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Nuclear-Powered Submarine Construction Yard

Biosecurity Report

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DOCUMENT SPECIFICATION

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This report has been prepared by Succession Ecology Pty Ltd for URPS

ACKNOWLEDGEMENT OF COUNTRY

Succession Ecology acknowledges and pays respect to the past, present and future Traditional Custodians and Elders of this nation and the continuation of cultural, spiritual and educational practices of Aboriginal and Torres Strait Islander peoples.

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LIST OF ABBREVIATIONS

ADS	Adelaide Dolphin Sanctuary
ALA	Atlas of Living Australia
ANI	Australian Naval Infrastructure
ASA	Australian Submarine Agency
BMP	Biosecurity Monitoring Plan
BWMP	Ballast Water Management Plan
BWMC	Ballast Water Management Certificate
BWMS	Ballast Water Management System
CEMP	Construction Environmental Management Plan
COP	Code of Practice
DCCEEW	Department of Climate Change, Environment, Energy and Water
DEW	Department for Environment and Water
DMP	Dredge Management Plan
DTI	Department for Trade and Investment
EIS	Environmental Impact Statement
EPA	Environment Protection Agency (SA)
EPBC	Environment Protection and Biodiversity Conservation Act (Commonwealth legislation)
EPP	Environment Protection Policy
TFFRA	Terrestrial Flora and Fauna Requirements Analysis
IBRA	Interim Biogeographical Regionalisation of Australia
LSA	Landscape South Australia Act (SA legislation)
NP	National Park
NPW	National Parks and Wildlife (SA legislation)
NPWS	National Parks and Wildlife Services
NV	Native Vegetation Act (SA legislation)
NVC	Native Vegetation Council
OEMP	Operational Environmental Management Plan
ONS	Osborne Naval Shipyard
PAE	Port Adelaide Enfield
PDI	Planning, Development and Infrastructure Act (SA legislation)
PIRSA	Primary Industries and Regions South Australia
POMS	Pacific Oyster Mortality Syndrome
SCY	Submarine Construction Yard
SRA	Same Risk Area

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EXECUTIVE SUMMARY

Succession Ecology Pty Ltd was engaged by URPS on behalf of Australian Naval Infrastructure (ANI) to prepare a Biosecurity Report to support the Nuclear-Powered Submarine Construction Yard (SCY) Environmental Impact Statement (EIS). The objectives of the Biosecurity Report are to:

- Address the State Planning Commission Assessment Requirements to provide detailed information and assessment of marine and terrestrial biosecurity within and in proximity to the Development.
- Provide an overview of the required management measures for biosecurity under Commonwealth and State legislation.
- Provide a series of recommended management measures to ensure best environmental practice for biosecurity.

The subject site is located on the Lefevre Peninsula, Osborne, South Australia, a highly industrialised area. Much of the subject site occurs within pre-disturbed land infested with Declared Plants and degraded or planted native vegetation. However, there are pockets of remnant vegetation in Mutton Cove Conservation Reserve and regenerating native vegetation throughout the subject site. Planted native and/or exotic vegetation is found within Falie Reserve and the Pelican Point Power Station. The subject site contains the Adelaide Dolphin Sanctuary and neighbours Torrens Island, which both offer high-value habitats for flora and fauna. In the wider locality, the Adelaide International Bird Sanctuary provides important habitat to migratory birds and resident shorebirds. The marine-based portion of the subject site is contained with the Port River which has been subject to substantial anthropogenic alterations. A variety of marine exotic organisms already exist within the Port River.

Potential biosecurity risks as a result of construction and operational activities include:

- Spread of declared noxious fish, plant and mollusc species listed under the *Fisheries Management Act 2007* due to construction activities, bilge water, biofouling and ballast water.
- Spread of diseases due to construction activities, bilge water, biofouling and ballast water.

It is anticipated that construction and operational biosecurity risks can be managed through targeted biosecurity management measures, which broadly align with industry-standard best practices.

1 INTRODUCTION

Succession Ecology Pty Ltd was engaged by URPS on behalf of Australian Naval Infrastructure (ANI) to prepare a Biosecurity Report to support the Nuclear-Powered Submarine Construction Yard (SCY) Environmental Impact Statement (EIS). The objectives of the Biosecurity Report are:

- Address the State Planning Commission Assessment Requirements (August 2024) to provide detailed information and assessment of marine and terrestrial biosecurity within and in proximity to the Development.
- Provide an overview of the required biosecurity management measures under Commonwealth and State legislation.
- Provide a series of recommended management measures to ensure best environmental practice for biosecurity.

1.1 Description of the Development and the Subject Site

The Australian Submarine Agency (ASA) was established in July 2023 to safely and securely acquire, construct, deliver, technically govern, sustain, and dispose of Australia's conventionally armed nuclear-powered submarine capability for Australia.

ANI as the owner and manager of the existing Osborne Naval Shipyard is proposing the Development of adjacent land to construct a new, purpose-built, secure SCY. The SCY will provide a facility for the construction of the submarines by a third-party ship builder, for delivery to ASA.

The Minister for Planning declared the SCY as an Impact Assessed Development under section 108 (1)(c) of the *Planning, Development and Infrastructure Act 2016* (*PDI Act*), which requires the preparation of an Environmental Impact Statement.

The Government Gazette Notice that declares the Nuclear-powered SCY as an Impact Assessed Development and describes the scope of the Development as follows:

Development for the purposes of establishing and operating a nuclear-powered Submarine Construction Yard at Osborne (being on the land and coastal waters specified in Table 1 and Figure 1, including:

(a) Development associated with the construction and operation of a submarine construction yard, including

(i) facilities associated with maritime construction works in respect of submarines for defence of the Commonwealth, including:

i. the processing of raw steel and other products to manufacture submarine components;
ii. general steel processing including cutting, forming, welding and non-destructive evaluation;
iii. general and specialist machining in support of fabrication and outfitting;
iv. outfitting of submarine sections and other structures with welded components such as submarine decks and fixed pipework;
v. outfitting units and other structures with electrical, mechanical and piping components;
vi. assembly, testing, commissioning and services installation in support of combat system integration;
vii. manufacture of pipe and electrical components;

viii. assembly, testing and commissioning of the nuclear propulsion system (but excluding the manufacture of the reactor power module);
ix. assembly, construction and commissioning of submarines;
x. on-site system testing, commissioning and set-to-work activities; and
xi. mechanical, hydraulic and electrical conveyance for the purpose of moving submarine components and submarine launch activities;

(ii) the storage or warehousing of chemicals or chemical products, including appropriate bunding/hardstand,

(iii) facilities and works associated with abrasive blasting and surface coating of submarines;

(iv) wet basin, wharf and related support facilities including any associated works (including dredging for the purposes of construction and operation of vessel berths but excluding dredging for the purposes of deepening the Port River Channel);

(v) truck loading and unloading facilities, access and egress;

(vi) ancillary infrastructure, including guard houses, car parking, warehousing, office accommodation, health centre, data centre and general information and communication technology services, sleeping quarters, and general amenities including training facilities and other staff and visitor support facilities, security, and access;

(vii) temporary construction compound and laydown areas; and

(viii) temporary protected storage of waste, including low-level radioactive waste;

(b) Development associated with any change in the use of land and coastal waters associated with any Development within the ambit of the preceding paragraphs;

(c) Development associated with the construction, installation or provision of any or all of the following infrastructure, facilities and services:

(i) stormwater;

(ii) water supply;

(iii) power supply;

(iv) telecommunications; and

(v) wastewater treatment or disposal

in each case, associated with any Development within the ambit of the preceding paragraphs;

d) Development (including Development undertaken on land or coastal waters in the State, inclusive but not limited to the land and coastal waters specified in Table 1 and Figure 1) associated with any excavation or filling of land associated with any Development within the ambit of the preceding paragraphs;

(e) Development (including Development undertaken on land or coastal waters in the State, inclusive but not limited to the land and coastal waters specified in Table 1 and Figure 1) associated with the division of land associated with any Development within the ambit of the preceding paragraphs; and

(f) any related or ancillary Development (including Development undertaken on land or coastal waters in the State, inclusive but not limited to the land and coastal waters specified in Table 1 and Figure 1) associated with any Development within the ambit of the preceding paragraphs;

but excluding:

(i) the relocation of existing electricity transmission lines, substation and gas pipelines;

(ii) works and activities associated with existing port and harbour operations; and

(iii) works associated with the construction and alteration of a road on Lot 103 DP82690, Lot 110 DP118046, Lot 777 DP87145, QP7 DP74306, Lot 208 DP 64682, Lot 801 DP76925 and Lot 601 DP121984.

Fabrication buildings will be of a significant scale, up to 50 metres in height and 200 metres in length.

The SCY subject site is located on the north-eastern side of the Lefevre Peninsula in Port Adelaide, South Australia. It encompasses the following Certificate of Titles shown in Table 1, Figure 1 and Figure 2.

Table 1: SCY Subject Site Certificate of Titles

CT6191/179	CT6191/180	CT6191/181	CT6191/182	CT6268/862	CT6236/388
CT6262/182	CT6289/763	CT6088/174	CT6088/171	CT6088/170	CT6088/177
CT6282/172	CT6088/175	CT6282/178	CT5858/214	CT5855/133	CT5856/14
CT6088/188	CT6088/186	CT6088/185	CT6088/184	CT6088/183	CT6231/17
CT6231/5	CT6282/169	CT6088/193	CT6088/190	CT6088/189	CT 6191/178
CT6191/176	CT6060/497	CT6282/175			

Hereafter, the Development will be referred to as the Nuclear-Powered Submarine Construction Yard (SCY) or the Development. When describing the area, the Development will be referred to as the 'subject site'. Where delineation is required, the subject site will be referred to as the 'land-based portion of the subject site' and/or the 'marine-based portion of the subject site'.

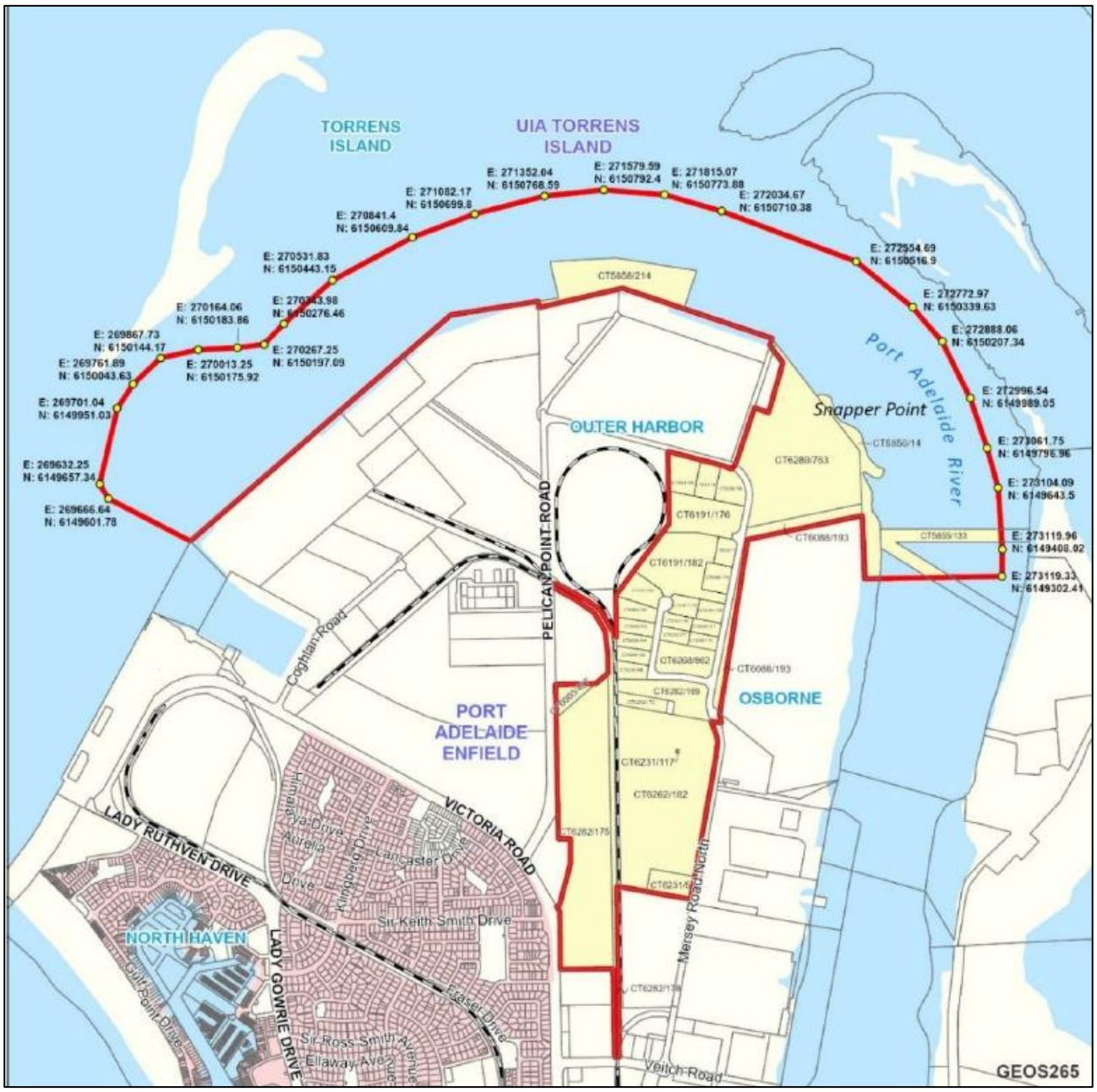

Figure 1: SCY Subject Site (provided to Succession Ecology by URPS 29/04/2024).

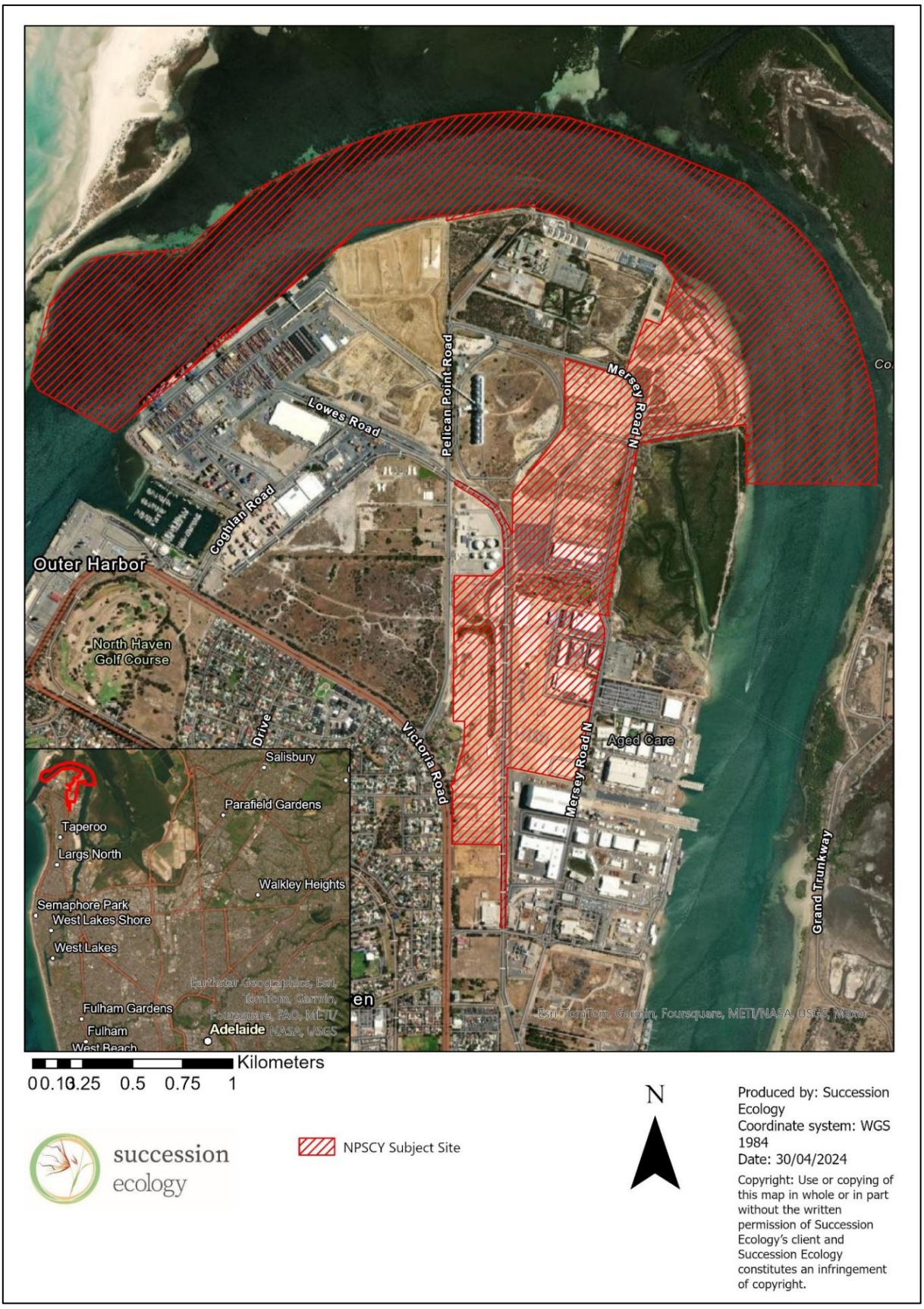

Figure 2: SCY Subject Site.

2 BIOSECURITY LEGISLATION AND COMMITTMENTS

The Development is subject to various environmental Commonwealth and State legislation, legislation relating to biosecurity is summarised in Table 2.

Table 2: Relevant Biosecurity and Environmental Legislation.

Legislation	**Relevance to Development**
***Adelaide Dolphin Sanctuary Act 2005* (SA; *ADS Act*)** The *Act* assists management of various activities in the sanctuary, including boating, fishing, and development activities, by requiring decision-makers administering other legislation to have consideration of the ADS objects and objectives. The objectives include the protection of the dolphins and key habitat features, improvement of water quality, community participation, and promotion of the environmental importance of the ADS and the principles of ecologically sustainable development.	The marine-based portion of the subject site occurs directly within the Adelaide Dolphin Sanctuary and therefore this *Act* is relevant to the Development.
Biosecurity Act 2015* (Commonwealth)** ***The Biosecurity Act and ***Biosecurity Regulations 2016*** outlines management for biosecurity threats to plant, animal and human health in Australia and its external territories.	The Development has potential to introduce biosecurity threats via a number of construction and operational activities. These are considered in section 6.
***Environment Protection Act 1993* (SA; *EP Act*)** Provides for the protection of the environment; to establish the Environment Protection Authority and define its functions and powers; and for other purposes.	Under section 25 – General Environmental Duty, a person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm. The Development will integrate this provision and other provision of the *Act* into relevant management plans and mitigations.
Fisheries Management Act 2007* (SA*; FM Act) and ***Fisheries Management (General) Regulations 2017*** **This *Act*** provides for the conservation and management of the aquatic resources of SA, the management of fisheries and aquatic reserves, the regulation of fishing and the processing of aquatic resources, the protection of aquatic habitats, aquatic mammals and aquatic resources and the control of exotic aquatic organisms and disease in aquatic resources; and for other purposes.	The Development and its marine based activities pose a potential risk to reserves, mammal and marine resources. This report addresses this potential risk and mitigations in accordance with the *FM Act.*
Landscape South Australia Act 2019* (SA; *LSA Act*)** and ***LSA Regulations 2020 Under the *LSA Act* land holders have the responsibility to manage Declared pest plants and animals and prevent land degradation.	Declared Animals listed under the *LSA Act* are considered in the Terrestrial Flora and Fauna Requirements Analysis.

Legislation	Relevance to Development
***Livestock Act 1997* (SA)** An *Act* to regulate matters relating to livestock.	The Ostreid herpesvirus type 1 microvariant (OsHV-1 microvariant) is notifiable disease under the *Act*. Therefore, several sections of the *Act* are relevant to the Development, including section 27 requirement to report notifiable conditions, s28 acts causing or likely to cause livestock to become affected with notifiable condition, s29 bringing notifiable disease into State, s30 movement of livestock or livestock products affected with notifiable condition. Further details of the OsHV-1 microvariant can be found in section 6.2.
***Planning, Development and Infrastructure Act 2016* (*SA; PDI Act*)** and ***Planning, Development and Infrastructure (General) Regulations 2017* (*PDI Regulations*)** Governs the development and management of land and buildings, provides a planning system to regulate development within the State, rules with respect to the design, construction and use of buildings, and other initiatives to facilitate the development of infrastructure, facilities and environments.	On 15 February 2024, the Minister for Planning declared that the proposed development of a Nuclear-Powered Submarine Construction Yard (SCY) by proponent Australian Naval Infrastructure at Osborne (subject land identified in Figure 1 and Figure 2) be assessed as an Impact Assessed development pursuant to section 108(1)(c) of the *PDI Act*. The EIS process is the highest level of assessment under the *PDI Act* and enables the holistic consideration of projects that are considered to be of economic, social or environmental importance to South Australia. The EIS process provides a comprehensive assessment of a development or project proposal and the expected effects on the receiving environment and within the broader context of its setting, which could relate to a local area, region, state or nation. This report addresses the biosecurity Assessment Requirements issued by the State Planning Commission.

Other Commonwealth and State legislation which may interact with aspects of biosecurity include:

- *Coast Protection Act 1972* (SA; *CP Act*)
- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth; *EPBC Act*) and *EPBC Regulations 2000.*
- *National Parks and Wildlife (Protected Animals—Marine Mammals) Regulations 2010* SA
- *National Parks and Wildlife Act 1972* (SA*; NPW Act*) and *NPW Regulations 2019*; and
- *Native Vegetation Act 1991 (SA; NV Act)* and the *NV Regulations 2017*.

Other environmental management plans and policies relevant to biosecurity include:

- Adelaide Dolphin Sanctuary Draft Management Plan 2024.
- South Australia's Biosecurity Policy 2020-2023.
- Primary Industries and Regions South Australia (PIRSA) Declared Plant Policies and Declared Animal Policies.
- Environment Protection Policies (EPP) (SA; Environmental Protection Agency).

3 ENVIRONMENTAL CONTEXT

3.1 Terrestrial and Marine Uses

The subject site is located on the Lefevre Peninsula, South Australia. The Lefevre Peninsula is a highly industrialised area. The Osborne Naval Shipyard (ONS), Quantem Fuel Terminal, Pelican Point Power Station, Snapper Point Power Station, Viterra Outer Harbour, Port Adelaide Passenger Terminal, and Flinders Port Adelaide Container Terminal each occupy substantial areas of the peninsula. Other land uses include residential dwellings in North Haven, Mutton Cove Conservation Reserve, Outer Harbor Railway Station Reserve, Falie Reserve, and North Haven Marina. Biodiversity Park occurs directly south of the subject site.

The marine-based portion of the subject site occurs within the Port River (Figure 4). The river supports industrial, recreational, historical and ecological uses and values. Primarily, the Port River is used as a major shipping channel in SA. It is the only maritime access to the existing ONS shipyard. The river contains several historic shipwrecks and forms part of the Gulf St Vincent and the Adelaide Dolphin Sanctuary (ADS).

Torrens Island Conservation Park and the Adelaide International Bird Sanctuary National Park - Winaityinaityi Pangkara are located within the wider landscape. The subject site is within the boundaries of the City of Port Adelaide Enfield (PAE) and the Green Adelaide Landscape management region.

3.2 Vegetation

Much of the land-based portion of the subject site is dominated by industrial land uses, however there are small pockets of regenerating native vegetation throughout. Planted native and /or exotic vegetation is found within Falie Reserve and the Pelican Point Power Station. The marine-based portion of the subject site contains patches of *Zostera* seagrasses.

The land-based portion of the subject site occurs with the IBRA Association of Parham, Eyre Yorke Block Region and Subregion St Vincent (Table 3). The marine-based portion of the subject site falls outside the IBRA classification scheme.

Table 3: Eyre Yorke Block Region Description

Feature	Description
Land type	Erosional, Depositional or Volcanic
Landscape	Dunefield
Landform	Low limestone dune ridges: small granitic islands with dunes
Geology	Ripon Calcrete; Loveday Soil in aeolian sand sheets, dune sand, red soils (terra rossa)
Soil	Sands soils of minimal pedologic Development, Brown calcareous earths, Brown sand soils, Shallow red brown sandy soils, Sandy soils with yellow clayey mottled subsoil.
Vegetation	Mallee Woodland and Shrubland
Climate	E2: Mediterranean climate, but with drier cooler winters and less growth than E1.

3.3 Geology, Soils and Landforms

The land-based portion of the subject site is characterised largely by flat terrain, excluding the several constructed drainage swales or other stormwater and drainage features. The underlying soils are estuarine muds and sands of an area that was formerly part of extensive tidal flats bordering Barker Inlet. This area was below sea level during the period of Holocene marine regression approximately 7,500 years ago. The majority of the land-based portion of the subject site has been cut-off from intertidal flows. The Port River is a tidal inlet from Gulf St Vincent and has been subject to historical dredging activities. Previous studies identified the riverbed was comprised of sand, silt and clay.

4 METHODOLOGY

The Client provided reports relevant to the Development. These reports were reviewed to support the production of this report, in addition to publicly available literature and resources.

For detailed methods refer to section 5 of the Succession Ecology 2024 Nuclear-Powered Submarine Construction Yard Terrestrial and Marine Flora and Fauna Ecological Report.

5 STATE PLANNING COMMISSION ASSESSMENT REQUIREMENTS

This report has been prepared in accordance with the *PDI Act*, *PDI Regulations* and the State Planning Commission's Practice Direction 17 Impact Assessment Development (Practice Direction 17). The report has also been prepared with guidance from the Department for Trade and Investment (DTI) Assessment Requirements Library, Impact Assessment Development s.108 (1) (b) (c) of the *PDI Act*.

URPS provided the Assessment Requirements to Succession Ecology on 23 August 2024, in which there was a total of 27 assessment requirements relating to the biological environment (biosecurity, terrestrial flora and fauna and marine flora and fauna) (Table 4). The Level of Assessment determined by the State Planning Commission is *Detailed*. This report directly responds to the State Planning Commission's Assessment Requirements on biosecurity. The assessment requirements for marine and terrestrial native flora and fauna are detailed in Succession Ecology's Terrestrial Flora and Fauna Requirements Analysis and the Terrestrial and Marine Flora and Fauna Ecological Report.

Terrestrial weeds are detailed in the Terrestrial Flora and Fauna Requirements Analysis (Succession Ecology 2024).

Table 4: The State Planning Commission's Assessment Requirements for Biosecurity.

Library Reference / Environmental Attribute / Level of Assessment	**State Planning Commission's Assessment Requirements**	**Section**
BE1 / Biosecurity / Detailed Objective: To ensure that construction and operation of the development avoids the introduction or spread of biosecurity threats including pest or nuisance animal and plant species (including marine pests), diseases and pathogens.	Describe how the proposal is consistent with the *South Australia's Biosecurity Policy 2020-2023* and any potential approvals, permits or licenses required prior to conducting marine work during construction and/or operation.	6.1
	Detail a monitoring program that would audit the success of biosecurity measures, identify whether objectives have been met, and describe corrective actions to be used if monitoring indicates objectives are not being met.	6.2
	Provide information on the proposed management techniques for incoming ship ballast and bilge waters.	6.4, 6.5
	Describe how the introduction of exotic marine organisms or notifiable pathogens (disease) will be avoided or managed.	6.2
	Outline strategies to monitor for the early detection of marine exotic organisms (including invasive marine pests) at or near the site, especially on and around marine infrastructure (e.g. wharf, jetty) and how these will be managed.	6.2
	Outline measures to ensure consistency with the Australian Ballast Water Management Requirements (and national biofouling management guidelines)	6.4, 6.6
	Outline strategies to monitor and prevent the introduction and spread of vermin and other nuisance species that can be attracted to port facilities, and measures to manage and monitor such species, including the need to restrict the spread of Pacific Oyster Mortality Syndrome (POMS) from the Port River to other areas of state waters / aquaculture areas.	6.2, 6.3

Library Reference / Environmental Attribute / Level of Assessment	State Planning Commission's Assessment Requirements	Section
	Outline strategies to monitor, control and manage biofouling of wetted surfaces.	6.6

6 BE1 - BIOSECURITY

This section addresses the State Planning Commission's Draft Assessment Requirements, BE1 – Biosecurity.

6.1 South Australia's Biosecurity Policy 2020-2023.

Assessment requirements addressed:

- *Describe how the proposal is consistent with South Australia's Biosecurity Policy 2020-2023 and any potential approvals, permits or licenses required prior to conducting marine work during construction and/or operation.*

The South Australian *Biosecurity Policy 2020-2023* outlines the approaches to protecting and improving the State's economy, environment, public health and amenity by preventing and reducing pest and disease impacts, maintaining food safety and responsible agricultural chemical use. The SA *Biosecurity Policy 2020-2023* is delivered through six priority areas including:

1. Securing primary production and food safety
2. Detection and response to new pests and diseases
3. Minimising the economic, social and environmental impacts of pests and diseases
4. Government, industry, and the community working together to enhance biosecurity
5. Biosecurity technical expertise; and
6. Modern fit for purpose infrastructure.

The priority area of the *Biosecurity Policy 2020-2023* that is relevant to the Development is detailed within Table 5. ANI will adopt, where necessary, the management measures to support the *Biosecurity Policy 2020-2023* (refer to the following sections of this report).

Table 5: Biosecurity Policy 2020-2023 Priority Areas and the relevant strategies for the Development.

Biosecurity Policy 2020-2023 Priority Area	**Strategies to achieve the Priority Area relevant to the Development**
Detection and response to new pests and diseases.	• Establishing surveillance programs for the early detection of new threats to industry, the environment and the community. • Developing, implementing and exercising pest and disease response plans. • Building and maintaining an emergency response system to deliver whole-of-government responses to incursions as required.

The Development may require specific biosecurity-related permits and/or approvals prior to marine construction activities based on the following legislation:

- *PDI Act* (Development Approval from the State Planning Commission)
- *NV Act* (approval from the NVC to clear native vegetation)
- *EP Act* / EPP (e.g. requirements for dredging and ballast water)
- *LSA Act* (Water Affecting Activities permit from the Green Adelaide Landscape Board)
- *FM Act* (permit from PIRSA for the removal of Declared Noxious species)
- *EPBC Act* (Strategic Assessment Decision conditions); and/or
- *ADS Act* (may require a permit in accordance with section 69 of the *NPW Act*).

For information about other permits and/or approvals that may be required prior to marine construction-based activities, refer to section 7.5.1 of the Succession Ecology 2024 Nuclear-Powered Submarine Construction Yard Terrestrial and Marine Flora and Fauna Ecological Report.

6.2 Exotic Marine Organisms or Notifiable Pathogens

Assessment requirements addressed:

- *Describe how the introduction of exotic marine organisms or notifiable pathogens (disease) will be avoided or managed.*
- *Outline strategies to monitor for the early detection of marine exotic organisms (including invasive marine pests) at or near the site, especially on and around marine infrastructure (e.g. wharf, jetty) and how these will be managed.*
- *Outline strategies to monitor and prevent the introduction and spread of vermin and other nuisance species that can be attracted to port facilities, and measures to manage and monitor such species, including the need to restrict the spread of Pacific Oyster Mortality Syndrome (POMS) from the Port River to other areas of state waters / aquaculture areas.*
- *Detail a monitoring program that would audit the success of biosecurity measures, identify whether objectives have been met, and describe corrective actions to be used if monitoring indicates objectives are not being met.*

Exotic marine organisms are fish, plants or animals (such as crabs, molluscs or invertebrates) that are not native to Australia (Department of Primary Industries and Regions 2022a). Exotic marine organisms compete with native species, impact aquaculture, marine recreation and tourism, pose health risks and carry potential diseases (Department of Primary Industries and Regions 2022a). Invasive marine species can be transported and spread in multiple ways. In the case of the SCY, there are four main impact pathways that have the potential to create marine biosecurity threats.

Artificial structures in a marine environment, such as the Development's proposed wharf and wet basin, dredging, ballast water and biofouling can provide opportunities for the introduction, establishment or spread of exotic marine organisms. A desktop search identified a total of 72 introduced species within a 5 km buffer of the ONS (J Diversity Pty Ltd 2023). Of these, a total of 20 species were recorded within the marine-based portion of the subject site, nine of those are listed under the *FM Act*, PIRSA concern, or on the Australian Government National Priority List (Table 6). The species listed under the *FM Act*, of PIRSA concern and/or listed on the Australian Government National Priority List, have been highlighted due to their risk to biosecurity, their ability to compete with native species, and their potential for rapid colonization and spread. These species are considered a priority to control within the marine-based portion of the subject site.

Table 6: Marine pest species identified within the marine-based portion of the subject site that have a legislative listing (J Diversity Pty Ltd 2023).

Species	Legislative Listing	Relevance to the Subject Site
Alexandrium minutum	Australian Government High National Priority	Recorded within the marine-based portion of the subject site. 35 records within a 5 km buffer.
Asian date mussel (*Arcuatula senhousia*)	Australian Government Medium National Priority *FM Act*: Declared Noxious	Recorded within the marine-based portion of the subject site. 15 records within a 5 km buffer.

Species	Legislative Listing	Relevance to the Subject Site
Caulerpa cylindracea	PIRSA concern	Known dominant components of habitats and communities within the Port River. Present south of the ONS Wharf in February 2022, however not observed within the 2023 survey. 1,194 records within a 5 km buffer.
Caulerpa taxifolia	PIRSA concern *FM Act*: Declared Noxious	Dominant components of habitats and communities within the Port River. Recorded just outside the southeastern end of the marine-based portion of the subject site in 2023. 227 records within a 5 km buffer.
European fan worm (*Sabella spallanzanii*)	Australian Government Medium National Priority PIRSA concern *FM Act*: Declared Noxious	Dominant components of habitats and communities within the Port River. 497 records within a 5 km buffer.
European green shore crab (*Carcinus maenas*)	Australian Government Medium National Priority PIRSA concern *FM Act*: Declared Noxious	Recorded within the marine-based portion of the subject site. 25 records within a 5 km buffer.
Pacific oyster (*Magallana gigas*)	Australian Government Medium National Priority PIRSA concern	Recorded within the marine-based portion of the subject site. 50 records within a 5 km buffer.
Schizoporella errata	Australian Government Medium National Priority	Recorded within the marine-based portion of the subject site. 11 records within a 5 km buffer.
Vase tunicate (*Ciona robusta*)	Australian Government Medium National Priority PIRSA concern	Recorded within the marine-based portion of the subject site. 56 records within a 5 km buffer.

Pacific Oyster Mortality Syndrome (POMS)

POMS is a disease that affects Pacific Oysters (*Magallana gigas*) and is caused by a virus called OsHV-1 microvariant (Department of Primary Industries and Regions 2022). OsHV-1 microvariant is a notifiable disease under the *Livestock Act 1997*. POMS causes rapid death and high mortality rates in farmed Pacific Oysters (Department of Primary Industries and Regions 2022b). Pacific Oysters are native to Japan and southern China and were introduced to Australia in the mid-1900s to establish oyster aquaculture industries (Australian Government n.d.) Feral oyster populations in the Port River are a risk to commercial oyster growing farms. The nearest commercial growing areas is at Port Vincent, approximately 60 km west from the subject site. Therefore, the control of Pacific Oysters in the marine-based portion of the subject site will be part of the Development's biosecurity measures. PIRSA states that Pacific Oysters and the virus are now endemic in the Port River (Department of Primary Industries and Regions 2022b). Eradication of feral Pacific Oysters and the virus is therefore considered unachievable in the Port River and estuary (J Diversity Pty Ltd 2023). In lieu of eradication, the Development will endeavour to integrate measures to restrict the spread of POMS during the construction and operation (J Diversity Pty Ltd 2023). Management measures for Pacific Oysters and POMs is outlined in Table 7.

6.2.1 Exotic Marine Organisms Regulatory Framework

Management of exotic marine organisms or notifiable pathogens is subject to legislation and guidelines including:

- *Biosecurity Act 2015* and the *Biosecurity Regulations 2016* (Commonwealth)
- *Environment Protection* (Sea Dumping) *Act 1991* (Commonwealth) (Note: the majority of dredging undertaken Australian Maritime Safety Authority Environment Protection (Sea Dumping) Act majority of dredging occurs within SA in state waters (including Spencer Gulf and Gulf St Vincent) therefore the application of the *Environment Protection* (Sea Dumping) *Act* rarely applies.
- *Fisheries Management Act 2007* (*SA; FM Act*)
- *Environment Protection Act 1993*
- Environmental Protection Agency (EPA), Dredge Guideline 2020.

6.2.2 Exotic Marine Organisms Management

The Development will manage exotic marine organisms to reduce the risk of introducing and/or spreading invasive marine species. Management measures for exotic marine organisms will consist of mandatory requirements under the relevant legislation and guidelines and recommended measures based on PIRSA best practice management techniques and expert knowledge (Table 7).

The required management measures for exotic marine organisms will be outlined in a Biosecurity Management Plan, which will be prepared as a subplan to the CEMP and OEMP.

Furthermore, measures specific to the management of exotic marine species during dredging activities will be outlined in a Dredge Management Plan, as required by the Dredge Guidelines (Environmental Protection Agency 2020). A DMP is a requirement to obtain a dredge licence and confirms the scope, methodology, environmental management, contingency and incident response arrangements for the dredging campaign. The Dredge Management Plan will be prepared in with the guidance of the EPA Dredge Guidelines. The DMP will include a water quality monitoring plan and will address community consultation and communication requirements. Environmental monitoring may be required as part of the DMP to ensure compliance with EPA legislation and that any impacts that may result in environmental nuisance or harm detected and appropriately managed. The DMP is a document to be prepared and implemented by the licensee.

Table 7: Management measures for Exotic Marine Organisms.

Impact pathway	Risk	Required Management Measures	Recommended Management Measures
Marine construction and operational activities (such as dredging, release of ballast water, bilge water and biofouling)	Introduction, establishment, or spread of pest marine species. Creation of new habitat for marine pest species.	Exotic Marine Organisms • Under the regulation 23A of the *FM General Regulations* a person must not take bivalve filter-feeding molluscs in Port Adelaide River estuary. • Obtain relevant permits under section 78 of the *FM Act* to appropriately manage exotic organisms and Declared Noxious species. • Obtain relevant permits to collect any fragments of Declared Noxious species that may have attached to the equipment, identify them, and report listed marine species to PIRSA. • Obtain relevant permits to dispose of Declared Noxious species in an allocated site waste and do not return pest marine species to the ocean. • Report Declared Noxious species to PIRSA. • Adhere to sections 27, 28, 29, and 30 of the *Livestock Act 1997*. • If OsHV-1 microvariant is identified during the Development, this is a notifiable disease and must be reported to PIRSA in accordance with the *Livestock Act 1997*. Required under the EPA Dredge Guideline 2020: • Prepare a Dredge Management Plan including details regarding how biosecurity measures will be managed.	Exotic Marine Organisms • Development of a Project and site specific Biosecurity Management Plan which focuses on the prevention, eradication, containment and control of marine pest species (particularly, those listed under the *FM Act*, of PIRSA concern, or on the Australian Government National Priority List). • For personnel working within the marine-based portion of the subject site, increase and maintain awareness of marine pest species and their management via a CEMP or Biosecurity Management Plan, pre-start, toolbox meetings and/or inductions. • Inspect any equipment used in the Port River and the Port River Containment Area before its use in any areas outside of the marine-based portion of the subject site. • Regular inspections of permanent, semi-permanent and temporary infrastructure to identify signs of pest species or unusual species, to be undertaken by staff trained in the identification of marine pests. • Wash equipment that may harbor exotic marine organisms after use in plastic bins using fresh water and bleach, for smaller items where feasible. • Inspect dredging and marine equipment for exotic marine pest species before and after use. Dredging • Undertake pre-dredging surveys to identify and quantify marine pest species existing in the subject site.

Impact pathway	Risk	Required Management Measures	Recommended Management Measures
		• Obtain a Dredging License in accordance with EPA requirements.	POMS* • Consultation and collaboration with PIRSA for ongoing removal, testing or monitoring of POMS, where risks to the marine infrastructure and operation of the SCY may occur. • Avoid dredging, where possible, when average water temperatures are above 18°C (generally October to March). • Periodic vessel cleaning and equipment decontamination (including any equipment to be used in the Port River e.g. dredging equipment). • Monitoring of the intertidal zone of the Port River. • Survey for bivalves before and after marine construction activities have occurred. * Some measures may not be applicable if dredged material is disposed on land and all transport is within the confines of the Port River (J Diversity Pty Ltd 2023). These management measures could be outlined in a Biosecurity Management Plan and a Dredge Management Plan.

6.3 Vermin and other terrestrial pest species

Assessment requirements addressed:

- *Outline strategies to monitor and prevent the introduction and spread of vermin and other nuisance species that can be attracted to port facilities, and measures to manage and monitor such species, including the need to restrict the spread of Pacific Oyster Mortality Syndrome (POMS) from the Port River to other areas of state waters / aquaculture areas.*

Pest species can persist and thrive in urbanised environments. Pest species, such as Feral Pigeons (*Columba livia*), have broad habitat preferences and utilise human infrastructure as habitat (Ducatez et.al 2018). A variety of introduced species occur within the land-based portion of the subject site. There is the potential for the Development to make a positive effect on vermin distribution, by reducing the extent of desirable areas for pest species through vegetation clearance, increased human activity, and increased artificial light.

Six Declared Animals listed under the *Landscape South Australia Act 2019* (*LSA Act*) were identified during the terrestrial field surveys, these included:

- Fox (*Vulpes vulpes*) (*LSA Act: Declared Animal)*
- Rabbit (*Oryctolagus cuniculus*) (*LSA Act*: Declared Animal)
- Starling (*Sturnus vulgaris*) (*LSA Act*: Declared Animal)
- House Sparrow (*Passer domesticus*) (*LSA Act*: Declared Animal)
- Common Blackbird (*Turdus merula*) (*LSA Act*: Declared Animal); and
- Feral Pigeon (*Columba livia*) (*LSA Act*: Declared Animal).

A desktop search identified an additional seven terrestrial pest fauna species within a 5 km buffer of the subject site, of which four are Declared Animals under the *LSA Act*:

- European (Common) Greenfinch (*Chloris chloris*) (*LSA Act*: Declared Animal)
- Alexandrine Parakeet (*Psittacula eupatria*) (*LSA Act*: Declared Animal)
- Rose-ringed Parakeet (*Psittacula krameria*) (*LSA Act*: Declared Animal)
- Spotted Dove (*Spilopelia chinensis*) (*LSA Act*: Declared Animal)
- Barbary Dove (*Streptopelia risoria*)
- Eurasian Skylark (*Alauda arvensis arvensis*); and
- European Goldfinch (*Carduelis carduelis*).

Additionally, although they were not identified in the desktop search or observed during field surveys, it is likely that Black Rat (*Rattus rattus*), Brown Rat (*Rattus norvegicus*), or House Mouse (*Mus musculus*) occur within or adjacent to the subject site.

6.3.1 Vermin and Other Terrestrial Pest Species Regulatory Framework

Management of vermin and other terrestrial pest species is subject to legislation and guidelines including:

- *Biosecurity Act 2015* (Commonwealth)
- *Landscape South Australia Act 2019.*

6.3.2 Vermin and Other Terrestrial Pest Species Management

The Development will manage vermin and other terrestrial fauna pest species to reduce the risk of introducing and/or spreading pest fauna species. Management measures for pest fauna species will consist

of mandatory requirements under the relevant legislation and guidelines and recommended measures based on expert knowledge (Table 8).

The required management measures for terrestrial vermin will be outlined in the Terrestrial Flora and Fauna Requirements Analysis (TFFRA), as a subplan to the CEMP and OEMP.

Table 8: Management Measures for Terrestrial Pest Fauna Species.

Impact pathway	Risk	Required Management Measures	Recommended Management Measures
Construction material creates artificial habitat suitable for pest fauna species.	Exacerbation of pest fauna species within the subject site.	• Management of Declared Animals in accordance with the Declared Animal Policies administered under the *LSA Act*.	• Pest identification and monitoring outlined in TFFRA and/or Biosecurity Management Plan. • Placement of segregated waste bins in accessible and designated areas within the subject site. • Regular emptying of waste bins, particularly for general / food wastebins. • Removal of potential shelter opportunities and artificial habitat for pest species (e.g. stockpile of construction materials). • Install mesh, wires and spikes on infrastructure to deter pest bird species, such as feral pigeons (City of Port Adelaide Enfield 2023). • Educate staff on not feeding birds within the subject site. • Feral animal control, such as coordinated baiting and cage trapping. Where relevant, the landholder will have to obtain relevant permits and authorisations from PIRSA, Green Adelaide Landscape Board and/or the City of Port Adelaide Enfield. • Report suspected sightings of Declared Animals to Development's environmental advisor and/or relevant authorities, as required. These management measures could be included in the Biosecurity Management Plan.

6.4 Ship Ballast Water

Assessment requirements addressed:

- *Provide information on the proposed management techniques for incoming ship ballast and bilge waters.*
- *Outline measures to ensure consistency with the Australian Ballast Water Management Requirements (and national biofouling management guidelines).*

Ballast water is the freshwater or ocean water stored in a ship's hull to provide stability and improve manoeuvrability during a voyage. Ballast water can contain a range of invasive marine species (Department of Agriculture, Water and the Environment 2020). When unmanaged, it can result in economic and environmental impact on Australia's marine environment (Department of Agriculture, Water and the Environment 2020).

Ballast water management is directly applicable to the Development during construction and operation due to the marine-based nature of the Development. Nevertheless, the Development is not anticipated to produce substantial volumes of ballast water. The primary source of ballast water produced is expected to be via submarine testing, commissioning and operations. Other sources may include marine vessels delivering materials for the Development's construction or operations and dredging activities.

6.4.1 Ship Ballast Water Regulatory Framework

The Department of Agriculture, Water and the Environment 2020, *Australian Ballast Water Management Requirements Version 8* is a key Commonwealth guideline for the obligations on vessel operators with regards to the management of ballast water and ballast tank sediment when operating within Australian seas. The *Australian Ballast Water Requirements version 8* has been developed in accordance with obligations under the:

- *Biosecurity Act 2015* and;
- International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Convention).

At the State level, key legislation and subordinate legislation relevant to the management of ballast water includes:

- *Environment Protection Act 1993*
- Environmental Protection Agency's (EPA) Environmental Protection Policies (EPPs); and
- EPA Code of Practice (COP) for vessel and facility management (marine and inland waters) (Environmental Protection Agency 2019).

6.4.2 Management of Ballast Water

The Development's management of ballast water will consist of mandatory requirements under the relevant legislation and guidelines and recommended measures based on the EPA Code of Practice for *vessel and facility management (marine and inland waters)* 2019 (Table 9).

All vessel owners/operators must prepare a Ballast Water Management Plan (BWMP) as per the requirements of the *Australian Ballast Water Management Requirements Version 8*. The required management measures outlined in Table 11 must be included in vessel owners/operators BWMP. It is expected that vessel contractors are likely to already have a BWMP in place.

Table 9: Management Measures for Ballast Water.

Impact pathway	Risk	Required management measures	Recommended management measures
Ballast water from vessels.	Introduction or spread of marine pest species.	*Australian Ballast Water Management Requirements Version 8* states that all vessels must: • All vessels designed to carry ballast water are required to carry a Ballast Water Management Plan. • All vessels must carry a valid International Ballast Water management certificate. • Vessels with a ballast water management system (BWMS) must carry a Type Approval Certificate specific to the type of Ballast Water Management System (BWMS) installed. • All vessels must maintain a complete and accurate record of all ballast water movements. • Adhere to the Biosecurity Act requirements in Part 4- Ballast water management plans and ballast water management certificates Part (where applicable). • Acceptable methods of ballast water exchange, as set out in the *Australian Ballast Water Management Requirements version 8*. If the Development requires an alternative method of management of ballast water that is not specified in the *Australian Ballast Water Management Requirements version 8*, approval from the Department for Agriculture, Water and the Environment will be required prior to discharge. • Same Risk Areas (SRA), the waters within the Gulf St Vincent and Spencer Gulf (including the marine-based portion of the subject site) are considered a SRA and water may be taken up and discharged within these areas without undertaking ballast water exchange. However, the Development must refer to the *Australian Ballast Water Management Requirements version 8* for specific requirements and exclusions.	The EPA COP *vessel and facility management (marine and inland waters)* 2019 recommends that operators should implement: • Removal of sediment from ballast tanks in controlled conditions in port, at a vessel mooring/repair facility, or slipway. Such sediment would be disposed of in a suitable land-based sediment reception facility. • Assurance that all practical steps are taken during ballast water uptake to avoid sediment accumulation. This can include avoiding areas with current phytoplankton blooms, shallow water where propellers may stir up sediment, and areas where dredging is or has recently been carried out. • Assurance that, if sediments are to be disposed of at sea, sediments (and water used to flush sediments) should be disposed of at least 200 nautical miles from the nearest land and be in water at least 200 m in depth. These management measures could be included in the vessel operators and owners Ballast Water Management Plan.

Impact pathway	Risk	Required management measures	Recommended management measures
		• The Development, where applicable, will develop appropriate measures for the disposal of ballast water sediment in accordance with the *Australian Ballast Water Management Requirements version 8*. EPA COP *vessel and facility management (marine and inland waters)* 2019, states that operators must implement: • Follow the requirements established under the Commonwealth *Biosecurity Act 2015* and the *Australian Ballast Water Management Requirements*. • Keep accurate and comprehensive records of the status of ballast water on a voyage-by-voyage basis.	

6.5 Bilge Water

Assessment requirement addressed:

- *Provide information on the proposed management techniques for incoming ship ballast and bilge waters.*

The bilge is the compartment at the lowest point of a ship, where water accumulates. Bilge water is a mix of freshwater, seawater, oil, sludge, chemicals, and other fluids. Bilge water can contain polycyclic aromatic hydrocarbons (PAHs). These carcinogens have been implicated in diseases of aquatic organisms and subsequent human health problems (Environmental Protection Agency 2019). Bilge compartments frequently need to be pumped out. Therefore, bilge water needs to be managed to prevent pollution (Environmental Protection Agency 2019). The biosecurity risk from bilge water is low, rather, the risks it poses centre around water pollution.

Bilge water management is directly applicable to the Development during construction and operation due to the marine-based nature of the Development. Nevertheless, the Development is not anticipated to produce substantial volumes of it. The primary source of bilge waters produced is expected to be via marine vessels delivering materials for the Development's construction or operations. Other sources may include submarine testing and commissioning.

6.5.1 Bilge Water Regulatory Framework

Management of bilge water is subject to legislation and guidelines including:

- *Environment Protection Act 1993*
- Environmental Protection Agency's (EPA) Environmental Protection Policies (EPPs); and
- EPA Code of Practice (COP) for *vessel and facility management (marine and inland waters)* (Environmental Protection Agency 2019).

6.5.2 Bilge Water Management

The Development and its contractors will manage bilge water to minimise the risk of pollution entering the marine environment. Management measures will consist of mandatory requirements under the relevant legislation and guidelines and recommended measures based on the EPA Code of Practice for *vessel and facility management (marine and inland waters)* 2019 (Table 10).

Any required management measures for bilge water will be outlined in the CEMP and OEMP. The vessel owner/operator will be required to adhere to these management measures. It is expected that vessel operators will already have bilge water management measures in place.

Table 10: Management Measures for Bilge Water.

Impact pathway	Risk	Required Management Measures	Recommended Management Measures
Bilge water from vessels.	Accidental leaks or spills of bilge water into waterways, diminish water quality.	EPA COP *vessel and facility management (marine and inland waters)* 2019, states that operators must implement: • For all vessels operating in State waters where oily bilge water is generated, install and maintain oil filtration devices on bilge pumps; or • Place commercially manufactured oil absorption material in bilges (e.g. bilge socks/rats). • Do not pump bilge water (unless for safety of the vessel) into a waterway or soil if it contains visible signs of oil, hydrocarbons or other wastes. • Do not use detergents or emulsifiers in bilge water.	The EPA COP *vessel and facility management (marine and inland waters)* 2019 recommends that operators should: • Use, maintain and dispose of filters and absorption devices according to manufacturer's instructions. • Maintain engines regularly to prevent oil and fuel leaks to the bilge. In particular, check fuel lines for cracks and loose connections. • Use polypropylene bilge socks in preference to biodegradable items. These management measures could be outlined in the CEMP/OEMP.

6.6 Biofouling

Assessment requirement addressed:

- *Outline measures to ensure consistency with the Australian Ballast Water Management Requirements (and national biofouling management guidelines).*
- *Outline strategies to monitor, control and manage biofouling of wetted surfaces.*

Biofouling is the accumulation of microorganisms, algae and marine fauna and flora on marine permanent, semi-permanent, or temporary infrastructure (Australian Government 2021). The environmental conditions and artificial nature of this infrastructure make them highly suitable for marine pests to establish new populations once they are introduced (Australian Government 2021). Biofouling, where unmanaged, can result in economic and environmental impact to Australia's marine environment (Department of Agriculture, Water and the Environment 2020).

Invasive marine species can be transported via multiple vectors. Biofouling is a key vector by which invasive marine pests can be transported, introduced and spread. Biofouling has the potential to occur on semi-permanent and permanent marine infrastructure, including the Development's wet dock, wharves and any other infrastructure, such as vessels.

6.6.1 Biofouling Regulatory Framework

Management of biofouling is subject to legislation and guidelines including:

- *Biosecurity Act 2015* (Commonwealth).
- Australian Government 2021, *National biofouling management guidelines for marinas, slipways, boat maintenance and recreational boating facilities* (Australian Government 2021).

The Australian Government's *National biofouling management guidelines for marinas, slipways, boat maintenance and recreational boating facilitie*s provides best practice guidelines for owners and operators to reduce and manage the risk of marine pest introduction, establishment and spread (Australian Government 2021).

6.6.2 Biofouling Management

The Development will manage biofouling to reduce the risk of invasive marine species. Management measures for biofouling will consist of mandatory requirements under the relevant legislation and guidelines and recommended measures based on the Australian Government's 2021 *National biofouling management guidelines for marinas, slipways, boat maintenance and recreational boating facilities* and the EPA's 2019 Code of Practice for *vessel and facility management (marine and inland waters)* (Table 11). Note that Government and Defence Vessels are exempt from a Ballast Water Management Plan and Certificate Requirements. The Commonwealth Department of Agriculture, Fisheries and Forestry does not regulate ballast water management for military vessels.

The management measures for biofouling will be outlined in the Biosecurity Management Plan, as a subplan to the CEMP and OEMP.

Table 11: Management Measures for Biofouling.

Impact pathway	Risk	Required Management Measures	Recommended Management Measures
Biofouling on permanent and semi-permanent infrastructure.	Establishment of pest marine species.	EPA COP *vessel and facility management (marine and inland waters)* 2019, states that operators must implement: • Comply with the EPA COP *vessel and facility management (marine and inland waters)* 2019, section 5.7 Vessel cleaning; and • Comply with the EPA COP *vessel and facility management (marine and inland waters)* 2019, section 5.11 Painting and vanishing. If antifoulant is to be used the Development must adhere to Part 13-Antifoulants of the *Environment Protection (Water Quality) Policy 2015*.	Australian Government 2021, *National biofouling management guidelines for marinas, slipways, boat maintenance and recreational boating facilities* recommend the following best practice management measures for biofouling: • Awareness and Education o Where relevant, educate staff on marine pest that are considered a risk in the subject site. o Provision of identification information of marine pest species to assist in early detection. • Environmental Management Systems Develop and implement a Construction and/or Operation Environment Management Plan or Code of Practice to reduce biosecurity threats. These plans could include: o Roles and responsibilities of staff to include biofouling management and marine pest issues. o A vessel risk assessment process to determine best biofouling management actions prior to vessel arrival. o A risk assessment of operations, infrastructure and equipment of marine facilities to assist in the identification of marine pest threats and mitigations to reduce introduction of marine pest species. o A marine pest emergency procedure in collaboration with key government agencies (e.g. PIRSA). o An EMP can be cross-referenced in other relevant management plans to ensure consistency across the Development's activities. • Infrastructure Management o Periodic inspection of infrastructure to check for marine pests (trained personnel to identify pest species) o Biofouling inspection of moveable structures. Moveable structures (semi-permanent or temporary infrastructure) should undergo

Impact pathway	Risk	Required Management Measures	Recommended Management Measures
			biofouling inspection before being moved between locations and cleaning where necessary. The inspection should outline the different levels of biofouling present and corresponding management actions. o Assess the application of anti-fouling coatings. o Ecological engineering. Ecological engineering design can be applied to fixed and moveable structures to promote establishment of native species over marine pests. Design techniques such as habitat complexity via creation of pits, crevices or featured tiles, ecologically design construction materials and decreased shading and 'pre-seeding' with native species. • Vessel Cleaning and Maintenance o Establish cleaning procedure for vessels prior to entry and exit of the subject site in accordance with the Anti-fouling and in-water cleaning guidelines (Australian Government 2015) and National biofouling management guidelines (Australian Government 2021). o Supply appropriate disposal and waste capture for removed biological material in accordance with SA Environment Protection Agency (EPA) and PIRSA requirements. • Record Keeping and Reporting o Detailed records of construction and operational activities relating to management of biofouling, including infrastructure, vessels, staff trained and inducted, anti-fouling coating applied to infrastructure or vessels, marine pest species identified. o Reporting of marine pest detection and the provision of marine pest detection kits kept on site. • Surveillance o Implement a monitoring plan or surveillance program for marine pest species on infrastructure and vessels. o Bi-annual inspections of marine pest on fixed infrastructure.

Impact pathway	Risk	Required Management Measures	Recommended Management Measures
			The EPA COP *vessel and facility management (marine and inland waters)* 2019 recommends that operators should implement: • Increase and maintain awareness of marine pest risks and management among vessel operators, vessel facility personnel and general users. • Incorporate biofouling management practices into environmental management systems and be prepared for emergency situations (e.g. declared outbreaks). • Provide and maintain vessel facilities to allow proper marine pest vessel maintenance. • Manage vessel facility infrastructure for marine pest risks. • Remove biofouling from vessel at an EPA licensed facility with adequate waste and wastewater controls to capture and dispose of waste material. • Remove slime (primary biofouling) from the hull with a soft cloth. • Rinse trailered vessels with fresh water after each trip, ensuring that the wastewater runoff does not re-enter the marine environment, and inspect the vessel for attached organisms. Remove any that are found and dispose of to a bin for landfill. Do not return organisms to water. • Where practical, allow the vessel to drain and air dry after each trip. Air drying is effective in killing most small pest species in about 24 hours. • Ensure hulls and other areas of vessel prone to fouling are painted with antifouling systems. • Regularly maintain the antifouling and anti-corrosion coatings of the following niche areas of the vessel, which are particularly susceptible to biofouling growth – bow and stern thrusters (cavitation forces), bilge keels, cooling and propulsion scoops, rudder hinges and stabiliser fin apertures. • Repair, as soon as practical, damage to antifouling paint as a result of grounding, collision or mechanical impact, even if the area of damage is relatively minor. Landing barge operators should be particularly vigilant. • If a vessel has remained at the same site (i.e. on a mooring, at anchor or alongside a wharf) for an extended period of time (two months or more),

Impact pathway	Risk	Required Management Measures	Recommended Management Measures
			inspect its hull and niche areas and in the event that it has secondary biofouling, slip and clean those areas before departing the locality. • Regularly inspect and maintain unpainted hull appendages such as anodes, velocity probes and echo sounders. • Regularly polish propellers to maintain operational efficiency and to prevent biofouling. Painting propellers and propeller shafts with silicone fouling release coatings can maintain efficiency and enable self-cleaning, limiting the need for regular polishing. • Inspect and clean equipment routinely (including mooring lines, anchors, chains, and warps). • Ensure inspection regimes, hull, equipment, and niche area cleaning are adequate for the type of vessel. • Ensure dredges that work in one area all the time undergo regular inspections to ensure that the vessel is not becoming a reservoir for marine pests. Hoppers, suction and discharge pipes, cutter heads and buckets should be thoroughly cleaned, with all spoil removed. • Be aware of the risks of translocating marine pests between mainland and offshore islands, especially ferry operators. • Maintain written records (e.g. a logbook) that includes operational activities (e.g. sailing patterns of vessel), hull and equipment cleaning (e.g. dates, methods, and locations at which such activities took place), application of antifouling coating (e.g. date, location and type of coating applied). These management measures could be outlined in a Biosecurity Management Plan, as a subplan to the CEMP and OEMP.

7 SUMMARY OF MANAGEMENT FOR BIOSECURITY

As outlined, the Development will implement the mandatory management measures required under legislation and associated guidelines. These mandatory management measures will be detailed in relevant environmental management plans and/or management subplans. The relationships among the relevant management plans are diagrammed in Figure 3.

The recommended management measures, in contrast, are derived from subordinate legislative instruments (e.g. guidelines) or developed by experts to achieve compliance against the relevant Acts and Regulations. These management measures are optional and not enforced under South Australian and/or Commonwealth law. However, they are strongly recommended to assist in achieving compliance under South Australian and Commonwealth legislation. Many of these management measures are best-practice environmental management and are standard for development and construction projects. It is suggested that the recommended management measures are tailored into relevant construction and operational environmental management plans and/or management subplans (Figure 3).

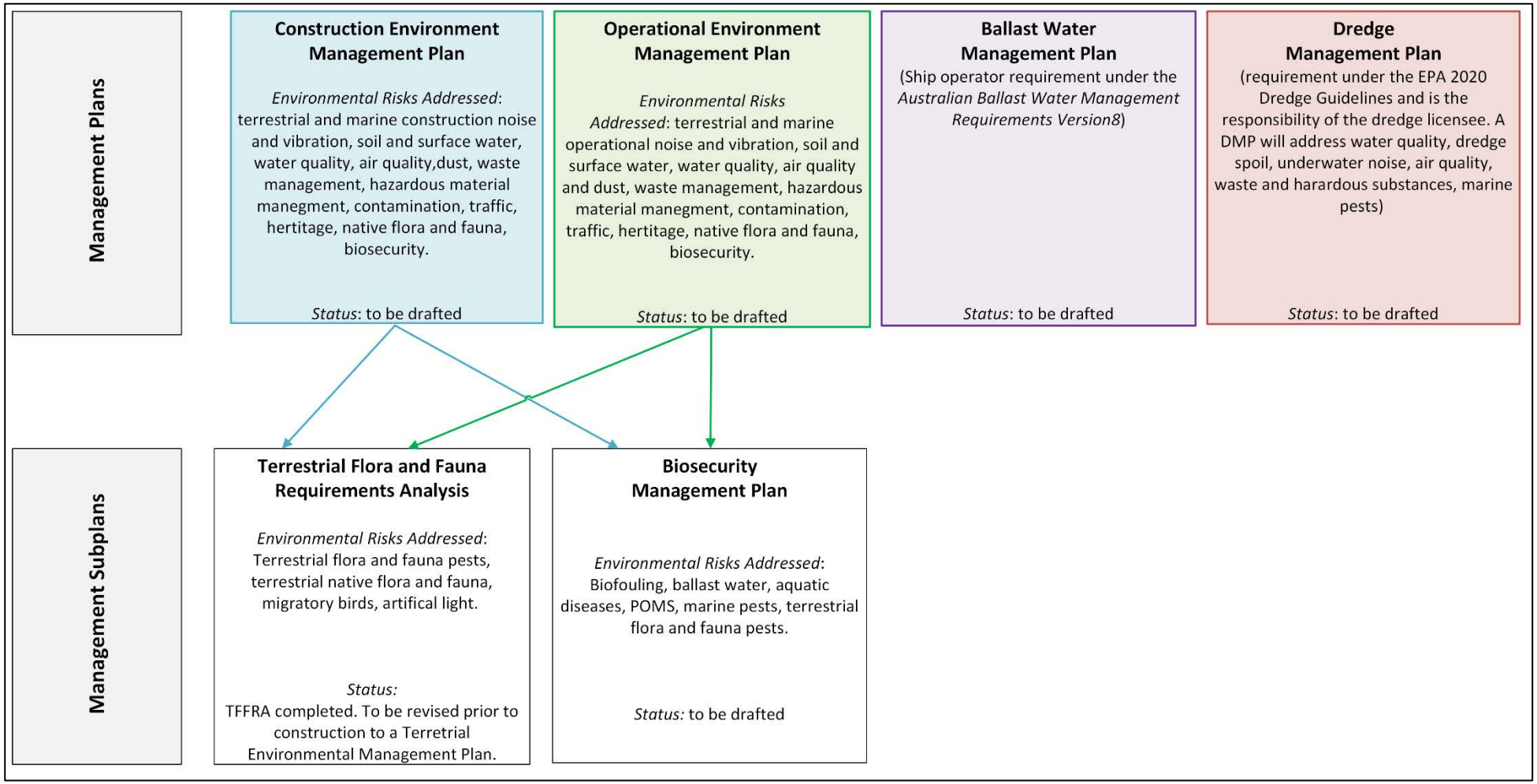

Figure 3: The Development's proposed Management Plans and their relationships to the Management subplans. This diagram refers only to management plans that address biosecurity risks. Refer to the Succession Ecology 2024 Nuclear-Powered Submarine Construction Yard Terrestrial and Marine Flora and Fauna Ecological Report, section 9, for a full summary of environmental management plans.

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9 GLOSSARY

Table 12: Glossary

Term	Definition
Land-based of the subject site	The SCY land-based portion of the subject site is located on the north-eastern side of the Lefevre Peninsula in Port Adelaide, South Australia.
Marine-based portion of the subject site.	The SCY marine based portion of the subject site is located on the within the Port River of the Lefevre Peninsula in Port Adelaide, South Australia.
Microalgae	Macroalgae (macroscopic algae, filamentous or thalloid) are the major flora of the littoral zones of many lakes, streams, and shallow estuarine and marine waters (Benavides, J & Castro, C 2023).
Subject Site	The SCY subject site is located on the north-eastern side of the Lefevre Peninsula in Port Adelaide, South Australia.
The Development	The Nuclear-Powered Submarine Construction Yard.

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