potentially impacted threatened marine species that have the potential to occur include:

- Four marine mammals
- Five marine reptiles
- Two sharks
- Three fish

4.1.4.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

No

4.1.4.6 Describe why you do not consider this to be a Significant Impact. *

Terrestrial

The Project is not expected to have a Significant Impact on any MNES.

The four species with a moderate to high likelihood of occurrence within the Project Area were assessed against the Significant impact guidelines 1.1 (2013). The assessment (Attachment 2, Section 3.5, p36-48) found that no significant impact is expected for any of the assessed species.

Swift Parrot (*Lathamus discolor*) – Critically Endangered

While the species has a moderate likelihood of occurrence within the Project Area, the Project is unlikely **to** significant impact to the species. No individuals were found during targeted surveys of the site. The key impact is the removal of potential habitat by the Project, consisting of 11.83 ha of potential foraging habitat (non-critical habitat under the national recovery plan for the species). There are no hollow-bearing trees suitable for parrots within the Project Area, however there are many suitable hollows surrounding the Project Area. There is an expansive amount of adjacent vegetation that is in similar or better condition to that being impacted by the Project which the parrots are more likely to use.

Direct and indirect impacts to the species are not considered to trigger any of the significant impact criteria for the species.

Koala (*Phascolarctos cinereus*) – Endangered

The species has a moderate likelihood of occurrence within the Project Area, with three suitable primary feed trees present including *Eucalyptus robusta* (high preferred use)*, Corymbia gummifera* (significant use)*,* and *Angophora costata* (significant use). The Project Area contains wet sclerophyll woodlands, with ***E.*** *robusta*, *E. pilularis* and *E. tereticornis* present**,** listed as either preferred or high use tree species for koalas in the central coast area. Although these tree species are abundant throughout the Project Area, suitable habitat of equal or greater quality is available within the nearby Wyrrabalong National Park. Surveys have been completed as per NSW guidelines including two nights of spotlighting and seven SAT plots, with no individuals or evidence of the species found. The key impact is the Project's removal of 11.83 ha of native vegetation; however, this is unlikely to result in any significant impacts to the species.

Direct and indirect impacts to the species are not considered to trigger any of the significant impact criteria for the species.

Charmhaven Apple (*Angophora inopina*) – Vulnerable

This species has a high likelihood of occurrence within the Project Area. Targeted surveys did not find any individuals within the Project Area, although one individual was within 50 m of the powerline supply corridor**,** east of the existing transmission hub. The key impact is the Project's removal of 11.83 ha of native vegetation**.** However, this vegetation is low to moderate quality, and not habitat critical to the survival of the species, therefore this removal is unlikely to result in any significant impacts to the species.

Direct and indirect impacts to the species are not considered to trigger any of the significant impact criteria for the species.

Magenta Lilly Pilly (*Syzygium paniculatum*) – Vulnerable

The species has a moderate likelihood of occurrence within the Project Area. The Project Area has marginal suitable habitat to support the species. Targeted surveys did not identify any individuals. The closest individual to the Project Area is within Noraville Cemetery, north of the Project, with 101 individuals previously recorded within 10 km of the Project.

The key impact is the Project's removal of 11.83 ha of **native vegetation** PCT 3544, however as this vegetation is of low to moderate quality, and is not habitat critical to the survival of the species, its removal is not considered to lead to a significant impact for the species.

Direct and indirect impacts to the species are not considered to trigger any of the significant impact criteria for the species.

Marine

Seabed disturbance, associated turbidity and water quality impacts

Pipeline installation activities are expected to overlay sediment. During construction this will result in sediment displacement in the direct footprint of the pipeline. During operation, localised scouring of sediment is likely to occur. The pipeline will create low relief habitat, an attachment opportunity not previously present, localised habitat and fouling opportunities (pending any treatments). Potential indirect impacts include generation of turbid plumes that will lead to suspension of sediment, affecting filter feeding organisms. Given the presence of rocky reef habitat, there is the potential for the smothering of sessile organisms that exist within close proximity to the installation activities. Turbidity has the potential to impact fish feeding ability, fish gills causing damage, feeding and respiratory organs of filter-feeding organisms.

Impact of the brine discharge at the existing marine outfall location has been considered. Near field modelling was undertaken of the immediate proximity to the undersea outlet diffuser. This evaluated the near-field mixing of the existing outfall infrastructure for the proposed comingled mixture (WWTP effluent and desalination brine mixture) in the marine environment. The comingled discharge, which undergoes momentum or buoyancy driven transport and enhanced mixing along its trajectory through the water column, will be released through the existing STP Norah Head ocean outfall point. This process reduces the impact of brine discharge as the discharge becomes quickly diluted in the marine environment once it leaves the outfall. Further assessment will be undertaken in the form of far-field modelling to understand and assess any further impacts to the marine environment.

Impingement and entrainment

Entrainment occurs when organisms that are small enough to pass through the intake screens and are caught in the intake system. Impingement occurs when larger organisms become trapped against the intake screen by the force of the water flow.

A review of US and United Kingdom power plants with ocean intakes show no empirical evidence that reducing entrainment and impingement would result in measurable improvements in marine fish populations. At the Sydney Desalination Plant entrainment was estimated at approximately 2% of local fish larvae for a productive capacity of 500 ML/day. Entrainment of larvae for a 125 ML/day productive capacity would be significantly less.

Larval fish life history stages may be entrained from the intake structure. Impingement could affect marine turtles, however there are no known aggregation or nesting sites within the Project Area. Turtles in the Project Area are therefore not likely to be hatchlings and as risk decreases with body size, are less likely to be affected directly by entrainment and impingement.

Artificial noise emissions

Anthropogenic noise can represent a threat to several taxonomic groups such as marine mammals, sharks, marine fishes and marine turtles. Humpback whales, southern right whales, fur seals and dolphins have the potential to overlap with the intake pipe route.

Compared to species such as marine mammals and fish, the impacts of noise on marine turtles are less well understood and there is very limited evidence that underwater noise impacts seabirds foraging, largely because exposure duration is restricted to underwater foraging events and is therefore short lasting. Impacts of anthropogenic noise on sensitive marine fauna include acoustic injury (temporary or permanent threshold shift), behavioural disturbance and displacement.

The proposed intake pipe laying and structure activities will generate above ground and underwater noise related to installation of the pipe (including one initial underwater blast), engine and general vessel operations. Vessels are expected to use sounders and other navigational equipment to support vessel

positioning and pipe laying operations. Impacts of these activities will be managed by implementing safety zones overseen by suitably-qualified marine fauna observers. Vessel noise will be managed by reducing vessel speed in the Project **A**rea.

Vessel interaction with marine fauna

More frequent vessel transits in the area will occur through all phases of the Project, which could lead to increased risk of vessel strikes for surface-orientated megafauna such as cetaceans, pinnipeds, and marine turtles.The consequences to fauna include changes to fauna behavioural patterns, injury or death of the animal due to a direct collision with construction vessels or entanglement with construction equipment. The risk of vessel strike is very low for vessels travelling less than 10 knots, and negligible for most species for vessels travelling less than 5 knots. The primary mitigation for vessel strikes is vessel speed reduction, which will also act to reduce vessel noise and likelihood of secondary entanglement.

Biosecurity

Invasive marine species (IMS) are identified as marine plants, animals and algae, which have been introduced into a location that is not within their natural dispersal range, but provides conditions that support their survivorship (DAFF, 2009). Vessels carrying IMS may unintentionally but successfully introduce these species to the region of the activity. IMS may be carried within the external biological fouling on the vessel hull, within seawater pipes (e.g. cooling water) and associated infrastructure or on submersible marine instruments and equipment. Ballast water exchange may also allow for the transportation and proliferation of IMPs within the activity area.

Sourcing vessels locally, ensuring that vessels adhere to Australian quarantine requirements and the proper management of ballast water (i.e. the possession of Australian Quarantine and Inspection Service (AQIS) Clearance documentation) prior to entry to the project area will assist in reducing the risk of introducing IMS.

4.1.4.7 Do you think your proposed action is a controlled action? *

No

4.1.4.9 Please elaborate why you do not think your proposed action is a controlled action. *

Terrestrial

Based on the results of terrestrial MNES biodiversity assessments for the Project, the likelihood of occurrence assessment, and formal Assessments of Significance, as well as the understood nature of construction impacts, the Project is not expected to have a significant impact on any terrestrial MNES.

Marine

Impacts of construction on marine environment (e.g. noise impacts, water quality impacts etc.) are short term and temporary, and in the case of impacts to the benthic environment and water quality, are limited to a relatively small area. The potential impacts of the blast on sensitive species will also be transient in time, but owing to the propagation of sound underwater, will occur over a larger spatial area. Underwater noise impacts will be mitigated by safety zones overseen by suitably-qualified marine fauna observers, and as such, underwater noise is not likely to have significant impacts on marine MNES.

Similarly, the operational environmental impacts of the water treatment plant on MNES are unlikely to be significant, given the open-ocean environment at the discharge location, which will act to rapidly disperse brine discharge. Impacts of water intake (impingement and entrainment) on plankton and early life history stages of fishes and invertebrates are also unlikely to be significant at this location, in light of the large populations and large spatial scale of pelagic dispersal for these species.

As no significant impacts are expected, and mitigation measures have been identified to manage the identified impacts, a controlled action under the EPBC Act is not required.

4.1.4.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Terrestrial

Environmental constraints such as sensitive vegetation, aquatic habitats, and existing utilities have been considered in the Project design to avoid impacts.

Avoidance:

Specifically, the design of the Project avoids impacts to the nearby Critically Endangered Littoral Rainforest and Coastal Vine Thickets of Eastern Australia TEC. Avoidance of TECs was a key factor in determining the design of the seawater intake, i.e. tunnelling the entirety of the intake alignment. The Project also avoids known occurrences of threatened species (Attachment 2, Figures 3-1 to 3-4), with one known individual of the Charmhaven Apple (*Angophora inopina)* within 50 m of the powerline corridor designed to be avoided.

Mitigation:

A Construction Environmental Management Plan (CEMP) would be implemented for the construction phase of the Project. The CEMP would include, as a minimum, industry-standard measures for the management of soil, surface water, weeds and pollutants, as well as site-specific measures. The proposed mitigation measures would include environmental safeguards for protection of neighbouring areas and waterways in accordance with relevant policy documentation and Government guidelines.

CEMP site specific measures may include mitigations such as:

- Pre-clearance surveys of the vegetation to be removed for threatened fauna. Surveys to be undertaken by an Ecologist prior to any vegetation or ground disturbance. These surveys will confirm the presence of threatened species, habitats and other features within impact areas When required, an ecologist will supervise vegetation clearing and other high-risk activities to ensure compliance with approval conditions and manage unexpected finds. If fauna are encountered, appropriate fauna handling, relocation or stop-work procedures will be implemented in accordance with relevant guidelines.
- Procedure to manage unexpected threatened species finds during vegetation clearing.
- Limit disturbance of vegetation to the minimum necessary to undertake the works.
- Prior to the commencement of any work adjoining areas of native vegetation, clearly delineate the construction area marking the limits of clearing to avoid unintended clearing of adjacent native vegetation. This will be done using fencing, flagging and signage prior to works commencing and will be shown on construction plans where practicable. Within these zones access, vehicle movement, stockpiling and disturbance will be strictly prohibited unless otherwise approved. Regular inspections will be undertaken to ensure the integrity of protection measures is maintained throughout construction.
- Workforce education and training – involving construction personnel to undergo site-specific environmental and heritage induction and training prior to works. Ongoing toolbox talks will be used to reinforce environmental responsibilities and site-specific risks as works progress. Training will include awareness of surrounding ecological values such as MNES species, identification of key environmental and heritage constraints, legal obligations and the required mitigation measures to address all of these.
- Erosion and sediment control – such controls will be implemented to limit off-site impacts to surrounding land and waterways. Controls will be appropriate to site conditions and scale of disturbance. Measures may include diversion drains, sediment fencing, stabilised access points and progressive rehabilitation of disturbed areas. Controls will be regularly inspected and maintained especially following rainfall.
- Weed management – controls will include vehicle and equipment hygiene measures, use of clean fill and materials, and prompt stabilisation and revegetation of disturbed areas where practicable. Any declared or priority weed species identified during works will be managed in accordance with legislation and best-practice control methods.

Biodiversity impacts associated with the Project can be appropriately managed through NSW assessment frameworks and standard mitigation measures. The Project has been designed to avoid known individuals of threatened flora in proximity to the works and to minimise impacts on remnant vegetation.

Marine

Impact mitigations for marine species are discussed below and sorted by type of impact.

Seabed disturbance and associated turbidity and water quality impacts

Water-based drilling fluids are considered the most environmentally acceptable drilling fluids because of their low toxicity and their ability to disperse easily and degrade rapidly, and would be used for the Project. Any localised increase in suspended sediment during installation works associated with the intake pipe structure would be temporary in nature with sediment settling and dispersing quickly out of suspension.

The Project would consider the construction option with least disturbance to the seabed area, with the least risk of break out of drilling fluids. Controlling the speed of drilling to surface would also minimise the volume of drilling fluids released into the marine environment. Visual observations during drilling for signs of increased turbidity and sedimentation, and the implementation of an Emergency Management Plan to support drilling activities, would be undertaken.

Impingement and entrainment

The marine desktop assessment (Attachment 3, Section 7.1.2, p24) found that the impacts of impingement and entrainment from larger seawater desalination plants (than the proposed Project) with open ocean intakes is not significant and would not have a measurable impact on the natural environment. Thus, at a much smaller inlet capacity of 60 ML/d, it is expected that entrainment and impingement will not significantly impact fish or marine invertebrate populations at the proposed intake pipe for the Project.

The proposed intake structure and pipe will be designed with consideration for low flow velocity and volume and reducing impacts on larvae and fish in the surrounding environment.

Artificial noise emissions

The impacts of the blasting on sensitive marine fauna will be mitigated by implementing safety zones (shutdown and observation) that are overseen by suitably-qualified marine fauna observers (MFOs), in addition to a pre-start observation period and a post-blasting search. Similarly, vessels will maintain watch for cetaceans (whales and dolphins) during construction and transit through the Project area, and will maintain the vessel separation distances prescribed in Division 2.1 of the Biodiversity Conservation Regulations 2017 (NSW). Vessel noise will also be managed by vessel maintenance and limiting vessel transit speed in the Project area.

Interaction with marine fauna

Vessels are required for construction, maintenance and decommissioning of marine infrastructure associated with the Project.

The risks of vessels strike will be mitigated by limiting speed to <10 knots in the Project area, which is the fundamental factor affecting the outcome of interactions between vessels and marine megafauna according to DCCEEW's National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna (2017). Vessel speeds typically range between
6-10 knots during pipe-laying operations, with vessels expected to be largely stationary during construction. In order to reduce the chance of vessel interaction with marine fauna, the identified management and legislative control measures would be implemented. Vessels will be largely stationary or very slow moving during construction.

The potential for vessels to disturb cetaceans (dolphins and whales) will be managed by a suitably-qualified marine fauna observer/team who will be maintaining watch for cetaceans and adherence to the legislation that regulates the conduct of vessels around cetaceans, which is the Biodiversity Conservation Regulations

2017 of the Biodiversity Conservation Act 2016 (NSW) in NSW Coastal Waters and the EPBC Regulations 2000 (Division 8.1) of the EPBC Act for Commonwealth Waters. The rules are slightly different between the NSW State and Commonwealth regulations, but both align with the Australian National Guidelines for Whale and Dolphin Watching 2017 (Commonwealth of Australia, 2017).

Biosecurity

Sourcing vessels locally, ensuring that vessels adhere to Australian quarantine requirements and the proper management of ballast water (i.e., the possession of Australian Quarantine and Inspection Service Clearance documentation) prior to entry to the project area will assist in reducing the risk of introducing IMS.

Standard industry obligations such as spill prevention and management measures and the implementation of standard guidelines for the onshore storage and management of waste and hazardous materials.

4.1.4.11 Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

No significant residual impacts are expected for the Project, therefore there will be no required offsets.

4.1.5 Migratory Species

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Direct impact	Indirect impact	Species	Common name
No	Yes	Balaena glacialis australis	Southern Right Whale
No	Yes	Balaenoptera borealis	Sei Whale
No	Yes	Balaenoptera edeni	Bryde's Whale
No	Yes	Balaenoptera musculus	Blue Whale
No	Yes	Balaenoptera physalus	Fin Whale
No	Yes	Carcharodon carcharias	White Shark, Great White Shark
No	Yes	Caretta caretta	Loggerhead Turtle
No	Yes	Chelonia mydas	Green Turtle
No	Yes	Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth
No	Yes	Eretmochelys imbricata	Hawksbill Turtle
No	Yes	Manta alfredi	Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray
No	Yes	Megaptera novaeangliae	Humpback Whale
No	Yes	Natator depressus	Flatback Turtle
No	Yes	Orcinus orca	Killer Whale, Orca

4.1.5.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

4.1.5.2 Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

Terrestrial

Direct impact pathways of the Project to terrestrial fauna and flora include:

- Direct loss of vegetation and fauna habitat:
  - Loss and disturbance of native vegetation and associated vegetation communities and listed threatened flora
  - Loss, degradation and/or fragmentation of habitat for listed threatened fauna species
  - Loss, degradation, barrier effects and/or fragmentation of terrestrial habitat
- Direct loss of fauna
  - Injury, mortality or displacement of fauna during construction or operation
  - Physical effects to fauna populations, including breeding/roosting/foraging habitats from construction activities or unplanned events

Indirect impact pathways of the Project to terrestrial fauna and flora include:

- Loss or degradation of vegetation and fauna habitat including ground disturbance, sedimentation and erosion, changes in surface water quality, hydrological and groundwater changes, dust and noise.
- Introduction and/or spread of weeds, pathogens and other pest plants and animals.
- Dewatering of groundwater during construction resulting in changes to groundwater dependent ecosystems.
- Ground disturbance increasing the risks of acid sulfate soils.

The PMST desktop review identified 57 migratory birds as potentially occurring within 10 km of the Project.

Marine

Direct impact pathways of the Project to marine fauna and flora include:

- Underwater noise and vibration from Project. Activities such as initial blasting for pipe tunnelling, use of vessels, geophysical and geotechnical surveys, pipe laying and installation of intake infrastructure. May result in behavioural avoidance/disturbance, temporary or permanent acoustic injuries to sensitive marine fauna.
- Vessel discharges to the marine environment. Vessel routine discharges such as sewage and waste oily water from Project vessels (installation, maintenance and support vessels). Discharge of waste to marine environment could induce toxic effects in marine organisms within surrounding area.
- Impingement and entrainment. Suction of seawater due to operation of intake pipe may result in entrainment of small organisms through the intake screens and into the intake system, and Impingement of fauna against the intake screen by the force of water flow and are unable to escape.
- Physical seabed disturbance. Caused by sediment sampling and geotechnical surveys, pipe jacking, segmentally lined tunnel using a tunnelling boring machine, horizonal directional drilling (HDD) and direct pipe, anchoring by vessels. May cause release of HDD fluids into water column in event of accidental breakthrough, localised increase in suspended sediment and potential smothering of sessile organisms during construction works of pipe burial/ploughing activities, damage/removal of benthic habitats (such as rocky reef) from anchoring and subsea infrastructure, suspension of sediments and increase in turbidity.
- Artificial lighting from Project vessels during night works and work barges safety lighting. May result in attraction of some species, attraction of prey species, or disorientation effects.
- Vessel strikes (unplanned) to marine fauna can cause physical injury or death.
- Dropped objects and waste from vessels (unplanned) can result in changes in water and sediment quality, impact health of flora and fauna, disturb benthic communities.
- Fuel/chemical spills/hydraulic spills (unplanned). Potential risk of release of drilling fluids during HDD construction activities, release of hydrocarbons due to vessel collision/fuel tank rupture, smothering of fauna, flora and ecological communities due to release of liquids.

- Brine discharge plume from existing outfall location with the potential risk of sudden exposure to very high salinity to marine fauna.

Indirect impact pathways of the Project to marine fauna and flora include:

- Physical presence of infrastructure below water may result in changes to benthic habitats that may change prey availability or alter the spatial distribution of biological productivity in the water column which may indirectly impact marine fauna.
- Underwater noise and vibration may result in behavioural disturbances which may indirectly result in the reduction in prey species.
- Unplanned introduction of invasive marine species (IMS) may cause significant disruption to existing marine communities, ecosystem health, biodiversity, fisheries and aquaculture, and introduction of new hard substrate may provide settling habitat for fauna and flora atypical to the region.

The 14 potentially impacted migratory species that have the potential to occur in the marine area of the Project include:

- Seven marine mammals
- Five marine reptiles
- Two sharks

4.1.5.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

No

4.1.5.6 Describe why you do not consider this to be a Significant Impact. *

Terrestrial

All identified migratory birds had a low likelihood of occurrence within the Project Area, with no migratory bird species detected during targeted surveys. In the case of all migratory birds, there is a lack of suitable terrestrial habitat to support the species in the Project Area. Within the terrestrial section of the Project, there are no permanent waterbodies, and any nearby lakes are at a distance whereby the Project would be unlikely to indirectly impact it. Based on these findings, it is considered unlikely that the Project would have a direct or indirect impact on terrestrial migratory species.

Marine

Seabed disturbance and associated turbidity and water quality impacts

Dredged or excavated material is additionally expected to be produced by pipe installation activities. Such activities have the potential to impact directly on biofouling and benthic communities through direct removal of the substrate from the environment, and indirectly through generation of turbid plumes that will lead to suspension of sediment, affecting filter feeding organisms. Given the presence of rocky reef habitat, there is the potential for the smothering of sessile organisms that exist within close proximity to the installation activities. Turbidity has the potential to impact on fish feeding ability, fish gills causing damage, feeding and respiratory organs of filter-feeding organisms.

Impact of the brine discharge at the existing marine outfall location has been considered. Near field modelling was undertaken of the immediate proximity to the undersea outlet diffuser. This was done to evaluate the near-field mixing of the existing outfall infrastructure for the proposed comingled mixture (WWTP effluent and desalination brine mixture) in the marine environment. The comingled discharge, which will undergo momentum or buoyancy driven transport and enhanced mixing along its trajectory through the water column, will be released through the existing STP Norah Head ocean outfall point. This process reduces the impact of brine discharge as the discharge becomes quickly diluted into the marine environment once it leaves the outfall. Further assessment will be undertaken in the form of far-field modelling to understand and assess any further impacts to the marine environment.

Impingement and entrainment

Entrainment occurs when organisms that are small enough to pass through the intake screens, are caught within the current and drawn into the intake system. Impingement occurs when organisms of sufficient size to avoid passing through intake screens become trapped against the screen by the force of water flowing through and are unable to escape.

A review of impingement at US and United Kingdom power plants with ocean intakes by indicates that there is no empirical evidence to support a conclusion that reducing entrainment and impingement would result in measurable improvements in marine fish populations. The Sydney Desalination Plant was estimated to entrain approximately 2% of the total population of fish larvae in the local area around an intake for a productive capacity of 500 ML/day, while entrainment of larvae for a 125 ML/day productive capacity would be significantly less.

Artificial noise emissions

Anthropogenic noise can represent a threat to a number of taxonomic groups such as marine mammals, sharks, fishes and marine turtles. Marine mammals with the potential to overlap with the intake pipe route include humpback whales, southern right whales, fur seals and dolphins.

Compared to species such as marine mammals and teleost fish, the impacts of noise on marine turtles and sharks are less well understood, and there is very limited evidence that underwater noise impacts foraging by seabirds largely because exposure duration is restricted to underwater foraging events and is therefore short lasting. Impacts of anthropogenic noise on sensitive marine fauna include acoustic injury (including temporary or permanent threshold shift), behavioural disturbance and displacement.

The proposed intake pipe laying and intake structure activities will generate above ground and underwater noise related to installation of the pipe (including one initial underwater blast), engine and general vessel operations. Vessels are also expected to use sounders and other navigational equipment to support vessel positioning and pipe laying operations. Impacts of these activities will be managed by implementing safety zones overseen by suitably-qualified marine fauna observers. Vessel noise will also be managed by reducing vessel speed in the Project area.

Vessel interaction with marine fauna

An increase in the frequency of vessel transits in the area will occur through all phases of the Project, which could lead to increased risk of vessel strikes for surface-orientated megafauna such as cetaceans, pinnipeds and marine turtles.

The consequences to fauna of this risk ranges from changes to fauna behavioural patterns to injury or death of the animal as a result of a direct collision with construction vessels or of being entangled in equipment during construction.

The risk of vessel strike is very low for vessels travelling less than 10 knots, and negligible for most species for vessels travelling less than 5 knots. The primary mitigation for vessel strikes will therefore be vessel speed reduction, which will also act to reduce vessel noise and likelihood of secondary entanglement.

Biosecurity

Invasive marine species (IMS) are identified as marine plants, animals and algae, which have been introduced into a location that is not within their natural dispersal range, but which provides conditions that support their survivorship (DAFF, 2009). Vessels carrying IMS may unintentionally but successfully introduce these species to the region where the activity is occurring. IMS may be carried within the external biological fouling on the vessel hull, within seawater pipes (e.g. cooling water) and associated infrastructure or on submersible marine instruments and equipment. Ballast water exchange may also allow for the transportation and proliferation of IMPs within the area of activity.

Sourcing vessels locally, ensuring that vessels adhere to Australian quarantine requirements and the proper management of ballast water (i.e., the possession of Australian Quarantine and Inspection Service (AQIS) Clearance documentation) prior to entry to the project area will assist in reducing the risk of introducing IMS.

4.1.5.7 Do you think your proposed action is a controlled action? *

No

4.1.5.9 Please elaborate why you do not think your proposed action is a controlled action. *

Terrestrial

Based on the results of terrestrial MNES biodiversity assessments for the Project, the likelihood of occurrence assessment, and formal Assessments of Significance, as well as the understood nature of construction impacts, the Project is not expected to have a significant impact on any terrestrial MNES.

Marine

Impacts of construction on marine environment (e.g. noise impacts, water quality impacts etc.) are short term and temporary, and in the case of impacts to the benthic environment and water quality, are limited to a relatively small area. The potential impacts of the blast on sensitive species will also be transient in time, but owing to the propagation of sound underwater, will occur over a larger spatial area. Underwater noise impacts will be mitigated by safety zones overseen by suitably-qualified marine fauna observers, and as such, underwater noise is not likely to have significant impacts on MNES.

Similarly, the environmental impacts of the water treatment plant on MNES are unlikely to be significant, given the open-ocean environment at the discharge location, which will act to rapidly disperse brine discharge. Impacts of water intake (impingement and entrainment) on plankton and early life history stages of fishes and invertebrates are also unlikely to be significant at this location, in light of the large populations and large spatial scale of pelagic dispersal for these species.

As no significant impacts are expected, and mitigation measures have been identified to manage the identified impacts, a controlled action under the EPBC Act is not required.

4.1.5.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Terrestrial

Environmental constraints such as sensitive vegetation, aquatic habitats, and existing utilities have been considered in the Project design to avoid impacts.

Avoidance:

The Project has been designed to minimise impacts on remnant vegetation that migratory species may use. For example, the seawater intake pipeline was determined to need to be tunnelled underground, to avoid surface impacts.

Mitigation:

A Construction Environmental Management Plan (CEMP) would be implemented for the construction phase of the Project. The CEMP would include, as a minimum, industry-standard measures for the management of soil, surface water, weeds and pollutants, as well as site-specific measures. The proposed mitigation measures would include environmental safeguards for protection of neighbouring areas and waterways in accordance with relevant policy documentation and Government guidelines.

CEMP site specific measures may include mitigations such as:

- Pre-clearance surveys of the vegetation to be removed for threatened fauna. Surveys to be undertaken by an Ecologist prior to any vegetation or ground disturbance. These surveys will confirm the presence of threatened species, habitats and other features within impact areas When required, an ecologist will supervise vegetation clearing and other high-risk activities to ensure compliance with approval conditions and manage unexpected finds. If fauna are encountered, appropriate fauna handling, relocation or stop-work procedures will be implemented in accordance with relevant guidelines.
- Procedure to manage unexpected threatened species finds during vegetation clearing.
- Limit disturbance of vegetation to the minimum necessary to undertake the works.
- Prior to the commencement of any work adjoining areas of native vegetation, clearly delineate the construction area marking the limits of clearing to avoid unintended clearing of adjacent native vegetation. This will be done using fencing, flagging and signage prior to works commencing and will be shown on construction plans where practicable. Within these zones access, vehicle movement, stockpiling and disturbance will be strictly prohibited unless otherwise approved. Regular inspections will be undertaken to ensure the integrity of protection measures is maintained throughout construction.
- Workforce education and training – involving construction personnel to undergo site-specific environmental and heritage induction and training prior to works. Ongoing toolbox talks will be used to reinforce environmental responsibilities and site-specific risks as works progress. Training will include awareness of surrounding ecological values such as MNES species, identification of key environmental constraints, legal obligations and the required mitigation measures to address these.
- Erosion and sediment control – such controls will be implemented to limit off-site impacts to surrounding land and waterways. Controls will be appropriate to site conditions and scale of disturbance. Measures may include diversion drains, sediment fencing, stabilised access points and progressive rehabilitation of disturbed areas. Controls will be regularly inspected and maintained especially following rainfall.
- Weed management – controls will include vehicle and equipment hygiene measures, use of clean fill and materials, and prompt stabilisation and revegetation of disturbed areas where practicable. Any declared or priority weed species identified during works will be managed in accordance with legislation and best-practice control methods.

Biodiversity impacts associated with the Project can be appropriately managed through NSW assessment frameworks and standard mitigation measures.

Marine

Impact mitigations for marine species are discussed below and sorted by type of impact.

Seabed disturbance and associated turbidity and water quality impacts

Water-based drilling fluids are considered the most environmentally acceptable drilling fluids because of their low toxicity and their ability to disperse easily and degrade rapidly, and would be used for the Project. Any localised increase in suspended sediment during installation works associated with the intake pipe structure would be temporary in nature with sediment settling and dispersing quickly out of suspension.

The Project would consider the construction option with least disturbance to the seabed area, with the least risk of break out of drilling fluids. Controlling the speed of drilling to surface would also minimise the volume of drilling fluids released into the marine environment. Visual observations during drilling for signs of increased turbidity and sedimentation, and the implementation of an Emergency Management Plan to support drilling activities, would be undertaken.

Impingement and entrainment

The marine desktop assessment (Attachment 3, Section 7.1.2, p24) found that the impacts of impingement and entrainment from larger seawater desalination plants (than the proposed Project) with open ocean intakes is not significant and would not have a measurable impact on the natural environment. Thus, at a much smaller inlet capacity of 60 ML/d, it is expected that entrainment and impingement will not significantly impact fish or marine invertebrate populations at the proposed intake pipe for the Project.

The proposed intake structure and pipe will be designed with consideration for low flow velocity and volume and reducing impacts on larvae and fish in the surrounding environment.

Artificial noise emissions

The impacts of the blasting on sensitive marine fauna will be mitigated by implementing safety zones (shutdown and observation) that are overseen by suitably-qualified marine fauna observers (MFOs), in addition to a pre-start observation period and a post-blasting search. Similarly, vessels will maintain watch for cetaceans (whales and dolphins) during construction and transit through the Project area, and will maintain the vessel separation distances prescribed in Division 2.1 of the Biodiversity Conservation Regulations 2017 (NSW). Vessel noise will also be managed by vessel maintenance and limiting vessel transit speed in the Project area.

Interaction with marine fauna

Vessels are required for construction, maintenance and decommissioning of marine infrastructure associated with the Project. The risks of vessel strike will be mitigated by limiting speed to ≤10 knots in the Project area, which is the fundamental factor affecting the outcome of interactions between vessels and marine megafauna according to DCCEEW's National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna (2017). Vessel speeds typically range between 6-10 knots during pipe-laying operations, with vessels expected to be largely stationary during construction. In order to reduce the chance of vessel interaction with marine fauna, the identified management and legislative control measures would be implemented. Vessels will be largely stationary or very slow moving during construction.

The potential for vessels to disturb cetaceans (dolphins and whales) will be managed by maintaining watch for cetaceans and adherence to the legislation that regulates the conduct of vessels around cetaceans, which is the Biodiversity Conservation Regulations 2017 of the *Biodiversity Conservation Act 2016 (NSW)* in NSW Coastal Waters and the EPBC Regulations 2000 (Division 8.1) of the EPBC Act for Commonwealth Waters. The rules are slightly different between the NSW State and Commonwealth regulations, but both align with the Australian National Guidelines for Whale and Dolphin Watching 2017 (Commonwealth of Australia, 2017).

Biosecurity

Sourcing vessels locally, ensuring that vessels adhere to Australian quarantine requirements and the proper management of ballast water (i.e., the possession of Australian Quarantine and Inspection Service Clearance documentation) prior to entry to the project area will assist in reducing the risk of introducing IMS.

Standard industry obligations such as spill prevention and management measures and the implementation of standard guidelines for the onshore storage and management of waste and hazardous materials.

4.1.5.11 Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

No significant residual impacts are expected for the Project, therefore there will be no required offsets.

4.1.6 Nuclear

4.1.6.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.6.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project does not involve any nuclear activities or actions.

4.1.7 Commonwealth Marine Area

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.7.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.7.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The proposed intake location is 1 km east of the coast and the existing outfall location is 2.8 km east of Norah Head, well within NSW Coastal Waters (5.56 km or 3 nm seaward at this location) and approximately 2.76 km or more westwards of the nearest Commonwealth Marine Area (CMA). Direct impacts to the marine environment (water quality and benthic habitat) on the CMA during construction are therefore unlikely.

This distance from the CMA will also reduce the risk of unplanned pollution or introduction of IMS. Adherence to Australian and NSW regulations that prevent both accidental pollution and pollution from routine vessel operations will also reduce the risk of pollution to the CMA. Sourcing vessels locally, ensuring that vessels adhere to Australian quarantine requirements and the proper management of ballast water (i.e. the possession of Australian Quarantine and Inspection Service (AQIS) Clearance documentation) prior to entry to the project area will assist in reducing the risk of introducing IMS

In terms of impacts from the operational phase of the Project, the brine discharge plume will disperse before it reaches the CMA. Intake impingement/entrainment is unlikely to affect recruitment of marine listed or marine ecosystem function in the CMA, given the distance and the localised impacts expected.

Impacts of construction noise and vessel traffic on cetaceans will be mitigated by the marine fauna observers and vessel speed reductions, respectively. Impacts of the intake blasting on cetaceans will be mitigated by suitably-qualified marine fauna observers who will oversee the safety zones, pre-start/ post-blasting procedures and reporting.

The distance of the Project from the CMA, coupled with the short-term nature of the construction activities and the mitigations proposed for activities with the highest risk (i.e. blasting and vessel operations), also reduce risk to listed marine species, cetaceans and the ecological function of the CMA. Once the water treatment plant is operation, the spatial extent of impacts of discharge and intake are limited.

The Project is therefore unlikely to have a real chance of possibility of:

- Introducing a known or potential pest species to a CMA.
- Modifying, destroying, fragmenting, isolating or disturbing an important or substantial area of habitat such that an adverse impact on marine ecosystem functioning or integrity in a CMA.
- Having a substantial adverse effect on a population of a marine species or cetacean including its life cycle and spatial distribution.
- Resulting in a substantial change in air quality or water quality (including temperature) which may adversely impact on biodiversity, ecological integrity; social amenity or human health.
- Resulting in persistent organic chemicals, heavy metals, or other potentially harmful chemicals accumulating in the marine environment such that biodiversity, ecological integrity, social amenity or human health may be adversely affected.
- Having a substantial adverse impact on heritage values of the Commonwealth marine area, including damage or destruction of an historic shipwreck.

4.1.8 Great Barrier Reef

4.1.8.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.8.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The project is not within proximity to the Great Barrier Reef; therefore, the project is unlikely to directly or indirectly impact the Great Barrier Reef.

4.1.9 Water resource in relation to large coal mining development or coal seam gas

4.1.9.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.9.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The proposed action does not involve the construction or operation of coal seam gas wells; and does not involve the extraction of coal seam gas.

4.1.10 Commonwealth Land

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.10.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.10.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No Commonwealth Land was identified by the PMST within 10 km of the referral area. The proposed action will avoid direct and/or indirect impact to any Commonwealth Land.

4.1.11 Commonwealth Heritage Places Overseas

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.11.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.11.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project activities do not intersect any areas of Commonwealth Heritage Places Overseas and therefore impacts to Commonwealth Heritage Places Overseas are not anticipated.

4.1.12 Commonwealth or Commonwealth Agency

4.1.12.1 Is the proposed action to be taken by the Commonwealth or a Commonwealth Agency? *

No

4.2 Impact summary

Conclusion on the likelihood of significant impacts

You have indicated that the proposed action will likely have a significant impact on the following Matters of National Environmental Significance:

None

Conclusion on the likelihood of unlikely significant impacts

You have indicated that the proposed action will unlikely have a significant impact on the following Matters of National Environmental Significance:

- World Heritage (S12)
- National Heritage (S15B)
- Ramsar Wetland (S16)
- Threatened Species and Ecological Communities (S18)
- Migratory Species (S20)
- Nuclear (S21)
- Commonwealth Marine Area (S23)
- Great Barrier Reef (S24B)
- Water resource in relation to large coal mining development or coal seam gas (S24D)
- Commonwealth Land (S26)
- Commonwealth Heritage Places Overseas (S27B)
- Commonwealth or Commonwealth Agency (S28)

4.3 Alternatives

4.3.1 Do you have any possible alternatives for your proposed action to be considered as part of your referral? *

Yes

4.3.2 Do you have an alternative timeline you are proposing for your proposed action? *

Yes

4.3.4 Do you have an alternative location you are proposing for your proposed action? *

No

4.3.5 Briefly describe why an alternative location for your proposed action was not possible. *

Previous studies and investigations have been undertaken since 2005.

WTP options and alternatives:

Alternative delivery approaches were reviewed through the previous studies, including:

- 4 x 5 ML/d distributed desalination plants
- 1 x 20 ML/d desalination plant

Alternative locations for the desalination plant were considered. The shortlisted location options included:

- Kincumber Water Quality Control Centre (approx. 30 km south of Toukley)
- Wyong South Sewerage Treatment Plant (approx. 17 km west of Toukley)
- Vales Point power station (approx. 17 km north of Toukley)

These options were eliminated from consideration due to source water quality risks as these options had raw water intakes from inland brackish water lake sources. This raw water source has potential water quality risks from stormwater run-off, wastewater overflows, elevated nutrient concentrations, and sediment entrainment. Construction difficulties, and environmental issues associated with the brine discharge also resulted in the elimination of the three locations.

The Central Coast Water Security Plan (CCC, 2023), identified a broad range of water supply options to improve water security and resilience. These included: seawater desalination, dam enlargement, groundwater, purified recycled water, rainwater tank scheme, recycled water, water sharing and water transfers. The preferred option is drought response desalination plant adjacent to Toukley STP.

During concept design of the Project (since 2025), multiple alternative locations for the seawater intake and outfall, and the power supply were considered.

In September 2025. GHD completed an intake option assessment workshop with Council. This workshop considered one location for the proposed desalination WTP and seven intake options.

Ultimately, Pebbly Beach (approx. 2 km south of Jenny Dixon Beach at Norah Head) and Jenny Dixon Beach were the two location options considered further for the design, with construction potentially including trenched pipelines, horizontal directional drilling and direct tunnel options. In the final assessment of constructability, land ownership, community and social impacts, environmental and heritage impacts, the Jenny Dixon Beach direct tunnelled option was determined to have the least social and environmental impact and was the most viable to construct.

Two outfall options were considered during the Project design: construction of a new outfall, or utilising the existing Norah Head outfall. However, it was clear that using the existing Norah Head outfall provided a significant reduction in environmental impacts associated with the construction of a new outfall.

The power required for the Project could potentially come from two different nearby zone substations, however one zone substation had insufficient capacity without significant upgrades to multiple components. Charmhaven zone substation however contains sufficient network capacity and spare connection sites.

4.3.6 Do you have alternative activities you are proposing for your proposed action? *

No

4.3.7 Briefly describe why an alternative activity for your proposed action was not possible. *

Desalination (and its associated activities) was identified as a last resort emergency response for an extreme drought, once all other measures have been implemented, as it offers a solution that is not dependent on rainfall. Therefore, no alternative activities have been considered for the Project.

During design of the Project, different treatment options of the desalinated water were considered (e.g. different types of microfiltrations and ultrafiltration). However, while all filtration options have been considered, only the pressurised microfiltration and ultrafiltration is suitable for this Project. It results in improved water quality within the desalination system, and greater environmental benefits when compared to other filtration options.

4.3.1 Alternatives: Timeline

4.3.1.1 Estimated start date for proposed alternative

01/01/2045

4.3.1.1 Estimated end date for proposed alternative

01/01/2145

4.3.1.2 Describe how the impacts and mitigation measures are different for your alternative timeline.

The impacts and mitigation measures described in this referral would remain the same.

For terrestrial or marine ecology, and other unique aspects to the environment, it is unlikely that change to such an extent that different or additional impacts or mitigations would need to be considered.

While hydrology and water flows may decrease in the future, as this is the purpose for the Project, there are no different or additional impacts or mitigations that would need to be considered.

As of current Project planning and design, the conservative commencement date for the Project would be in 2036. This start date aligns with the approach of the Central Coast Council who is seeking a 10 year approval term for the NSW Environmental Impact Assessment, during which time further project stages may be instigated based on future water supply system modelling.

The procurement and construction of the desalination plant, the latter of which is estimated to be completed over a 36 month period, would be initiated in line with the CCC’s planning approach in the Central Coast Water Security Plan 2023 (CCWSP) which currently proposes a trigger point when raw water storage levels approach 45%. The actual timing to commence delivery of the desalination plant, alongside other CCWSP drought responses, depends on the lead time to construct them before reaching a critical storage level of 15%.

If implementation of the desalination plant is not triggered by the drought triggers – based on current forecasts in the CCWSP and based on population growth, water conservation rates and climate sensitive demand, the desalination plant will likely be required in the early 2040s.

4.3.4 Alternatives: Impact and mitigation

4.3.4.1 Do these alternatives have a different impact, avoidance, or mitigation measure compared to what you have already provided? *

No

4.3.5 Alternatives: Considered alternatives

4.3.5.1 Do you have any other alternative actions, including not taking the action, that you have considered but are not proposing as part of this referral? *

Yes

4.3.5.2 Describe the details of this possible alternative that you have considered but are not proposing. *

The ‘do nothing’ option would involve the Proponent not planning, constructing or operating a drought response desalination plant. The Central Coast region is vulnerable to drought because water storage levels can fall quickly in prolonged periods of dry weather. Desalination was identified as a last resort emergency response for a very extreme drought, once all other measures have been implemented, as it offers a solution that is not dependent on rainfall.

The ‘do nothing’ option would compromise water security because the Proponent would not be able to supplement supply with a climate independent source of water in the event of a severe drought. The project would be designed to produce up to 40 ML/d capacity in response to future demand.

Therefore, the ‘do nothing’ option was therefore not pursued further.

5. Lodgement

5.1 Attachments

1.2.1 Overview of the proposed action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 1_General features figure.pdf Figure attachment of general features of the Project Area	11/02/2026		High

3.1.1 Current condition of the project area's environment

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 1_General features figure.pdf Figure attachment of general features of the Project Area	12/02/2026	No	High
#2.	Document	Attachment 2_MNES biodiversity report.pdf Terrestrial biodiversity MNES report	11/02/2026	No	High
#3.	Document	Attachment 3_Marine desktop assessment.pdf Marine desktop options assessment report	02/09/2025	No	High

3.2.1 Flora and fauna within the affected area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2_MNES biodiversity report.pdf Terrestrial biodiversity MNES report	10/02/2026		High
#2.	Document	Attachment 3_Marine desktop assessment.pdf Marine desktop options assessment report	01/09/2025		High

4.1.4.2 (Threatened Species and Ecological Communities) Why your action has a direct and/or indirect impact on the identified protected matters

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2_MNES biodiversity report.pdf Terrestrial biodiversity MNES report	10/02/2026		High

4.1.4.6 (Threatened Species and Ecological Communities) Why you do not consider the direct and/or indirect impact to be a Significant Impact

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2_MNES biodiversity report.pdf	10/02/2026		High

Terrestrial biodiversity MNES report

4.1.4.10 (Threatened Species and Ecological Communities) Avoidance or mitigation measures proposed for this action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2_MNES biodiversity report.pdf Terrestrial biodiversity MNES report	10/02/2026		High
#2.	Document	Attachment 3_Marine desktop assessment.pdf Marine desktop options assessment report	01/09/2025		High

4.1.5.10 (Migratory Species) Avoidance or mitigation measures proposed for this action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 3_Marine desktop assessment.pdf Marine desktop options assessment report	01/09/2025		High

5.2 Declarations

Completed Referring party's declaration

The Referring party is the person preparing the information in this referral.

ABN/ACN	39008488373
Organisation name	GHD PTY LTD
Organisation address	Level 3, 24 Honeysuckle Drive Newcastle 2000 NSW Australia
Representative's name	Bernadette Wood
Representative's job title	Senior Environmental Planner
Phone	+612 4979 9999
Email	bernadette.wood@ghd.com
Address	Level 1, 66 Lord Street, Port Macquarie NSW 2444 Australia

☑ Check this box to indicate you have read the referral form. *

☑ Check this box to confirm these are the correct identification details. *

☑ By checking this box, I, **Bernadette Wood of GHD PTY LTD**, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. *

You may receive automated notifications that aim to assist you in tracking the progress of your project. You can opt out of these notifications by updating your communication preferences on your profile.

Completed Person proposing to take the action's declaration

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	73149644003
Organisation name	Central Coast Council
Organisation address	PO Box 20 Wyong, 2259 NSW Australia
Representative's name	Neil Dignam

Representative's job title	Project Manager - Water resilience
Phone	02 4304 7217
Email	Neil.Dignam@centralcoast.nsw.gov.au
Address	PO Box 20 Wyong, New South Wales, 2259 Australia

☑ Check this box to indicate you have read the referral form. *

☑ Check this box to confirm these are the correct identification details. *

☑ I, **Neil Dignam of Central Coast Council**, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity. *

You may receive automated notifications that aim to assist you in tracking the progress of your project. You can opt out of these notifications by updating your communication preferences on your profile.

✔ Completed Proposed designated proponent's declaration

The Proposed designated proponent is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

☑ Check this box to indicate you have read the referral form. *

☑ Check this box to confirm these are the correct identification details. *

☑ I, **Neil Dignam of Central Coast Council**, the Proposed designated proponent, consent to the designation of myself as the Proposed designated proponent for the purposes of the action described in this EPBC Act Referral. *

You may receive automated notifications that aim to assist you in tracking the progress of your project. You can opt out of these notifications by updating your communication preferences on your profile.