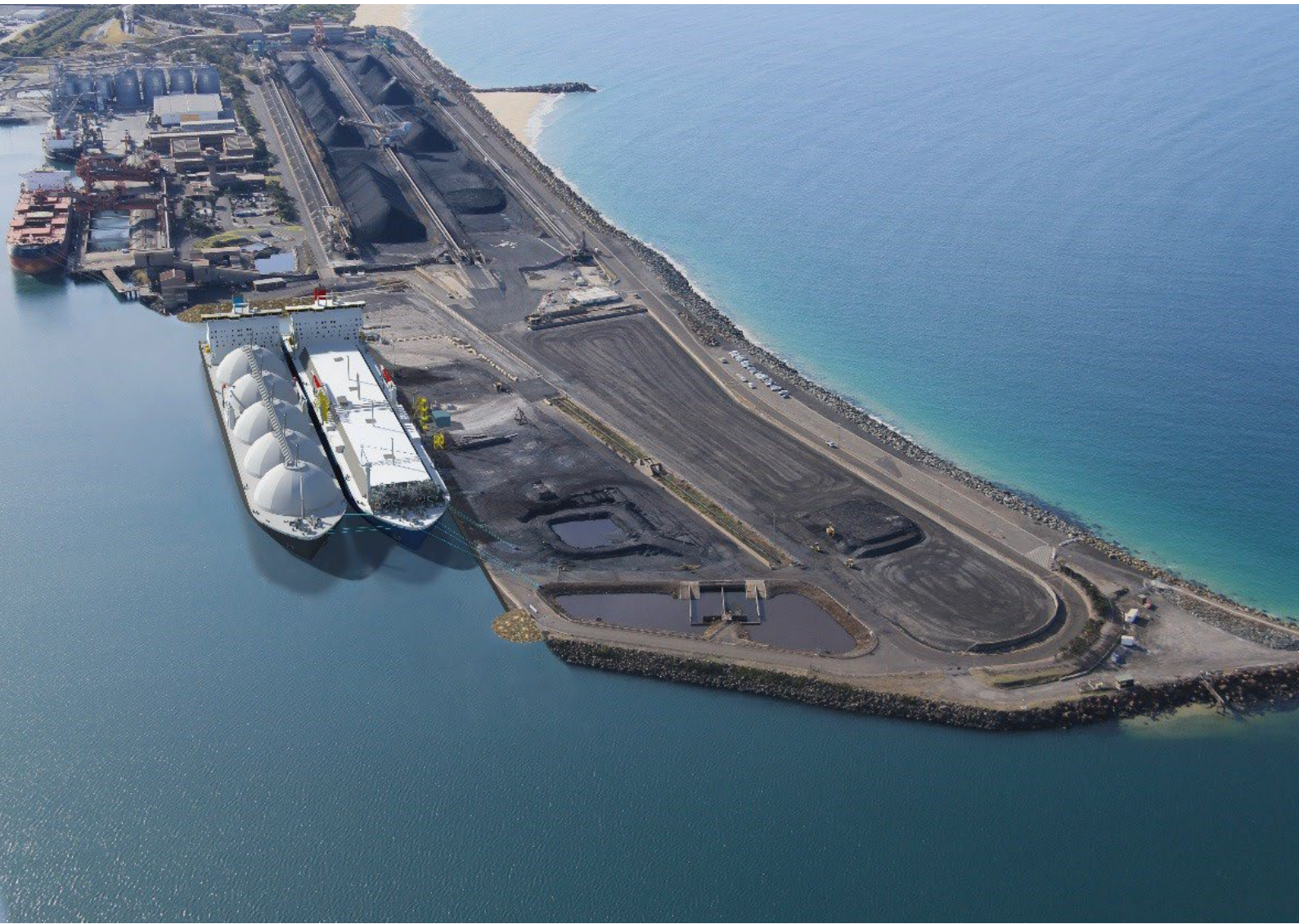
Port Kembla Gas Terminal

Dredge and Excavation Management Plan Stage 2A and 2B Marine Berth Construction and Dredging – Land and Marine Based

Australian Industrial Energy

30 May 2022

→ **The Power of Commitment**



GHD Pty Ltd | ABN 39 008 488 373
133 Castlereagh Street, Level 15
Sydney, New South Wales 2000, Australia
T +61 2 9239 7100 | **F** +61 2 9239 7199 | **E** sydmail@ghd.com | **ghd.com**

Heron Construction Company Ltd | ABN 35705294204PO Box 171
Wickham, New South Wales 2293, Australia
T +64 9 299 9767 | **F** +64 9 299 9510 | **E** **info@heronconstruction.co.nz** | **heronconstruction.co.nz**

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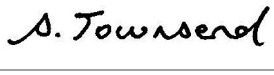
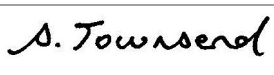
	EK Marsh (GHD)	N Alexander (GHD)		K Rosen (GHD)		
B	G Ward (Heron)	A Lovell (AIE)		A Lovell (AIE)		28/02/22
	EK Marsh (GHD)	S Townsend (GHD)		K Rosen (GHD)		
C	G Ward (Heron)	A Lovell (AIE)		A Lovell (AIE)		23/03/22
	EK Marsh (GHD)	S Townsend (GHD)		K Rosen (GHD)		
D	G Ward (Heron)	A Lovell (AIE)		A Lovell (AIE)		30/05/22
	EK Marsh (GHD)	S Townsend (GHD)		K Rosen (GHD)		

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Acronyms

Acronym	Definition
ADT	Articulated dump truck
AHD	Australian Height Datum
AIE	Australian Industrial Energy
AIS	Automatic identification system
AMSA	Australian Maritime Safety Authority
ASS	Acid Sulfate Soils
ASSMP	Acid Sulfate Soil Management Plan
Berth 101	MBD Site Compound
BC Act	*Biodiversity Conservation Act 2016*
BHD	Backhoe Dredge
CAD	Computer aided design
CD	Chart Datum
COLREG	Convention on the International Regulations for Preventing Collisions at Sea, 1972
CSP	Contaminated Spoil Protocol
CSSI	Critical State Significant Infrastructure
CTMP	Construction Traffic Management Plan
DEMP	Dredge and Excavation Management Plan
DPA	Designated person ashore
DP&E	Department of Planning and Environment
DPGS	Differential Global Positioning System
ECR	Emplacement Cell Report
EIS	Environmental Impact Statement
EMS	Environmental Management Strategy
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 197*
EPBC Act	*Environment Protection Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
ESCP	Erosion and Sediment Control Plan
FFMP	Flora and Fauna Management Plan
FM Act	*Fisheries Management Act 1994*
FSRU	Floating Storage and Re-gasification Unit
GHD	GHD Pty Ltd
GNSS	Global Navigation Satellite System
GP	general purpose
GPS	Global Positioning System
Heron	Heron Construction Co Ltd
HM	Harbour Muds
HS	Harbour Silts
Hs	significant wave height

Acronym	Definition
HSE	Health, Safety and Environment
IMO	International Maritime Organisation
IMS	invasive marine species
ISM Code	International Safety Management code
ISPS Code	International Ship and Port Facility Security Code
LAT	Lowest Astronomical Tide
LNG	liquefied natural gas
KPI	Key Performance Indicators
m^3	Cubic metres
Machiavelli	Backhoe dredge
Marine Pollution Act	*Marine Pollution Act 2012*
MARPOL	International Convention for the Prevention of Pollution from Ships
MBD	Marine Berth Construction and Dredging
Mbgl	Metres below ground level
MHB	Material Handling Barge
MLA	Marine Loading Arms
MSL	Mean Seal Level
National Plan	National Plan for Maritime Environmental Emergencies (AMSA, 2020)
Navigation Act	*Navigation Act 2012 (Cth)*
OHDSCA	Outer Harbour Dredged Spoil Containment Area
ORF	Onshore Receiving Facilities
PANSW	Port Authority of NSW
PASS	Potential Acid Sulfate Soils
PIRMP	Pollution Incident Response Management Plan
PKGT	Port Kembla Gas Terminal
PKGT EIS	Port Kembla Gas Terminal Environmental Impact Statement
PKHD	Port Kembla Height Datum
Planning Systems SEPP	State Environmental Planning Policy (Planning Systems) 2021
POEO Act	*Protection of the Environment Operations Act 1997*
POMP	Port Operations Management Plan
QA	Quality Assurance
RL	Reduced Level
RTK	real-time kinematic
SHB	Split Hopper Barges
SMP	Spoil Management Plan
SMS	Safety Management System
SMEC	SMEC Australia Pty Ltd
SOLAS	International Convention for the Safety of Life at Sea 1914
SOP	Standard Operating Procedure
SOPEP	Shipboard Oil Pollution Emergency Plan
SWMS	Safe Work Method Statements
TfNSW	Transport for NSW

Acronym	Definition
The Project	Port Kembla Gas Terminal Project
VTS	Vessel Traffic Services
WM Act	*Water Management Act 2000*
WQMP	Water Quality Monitoring Plan
X, y, z	northing, easting & reduced level

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1. Introduction

1.1 Overview

This Dredge and Excavation Management Plan (DEMP) has been developed as a Sub - plan to the Port Kembla Gas Terminal Project (the Project) Spoil Management Plan (SMP). The SMP is a Sub - plan to the Project's overarching Environmental Management Strategy (EMS). This DEMP has been prepared by GHD Pty Ltd (GHD) and Heron Construction Co Ltd (Heron) on behalf of Australian Industrial Energy (AIE) to apply to construction activities associated with Stage 2A and Stage 2B construction of the Project.

This DEMP overarches the other associated Sub-plans, which together describe the proposed structure for environmental management and monitoring requirements for the Project. This DEMP addresses the requirements of the Port Kembla Gas Terminal Environmental Impact Statement (PKGT EIS) and associated Infrastructure Approval (SSI 9471) and Environment Protection Licence (EPL) No. 21529.

1.2 Background

AIE is developing the Project which involves the development of a liquefied natural gas (LNG) import terminal at Port Kembla, south of Wollongong, NSW. The Project will be the first of its kind in NSW and will provide a simple and flexible solution to the state's gas supply challenges.

NSW currently imports more than 95 percent of the natural gas it uses from other eastern states. In recent years, gas supplies to the Australian east coast market have tightened, resulting in increased natural gas prices for both industrial and domestic users.

The Project provides an immediate solution to address the predicted shortages and will result in significant economic benefits for both the Illawarra region and NSW. The Project will have a capacity to deliver more than 100 petajoules of natural gas, equivalent to more than 70 percent of NSW gas needs and will provide between 10 to 12 days of natural gas storage in case of interstate supply interruption. LNG will be sourced from worldwide suppliers and transported by LNG carriers to the gas terminal at Port Kembla where it will be re-gasified for input into the NSW gas transmission network.

The Project has been declared Critical State Significant Infrastructure (CSSI) in accordance with Section 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (NSW) and Schedule 5 of the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP). The Project received Infrastructure Approval from the Minister for Planning and Public Spaces on 29 April 2019.

The construction of the Project is primarily associated with the establishment of a new berth facility at Port Kembla to enable an LNG carrier to berth alongside the Floating Storage and Re-gasification Unit (FSRU) and new infrastructure to connect the terminal to the existing gas network. Excavation and dredging would be required to establish the new berth facility, with spoil deposited in a cell (referred to as the 'Emplacement Cell') in the Outer Harbour.

The development has progressed to Stage 2A and Stage 2B works located at Berth 101 (referred to as the 'Marine Berth Construction and Dredging (MBD) Site Compound') and the Outer Harbour Dredged Spoil Containment Area (referred to as 'OHDSCA' or the Emplacement Cell). Collectively, these two locations are referred to as "the site". The Stage 2A works include:

– Completion of excavation works undertaken during Stage 1 (including transport of spoil materials to the Emplacement Cell Construction Site).
– Construction of the quay wall at the MBD Site Compound.
– Construction of Onshore Receiving Facilities (ORF) at the MBD Site Compound (including construction of Wharf Topside Area, Utility Area, and Common Area).
– Installation and commissioning of power, communications, and potable water.
– Installation of gas pipeline within the MBD Site Compound as part of ORF.

The Stage 2B works include:

– Continuation of Stage 2A works.

– Excavation and dredging of the MBD Site Compound in the Inner Harbour and the Emplacement Cell in the Outer Harbour.
– Construction of the Emplacement Cell in the Outer Harbour.
– Marine based construction activities including installation of navigational aids and revetments at the MBD Site Compound.

1.3 Purpose and scope

This DEMP has been prepared in accordance with the PKGT EIS and associated Infrastructure Approval (SSI 9471) and EPL No. 21529. It describes how the management measures and commitments in the PKGT EIS, Infrastructure Approval (SSI 9471) and EPL No. 21529 relating to dredging are to be implemented by the Principal Contractor's during Stage 2A and Stage 2B construction of the Project. Specifically, this plan includes requirements to:

– Minimise generation and dispersion of sediments during dredging and disposal activities,
– Ensure no waters are polluted as a result of dredging and disposal activities,
– Management and procedures for handling, transporting, storing and disposal of dredged materials, and
– Location and depths of dredging and disposal areas.

This plan addresses the above requirements and includes, but is not limited to:

– Performance criteria for minimising sediment generation and dispersion.
– Mitigation strategies to minimise impacts on water and air quality during dredging works.

Odour and air emission mitigation measures related to the handling of sediments are included in the Stage 2A and Stage 2B Air Quality Management Plan (AQMP).

Minimising sediment generation and dispersion during dredging and placement activity is a key component of the Stage 2A and Stage 2B DEMP. Specific mitigation measures are contained throughout this Plan, and include measures related, but not limited, to the following:

– Implementation and action of a Trigger Action Response Plan (TARP) in the event exceedance of the total suspended solids/turbidity trigger levels are detected (additional detail provided in the Stage 2A and Stage 2B Water Quality Monitoring Plan (WQMP)).
– Installation of silt curtains within the Inner and Outer Harbour areas.
– Design parameters, including defined horizontal and vertical dredge limits, and appropriate equipment selection which seek to minimise sediment disturbance as much as practicable.
– Use of backhoe dredge and mechanical dredging methods have been chosen rather than hydraulic dredging

AIE and its contractors acknowledge that maintaining water and air quality during dredging and placement activity in the vicinity of the Project site is paramount to the successful delivery of the construction phase of the Project. AIE is committed to ensuring this DEMP is implemented, reviewed and updated regularly to ensure its objectives are met and that the approval conditions outlined in the Infrastructure Approval (SSI 9471) and EPL No. 21529 are achieved.

This DEMP is applicable to all staff, employees, subcontractors, and any statutory service authorities undertaking the Stage 2A and Stage 2B works described in Section 2 of this DEMP. The DEMP implementation and on-going development will be managed by the Project Team (refer to Section 3).

2. Project overview

2.1 Site description

The site of the Project is situated at Port Kembla within the Illawarra region of NSW, about 80 kilometres south of Sydney. Port Kembla is mainly characterised by an existing import and export terminal and multiple other business, cargo, logistics, bulk goods, and heavy industrial facilities in the vicinity.

Port Kembla is situated about two kilometres south of the centre of Wollongong. Other localities surrounding Port Kembla and the Project site include Mangerton, Mount St. Thomas and Figtree to the north-west; Unanderra to the west; Berkeley to the south-west; and Cringila, Lake Heights, Warrawong and the residential region of Port Kembla to the south.

The zoned land use in the region includes special use and industrial use at Port Kembla and a mix of primarily residential and commercial uses at the surrounding localities. Major infrastructure in the region of Port Kembla includes the Princes Highway, which is a major state and regional highway connecting Sydney and Wollongong and regional areas further south. Princes Highway provides access to Port Kembla through turnoffs at Masters Road, Five Islands Road and Northcliffe Drive and is broadly utilised including by heavy vehicles from the port.

The South Coast railway line runs along the periphery of Port Kembla including the stations Port Kembla, Port Kembla North, Cringila and Lysaghts. The rail line services commuters and is also used to transport bulk solid goods like coal, grain, copper and steel from Port Kembla. The environmental features of Port Kembla and the surrounding region are limited given the extensive industrial, commercial and residential development. Waterways in the region include the Gurungaty Waterway, Allans Creek, American Creek and Byarong Creek. Green space includes JJ Kelly Park and Wollongong Golf Club to the north and a larger open area to the south-west.

The Project will be predominantly located within land zoned for dedicated port and industrial uses. Berth and wharf facilities, as well as the FSRU, would be situated at Berth 101 at the Inner Harbour, while the gas pipeline would extend around the periphery of port operations from Berth 101 to a tie-in point at Cringila. The Emplacement Cell will be located in the Outer Harbour. A site overview is provided as Figure 2.1.

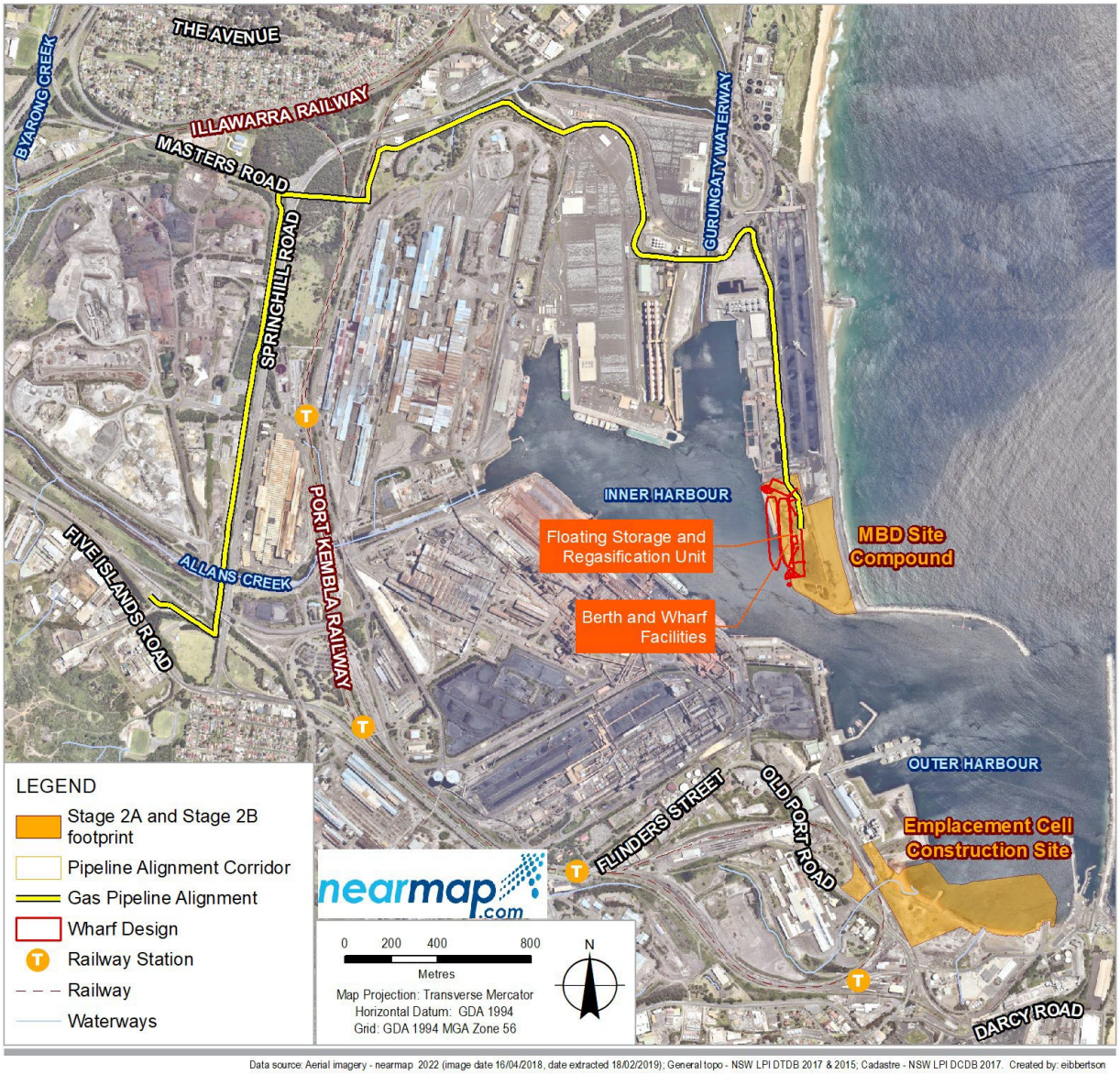


Figure 2.1 Site overview

2.2 Project construction scope of works

2.2.1 Overview

The Project construction scope of work has been divided into three main packages (with associated activities), as outlined in Table 2.1. Construction staging of the Project has been approved in accordance with Condition 3 of Schedule 4 of Infrastructure Approval (SSI 9471) as per correspondence from the Department of Planning and Environment (DP&E) dated 27 October 2021. This DEMP applies only to the works associated with Stage 2A and Stage 2B.

Table 2.1 Construction stages/work packages

Stage	Package	Proposed commencement	Activities
1	Early Enabling Works	May 2021	Demolition of Berth 101, removal of structures and land based excavation works, and Cone Penetration Testing in the Outer Harbour to inform Emplacement Cell design and relocation of Bunker Oil Pipeline.
2A	Marine Berth Construction – Land Based	January 2022	Completion of excavation works undertaken during Stage 1. Transport of spoil materials for storage at the Emplacement Cell Construction Site.
			Quay wall construction.
		February 2022	Installation of communications conduit, potable water line, and 11kV power cable and padmount substation within MBD Site Compound.
		April 2022	Construction of the ORF, which comprises three areas: Wharf Topside Area; Utility Area; and Common Area.
		June 2022	Pipeline construction and associated ancillary infrastructure within MBD Site Compound delivered as part of ORF scope.
2B	Marine Berth Construction and Dredging – Land and Marine Based	March 2022	Continuation of Stage 2A with the addition of the following activities:
			Excavation/dredging of the MBD Site Compound in the Inner Harbour and construction of the Emplacement Cell in the Outer Harbour.
			Marine based construction activities including installation of navigational aids and revetment shore protection.
3	Pipeline installation including tie-ins	June 2022	Construction of an 18” onshore natural gas pipeline approximately 6.3km in length from the Berth 101 site boundary to tie - in facility at Cringila for connection to the Eastern Gas Pipeline. Pipeline construction to occur concurrently with Jemena, subject to separate set of management plans.

*Proposed dates and may be subject to change.

The following will be undertaken as part of the Stage 2A land-based works:

– Construction of the quay wall at MBD Site Compound incorporating finalisation of excavation works undertaken during Stage 1 (including transport of spoil materials to Emplacement Cell Construction Site).
– Installation of and commissioning of power, communications, and potable water.
– Construction of ORF at MBD Site Compound (including construction of Wharf Topside Area, Utility Area, and Common Area).
– Installation of gas pipeline within the MBD Compound site.

The following will be undertaken as part of the Stage 2B land and marine-based works:

– Continuation of Stage 2A works.
– Installation of site facilities and preparatory earthworks at Emplacement Cell Construction Site.
– Marine-based construction activities including installation of silt curtains, navigational aids, and revetment shore protection at the MBD Site Compound.

– Construction of the Emplacement Cell in the Outer Harbour.
– Excavation and dredging of the MBD Site Compound in the Inner Harbour.

An outline of the tasks associated with Stage 2A and Stage 2B is provided in Section 2.3 through Section 2.7. The site includes the MBD Site Compound, the Emplacement Cell Construction Site, and the Emplacement Cell located in the Outer Harbour. The location of the Stage 2A and Stage 2B works is shown in Figure 2.2.

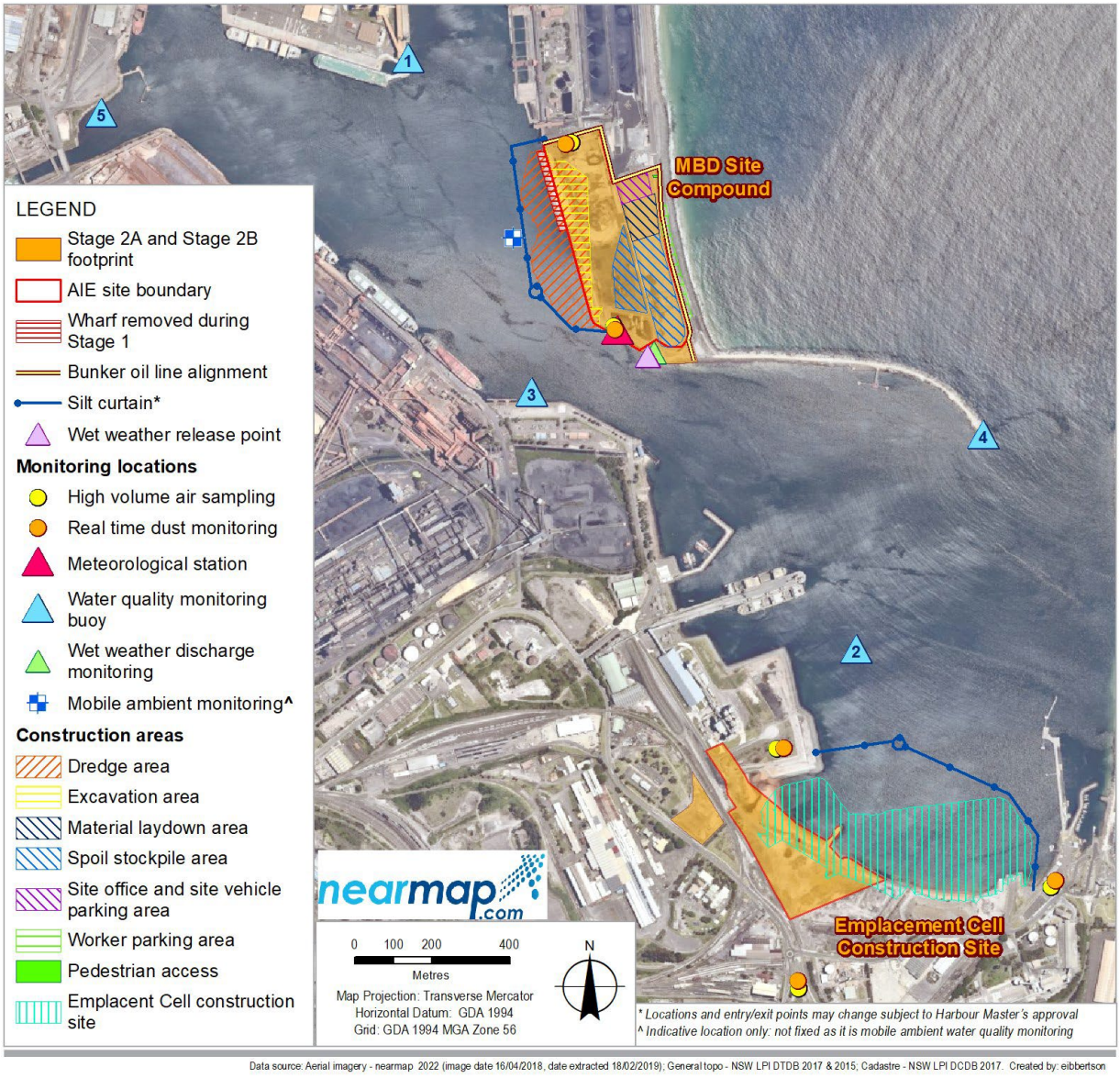


Figure 2.2 ***Stage 2A and Stage 2B works and location of MBD Site Compound, Emplacement Cell and Emplacement Cell Construction Site***

2.2.2 Traffic

Road traffic generated by Stage 2A and Stage 2B will be controlled through the gate on Sea Wall Road. Heavy vehicle movements will be generated by the delivery of materials, equipment, and plant to the MBD Site Compound and transport of stockpiled material to the Emplacement Cell Construction Site.

In addition to the material that has already been transported to Emplacement Cell Construction Site (Outer Harbour Laydown Area) during Stage 2A, up to 30,000 cubic metres (m^3) of material from the MBD Site Compound is anticipated to be transported via road to the Emplacement Cell Construction Site during Stage 2B.The activities associated with this task will involve loading, road transportation via truck and trailer (approximately 30-tonne capacity), unloading, stockpiling, and management of the stockpiles.

Light vehicle movements will be generated from construction workers accessing the MBD Site Compound and Emplacement Cell Construction Site. Parking will be provided for up to approximately 100 workers at the MBD Site Compound and approximately 37 workers at the Emplacement Cell Construction Site (refer to Figure 2.3 and Figure 2.4).

Road traffic movements will be undertaken in accordance with the Stage 2A and Stage 2B Construction Traffic Management Plan (CTMP).

The road traffic generated by Stage 2B will mainly be associated with the delivery of the quarry materials from quarries located in the surrounding area. It is anticipated that about 40-50 daily truck movements will be required, consisting of three - five axle semi-trailers or rigid truck and five axle dog-trailers of less than 40 tonnes (GML). The activities will take place during the standard daytime construction working hours, averaging approximately eight heavy truck movements per hour (four vehicles in and out of site). The total number of vehicles required for the operation will be 12-16.

The majority of traffic generated during Stage 2B activities will be marine traffic movements during dredging operations. Marine traffic navigation and management will be undertaken in accordance with the CTMP for Stage 2A and Stage 2B, which is made consistent with a Port Navigation Plan, herein referred to as the Port Operations Management Plan (POMP), produced by the Stage 2B Principal Contractor (Heron) in consultation with the Port Authority of NSW (PANSW).

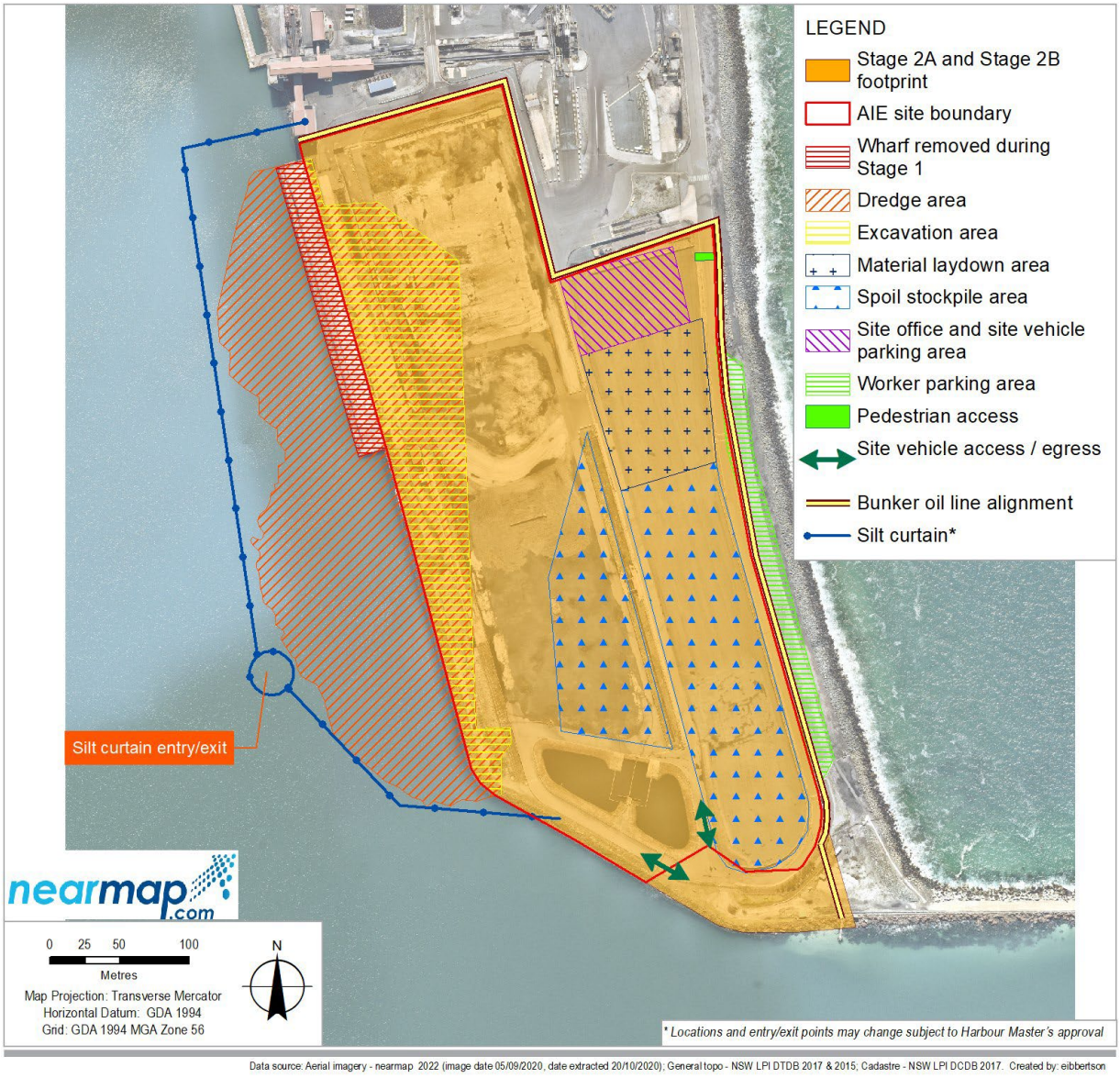


Figure 2.3 Layout of MBD Site Compound

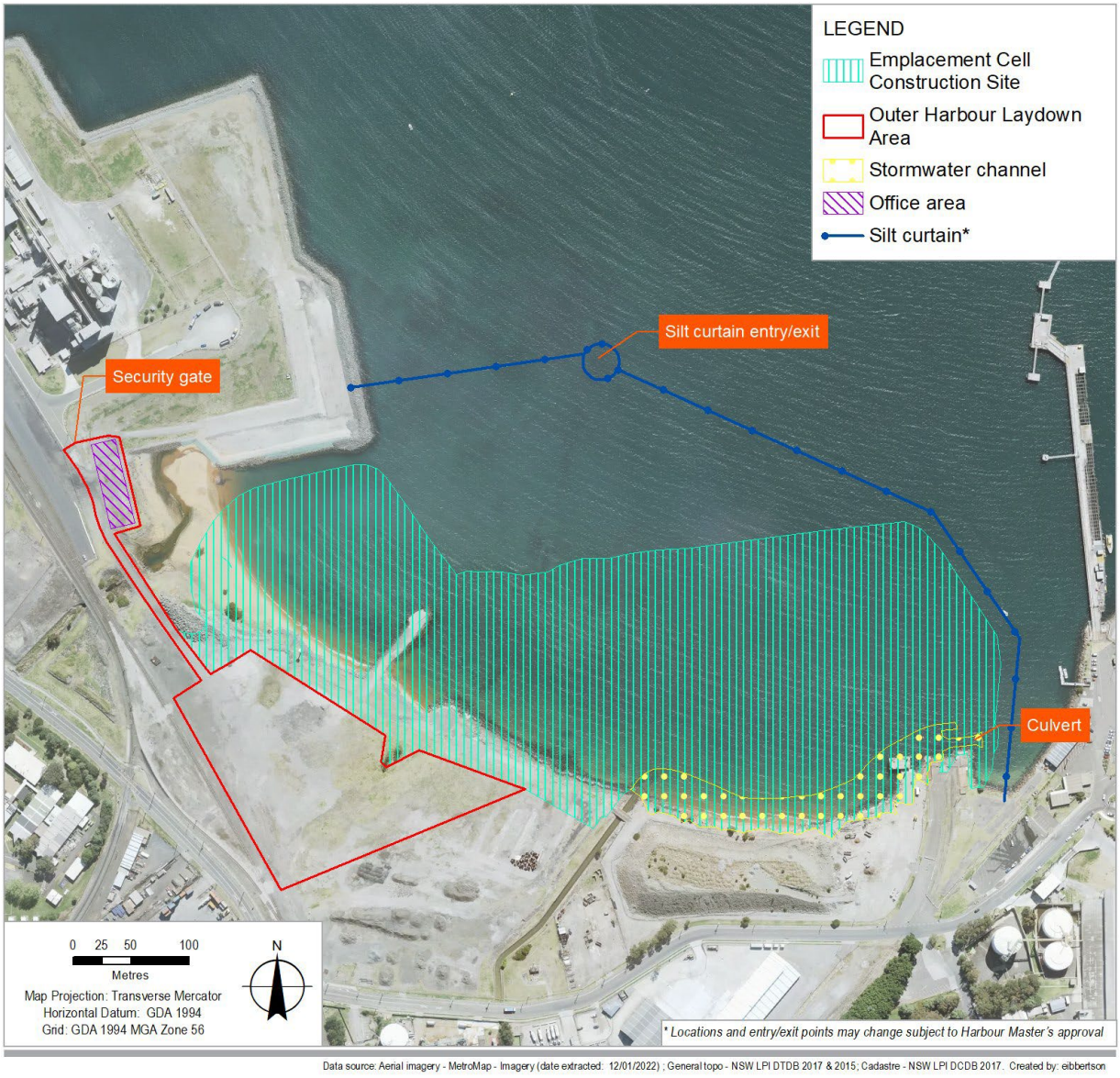


Figure 2.4 Layout of Emplacement Cell Construction Site

2.2.3 Program

The Stage 2A works commenced in January 2022. Stage 2B, which includes the continuation of land-based construction and marine-based works, are then anticipated to commence in March 2022 (refer to Table 2.1 for construction staging). As noted in Section 2.2, these dates are only proposed and may be subject to change.

2.3 Stage 2A: Construction of quay wall (MBD – Land Based)

A number of structures will be constructed within the MBD Site Compound to accommodate the FSRU and LNG carrier for the Project. Excavation and stockpiling activities from the Stage 1 Early Enabling Works will continue on-site during Stage 2A to lay the platform for ongoing construction activities at the MBD Site Compound.

The new structures that will commence construction during Stage 2A are summarised in Table 2.2. The location of the quay wall and layout of the marine berth and wharf facilities is shown in Figure 2.5.

Table 2.2 Marine berth and wharf structures to be constructed during Stage 2A

Component	Works required
Earthworks and stockpiles	– Completion of excavation and backfilling works from Stage 1 Early Enabling Works. – Excavated materials from the Early Enabling Works have been stockpiled within the Eastern and Western Stockyards of the MBD Site Compound and the Emplacement Cell Construction Site. – The excavated materials stockpiled at the MBD Site Compound include: • Approximately 9,700m³ of demolished concrete crushed to nominal 70mm minus. • Approximately 12,500m³ of heavily bound base course crushed to nominal -150mm minus. • Approximately 33,900m³ of mixed slag, general fill, and coal nominally < 150mm in size. • Approximately 10,700m³ of predominantly sand material. • Approximately 8,600 m³ of asbestos impacted soils. – The excavated materials stockpiled at the Emplacement Cell Construction Site include: • Approximately 44,000 m³ of sand material.* – The excavated materials will be used/reused for quay wall construction and to backfill the landside area of the quay wall or transported to the Emplacement Cell Construction Site for storage and use in construction of the Emplacement Cell.
Quay wall	– Construction of a new piled quay wall keyed into bedrock where necessary complete with sheet pile anchor wall, capping beam and tie rods to the south of the existing coal terminal. – Excavated and processed materials from the Stage 1 Early Enabling Works are stockpiled within the MBD Site Compound and will be used during construction of the quay wall and to backfill on landside area of the wall. – Installation of a marine fender system attached to the capping beam along the quay wall to protect the quay wall from berthing and mooring loads. – Installation of a cathodic protection system to the quay wall and associated elements, including assessment of the potential impacts the FSRU and pipeline cathodic protection will have on quay wall. – Backfilling and compaction on landside area of wall utilising the site stockpiled materials.
Mooring dolphins	– Installation of landside mooring dolphin structures on reinforced concrete platforms supported by steel piles. – Mooring equipment will be installed and comprise the following: • 20 load sensing quick release hooks. • Up to four land-based mooring winches on mooring dolphins may be required. • Up to four swivel fairleads may be required to enable each mooring line to land-based winches to be fed in a horizontal alignment.
Marine Loading Arm (MLA) foundations	Construction of a new reinforced concrete foundation supported on steel piles, located behind the new quay wall.
Gangway tower foundation	Construction of foundation for Gangway tower.
Fire monitor foundation	Fire monitor foundations, subject to risk studies.

*The volumes provided are approximate and may vary.

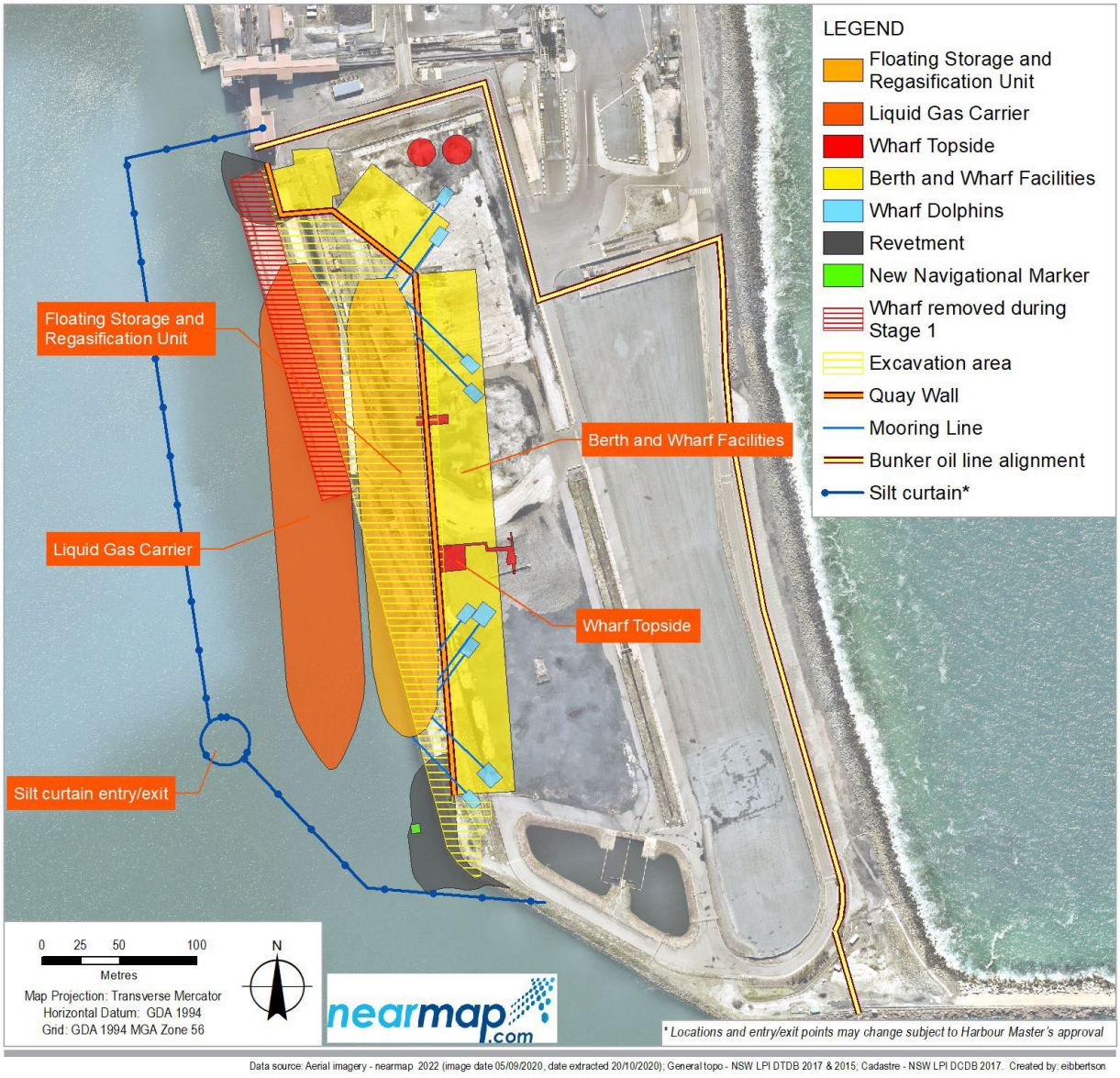


Figure 2.5 Location of quay wall and layout of MBD and ORF (Stage 2A)

2.4 Stage 2A: Power, communications, and water connections

Works required for power, communications, and water connections for Stage 2A are summarised in Table 2.3.

Table 2.3 Construction of utility connections for Stage 2A

Component	Works required
Power and communications	– Construction and installation of a new 11kV power cable in a buried conduit and substation. – Energisation of the padmount substation and 415kV temporary building supply. – Installation of communication conduit and pits.
Potable water	– Extension of existing potable water line within the MBD Site Compound.

2.5 Stage 2A: Construction of ORF

The general layout of the ORF areas is shown in Figure 2.5. Works required for the three ORF areas during Stage 2A are summarised in Table 2.4.

Table 2.4 Structures to be constructed for ORF during Stage 2A

Component	Works required
Wharf Topside Area	
MLAs	Installation of MLAs, including: – Civils and structures. – Associated works such as piping, hydraulics, electrical, instrumentation, and auxiliary systems.
Piping and valving	– All necessary piping and valving. – Odorant injection facilities. – Pig launcher, downstream of the MLAs to tie-in to the natural gas pipeline.
Gangway	– Gangway access tower to provide connection between the wharf and FSRU.
Utility connections	FSRU utilities connections for: – Communications. – Marine Diesel Oil. – Freshwater. – Sewage, bilge, and grey water.
Utility Area	
Site utilities	Site utilities including: – Potable water and sewerage. – Instrument air and bottled nitrogen. – Diesel storage. – Electrical distribution (including UPS and emergency diesel generators). – Control and instrumentation. – Telecommunications.
Common Areas	
Firefighting systems and equipment	Firefighting equipment including: – Firewater storage. – Pumps. – Firewater monitors.
Security systems and equipment	– CCTV. – Fencing and gates. – Security access and monitoring systems.

Component	Works required
Equipment housing	Equipment shelters and buildings to house: – Electrical, control, and operating equipment, critical spares, emergency response and site monitoring facilities. – Buildings will include appropriate building services e.g., heating, ventilation and air conditioning, potable water, amenities, sewerage etc.
Site roadways, lighting, and drainage	– Roads and car parking areas. – General lighting, earthing, lightning system. – Drainage system to tie into the existing Port Kembla drainage system.
Gas Pipeline	A section of gas pipeline will be installed within the MBD Site Compound as part of the Stage 2A works. Final safety studies will be prepared prior to the construction of the gas pipeline and prior to commencement of operation as per Schedule 3, Condition 21 of Infrastructure Approval (SSI 9471).

2.6 Stage 2B: Excavation and dredging

An Emplacement Cell Report (ECR) has been developed by SMEC Australia Pty Ltd (SMEC) titled 'Port Kembla Gas Terminal Development – Emplacement Cell Report' in accordance with Infrastructure Approval (SSI 9471) Schedule 3, Condition 8 and 9. The ECR outlines the design and construction methodology of the Emplacement Cell.

Approximately 450,000 m^3 of materials will be excavated/dredged from the MBD Site Compound and placed within the boundaries of the Emplacement Cell. Further details, including detailed design drawings, can be found in the ECR (SMEC, 2022). A summary of the excavation and dredging works is provided in Section 2.6.2 and Section 2.6.3.

2.6.1 Silt curtains

Prior to the commencement of dredging activities, silt curtains will be installed within the Inner Harbour (MBD Site Compound) and Outer Harbour (Emplacement Cell). A fixed gate or bubble curtain gate will be installed to allow for the entrance and exit of barges whilst also controlling the dispersion of silt.

Silt curtains will be suitable for tidal and working harbour conditions.

Navigation and special markers will be installed to the satisfaction of the Harbour Master to alert marine vessels operating in the port harbours of the presence of silt curtains any other risks to navigation.

Further information regarding the use of silt curtains is provided in Section 10.1.

2.6.2 Excavation and dredge staging

Construction activities undertaken during Stage 1 involved the excavation of fill materials at the MBD Site Compound. Excavation has continued through Stage 2A and will continue as part of Stage 2B. On completion of existing fill materials being excavated, dredging operations will commence at the MBD Site Compound as part of the Stage 2B works.

Dredging activities at the MBD Site Compound and Emplacement Cell will be staged to accommodate other construction works occurring at the MBD Site Compound.

Construction staging for excavation and dredging activities to be undertaken are summarised in the ECR (SMEC, 2022). Excavation and dredging at the MBD Site Compound is shown in Figure 2.6. An overview of the Emplacement Cell is shown in Figure 2.7.

2.6.3 Marine-based construction activities at MBD Site Compound

Marine based construction works required at the MBD Site Compound during Stage 2B are summarised in Table 2.5.

Table 2.5 Marine based construction works during Stage 2B

Component	Works required
Navigational aids	– Construction of new navigation aid pile through the new southern revetment. – Installation of navigation platform, tower, and lights, including all access requirements such as ladders, platforms, and handrails. – Lights will be battery powered and charged via solar panels. – Existing navigation aid to be removed after the commission of the new navigation aid.
Revetment shore protection	– Revetments will be constructed at the north and south embankments of the new MBD Site Compound wharf (refer to Figure 2.6) following completion of dredging works. – Works will comprise: • Laydown of Texcel 1200R geotextile. • Placement of thick quarry run to a depth of 190mm. • Placement of underlay rock to a depth of 400mm. • Placement of armour rock to a depth of 900 mm.
Revetted Trench	– Dredging of an approximate 10x10m trench to -14.5 reduced level (RL) Port Kembla Height Datum (PKHD) for accommodating the under-keel requirements of the FSRU strainers. An approach channel may also be required. – The trench should have sufficient scour protection.
Berthing box	– Dredging will be undertaken to facilitate berthing boxes to be constructed.

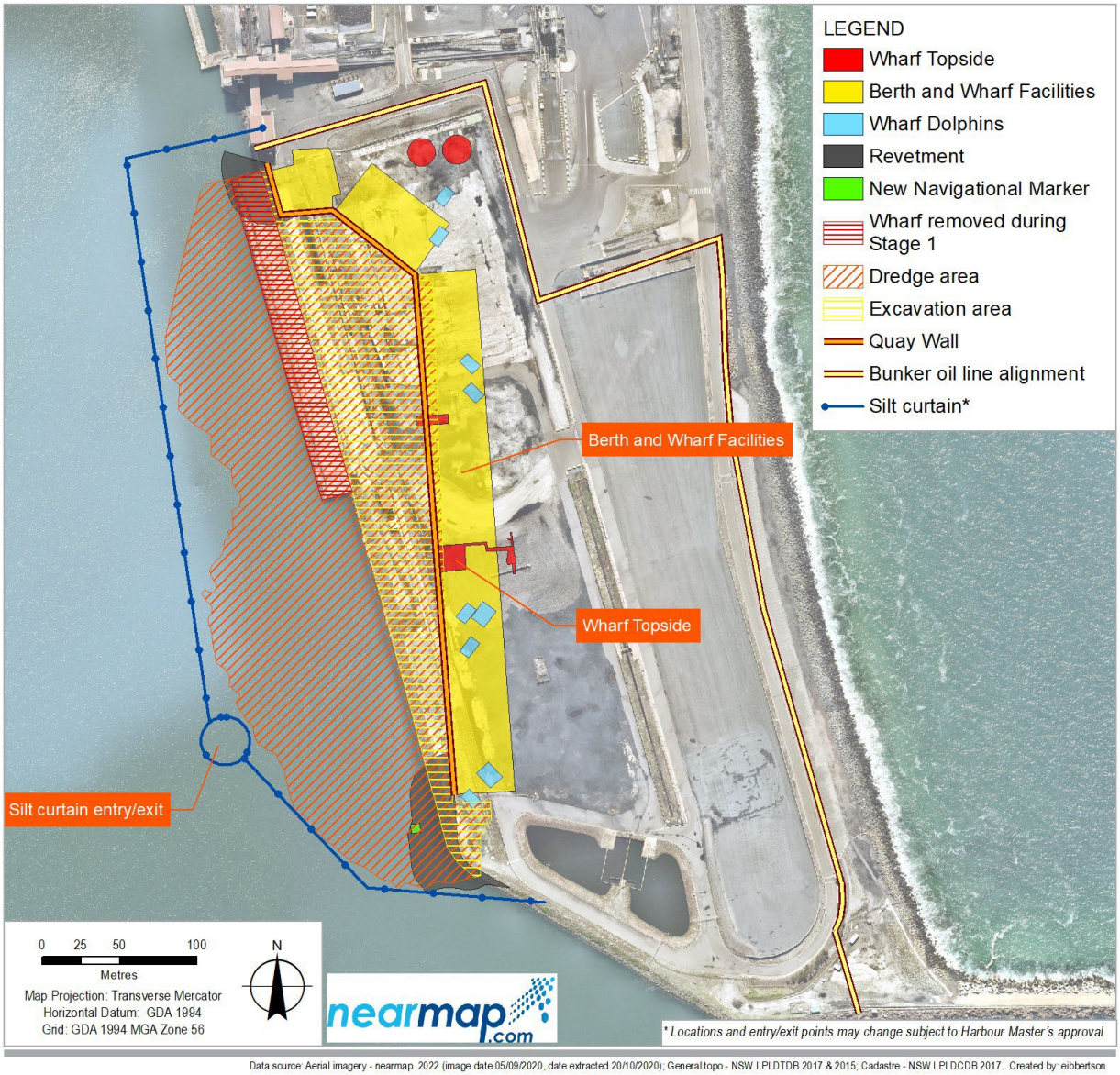


Figure 2.6 Dredging and excavation works for MBD Site Compound (Stage 2B)

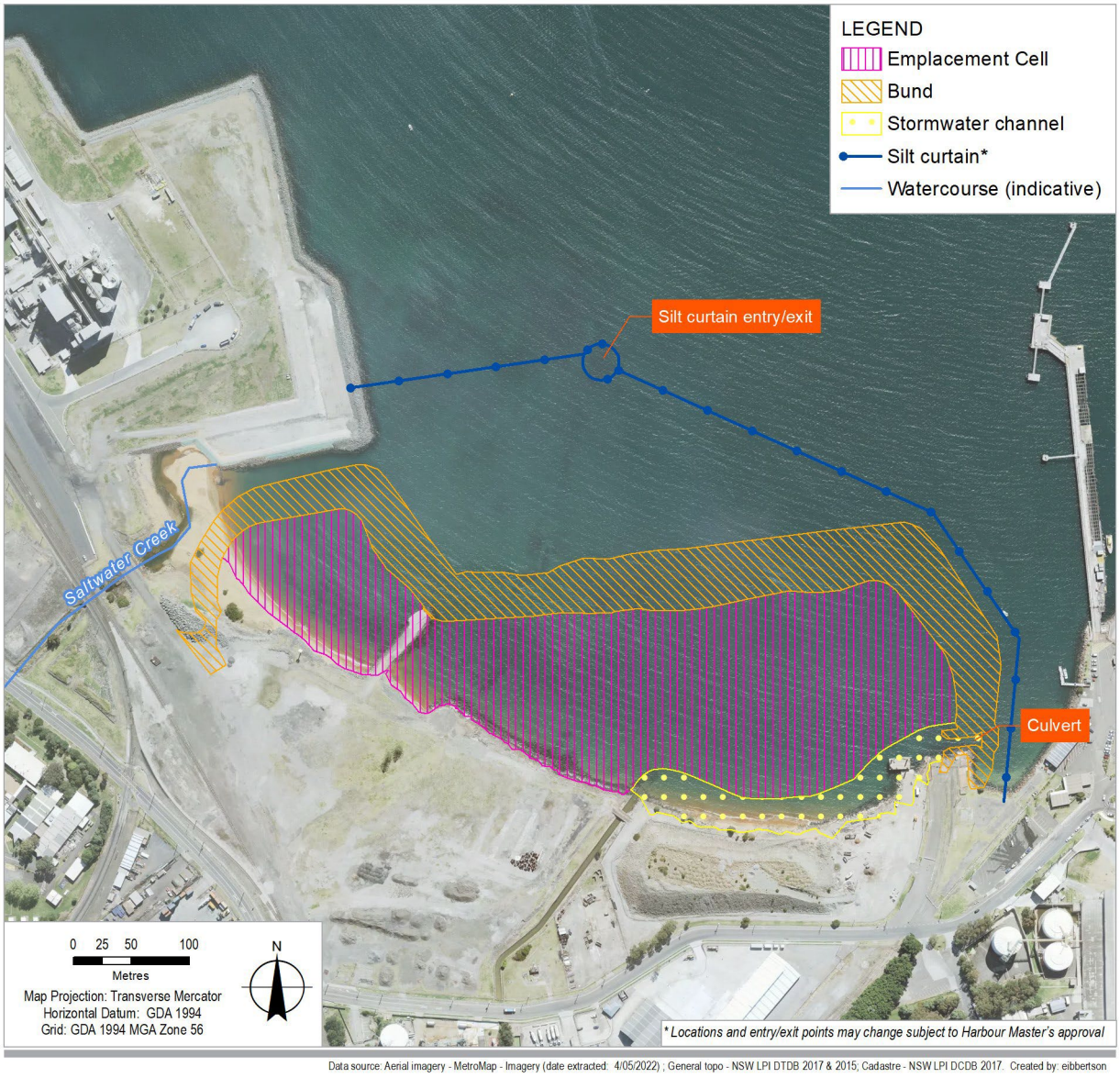


Figure 2.7 Emplacement Cell overview (Stage 2B)

2.7 Stage 2B: Construction of the Emplacement Cell

The Emplacement Cell will be located within the Outer Harbour, comprising of an approximate 800-metre perimeter bund. The Emplacement Cell has been designed and constructed to receive approximately 450,000 m³ of dredged materials from the MBD Site Compound. All contaminated materials including Harbour Muds (HM)/Harbour Silts (HS) Harbour Muds (HM)/Harbour Silts (HS) is to be placed below -1 m PKHD and at a maximum below LAT [below ~-0.02 m PKHD], and Potential Acid Sulfate Soils (PASS) will be placed below +0.9m PKHD within the Emplacement Cell.

The construction work components and key features of the Emplacement Cell are summarised in Table 2.6. An overview of the Emplacement Cell is shown in Figure 2.7. Further details are provided in the ECR (SMEC, 2022).

Table 2.6 Emplacement Cell key features – Stage 2B

Component	Description
Emplacement Cell	– All contaminated soils, including HM/HS and PASS, will be placed within the Emplacement Cell generally below lower than -1.0m PKHD and in no instances above the LAT (~-0.02m PKHD). – The final Emplacement Cell levels will be graded towards the proposed stormwater channel. – Design life of 15 years.
Perimeter bund	– The design bund crest level was derived based on tide, storm surge, sea level rise and wave overtopping and assumed to be +3.55m PKHD. The adopted crest level also includes allowance for assessed post-construction settlement of up to 250mm. – Minimum crest width of 6m and 11m at passing bays. – Maximum permanent batter slopes of 1V:3H for seaward slopes and 1V:2H for landward/internal slopes. – The bund is to accommodate a 110t long reach excavator, fully loaded semi-trailer and temporary material stockpiles.
Rock revetment	– Rock revetment structure will extend to the toe of the main bund to provide protection to the bund structure against coastal processes.
Stormwater channel	– Stormwater channel to extend from the existing Darcy Road drain outlet to the eastern side of the Emplacement Cell. – Stormwater channel outlet is to comprise a box culvert structure on the eastern end of the Emplacement Cell, providing vehicular access onto the bund at the Jetty 3 abutment and within the NSW Ports property boundary.

3. Roles and responsibilities

The Project Team is responsible for all activities associated with Stage 2A and Stage 2B, including the implementation and maintenance of the various mitigation/management measures outlined in this DEMP. Relevant roles and responsibilities of the Project Team are outlined in Table 3.1.

Table 3.1 Roles and responsibilities of Project Team

Project Role	Responsibility
AIE Project Director	– Responsible for the overall funding and direction of works associated with Stage 2A and Stage 2B. – Ensuring provision of adequate resources to achieve the environmental objectives for the Project including ensuring sufficient resourcing for the Environmental Team, Engineering and Construction Teams.
AIE Construction Manager	– Proactively stewards the effective implementation of Stage 2A and Stage 2B in accordance with requirements of the Infrastructure Approval (SSI 9471), this DEMP, Environmental Strategy and all related Sub - plans. – Demonstrate proactive support for environmental requirements.
AIE HSE Manager	– Develop and update of all Health, Safety and Environmental (HSE) Management Strategies and Sub - plans. – Ongoing liaison and engagement with government agencies and point of escalation for any environmental incidents. – Identifying environmental issues as they arise and proposing solutions. – Coordinate and facilitate periodic environmental inspections with the key contractors. – Environmental Reporting.
Emplacement Cell Auditor	– Audit the construction of the Emplacement Cell and verify that works have been completed in accordance with the design intent (Emplacement Cell), The auditor role is to satisfy Condition 10 Schedule 3 of the Infrastructure Approval and any other relevant conditions therein.
Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager	– On-site Project management and control. – Decision-making authority relating to environmental performance of the construction program. – Authority over Project construction and site activities in accordance with the EMS. – Ensure relevant training is provided to all Project staff prior to commencing individual activities. – Reports to AIE Construction Manager on environmental matters. – Ensures appropriate Contractor resources are allocated to implement the environmental requirements. – Responsible for planning and scheduling of construction, and to ensure operations are conducted in accordance with statutory requirements and the EMS. – Monitors performance against environmental Key Performance Indicators (KPIs). – Ensures that all environmental objectives associated with the Project are achieved. – Day-to-day decision-making authority relating to environmental performance of construction activities and direct site activities and construction. – To provide resources to ensure environmental compliance and continuous improvement, including IMS risk assessment. – Ensure all personnel are aware of any changes to EMS, this DEMP and improved procedures. – Ensure this DEMP is implemented for the duration of Stage 2A and Stage 2B.
Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal Contractor Construction Foreman	– I Implement requirements contained in the EMS and Sub - plans, work procedures and standard drawings. – Maintaining open and transparent communication with other Project discipline managers and other areas of the Project. – Reporting of hazards and incidents and implementing any rectification measures. – Ensures appropriate contractor resources are allocated.

Project Role	Responsibility
	– Orders STOP WORK for any environmental breaches and reports incidents to the Project Manager. – Ensure this DEMP is implemented for the duration of Stage 2A and Stage 2B.
Stage 2A Principal Contractor Environmental Representative and Stage 2B Principal Contractor Environmental Representative	– Delivers environmentally focussed toolbox talks and provides applicable site inductions. – Provides environmental advice, assistance, and direction to Project Manager to ensure construction activities are conducted in accordance with regulatory legislation and this DEMP. – Participate and cooperate with AIE HSE Manager with regards to undertaking of joint environmental site inspections. – Coordinate / undertake wet-weather inspections as per EPL No.21529 and report accordingly to the AIE HSE Manager. – Develop strong working relationships with the AIE team and Consultants. – Ensure environmental risks are appropriately identified, communicated, and effectively managed. – Ensure communication of relevant environmental information to Project personnel. – Provide specialist advice and input as required. – Ensure construction manager, superintendents and field supervisors fully understand the environmental constraints and how construction practices must ensure any such constraints are considered and mitigated against during construction. – Orders STOP WORK for any environmental breaches and immediately reports incidents to Principal Contractor Project Manager and AIE HSE Manager.
AIE Environmental Representative and AIE Environmental Contractor	– Develop strong working relationships with the Principal Contractor Team and Consultants. – Ensure environmental risks are appropriately identified, communicated, and effectively managed. – Instruct and advise management team on compliance issues. – Provide specialist advice and input as required. – Co-ordinate internal audits of this DEMP. – Conduct audit review as required. – Reports on the performance of this DEMP and recommends changes or improvements to Project Manager. – Orders STOP WORK for any environmental breaches and immediately reports incidents to the AIE Construction Manager and AIE HSE Manager. – Conducts investigation and response to environmental complaints and inquiries, where required. – Undertake all required environmental monitoring for this phase of the Project.
Subcontractors and construction personnel	– Undertake an environmental induction prior to accessing to site. – Comply with legislative requirements. – Participate in weekly inspections and audits. – Follow environmental procedures. – Report all environmental incidents and hazards. – Introduce environmental topics to prestart meetings. – Ensure that all relevant permits and clearances are in place prior to commencing work.
NSW EPA Accredited Site Auditor	– Reviews various documentation associated with the contaminated land aspects of the Project. – Prepares and issues a Section A site audit statement confirming the suitability of the site for its intended use at the completion of dredging, excavation, and disposal.
Dredging Superintendent	The Dredging Superintendent is responsible for the dredge spread. He is responsible for safety, pollution prevention and the efficient operation of the dredge spread. He may deviate from documented Dredging Procedures, if human life, property and/or the environment is at risk. The Dredging Superintendent will: – Oversee and enforce the correct utilisation of Personal Protective Equipment (PPE) and safety equipment. – Ensure procedures are followed. – Ensure latest Survey is available and utilised.

Project Role	Responsibility
	– Ensure preventative maintenance is implemented as per schedule. – Ensure machinery and equipment is safe and properly maintained. – Report all near misses and incidents to Project Manager. – Act on safety problems in an appropriate and hastily manner. – Ensure work areas are maintained in a safe condition. – Lead and manage emergency procedures. – Ensure all employees are inducted onto dredge. – Report any safety concerns to the HSE Manager or Project Manager; and – Lead by example.
Dredging Principal Contractor Surveyor	The Surveyor will be responsible for the overall set out, monitoring and verification of the dredging and placement of the material in the Emplacement Cell. Providing up to date data to the Dredging Superintendent and Works Manager on a daily basis, of the material removed, material placed, design levels in real time, rock placement and all aspects of quality control. In addition, the surveyor is responsible for: – Initial establishment of benchmarks and all the stations as the reference. – Positioning systems are calibrated and operational prior to mobilisation. – Conduct both hydrographic and a terrestrial survey of the MBD Site Compound dredge area, Emplacement Cell and stockyard areas. – Managing positioning data and tracking data on board vessels. – Ensuring that the survey vessel is available for operation. – Processes data and produce drawings to the Project standard. – Liaise with the PANSW survey team as required. – Having sufficient redundancy parts. – Managing the project as per the Survey Project Plan. – Standard operating procedures (SOP) are adhered to, and PPE worn at all times where required. – Liaising with stakeholders as per the contract requirements; and – Ensuring deliverables are on time according to schedule.
Vessel/Tug Master	The Master is always in charge of the vessel. The Master has complete authority and is responsible for safety, pollution prevention and the efficient operation of the vessel. The Master may deviate from documented vessel procedures if human life, property, or the environment is at risk. In everything to do with the safety of persons, property or the environment, the Master reports directly to the designated person ashore (DPA). The Master is responsible for: – Making sure the safety policy is implemented. – Making sure the crew understands all AIE and Contractor policies. – Making sure the crew understands and carries out AIE safety and environmental protection policy. – Reviewing safety and pollution prevention activities and reporting any problems to the DPA. – Issuing orders in a clear and concise manner. – Making sure that procedures for safe operations and the protection of the environment are followed. – Reporting defects, hazards, incidents/accidents to the office. – Making sure the crew understands their duties and responsibilities as described in the Safety Management System (SMS). – Evaluating and reviewing the SMS on board the vessel and reporting any problems to the office. – Making sure that SMS records are up to date and available; and – Making sure when manoeuvring vessels that cetacean management requirements are always considered.

4. Legislative requirements

The legislative requirements applicable to Stage 2A and Stage 2B are listed in Table 4.1.

Table 4.1 Legislation and relevant policy applicable to this DEMP

Legislation	Project Relevance	Applicability
International		
International Safety Management code (ISM Code)	The ISM Code is the international standard for the safe operation of ships and pollution prevention through various ISM Code certifications. The Australian Maritime Safety Authority (AMSA) is the recognised government body who issues certifications to Australian registered vessels. AMSA have established a number of standards, legislation and guidelines to support the implementation of the objectives and requirements set out by the ISM Code.	The ISM Code is primarily implemented through the Federal *Navigation Act 2012* (Navigation Act) and NSW legislation as outlined below. Applicable legislative requirements to Stage 2A and Stage 2B works are addressed below in the respective legislation.
Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREG)	The COLREGs are managed by the International Maritime Organisation and outline internationally agreed upon rules for safe navigation between vessels and other safety requirements regarding travel speed, narrow channel navigation and signals to be used to prevent collisions.	The requirements of COLREGs apply to all vessels on waters within NSW, including harbours. Provisions are implemented in the NSW Marine Safety Regulation 2016 which is addressed below.
International Convention for the Prevention of Pollution from Ships (MARPOL)	MARPOL is the international standard for addressing ship sourced pollution. It includes regulations aimed at preventing accidental pollution and pollution generated from routine vessel operations. MARPOL includes the following six technical annexes: – Annex I: Regulations for the prevention of pollution by oil. – Annex II: Regulations for the control of pollution by noxious liquid substances in bulk. – Annex III: Regulations for the prevention of pollution by harmful substances carried by sea in packaged form. – Annex IV: Regulations for the prevention of pollution by sewage from ships. – Annex V: Regulations for the prevention of pollution by garbage from ships. – Annex VI: Regulations for the prevention of air pollution from ships.	MARPOL is implemented through various Federal legislation which are applicable to Stage 2A and Stage 2B works, including: – *Protection of the Sea (Prevention of Pollution From Ships) Act 1983*. – *Protection of the Sea (Prevention of Pollution From Ships) (orders) Regulations 1994*. – Navigation Act. AMSA also implements the following marine orders which give effect to MARPOL: – Marine Order 91 (Marine pollution prevention—oil) 2014 – Marine Order 93 (Marine pollution prevention—noxious liquid substances) 2014 – Marine Order 94 (Marine pollution prevention—packaged harmful substances) 2014 – Marine Order 95 (Marine pollution prevention—garbage) 2013 – Marine Order 96 (Marine pollution prevention—sewage) 2013 – Marine Order 97 (Marine pollution prevention—air pollution) 2013. NSW legislation which gives effect to MARPOL is the *Marine Pollution Act 2012* (Marine Pollution Act). These requirements are addressed below.
International Convention for the Safety of Life at Sea 1914 (SOLAS)	The International Ship and Port Facility Security Code (ISPS Code) is made under Chapter XI-2 of SOLAS and provides comprehensive measures for the security of ships and port facilities.	The PANSW requires all vessels arriving in Port Kembla to be in possession of an International Ship Security Certificate in accordance with the ISPS Code.

Legislation	Project Relevance	Applicability
Federal		
Navigation Act	The Navigation Act implements Australia's obligations under MARPOL. It outlines matters relating to maritime safety and the prevention of pollution to the marine environment. The Act also provides provisions related to construction standards, occupational health and safety and monitoring and enforcement activities.	Chapter 3 of the Navigation Act outlines vessel safety requirements, including the safety regulations and certifications of vessels, and offences and penalties related to the use of unseaworthy vessels being used. Chapter 4 outlines measures related to pollution from vessels and prevention of pollution. Division 2 states that vessels must not be operated in a manner that causes pollution or damage to the Australian marine environment and includes penalties for offences. Marine movements undertaken during Stage 2A and Stage 2B will be undertaken in accordance with the Navigation Act and are addressed in greater detail in the CTMP.
Protection of the Sea (Prevention of Pollution from Ships) Act 1983	The *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* implements Australia's obligations under MARPOL. The Act outlines requirements to prevent pollution, duty to report incidents and penalties related to failure to comply with the requirements of the Act.	Section 11A states that Australian ships with a gross tonnage of 400 or more must keep on board a Shipboard Oil Pollution Emergency Plan (SOPEP). A SOPEP has been developed by the Dredging Principal Contractor for the Stage 2A and Stage 2B activities (refer to Section14.3).
Maritime Transport and Offshore Facilities Security Act 2003	The *Maritime Transport and Offshore Facilities Security Act 2003* regulates the security of Australian maritime transport. The Act was introduced to meet Australia's obligations to Chapter XI-2 of SOLAS. The Act outlines the regulatory framework for maritime operators (including ports) to assess their operations for security risks and undertake security assessments. Under the Act port and ship operators are obligated to have an approved security plan.	Ships are defined as any vessel that is capable of navigating the high seas but does not include vessels that are not self-propelled. Under Part 4 of the Act, ship security plans and ISCCs are required for regulated Australian ships.
Marine Safety (Domestic Commercial Vessel) National Law Act 2012	The *Marine Safety (Domestic Commercial Vessel) National Law Act 2012* creates a national cooperative scheme between the Commonwealth, States and Territories to provide a single framework for safe operation, design, construction and equipping of domestic commercial vessels. The Act delegates the AMSA as the National Marine Safety Regulator, which has function to make and maintain marine orders under Section 163, develop and maintain national standards and undertake investigations, monitoring and enforcement activities.	The provisions of the Act are given effect by the NSW *Marine Safety Act 1998*. Relevant provisions applicable to the Stage 2A and Stage 2B works under the *Marine Safety Act 1998* (NSW) are discussed below.
Biosecurity Act 2015	The Federal *Biosecurity Act 2015* provides for the management of biosecurity risks, risks related to ballast water, and gives effect to Australia's international rights and obligations under the International Convention for the Control and Management of Ships' Ballast Water and Sediments, the United Nations Convention on the Law of the Sea, and the Biodiversity Convention.	The Australian Ballast Water Management Requirements (DAWE, 2020) provides guidance to vessel operators on the management of ballast water when operating in Australian waters in order to comply with the legislative requirements of the Federal *Biosecurity Act 2015* measures. Under the Requirements, vessel masters must comply with the applicable provisions and obligations with regards to the management of ballast water. Additional information on ballast water requirements related to the Stage 2A and Stage 2B activities is provided in Section 7.1.2.
Occupational Health and Safety (Maritime Industry) Act 1993	The *Occupational Health and Safety (Maritime Industry) Act 1993* provides for the health, safety, and welfare for maritime workers. It aims to protect all people at or near maritime	Part 2 outlines the general duties relating to occupational health and safety. AIE and both Principal Contractor's involved in the Stage 2A and Stage 2B works (refer to Section 3) are committed to ensuring all reasonable steps are

Legislation	Project Relevance	Applicability
	operations, including contractors and employees.	taken to protect the health and safety of all persons involved in the construction of the Project. Roles and responsibilities are outlined in Table 3.1 and health and safety matters outlined in Section 14.
National Plan for Maritime Environmental Emergencies (AMSA, 2020) (National Plan)	The National Plan is an integrated arrangement between the Federal, State and Northern Territory governments and industry that sets out the national arrangements, policies and principles for the management of maritime environmental emergencies. The National Plan aims to protect the community and environment of Australia from the adverse effects of oil and other hazardous substances spilt into the marine environment. The plan is managed by AMSA and implements Australia's obligations to international treaties such as the United Nations Convention on the Law of the Sea (1982); the International Convention on Oil Pollution Preparedness, Response and Co-operation, (1990); and the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (2000).	The NSW State Waters Marine Oil and Chemical Spill Contingency Plan (RMS, 2016) is the applicable State plan that has been prepared in support of the National Plan. The NSW State Waters Marine Oil and Chemical Spill Contingency Plan outlines arrangements and protocols for managing marine and chemical spills and maritime incidents within NSW waters. Further requirements of this are addressed below.
State		
Marine Safety Act 1998	The *Marine Safety Act 1998* ensures the safe operations of vessels within ports and waterways within NSW and promotes the responsible operation of vessels to ensure the safety and amenity of users. The Act outlines the framework for marine legislation enforcement and investigation of marine accidents. The Act applies and makes provisions of the Commonwealth *Marine Safety (Domestic Commercial Vessel) National Law Act 2012* as a law of NSW.	A 'vessel' under the Act is defined as 'water craft of any description used or capable of being used as a means of transportation on water'. Marine based activities undertaken during Stage 2A and Stage 2B will be subject to the provisions of the Act. Division 3 outlines the requirements of port pilotage, stating pilotage is compulsory in every pilotage port for vessel movements entering, leaving or within the port. Tugs towing and all other vessels 30 metres or greater in length are required to have a pilot on board as per Section 74. Under Section 75, pilotage is not compulsory if vessel master holds a marine pilotage exemption, or a certification of local knowledge administered under the Act. Additional information regarding pilotage of vessels is included in the Stage 2A and Stage 2B CTMP.
Marine Safety Regulation 2016	The Marine Safety Regulation 2016 incorporates safety requirements of the COLREGs in an NSW localised context. Schedule 4 outlines modifications to the COLREGs to NSW 'special rules' regarding signals, diving operations and flag and lighting requirements.	Vessel movements required for the Stage 2A and Stage 2B works will be managed and undertaken in accordance with the Regulations for preventing collisions at sea. Additional information regarding pilotage of vessels is included in the POMP.
Marine Pollution Act	The Marine Pollution Act aims to enhance and protect NSW waters from marine pollution from vessels. The Act gives effect to the following annexes of MARPOL: – Annex I: Regulations for the prevention of pollution by oil. – Annex II: Regulations for the control of pollution by noxious liquid substances in bulk. – Annex III: Regulations for the prevention of pollution by harmful substances carried by sea in packaged form. – Annex IV: Regulations for the prevention of pollution by sewage from ships.	A 'ship' is defined under the Act as any vessel capable of being used on or in water, including floating craft, fixed or floating platforms and barges (self-propelled or not). Under Part 10 of the Act, it is an obligation for a SOPEP to be carried on board a ship. Section 97 outlines the contents that must be included in the SOPEP, including procedures to be followed in reporting incidents, authorities to be notified in reporting a reportable incident and actions to be taken in combating pollution caused by the incident. The Dredging Principal Contractor have prepared a SOPEP for the Stage 2A and Stage 2B works.

Legislation	Project Relevance	Applicability
	– Annex V: Regulations for the prevention of pollution by garbage from ships. The Act provides the framework for the protection of NSW water from vessel pollution that is complementary of Commonwealth legislation.	
Biodiversity Conservation Act 2016 (BC Act)	The BC Act aims to conserve biodiversity at the bioregional and state scale and lists a number of threatened species, populations, and ecological communities to be considered when deciding if a project is likely to have a significant impact on threatened biota, or their habitats.	The MBD Site Compound where Stage 2A and Stage 2B construction works will occur has had previous sightings of the Green and Golden Bell Frog, a listed threatened species of both the BC Act and *Environment Protection Biodiversity Conservation Act 1999 Cth (*EPBC Act). Three marine species listed under Schedule 1 of the BC Act were assessed as likely to occur within the Port Kembla harbour. Additional information on potential impacts and management of flora and fauna species is included in the Stage 2A and Stage 2B Flora and Fauna Management Plan (FFMP).
Biosecurity Act 2015	The *Biosecurity Act 2015* specifies the duties of public and private landholders as to the control of priority weeds and biosecurity matters including terrestrial, aquatic, and marine species. The Act defines priority weeds by local government area and assigns duties for their control. Part 3 of the Biosecurity Act provides that any person who deals with biosecurity matter and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter has a duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated, or minimised. Part 4, Division 5 outlines the duties to notify biosecurity events, which are defined as 'something that has occurred, is occurring or is likely to occur and that has had, is having, or is likely to have, a significant biosecurity impact'.	The Stage 2A and Stage 2B works have the potential to introduce and/or spread terrestrial and marine weed and pest species if not appropriate managed. The terrestrial and marine biodiversity assessments prepared as part of the EIS identified weed and marine pest species in the Project area and vicinity. The management of terrestrial and marine weed and pest species are included in the Stage 2A and Stage 2B FFMP.
*Fisheries Management Act 1994 (*FM Act)	The objectives of the FM Act are to conserve, develop and share the fishery resources of NSW for the benefit of present and future generations. Part 7 of the FM Act requires a permit for a number of activities, including those involving dredging and reclamation work and those involving harm to marine vegetation.	Permits under Section 201, 205 or 219 of the FM Act are not required for approved CSSI in accordance with Section 5.23 of the EP&A Act. The PKGT EIS Marine Ecology Impact Assessment assessed potential impacts associated with dredging and disposal works on fisheries and marine vegetation. Management measures related to potential impacts from dredging activities on marine flora and fauna species are included in the Stage 2A and Stage 2B FFMP.
Water Management Act 2000 (WM Act)	The WM Act aims to provide for sustainable and integrated management of water sources in NSW for the benefit of present and future generations. In particular the Act seeks to protect, enhance and restore water sources, apply the principles of ecologically sustainable development and encourage best practice in the management and use of water. Part 2 of the WM Act requires a licence for the "taking of water" from a water source. A licence entitles its holder to specified shares in the available water within a defined water management area or from a specified water source. Part 3 specifies approval requirements for water use, water management works approvals and	Stage 2A and Stage 2B works will involve excavation within 40 metres of the shoreline and has the potential to intercept water within an aquifer. Approval under Sections 89, 90 and 91 of the WM Act are not required for CSSI in accordance with Section 5.23 of the EP&A Act. Water quality monitoring and management measures are included in the Stage 2A and Stage 2B WQMP.

Legislation	Project Relevance	Applicability
	activity approvals. The two activities are controlled activities (works within 40 metres of a water source) and aquifer interference. Approvals are outlined under Sections 89, 90 and 91 of the WM Act.	
Protection of the Environment Operations Act 1997 (POEO Act)	The objectives of the POEO Act are to protect and enhance the environment of NSW with regard to the need for ecologically sustainable development. The Act provides mechanisms to reduce risks to human health and the degradation of the environment. The POEO also outlines the Scheduled Activities that require an EPL in order to be carried out. Part 5.3 outlines provisions related to water pollution. It is prohibited to pollute any waters under Section 120 of the POEO Act.	An EPL has been issued for the Project (EPL No. 21529) which outlines the requirements related to dredging and excavation that must be implemented for the construction and operational phases of the Project. Conditions related to monitoring and management requirements for Stage 2A and Stage 2B construction works regarding dredging and excavation are addressed in this DEMP. Part 5.7 states a licence holder must prepare a Pollution Incident Response Management Plan (PIRMP). A PIRMP has been prepared for the Stage 2A and Stage 2B works and will be kept at the premises where the activities are taking place.
Ports and Maritime Administration Act 1995	The *Ports and Maritime Administration Act 1995* regulates the operation of ports in NSW across a range of matters including commercial operation and port charges that apply, management of port infrastructure, port safety and the functions of port corporations as well as Transport for NSW (TfNSW) in relation to port operations. Section 6 establishes the PANSW as a statutory State-owned corporation. The Act provides broad powers to port operators to regulate activities that may pose a risk to the safety or security of the port including but not limited to the movement of vehicles and the loading/unloading of material.	A Port Safety Operating Licence has been issued to the PANSW under Section 12 of the Act which enables the PANSW to perform safety functions related to pilotage, navigation aids and emergency response. The PANSW manages water-based activities, including navigation and operational safety, and waterside security. NSW Ports are responsible for land activities, including leases and port infrastructure. This DEMP has been prepared in consultation with both the PAWNSW and NSW Ports for Stage 2A and Stage 2B construction activities.
NSW State Waters Marine Oil and Chemical Spill Contingency Plan (RMS, 2016)	The NSW State Waters Marine Oil and Chemical Spill Contingency Plan has been prepared in support of the NSW State Emergency Plan, and National Plan to outline the management and procedures related to marine oil or chemical spills and incidents that could result in an oil and/or chemical spill in NSW waters. The Plan lists the agencies responsible for specific areas of NSW waters and the typical sequencing of responding to maritime incidents. Oil and chemical spills and the responses required are categorised into the following levels: – Level 1: potential emergency condition – small spill/incident. – Level 2: limited emergency condition – medium or significant spill/incident. – Level 3: full emergency condition – a major spill/incident.	The PANSW is listed as the agency responsible for responding and combating oil and chemical spills within Port Kembla. In its capacity as the combat agency, the PANSW must notify other appropriate agencies, provide an Incident Controller, and establish an incident control centre. The PANSW also holds the Port Kembla Marine Oil and Chemical Spill Contingency Plan which forms part of the NSW State Waters Marine Oil and Chemical Spill Contingency Plan (RMS, 2016. In the event of an incident that results in a chemical/oil spill, both Principal Contractors and AIE representatives responsible for notifying and responding to incidents will notify the PANSW as soon as they become aware of an incident (refer to Section 3). Additional information on incident management and emergency response is provided in Section 17.

5. Planning requirements

5.1 Conditions of approval

The planning requirements and the corresponding dredging management measures applicable to Stage 2A and Stage 2B are listed in Table 5.1 and Table 5.2. Management measures are detailed in Section 9 through Section 14.

The planning requirements include the conditions set out in the Infrastructure Approval (SSI 9471) dated 13 October 2021, the EPL No. 21529 conditions and the mitigation/management measures outlined in the PKGT EIS.

Table 5.1 Planning requiremetns

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
Infrastructure Approval Requirements (SSI 9471)				
Spoil Management The Proponent must not transport more than 360,000 cubic metres of spoil to the disposal area by road and must maintain records of the volume of spoil transported by road to track compliance against this condition.	Schedule 3, Condition 7	– AIE Construction Manager – Principal Contractor Project Manager	Refer to CTMP	Applicable
Acid Sulfate Soils (ASS) The Proponent must ensure that any construction activities in identified areas of acid sulphate soil risk are undertaken in accordance with Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998).	Schedule 3, Condition 6	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager	Section 6.3 Refer to ASSMP	Applicable
Emplacement Cell Report Prior to the commencement of dredging, disposal and emplacement activities, the Proponent must prepare an ECR to the satisfaction of the Planning Secretary. This report must be prepared in consultation with the Environment Protection Authority (EPA), NSW Ports, DPI Water, the PANSW and an EPA accredited site auditor, and must: – be prepared by a suitably qualified and experienced expert/s approved by the Planning Secretary. – include details of the emplacement cell design and construction methodology, including the final shape, depth and capping. – demonstrate that the design would achieve the performance objectives in condition 8 of this schedule, including a description of the measures to be implemented to achieve this outcome. – includes details of the stormwater drainage design for managing runoff and tidal flows from and into stormwater systems discharging into the disposal area, including the Salt Creek and Darcy Road drains. – describe the contingency measures that would be implemented in the event of a failure or deficiency; and – include details of the process and timing for transferring responsibility for the long-term monitoring and maintenance of the emplacement cells to NSW Ports or another entity.	Schedule 3, Condition 9	– AIE HSE Manager – Principal Contractor for Emplacement Cell Design	Refer to ECR (SMEC, 2022)	Applicable
Emplacement Cell Audit The Proponent must engage a suitably qualified and experienced person to audit the construction of the emplacement cells and the emplacement of dredged sediments at the completion of each of the following stages:	Schedule 3, Condition 10	– AIE HSE Manager – Principal Contractor for Emplacement cell Design	Refer to EMS	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
– the dredging and relocation of existing spoil within the disposal area – construction of bunds within and around the disposal area – emplacement of dredged and excavated spoil in the disposal area; and – the emplacement cell capping. The auditor must provide the Planning Secretary with a report within one month of each audit confirming that the cell construction and sediment emplacement are in accordance with the conditions of this approval and the Emplacement Cell Report required under condition 9 of this approval.				
Spoil Management Plan Prior to the commencement of construction, the proponent must prepare a Spoil Management Plan to the satisfaction of the Planning Secretary and in consultation with the EPA, DP&I Water, NSW Ports, PANSW and an EPA accredited contaminated site auditor. The plan must be consistent with the Emplacement Cell Report and include:	Schedule 3, Condition 11	– AIE HSE Manager	Refer to SMP	Applicable
(a) a CSP that includes: – procedures for identifying and managing unexpected finds of contaminated or asbestos containing materials along the pipeline route and at Berth 101. – a strategy for addressing any contamination that has been encountered, if required (including the remediation and/or removal of contaminated soil or groundwater); and – details on how environmental and health risks will be mitigated and managed.		– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Stage 2A Principal Contractor Environmental Representative and Stage 2B Principal Contractor Environmental Representative	Refer to CSP	Applicable
(b) a DEMP that:		– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Dredging Principal Contractor Surveyor	This Plan	Applicable
– describes all activities to be undertaken during dredging, excavation and disposal works.			Section 9 Section 10	
– describes in detail the location and depth of disposal areas during all stages of construction, including the final form of the emplaced material.			Section 10 Section 11	
– includes procedures for handling, transporting, storing and disposing of dredge and excavated material, including: • potentially acid forming material • contaminated material			Section 9.3 Section 9.4 Refer to ASSMP, SMP and CSP	

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
• asbestos containing materials; and				
– includes an investigation of all reasonable and feasible measures to reduce the road haulage of spoil.			Section 10.10 Refer to CTMP	
– includes a description of measures that would be implemented to: • minimise the generation and dispersion of sediments during dredging and disposal. • minimise soil erosion and discharge of sediment and other pollutants to lands and/or Port Kembla harbour. • monitor and manage odours and air emissions during handling of sediments or from stored material prior to emplacement within the disposal area; and			Section 1.3 Section 9.1 Section 10.1 Section 10.2 Refer to ESCP and Air Quality Management Plan	
– includes contingency measures in the event of a failure of the silt curtains.			Section 10.1	
(c) a WQMP that includes: – a description of the water quality monitoring that would be undertaken to monitor turbidity and pollutant concentrations surrounding dredging and disposal works, including real-time turbidity monitoring. – a broader program to monitor harbour-wide water quality trends and the ecological health of Port Kembla Harbour. – objectives and performance criteria, including trigger levels for investigating any potential or actual adverse impacts associated with construction activities on water quality and the ecology of Port Kembla Harbour. – a plan to respond to any exceedances of the trigger levels and/or performance criteria, and minimise any adverse water quality impacts of the development; and, – reporting procedures for the results of the monitoring program.		– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Stage 2A Principal Contractor Environmental Representative and Stage 2B Principal Contractor Environmental Representative	Refer to WQMP	Applicable
At the completion of any dredging, excavation and disposal works, the Proponent must engage a site auditor accredited by the EPA to issue a Section A Site Audit Statement confirming the suitability of the site for its intended use.	Schedule 3, Condition 13	– AIE HSE Manager – Emplacement Cell Auditor	Section 16.3	Applicable
TRAFFIC **Construction Traffic Management Plan** Prior to the commencement of construction, unless the Planning Secretary agrees otherwise, the Proponent must prepare a CTMP for the development to the satisfaction of the Planning Secretary. This plan must: – be prepared in consultation with TfNSW, NSW Ports and Council. – include details of the transport route to be used for all construction traffic.	Schedule 3, Condition 15	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Dredging Superintendent	Section 10.10 Refer to CTMP	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
– include details of the measures that would be implemented to minimise traffic safety issues and disruption to local users of the transport route/s during construction works, including: • facilitating the use of barges to transfer spoil to the disposal site. • temporary traffic controls, including detours and signage. • ensure loaded vehicles entering or leaving the site have their loads covered or contained. • minimise dirt being tracked on the public road network from development-related traffic.		– Vessel/Tug Master		
includes a driver's code of conduct that addresses: – travelling speeds – driver fatigue – procedures to ensure that drivers adhere to the designated transport route/s; and – procedures to ensure that drivers implement safe driving practices.			Refer to CTMP	Not applicable
PKGT EIS Management Measures				
The movement of barges will be coordinated by the Port Authority Vessel Traffic Services (VTS). Adherence with existing Port Kembla navigational protocols through close liaison and compliance to directions of the Harbour Master.	EIS Measure PN2	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Vessel/Tug Master	Section 13.1.2 Refer to CTMP	Applicable
Development of a construction marine traffic management plan for submission to the Harbour Master.	EIS Measure PN3	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager	Refer to CTMP	Applicable
Barge operation will be controlled through a permit system under the control of the Harbour Master (through the VTS) and Masters will be required to obtain Certificates of Local Knowledge as required by the Harbour Master and NSW Marine Safety Regulation 2016.	EIS Measure PN4	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Vessel/Tug Master	Section 4 Refer to CTMP	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
Permission of the Harbour Master will be sought for split hopper barges to be used at night. Construction will be coordinated so as to not impact other vessels and port navigation, with due regard to the port instructions and port protocols (Port Authority of NSW, 2015).	EIS Measure PN5	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Vessel/Tug Master	Refer to CTMP	Applicable
Monitoring of the depth of deposited dredged material from the seabed in the disposal area to ensure that the barges transferring dredged material are not at risk of grounding.	EIS Measure PN6	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Dredging Principal Contractor Surveyor	Section 11	Applicable
Adherence with the existing port instructions and port protocols (PANSW, 2015).	EIS Measure PN7	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Vessel/Tug Master	Section 4 Refer to CTMP	Applicable
Removal of any remnant asbestos containing materials fragments from the ground surface. The removal should be undertaken by a licenced removalist in accordance with relevant SafeWork NSW codes of practice. Following removal, a licenced asbestos assessor should inspect the site and provide a clearance certificate confirming removal of asbestos.	EIS Measure C02	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal Contractor Construction Foreman	Refer to SMP	Applicable
Inclusion of an unexpected finds protocol (UFP) for contamination in the EMS for the work associated with construction activities.	EIS Measure C03	– AIE HSE Manager – AIE Construction Manager – Stage 2A Principal Contractor Project	Refer to CSP	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
		Manager and Stage 2B Principal Contractor Project Manager – Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal Contractor Construction Foreman		
Preparation of an ASSMP by a consultant experienced in the identification and management of ASS. This will also include appropriate management and/or treatment of ASS. The ASSMP will be developed in line with the requirements of the Acid Sulphate Soils Management Advisory Committee Guidelines (ASSMAC, August 1998 and as updated). The ASSMP will be prepared to identify, manage and treat the ASS encountered during excavation and dredging to minimise the production of acid leachate.	EIS Measure C04	– AIE HSE Manager	Refer to ASSMP	
Preparation and implementation of an EMS to include an UFP to effectively manage the potential contamination issues identified from both a human health and environmental perspective. This would include the assessment of materials to be disturbed across the site to inform appropriate management strategies.	EIS Measure C05	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager	Refer to CSP	Applicable
Assessment and classification of all material to be disposed of offsite as per NSW EPA (2014) Waste Classification Guidelines, Part 1: Classifying Waste and Part 4: Acid Sulfate Soils prior to off-site disposal.	EIS Measure C06	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager	Refer to SMP	Applicable
A dredge management plan will be prepared prior to the dredging of Berth 101, outlining the contamination management measures, including: – surface water monitoring, which will be implemented during the course of the works to minimise potential impacts to the receiving waters. – use of a turbidity curtain to restrict the generation of turbidity plumes and localise any water quality issues.	EIS Measure C08	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager	This Plan	Applicable
The western extent of the reclamation footprint has been limited to ensure Salty Creek remains open to the Outer Harbour without the need for enclosed culverts, thereby minimising the impacts to fish passage.	EIS Measure W3	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B	Section 7.2	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
		Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor		
The footprint of the Outer Harbour placement area has been minimised by raising the proposed fill height to include emergent reclamation. This approach minimises the quantity of material to be bottom dumped and thereby reduces the potential for generation of turbid plumes and mobilisation of sediments.	EIS Measure W4	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor	Section 7.2	Applicable
Preparation of a EMS including specific dredge management plan to provide a framework for the environmental management of construction activities to minimise the environmental risks to a level that is as low as practically possible for this project.	EIS Measure W5	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor	Refer to EMS This Plan	Applicable
Design and implementation of a WQMP to ensure construction works do not cause exceedance of the marine water quality criterion of background plus 50 mg/L of suspended sediment, in accordance with recent EPL for similar activities within Port Kembla such as the Berth 103 Stage 2 Dredging & Spoil Disposal EPL20563). Continuous turbidity monitoring would be undertaken using a series of monitoring buoys to provide impact and background data (turbidity (NTU), pH, temperature). Prior to commencement of the dredging works, buoys would be deployed for an agreed period of time to confirm background conditions in the vicinity of the monitoring points. Data would be logged and transmitted to an onshore recording station where it would be processed to allow automated comparison of median turbidity levels to a series of green, amber and red trigger levels. When exceeded, an alarm would be triggered, automated email and SMS alerts sent and agreed the procedures implemented. Such procedures may include hand held monitoring to verify readings, reduction in the rate of dredging, relocation of dredging	EIS Measure W6	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor	Refer to WQMP	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
activities or cessation of turbidity generating works until turbidity readings reach acceptable levels. Daily visual observations would be undertaken during dredging operations to monitor the potential release of oil or grease. Collection of water samples and laboratory analysis for an agreed set of contaminants would be undertaken on a weekly basis during dredging operations. The WQMP would include regular reporting, evaluation and revision where required to ensure the project objectives and approval conditions are achieved.				
Silt curtains would be installed prior to commencement of the works in order to minimise the spread of any sediments entrained within the water column during dredging and disposal operations. Silt curtains are available in a range of designs and would be provided by the successful Contractor. It is envisaged that the silt curtain would comprise a geocomposite material consisting of a non-woven geotextile sewn to a woven geotextile, which would provide the required filtering capacity and rigidity respectively. Vessel access would be via gated or overlapped curtains or through installation of a bubble curtain. The top of the curtain would be supported by a floating boom, whilst the lower portion of the curtain would be weighted with appropriate ballasting (e.g., bars or chains) to ensure that the full length if the curtain is maintained at all times. The curtain would be anchored or fixed to existing structures as necessary.	EIS Measure W7	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal Contractor Construction Foreman	Section 10.1	Applicable
Subaqueous sediment removal would be undertaken using a backhoe dredge. The use of mechanical dredging (rather than hydraulic dredging) ensures that sediments are removed, transported and placed as close to their in-situ density as possible. Thereby minimising the suspension and mobilisation of sediments at the dredge and disposal sites. Method statements would be prepared by the contractor to ensure that loading of dredged materials into the hopper barges is undertaken in a manner that reduces spillage and avoids overfilling barges.	EIS Measure W8	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal Contractor Construction Foreman	Section 11	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
A perimeter bund would be constructed within the Outer Harbour placement area to ensure long term stability of dredged materials and to minimise sediment migration during placement.	EIS Measure W9	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal Contractor Construction Foreman	Section 10.8	Applicable
A site-specific ESCP will be prepared as part of the SMP to provide control of all land based excavation and stockpiling requirements. All erosion and sediment control measures shall be designed, implemented and maintained in accordance with 'Managing Urban Stormwater: Soil and Construction Volume 1' (Landcom 2004) ('the Blue Book).	EIS Measure 10	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor	Refer to ESCP	Applicable
A site-specific emergency spill plan will be developed and will include spill management measures in accordance relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including TfNSW and EPA officers).	EIS Measure W11	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal	Refer to Emergency Spill Plan	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
		Contractor Construction Foreman		
An emergency spill kit will be kept on site at all times. All staff will be made aware of the location of the spill kit and trained in its use.	EIS Measure W12	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal Contractor Construction Foreman – Subcontractors and construction personnel	Refer to WQMP and Emergency Spill Plan	Applicable
Machinery will be checked daily to ensure there is no oil, fuel or other liquids leaking from the machinery. All staff will be appropriately trained through toolbox talks for the minimisation and management of accidental spills.	EIS Measure W13	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal Contractor Construction Foreman – Subcontractors and construction personnel	Refer to Emergency Spill Plan	Applicable
The following controls should be implemented prior to dredge activities:	EIS Measure ME2	– AIE HSE Manager	Section 7.1	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
– Physical controls such as installation of silt curtains prior to commencement of construction works would be adequate in minimising the spread of any sediments within the water column at the dredging and disposal locations. – Dredging techniques that minimise sediment resuspension during excavation and disposal (such as using mechanical methods over hydraulic methods) should be implemented throughout the project. Barge loads will also be controlled such that overflow of barge loads is avoided. – Screening technologies will be implemented to ensure that any contaminated sediments are disposed of responsibly. Contaminated dredge material will be placed such that it may be capped by uncontaminated material in accordance with a dredge management plan. – Implementation of a water quality monitoring program to ensure construction works do not exceed the project's agreed marine water quality criteria. – Daily visual observations of any potential toxic dinoflagellate blooms within the Inner Harbour.		– Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Stage 2A Principal Contractor Construction Foreman and Stage 2B Principal Contractor Construction Foreman		
Locally sourced vessels (within NSW waters) to complete the construction works, where possible. International vessels to empty ballast water in accordance with the latest version of the Australian Ballast Water Management Requirements (DAWE, 2020). If an Introduced Marine Pest is identified or suspected, then the Contractor is obliged to immediately (within 24 hours) notify the NSW Department of Primary Industries Aquatic Biosecurity Unit hotline on (02) 4916 3877. Project activities to adhere to the National System for the Prevention and Management of Marine Pest Incursions and NSW requirements for Introduced Marine Pest identification and management.	EIS Measure ME9	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Vessel/Tug Master	Section 7.1.2 Refer to FFMP and CTMP	Applicable
Appropriate waste containment facilities will be included on site and managed to avoid overflow or accidental release to the environment. No waste materials will be disposed of overboard of vessels, all non-biodegradable and hazardous wastes will be collected, stored, processed and disposed of in accordance with the vessel's Garbage Management Plan as required under Regulation 9 of MARPOL Annex V. All marine vessels will be operated and maintained in accordance with the South Australian Government's Code of practice for vessel and facility management (marine and inland waters) 2008. Hazardous wastes will be separated, labelled and retained in storage onboard within secondary containment (e.g. bin located in a bund). All recyclable and general wastes to be collected in labelled, covered bins (and compacted where possible) for appropriate disposal at a regulated waste facility.	EIS Measure M10	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Vessel/Tug Master	Section 13.5	Applicable

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
Solid non-biodegradable and hazardous wastes will be collected and disposed of onshore at a suitable waste facility.				
All liquid waste to be stored for discharge to an appropriate onshore facility Chemicals and hydrocarbons will be packaged, marked, labelled and stowed in accordance with MARPOL Annex I, II and III regulations. These include provisions for all chemicals (environmentally hazardous) and hydrocarbons to be stored in closed, secure and appropriately bunded areas. A Materials Safety Data Sheet (MSDS) will be available for chemicals and hydrocarbons in locations nearby to where the chemicals / wastes are stored Vessel operators will have an up to date SOPEP and Shipboard Marine Pollution Emergency Plan (SMPEP). All shipboard chemical and hydrocarbon spills will be managed in accordance with these plans by trains and competent crew. Any contaminated material collected will be contained for appropriate onshore disposal Any equipment or machinery with the potential to leak oil will be enclosed in continuous bunding or will have drip trays in place where appropriate Following rainfall events, bunded areas on open decks of the vessels or within any construction laydown areas will be cleared of rainwater All hoses for pumping and transfers will be maintained and checked as per the PMS	EIS Measure M11	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Vessel/Tug Master	Section 13.5 Section 14.3	Applicable
Visual observations will be maintained by watch keepers on all vessels and plant/moving machinery. All vessels must comply with relevant marine navigation and safety standards. Marine diesel oil compliant with MARPOL Annex VI Regulation 14.2 (i.e. sulphur content of less than 3.50% m/m) is the only diesel engine fuel to be used by the vessels Oil spill responses will be executed in accordance with the vessel's SOPEP, as required under MARPOL. Emergency spill response procedures would be developed and implemented when required.	EIS Measure M12	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Vessel/Tug Master	Section 13.5 Refer to Emergency Spill Plan	Applicable
It is recommended than a 109-metre observation zone be established around the underwater piling zone. The 100-metre observation zone would permit up to thirty minutes of continuous piling. Larger observation zones can permit longer durations of piling.	EIS Measure NV16	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and	Refer to NVMP	

Requirement	Reference	Responsibility	Evidence	Applicability to this DEMP
		AIE Environmental Contractor – Vessel/Tug Master		
The Underwater Piling Noise Guidelines (2012) recommends the following standard management and mitigation procedures with respect to underwater piling operations: – Avoid conducting piling activities during times when marine mammals are likely to be breeding, calving, feeding, migrating, or resting in biologically important habitats located within the potential noise impact footprint. – Use low noise piling methods, instead of impact piling, where possible. – Presence of marine mammals should be visually monitored by a suitably trained crew member for at least 30 minutes before the commencement of the piling procedure – If no marine mammals are nearby, a soft-start piling procedure should be used. This involves gradually increasing the piling impact energy over a 10-minute time period. Visual observations of marine mammals within the safety zone should be maintained by trained crew throughout the start period. – If a marine mammal is sighted within the observation zone during the soft start of normal operation procedures, the operator of the piling rig should be placed on stand-by to shut down the piling rig. – A record of procedures employed during the operations should be maintained by the piling contractor.	– EIS Measure NV17	– AIE HSE Manager – Stage 2A Principal Contractor Project Manager and Stage 2B Principal Contractor Project Manager – AIE Environmental Representative and AIE Environmental Contractor – Vessel/Tug Master	Refer to FFMP	Applicable

5.2 Environment Protection Licence

The NSW EPA has issued an EPL (EPL No. 21529) for the Project, with the relevant monitoring and reporting conditions incorporated in this plan. Conditions applicable to dredging activities are outlined in Table 5.2.

Table 5.2 EPL No. 21529 conditions

Condition	Reference	Evidence
Processes and management Silt curtains must be installed and operated at the premises to minimise the pollution of waters beyond the boundary of the premises during any marine based works. Marine based works includes but is not limited to: pile removal; or any dredging; or construction of the Outer Harbour emplacement cell. Note: Any reclamation of material to the emplacement cell is subject to a licence variation in accordance with Licence Condition A1.4.	Condition O4.6	Section 10.1
Care must be taken with the installation and maintenance of silt curtains to ensure that there are no gaps at the ends, or in the fabric, or in the floating boom.	Condition O4.7	
There must be no spillages of any materials from above the water surface into waters outside of the silt curtain/s.	Condition O4.8	
The silt curtain/s may only be removed following the prior written approval of the EPA.	Condition O4.9	
Vessels used for the transport of dredge spoil from the dredge site to the Outer Harbour stockpile area must not leak or release dredge spoil into waters en-route.	Condition O4.10	Section 11.6 Section 13.5
All dredgers and associated vessels must have their ballast & bilge water pumped out prior to arriving in Port Kembla Harbour.	Condition O4.11	Section 7.1.2
The licensee must continue to treat water from the southern ponds in Berth 101 prior to discharge from Licensed Discharge Point 20. The treatment method must be provided in writing to the EPA and cannot be changed without EPA approval.	Condition O4.12	Section 13.3
Waste management Excavated material and/or dredged spoil must not be stockpiled in Outer Harbour unless it will be re-used within the proposed Outer Harbour emplacement cell.	Condition O5.1	Section 13.5
Stockpiles of material stored at the premises must either be used as on-site backfill or emplacement cell construction or disposed offsite to a facility licensed to accept the material, within 12 months following stockpile creation.	Condition O5.2	Refer to CSP
Monitoring records The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition. All records required to be kept by this licence must be: a. in a legible form, or in a form that can readily be reduced to a legible form b. kept for at least 4 years after the monitoring or event to which they relate took place; and c. produced in a legible form to any authorised officer of the EPA who asks to see them. The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a. the date(s) on which the sample was taken b. the time(s) at which the sample was collected c. the point at which the sample was taken; and d. the name of the person who collected the sample	Condition M1.1 – M1.3	Refer to SMP
Recording of pollution complaints The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	Condition M7.1	Section 15.3
The record must include details of the following:	Condition M7.2	

Condition	Reference	Evidence
a. the date and time of the complaint b. the method by which the complaint was made c. any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect d. the nature of the complaint e. the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f. if no action was taken by the licensee, the reasons why no action was taken. The record of a complaint must be kept for at least 4 years after the complaint was made. The record must be produced to any authorised officer of the EPA who asks to see them.	Condition M7.3	
Telephone complaints line The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence. The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint. The preceding two conditions do not apply until 1 month after the date of the issue of this licence.	Condition M8.1 Condition M8.2 Condition M8.3	Section 15.3
Other monitoring and recording conditions The licensee must carry out, as a minimum, daily inspections of all water pollution control measures required by this licence. A record of each inspection must be made and produced to an EPA authorised officer if requested. The record must include: a. Date and time of inspection b. Details of the location of dredging operations c. Condition of silt curtains and other water pollution controls. Note: No movement of dredge spoil is permitted when a silt curtain required by this licence has not been maintained or is not achieving the requirements of this licence.	Condition M10.1	Section 16
Notification of environmental harm Notifications must be made by telephoning the Environment Line service on 131 555. Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act. The licensee must provide written details of the notification to the EPA within 7 days of the date on which they became aware of the incident.	Condition R2.1 Condition R2.2	Section 17.2
ECR Condition of consent No. 8 for the Project (SSI 9471) requires that an ECR (report) is prepared to the satisfaction of the Planning Secretary prior to the commencement of dredging, disposal and emplacement activities. The licensee must provide a ECR to the EPA for comment. The report must be provided to the EPA at least four weeks prior to commencement of dredging disposal and emplacement activities.	Condition E1.1	Section 2.7 Refer to ECR (SMEC, 2022)
PIRMP The Licensee must prepare a PIRMP that complies with Part 5.7A of the POEO Act (1997) in relation to the activity to which the licence relates. The PIRMP must be in the form required by the 'Regulations' and include the following: – the procedures to be followed by the holder of the relevant environment protection licence, or the occupier of the relevant premises, in notifying a pollution incident to:	Condition E2.1	Section 17.2 Section 18.3

Condition	Reference	Evidence
i. the owners or occupiers of premises in the vicinity of the premises to which the environment protection licence or the direction under section 153B relates, and ii. the local authority for the area in which the premises to which the environment protection licence or the direction under section 153B relates are located and any area affected, or potentially affected, by the pollution, and iii. any persons or authorities required to be notified by Part 5.7, – a detailed description of the action to be taken, immediately after a pollution incident, by the holder of the relevant environment protection licence, or the occupier of the relevant premises, to reduce or control any pollution, – the procedures to be followed for co-ordinating, with the authorities or persons that have been notified, any action taken in combating the pollution caused by the incident and, in particular, the persons through whom all communications are to be made, – any other matter required by the regulations, including 'Keeping of Plan', 'Testing of Plan', 'Making Plan Readily Available' and 'Implementation of Plan''.		

6. Summary of site conditions

Construction works for Stage 2A and Stage 2B will be undertaken within the MBD Site Compound, the Emplacement Cell Construction site located in the Outer Harbour and the Emplacement Cell located in the Outer Harbour (refer to Figure 2.2).

The following summary is applicable to excavation and dredging works based on information from previous GHD investigations (GHD, 2018a), (GHD, 2021a) and (GHD, 2021b) and the Stage 2A and Stage 2B SMP. Reference should be made to these reports and the SMP for more detailed information.

6.1 Site conditions

Following the completion of the Stage 1 Early Enabling Works (proposed completion date of December 2021) the existing above and underground structures within the MBD Site Compound will have been demolished. Excavation down to level of RL +2.5 metres PKHD has been undertaken and the following materials stockpiled at the MBD Site Compound:

– Approximately 9,700 m³ of demolished concrete crushed to nominal 70mm minus.
– Approximately 12,500 m³ of heavily bound base course crushed to nominal -150mm minus.
– Approximately 33,900 m³ of mixed slag, general fill, and coal nominally < 150mm in size.
– Approximately 10,700 m³ of predominantly sand material.
– Approximately 8,600 m³ of asbestos impacted soils.

The excavated materials stockpiled at the Emplacement Cell Construction Site include:

– Approximately 44,000 m³ of sand material.

Land based construction works proposed to be underway by the commencement of excavation and dredging include:

– Completion of all Stage 1 excavation works.
– Transport of spoil materials to the Emplacement Cell Construction Site.
– Quay wall construction within MBD Site Compound, and
– Installation of communications conduit, potable water line, 11kV power cable, and 315 kVA padmount substation within the MBD Site Compound.

Many of the activities associated with Stage 2A and Stage 2B will be required to be undertaken concurrently to enable continuality of the works. All aspects of the dredging and placement of the material will rely on the smooth unloading of the barges.

6.2 General soil description

The soil to be dredged consist of sand, clayey sand, clay, silt and some rock. Additional site-specific information is included in the SMP and CSP for Stage 2A and Stage 2B. Generalised fill materials observed during the GHD investigations and ECR (SMEC, 2022) are summarised in Table 6.1.

Table 6.1 Generalised material descriptions for Fill and Unit 1

Stratigraphic Unit Average thickness (m)	Generalised Description	Corresponding Stratigraphic Unit	Depth range (mPKHD)
Fill 3.9	Gravelly SAND, sand, silt, black, dark brown, grey, some to trace, silts and cobbles. Foreign materials, coal wash, coal, slag, steel, wood, concrete.	Fill	5 to 2.5
Unit 1A[1]	SAND, brown, pale brown, yellow, orange, fine to coarse grained, trace amounts of shell fragments, fine to coarse gravel, silt bands and layers, clayey sand layers, trace iron stained sand, fine black sand layers (probable heavy mineral sands), rounded to sub-rounded gravel, clay lenses and layers. Foreign materials: charcoal, wood and coal.	Marine/Aeolian (SMEC, 2022) Probable reclaimed sand (GHD, 2021a)	4 to -6
	SAND, brown, pale brown, yellow, orange, fine to coarse grained, trace amounts of shell fragments, fine to coarse gravel, silt bands and layers, clayey sand layers, trace iron-stained sand, fine black sand layers (probable heavy mineral sands), rounded to subrounded gravel, clay lenses and layers.	Possible Alluvium/Tidal Sands (GHD, 2021c)	
Unit 1B[1] 5.5	Clayey SAND, black, dark grey, grey, fine to coarse grained sand, medium to high plasticity clay, trace silt, shell fragments, gravel.	Estuarine (SMEC, 2022)	-1 to -9
	Gravelly CLAY, black, dark grey, grey, low to medium plasticity, fine to coarse grained angular to sub-angular gravel, trace of fine to coarse grained sand.		
Unit 1C varies	Clayey SAND, black, dark grey, grey, fine to coarse grained sand, medium to high plasticity clay, trace silt, shell fragments, gravel (SMEC, 2022).	Not observed by GHD (GHD, 2021d)	N/A
	Gravelly CLAY, black, dark grey, grey, low to medium plasticity, fine to coarse grained angular to subangular gravel, trace of fine to coarse grained sand (SMEC, 2022).		
Unit 2 6.1	SAND, brown, pale brown, yellow, orange, fine to coarse grained, trace amounts of shell fragments, fine to coarse gravel, silt bands and layers, clayey sand layers, trace iron-stained sand, fine black sand layers (probable heavy mineral sands), rounded to sub-rounded gravel, clay lenses and layers. Low to High Plasticity Clays and Sandy Clay (SMEC,2022)	Estuarine (SMEC, 2022)	-9 to -16
Unit 3 4.3	Sandy CLAY with lesser amounts of Silty CLAY, Silty/Clayey SAND and CLAY SILTSTONE with lesser amounts of Sandy	Residual Soil (SMEC, 2022)	-15 to -21
Unit 4 N/A	SILTSTONE, Silty SANDSTONE and SANDSTONE	Bedrock (SMEC, 2022)	-16 to unknown
Harbour Muds & Harbour Sands	Upper unit black-brown clayey silt mud (HM) with coarse sand and gravel sized coal and lower unit of grey silty clay (HS).	(Worley Parsons, 2012)	unknown

[1] Unit 1A/1B often only display subtle variations and cannot always be easily distinguished.

Dredge volume estimates for the various materials are provided in the ECR (SMEC, 2022), including estimates based on bulking factors.

During dredging operations, the dredge operators will work in controlled cuts, limit the amount of spillage from the buckets and have in place sediment controls devises i.e., a fixed silt curtain around the active dredge area.

The information provided in the model below showing the various depths of each material Unit will be input into the SeaTools dredge system on the dredge. Operators will be alerted by the SeaTools system if they are dredging beyond the defined layers that are intended to be dredged. Dredge operators will also report visually on the types of material they are dredging, in particular if material changes significantly. Each barge load of material will be tracked from the dredge to final placement.

6.3 Acid Sulfate Soils

The ASS Risk Map (DLWC, 1997) indicates that the MBD Site Compound area (in red outline) is situated in an area mapped as disturbed terrain at an elevation >4 metres (shown in grey shading) in Figure 6.1 below. Estuarine sediments exist within the harbour and are mapped as high probability of ASS.

Low risk ASS was identified in probable reclaimed sands and alluvial / tidal sands encountered at depths between 0 metres and 25 metres below ground level (mbgl). The probable reclaimed sands had pockets and lenses of high-risk ASS. Estuarine material encountered at depths between 0.4 metres and 25 mbgl, typically below the alluvium, was assessed as high-risk ASS.

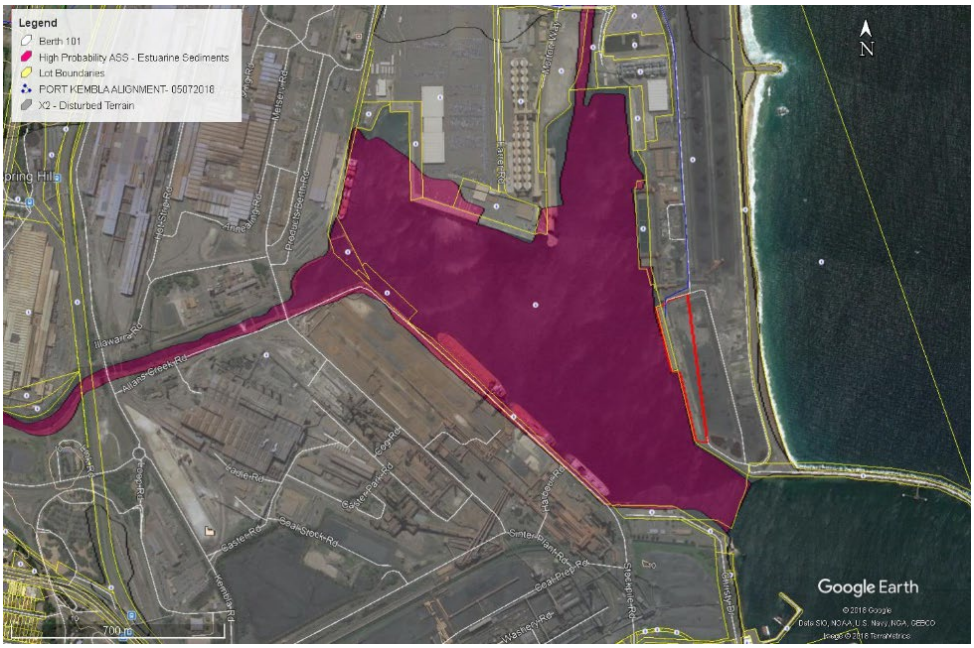


Figure 6.1 ASS risk map

6.4 Tidal conditions

The Australian Tides Manual Special Publication No 9 Version 5 (ICSM, 2018) summarises the various datums used around Australia to predict tidal behaviour. An understanding of the tidal terminology is required when comparing chart datums, tidal effects on ASS and the potential for acid production. Table 6.2 provides a definition of the relevant terminology and gives the average limits observed at Port Kembla, and Figure 6.2 shows the tidal variation at Port Kembla from 1957 to 2020 (Fox Environmental Consulting, 2020).

Table 6.2 Explanation of terms and datums used in Australian ports

Term	Purpose	Definition[1]	Port Kembla
Highest Astronomical Tide	Landward limit of the tidal interface.	The highest level of water which can be predicted to occur under any combination of astronomical conditions.	2.33m CD (+1.458m AHD)[2]
Lowest Astronomical Tide (LAT)	Baseline for the purposes of defining Australia's maritime boundaries.	The lowest tide level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions.	-0.0217m CD (-0.655 m AHD)
Mean High Water (MHW)	Common datum for cadastral mapping and common limit for topographic mapping.	The average of all high waters observed.	~1.80m CD (+1.458m AHD)[2]
Mean Sea Level (MSL)	Average limit of tides.	Arithmetic mean of hourly heights of sea over a sufficient period of time.	~0.910m CD (0.0m AHD)[3,4]
Mean Low Water	Used as the limit of Australian States As definition of 'low water'.	Arithmetic mean of all low water heights of sea over a sufficient period of time.	~0.20m CD (-0.655m AHD)[2]
Australian Height Datum (AHD)	National vertical Datum of Australia and refers to Australian Height Datum 71 for Australian Mainland.	AHD71 is a surface that passes through approximate MSL measured between 1966 and 1968 at 30 tide gauges around the Australian mainland.	0.0mAHD (0.872m CD)[3,4]
Chart Datum (CD)	Local Port Kembla Sea Level Datum.	In use since at least 1957.	0.0m CD (-0.872m AHD)[3,4]

Table notes:

[1] Definitions taken from Australian Tides manual v5 (ICSM, 2018).

[2] Mean High Water and Mean Low Water taken from monthly recorded sea levels for Port Kembla - 1957 to 2020 **http://www.bom.gov.au/ntc/IDO70000/IDO70000_60420_SLD.shtml**

[3] Chart Datum from **http://www.bom.gov.au/oceanography/projects/absImp/data/data.shtml**

[4] MSL at Port Kembla also given as 0.910m CD on **http://www.bom.gov.au/ntc/IDO70000/IDO70000_60420_SLD.shtml**

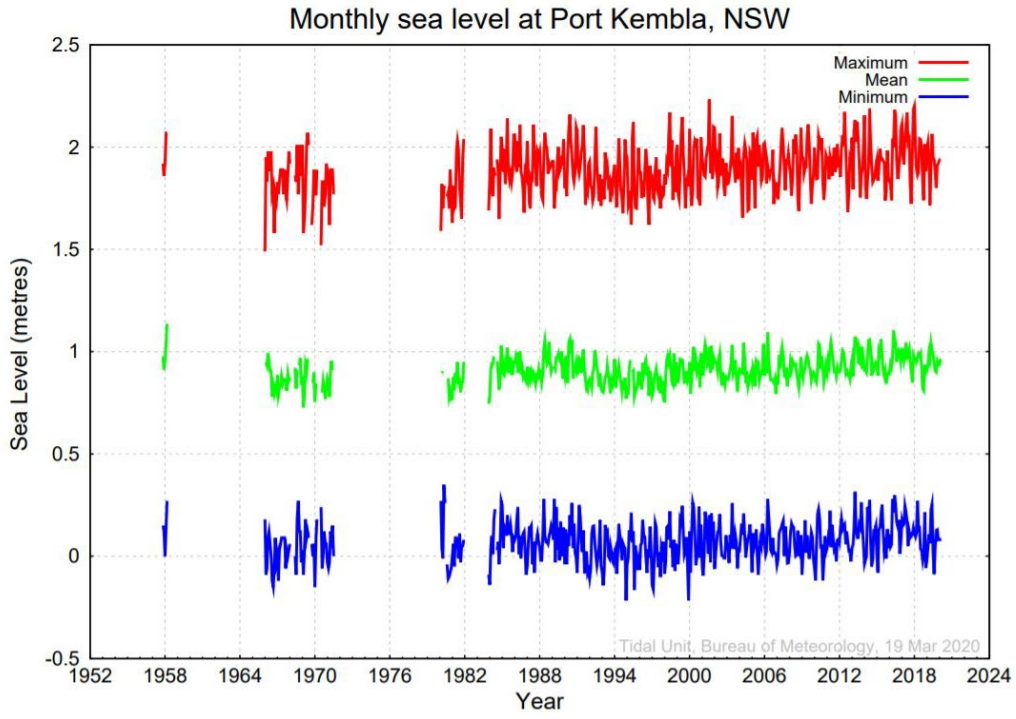


Figure 6.2 Monthly Tidal Range in LAT Port Kembla Harbour (source: BOM website)

6.5 Water quality

The Port Kembla marine environment has been historically impacted by urban and industrial development and port activities. The Inner and Outer Harbours are highly modified and industrial settings receiving stormwater runoff and waste discharge from neighbouring industries. Additional information regarding water quality in Port Kembla Harbour and contamination status of its marine environment is included in the Stage 2A and Stage 2B SMP and WQMP.

7. Project preparation

Stage 2A and Stage 2B dredging and excavation activities will be undertaken in accordance with the methodology described in Section 9 of this DEMP. This DEMP aims to minimise impacts from the dredging, transport and unloading of materials. This is achieved through the implementation of mitigation and management controls, including defined horizontal and vertical dredge limits, controls to minimise disturbance to recreational activities, and controls for the placement of material inside the Emplacement Cell.

The Stage 2A and Stage 2B dredging and excavation works will be completed using a Backhoe Dredge (BHD), the Machiavelli, tugs pulling/pushing two Split Hopper Barges (SHB) and unloading via the Mesenge barge. The BHD will remain on site with SHBs manoeuvred using a tug. Once loaded, the SHB will be taken directly to the Emplacement Cell and be dumped or unloaded by the Material Handling Barge (MHB). Equipment specification sheets for all proposed equipment is included in Appendix A.

7.1 Pre-construction activities

Prior to the commencement of any construction activities, the following pre-construction activities are required to be carried out:

– Ensure that all necessary permits have been obtained prior to commencement of works, including the obtainment of a Certificate of Local Knowledge by vessel Masters as required by the Harbour Master and NSW Marine Safety Regulation 2016 and completion of the PANSW Port Kembla Vessel 48 Hour Pre-Arrival Checklist and Harbour Master Approval to disturb the seabed.
– All applicable pre-surveys have been conducted (refer to Section 12.1).
– Biofouling requirements (refer to Section 7.1.1).
– Ballast water requirements (refer to Section 7.1.2).
– Vessel inspections (refer to Section 7.1.3).

7.1.1 Biofouling requirements

Marine vessels have the potential to unintentionally translocate and introduce invasive marine species (IMS) to new environments. IMS have the potential to significantly impact local ecosystems through the introduction of disease, damage the natural environment and impact human health and the economy. There are both international and national guidelines related to the management of biofouling. The National biofouling management guidelines on non-trading vessels (DAWE, 2009) have been developed to prevent biofouling on vessels, including guidance on cleaning of vessels, reporting of pests and prevention of the spread of IMS. The International Maritime Organisation (IMO) have developed the 2011 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species, adopted under Resolution MEPC.207 (62) on 15 July 2011 (IMO, 2011).

Marine plant and equipment required for the Stage 2A and Stage 2B works will be towed from Newcastle, NSW where it has been laid up since completing a small project at in Port Latta, Tasmania and New Zealand. The Machiavelli BHD and two SHBs were slipped in January/February 2019 as part of their survey requirements. The Mesenge barge will be towed from New Zealand to Port Kembla on completion of inspections. Hulls of the vessels will be cleaned and new five year antifoul system applied.

Each of the vessels proposed for the Project will have a Biofouling Management Plan that is specific to that vessel in accordance with the IMO 2011 guidelines (IMO, 2011). Additional information regarding biofouling related to the Project is included in the Stage 2A and Stage 2B FFMP.

In preparation for mobilising to Port Kembla, the Dredging Principal Contractor will have an IMS risk assessments of all vessels to be used during the Stage 2A and Stage 2B works completed by a Marine Biologist. The IMS risk assessment will be obtained from the Dredging Principal Contractor prior to mobilisation to site to ensure that the contractor has complied with all State and Federal requirements.

7.1.2 Ballast water

As described in Table 4.1, the Australian Ballast Water Management Requirements (DAWE, 2020) outlines the obligations of vessel operators regarding the management of ballast water and ballast water tank sediment when operating in Australian waters. Under the requirements, vessel Masters are required to:

– Ensure the vessel has a valid Ballast Water Management Plan and a valid Ballast Water Management Certificate.
– Ensure all operations are recorded in the Ballast Water Record System.
– Ensure the vessels have met the reporting obligations.
– Ensure all ballast water is managed in accordance with one of the approved methods of management. The approved methods are:
    - use of a Ballast Water Management System.
    - ballast water exchange conducted in an acceptable area.
    - use of low-risk ballast water (such as fresh potable water, high seas water or fresh water from an on-board freshwater production facility).
    - retention of high-risk ballast water on board the vessel.
    - discharge to an approved ballast water reception facility.

All dredge equipment and associated vessels that will arrive to be used for the project will not have ballast and bilge water. When dredging equipment and vessels are in operations, it is expected to accumulate bilge water which will be pumped out in accordance with one of the approved methods under the DAWE, 2020 requirements.

7.1.3 Vessel inspections

All vessels are to be inspected prior to mobilisation by the Dredging Principal Contractor Marine Superintendent who will provide a report for each vessel in the dredge spread showing they have in place a current certificate of classification, insurances and are in good working order. The AIE HSE Manager or delegate may be present for all or any of the IMS inspections, condition inspections and verification inspections prior to mobilisation of plant and equipment to the Port Kembla harbour.

7.1.4 Weather predictions

Heron will engage to provide daily weather reports and seven-day forecasting. These forecasts will predict wind speed and direction, wave eight, period and direction, sea height, tide time for a seven-day period. Forecasts will be provided for the site to assist with construction operation and planning.

7.2 Design parameters

7.2.1 Outer Harbour footprint

The development footprint for the Emplacement Cell is detailed in the ECR (SMEC, 2022). The extent of the footprint has been limited to avoid Salty Creek and no diversions or modifications of the catchment will be required during Stage 2A and Stage 2B construction works (refer to Figure 2.7). This also enables the waterway to remain open and minimises any potential impacts to fish passage. Impacts related to traffic and potential runoff from stockpiles will be mitigated as per the management measures outlined in the Stage 2A and Stage 2B CTMP and ESCP.

The overall footprint of the Emplacement Cell has been minimised by excluding Sandy Creek and the submerged finger, and by raising the proposed fill height to include emergent reclamation. This reduces the need for bottom dumping materials into the Emplacement Cell, reducing the potential for turbid plumes generating and the mobilisation of sediments. Section 9 outlines the dredging methodology. Additional information is provided in the ECR (SMEC, 2022).

7.2.2 Dredging limits and depths

Dredge depths at the MBD Site Compound are proposed to RL -13.3 PKHD. This includes a 300-millimetre siltation allowance on the declared dredge depth berth pocket. Local deepening to RL -14.9m PKHD may be required in some areas as dictated by design drawings. The design dredge depth shall be achieved over the entire extent of the various dredge areas for clearance sounding purposes. The Dredging Principal Contractor shall have an over dredge allowance of 300 millimetre below the finished design level. The Dredging Principal Contractor Project Manager, AIE Construction Manager and HSE Manager Representative shall ensure that no dredging is to be carried out outside this extent or levels.

Dredging is specified in the vicinity of existing and proposed structures. Section 9 outlines the methodology details regarding how the dredging work will be achieved safely and without any potential for damage to the existing structure. The dredging may need to be carried out in a sequential manner to accommodate the installation and curing of the combi pile wall capping beam.

Within the dredge profile, various material types are anticipated be encountered, including PASS and contaminated materials. All PASS and contaminated material must be placed within the Emplacement Cell and capped with Unit 1 material. Bunding and/or capping of the Emplacement Cell with Unit 1 material is subject to ASS neutralising capacity verification testing. Additional information on PASS materials is provided in Section 6.3 and the Stage 2A and Stage 2B ASSMP. Additional information related to contaminated materials is provided in Section 6.9 of the Stage 2A and Stage 2B SMP.

7.2.3 Dredging tolerances

The Dredging Principal Contractor shall achieve the required depth and profile at all locations. The Dredging Principal Contractor shall dredge all areas to leave the seabed surface as level as possible, consistent with good dredging practice.

Dredge tolerances to be achieved are outlined in Table 7.1.

Table 7.1 Dredge tolerances

Dimension	Location	Tolerance dredge design	
Vertical	Toe lines to existing and proposed structures, to a distance of 10m off the existing or proposed structure	Deeper	0.3 m
		Shallower	0.0 m
	Scour Mat and Rock Revetment	Deeper	0.3 m
		Shallower	0.0 m
	Front of completed Quay wall	Deeper	0.3 m
		Shallower	0.0 m
	All other areas:	Deeper	0.3 m
		Shallower	0.0 m
Horizontal	All areas. For clarity, it is not allowable to dredge outside the provided dredging limits or lines indicating changes in batter slope.	Deeper	0.0 m
		Shallower	1.0 m
	Front of completed Quay wall.	Deeper	0.0 m
		Shallower	1.0 m

In the unlikely event that materials have been removed from outside the tolerances as indicated above, the AIE Project Manager may require the Dredging Principal Contractor to backfill such over-depth in an approved manner and timing, with materials to be selected by the AIE representative. Additional information related to backfill and reinstatement are provided in Section 7.4.2 of the Stage 2A and Stage 2B SMP.

8. Plant and equipment

Plant and equipment associated with the works will be in good working order and have the capacity to safely and efficiently do the work required. All necessary plant inspections and invasive marine species assessments will be undertaken in accordance with the Infrastructure Approval (SSI 9471) and EPL No. 21529 requirements (refer to Section 7.1).

Table 8.1 lists the plant and equipment expected for the Stage 2A and Stage 2B works. Additional plant or equipment necessary may be identified following assessment processes. Section 8.1 and Section 8.2 outline the specific information related to the BHD Machiavelli and SHBs. A copy of each of the proposed plant and equipment specifications are provided in Appendix A.

Table 8.1 Plant and equipment

Plant and Equipment required for the works:	Type of Works
Machiavelli BHD	Dredge material into barges from the MBD Site Compound and toe trench
H1201 SHB	Transporting material to the Emplacement Cell
H1202 SHB	Transporting material to the Emplacement Cell
Mesenge spudded barge	Unloading barges
PT May – Tug	Pushing barges from dredge to Emplacement Cell
Kaiwea Survey Vessel	Hydrographic survey and crew changes
MHB fitted with a Liebherr- material handler	Unloading barges and revetment placement from water side.
Longreach or similar – excavator	Installing revetment, bund trimming
Excavator	Loading trucks
Bulldozer	Assisting the MHB
Articulated dump truck (ADT) dump trucks	Placing fill material

8.1 Backhoe dredge - Machiavelli

BHD Machiavelli is a De Donge built, mechanical dredger with a heavy-duty hydraulic excavator mounted on a pontoon, best suited for dredging in shallow areas with little opportunity for manoeuvring. The BHD Machiavelli can be fitted with multiple combinations of buckets, sticks and booms depending on the material to be excavated and the depth of the design. The pontoon features two spuds in a fixed position and one travel spud on a carriage used to reposition the pontoon. The general layout of the Machiavelli is provided in Figure 8.1.

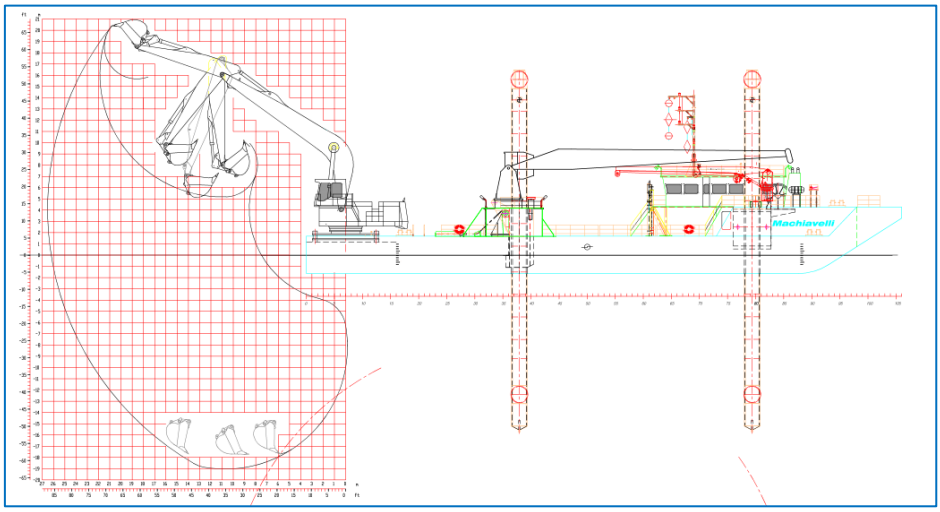


Figure 8.1 General layout of the Machiavelli

The dredging spread proposed for the Stage 2A and Stage 2B works utilises several measures to prevent hydrocarbons and/or other environmentally hazardous substances from entering the water or impacting on the marine environment.

The prevention measures include, but are not limited to:

- Periodic documented preventative maintenance program.
- Replacement of high-risk hydraulic hoses after a predetermined time (machine hours), not after they have failed.
- A hydraulic hose register that records the details of every hose e.g., manufacturer, date of manufacture, date of installation, type, size, length, etc.
- Boom and dipper cylinders fitted with anti-burst valves which prevent loss of oil from the hydraulic ram should a hose fail.
- One further measure implemented that minimises the potential of environmentally hazardous substances entering the water is that all hydraulic systems on the Machiavelli and hopper barges use Panolin HLP Synth 46 biodegradable hydraulic oil.

8.1.1 Deck area

The Machiavelli has a significant amount of deck space available to store spare buckets. The Machiavelli is fitted with two service cranes, the largest with a capacity of 15 tonne at 25 metres. This capacity allows the crew of the Machiavelli to change sticks and buckets without the assistance of land-based cranes. The location of the cranes ensures that there is 100 per cent crane coverage over the deck.

The ability of a BHD to operate requires that weather and sea state are within the capabilities of the dredge. Generally, this can be limited by a combination of wave height, swell direction and current. The Machiavelli can operate in sea conditions of between significant wave height (Hs) <1.0-1.5 metres. Without a barge alongside the vessel, these parameters maybe increase if the bow of the dredge can be positioned into the prevailing swell/wind direction.

If the BHD pontoon has reached its limitations, the Principal Contractor Dredging Manager, or delegate, will decide when dredging will be terminated as per the De Donge operational manual requirements.

Daily weather information and forecasts will be made available to each of the project vessels so the vessel Masters can inform their decisions relevant to the conditions.

8.1.2 Working principles

BHDs generally work backwards as this generates less spillage from the dredging operation than working forwards and is preferable in terms of productivity and efficiency (refer to Figure 8.2). In some instances, if the existing

water depth is less than the draft of the pontoon or when dredging is required alongside or near to a structure, then forward dredging allows the BHD to create its own channel.

Dredging is carried out by removing all the material within reach of the excavator in a radius from the centre the excavator. Cut depths and radius depend on material types to be dredged and the configuration of the excavator.

During excavation of material, a SHB will be moored alongside the BHD. The excavator will load the material into barges until the required draft is attained and the 1,200 m^3 hopper barges will be used to transport the material to the Emplacement Cell. Once a profile / cut has been completed the dredge will move to the next cut.

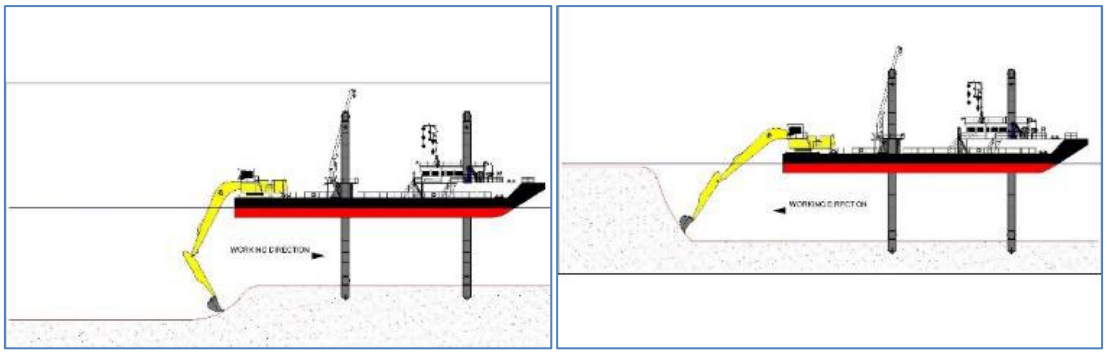


Figure 8.2 Working principles

8.2 Split Hopper Barges

SHBs assisted by tugs will transport and place the dredged material on a continual basis moving between five and eight loads to the Emplacement Cell site per day. SHBs will be predominately pushed to the Emplacement Cell site.

The Dredging Principal Contractor undertaking dredging works have two identical 1,200 m^3 SHBs that will be used for the Stage 2A and Stage 2B works (refer to Figure 8.3 and Appendix A). These SHBs are set up to be remotely started, opened, closed, and stopped by the crew on the tugs. The SHBs will be fitted with a Differential Global Positioning System (DGPS) and data logger systems. This will provide track plots for the SHBs and record the position, elevation, and time and that the SHB opened and closed.

The design of the SHB includes the installation of a stern thruster system. The thruster is remotely operated from the tug. This is beneficial when accuracy is required to position the SHB in the Emplacement Cell disposal area. Thrusters will also assist with manoeuvrability and speed up the process of berthing SHBs alongside the Machiavelli and the MHB.

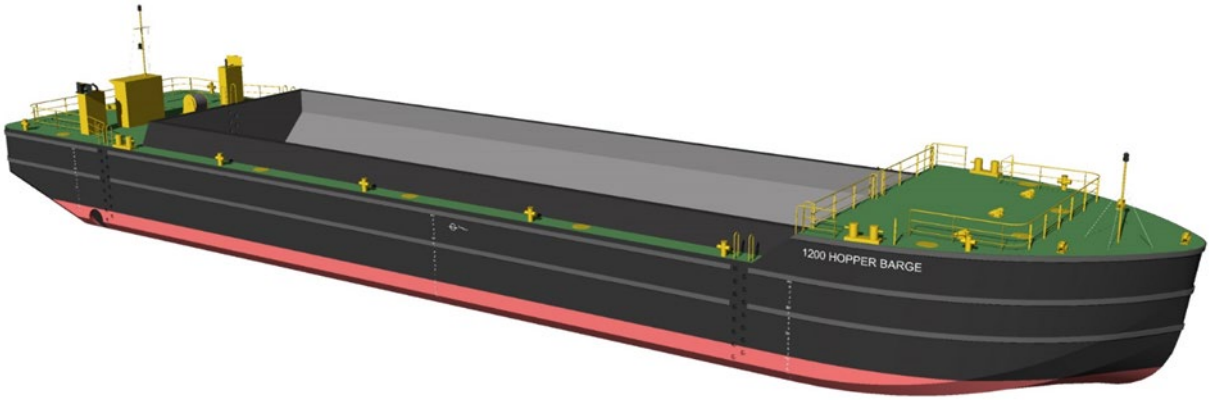


Figure 8.3 Split Hopper Barge

8.2.1 Sea state

Tugs with a hipped-up barge can operate in sea conditions that are up to Hs<1.0m. When the SHB is connected to a tug, the Tug Master is deemed responsible (refer to Section 3). The Tug Master, prior to commencing any voyage, is to satisfy themselves that they have considered the conditions for sailing to and from the Emplacement Cell. Checks to be completed may include but not be limited to:

– Assess sea state conditions through VTS weather reports. Check weather, swell, wave height – are conditions worsening or improving?
– Communicate the above information with the Dredging Principal Contractor Marine Superintendent about the current/future sea state conditions.
– Is there restricted visibility due to fog, rain, or smog?
– Communicate with the incoming tug as to sea state in the Emplacement Cell site.
– Sea state is to be reassessed on approach to Emplacement Cell site.
– The Tug Master is to log the communication process.

If the Tug Master considers that conditions are not suitable to safety move a barge to the Emplacement Cell, they are to communicate with the Dredging Principal Contractor Marine Superintendent immediately. Under no circumstances are they to sail if there is doubt that the vessel can safely transit to the Emplacement Cell.

8.2.2 Barge Movement

The preferred method of connection between the tug and SHB when transiting will be “hipped up” to the SHB and push the SHB to the dredge area. All tugs will be fitted with heavy duty towing winches so that SHBs can be retrieved to the tug quickly and safely. Tugs hipping up to a barge retrieve set lines and do not require, in most instances, a person to board the SHB until it is secured to the tug. In the event of broken lines or mechanical issues a crew member may be required to board a SHB. In these circumstances, the SOP must always be followed (refer to Section 14.2).

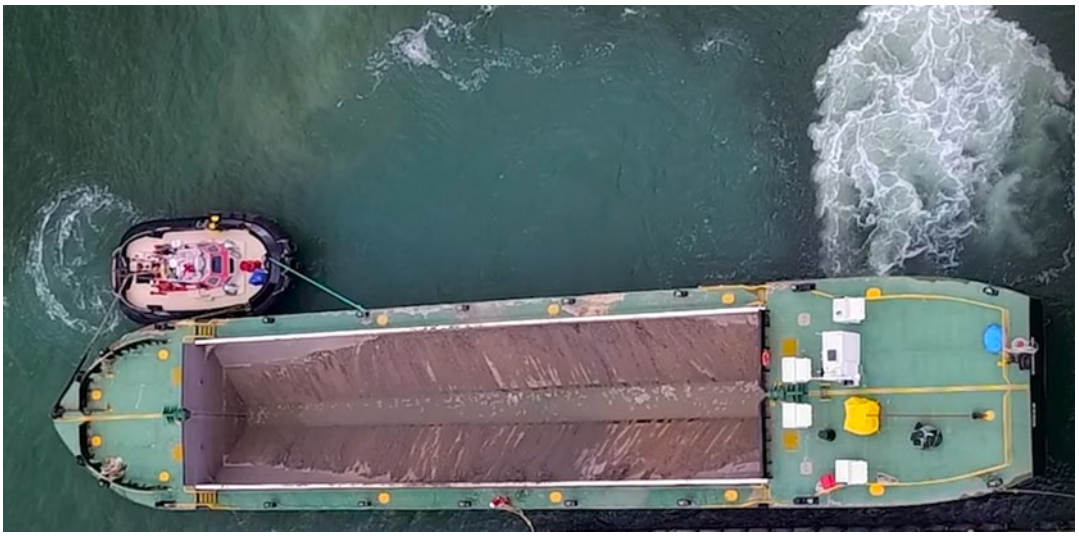


Figure 8.4 Hipped up configuration with thruster operational

Additional plant and equipment specification information is provided in Appendix A.

9. Dredging works methodology

The dredging works will be undertaken in accordance with the methodology described in this section.

9.1 Dredging

Dredging will be carried out by the BHD Machiavelli and two SHBs for the duration of the Stage 2A and Stage 2B activities. The BHD will be configured to allow for maximum production in the material expected to be encountered at the depths required whilst minimising environmental impact. Currently it is planned to use the BHD with a 16-metre boom, seven-metre stick and a 5.6 m^3 general purpose (GP) bucket for the majority of dredging activity. This will allow production rates greater than 4,000 m^3 per day at the design depths while minimising impact to the surrounding environment. Two additional bucket types may be used during dredging activity, a demolition bucket for the removal of the existing revetment at the MBD Site Compound, and a 3.5 m^3 HD rock bucket if harder than expected rock is encountered.

To aid in the sequencing and overall management of the dredging works, The Dredging Principal Contractor personnel overlay a box system on the dredge area for easy identification of work areas, typically boxes 30 metres wide and 50 metres long. Dredge boxes are displayed on all vessel computers so that all vessels view the same image. Programming and daily reporting of the dredge progress also references the box the dredge has worked in for the last 24-hour period. An example of the grid overlay is shown in Figure 9.1.

Prior to dredging operations commencing, a 12D model will be developed using existing bore hole information. This model identifies the levels that material type changes. In addition, the 12D model has a tolerance, or buffer, applied to the 'inferred geotechnical profile' to manage both dredging tolerance and variances in material horizons between boreholes. The buffer increases the volume of PASS material to be contained in the Emplacement Cell but ensures compliance in material management. Additionally, the use of the buffer in assessing variances in materials enables efficient transfer of materials are buckets will not require assessment from personnel.

Each of the dredge boxes will be split into layers that reflects the identified material types. This information will be input into the dredge computer to create a working design for the dredge operators (refer to Section 11.1). In addition, regular hydrographic survey will be conducted to monitor the results of the dredging compared to the design (refer to Section 12.2).

A comprehensive reporting system will track all material removed from the dredge area to its placement area within the Emplacement Cell.

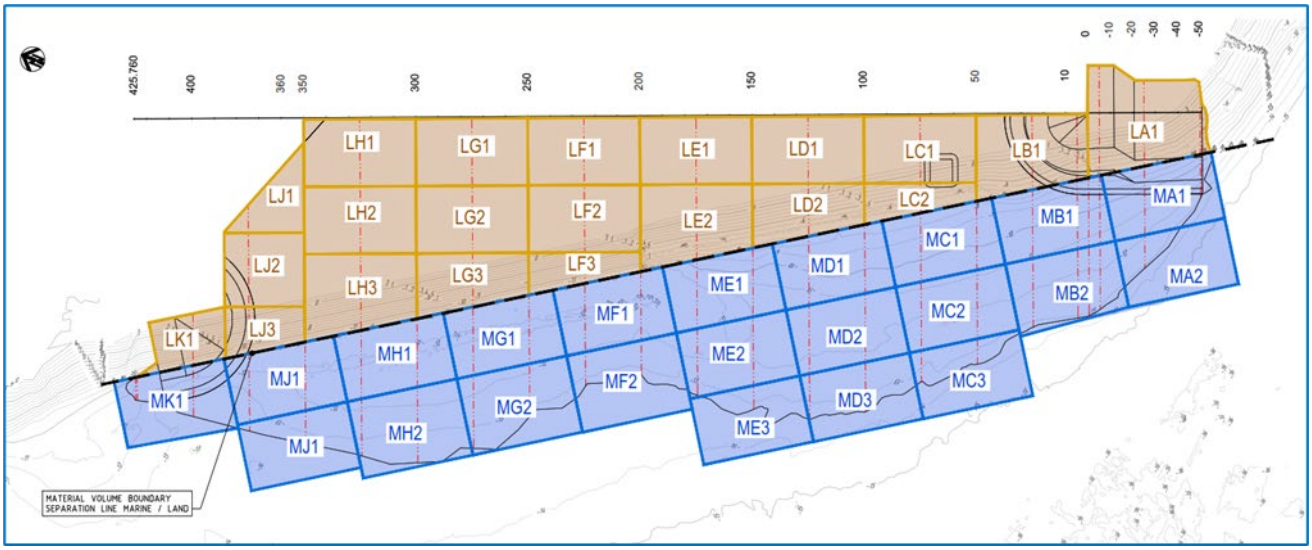


Figure 9.1 Dredge area with grid overlay

9.2 Outer Harbour Emplacement Cell

The Dredging Principal Contractor will use a combination of bottom dumping and unloading of barges to place the dredge material in the Emplacement Cell disposal area. This will maximise the capacity of the Emplacement Cell and provide the most economical solution for the Project. Where possible SHBs will place material by bottom dumping. However, due to the restricted draft this will not be possible for the entire duration of Stage 2A and Stage 2B dredging activities.

A MHB with a material handling excavator installed on the barge will be mobilised for the duration of the Stage 2A and Stage 2B works. Unloading of material by MHB will be controlled by a SeaTools dredge management system allowing the northing, easting & reduced level (x,y,z) data of the excavator to be downloaded for all operations. A grid system is set up on the operators' screen which indicates where material is to be placed and records the time, position, and depth the grab is opened (refer to Figure 10.9). A 500-millimetre buffer has been incorporated into the dredge model to assist in separation of potentially contaminated materials from the uncontaminated materials to be used in the construction of the Emplacement Cell bund. Additional design and buffer information is included in the ECR (SMEC, 2022).

SHBs will be moored alongside the MHB and then unloaded by the material handler directly to the required storage area at the required elevation. SHBs may be completely or partially unloaded by the MHB. Once the require barge draft has been achieved, the barge will then be bottom dumped and returned to the dredge.

When unloading to the final design bund crest of RL+3.55m, landside equipment will be required to trim and place some material, including access pavement materials, which are either imported or sourced from the MBD Site Compound.

Using this combination of unloading methods, it will be possible to place 100 per cent of the dredged material from the marine side, eliminating the need for road trucks on public roads. Transport via road will be required for the transport of revetment rock, or materials delivered as part of Stage 2A and 2B site mobilisation and preparation.

Construction of the bunds will commence with the excavation of the bund foundation trench (pre-dredge) and placing the excavated pre-dredge material in the shallow near shore waters of the Emplacement Cell. Nominally, a 350-metre trench will initially be excavated.

Once the dredge area at the MBD Site Compound is prepared, the initial removal of revetment rock will be followed by the dredging of fill and Unit 1 materials for transfer and bottom dumping into the toe trench. This will progressively raise the level to RL-3m PKHD. Once barges become draft restricted, the bund construction will continue using the MHB, unloading SHB's and placing materials directly over the bund.

At this stage of the works, it will become possible for land-based equipment to progressively work out from the shore on the bunds, which will enable the use of stockpiled Unit 1 fill to be used on the bunds. Only Unit 1 material will be stockpiled for bund construction or capping of the contaminated/PASS material by land-based equipment. All other material will be placed directly from the barge or by the MHB below RL +0.9m PKHD.

Dredging activities between the MBD Site Compound and Emplacement Cell will be staged to accommodate other construction works being undertaken at the MBD Site Compound (refer to Section 2.2). The staging works are outlined in Section 10 and detailed information is provided in the ECR (SMEC, 2022).

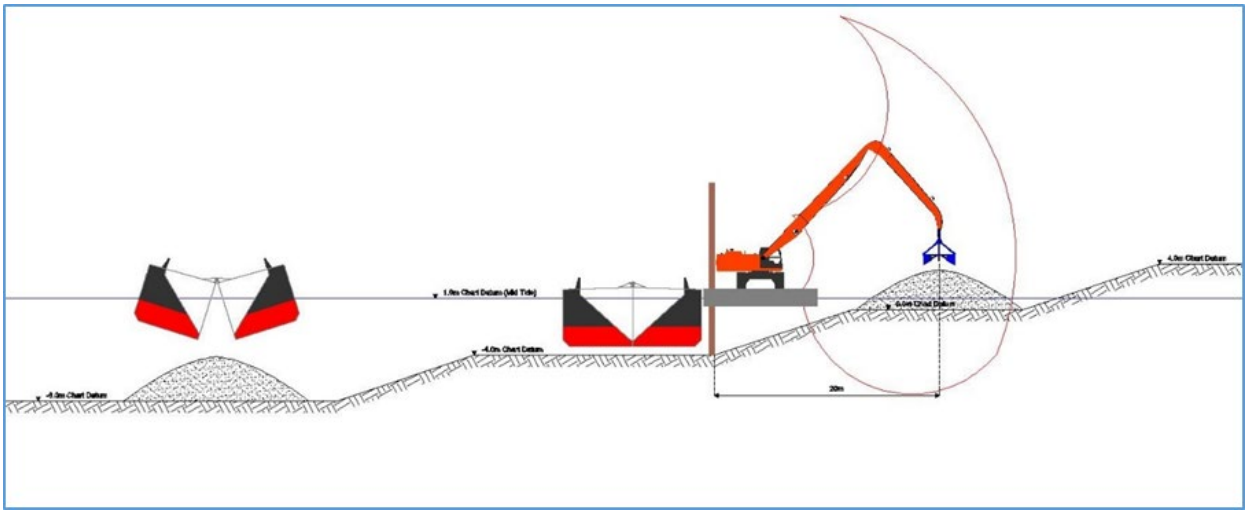


Figure 9.2 Placement Options

9.2.1 Repositioning the BHD

The Machiavelli is held in positioned by three “spud” legs. The two aft spuds are fixed and operate up and down. The third forward spud travels backwards and forwards in a spud carriage, with a stroke of approximately seven metres enabling the Machiavelli to manoeuvre while it is dredging without assistance from tugs, anchors, cables, or winches. The spuds are lowered to the seabed and hold the Machiavelli in position for the dredging operation. They are controlled from the operator cab and movement is seen in real-time on the DipMate screens by the operator.

The manoeuvring of the BHD with the spud legs is done only whilst dredging; for movements of further distances a tug is employed to relocate the Machiavelli.

9.2.2 Relocating BHD non-assisted

The process for non-assisted repositioning (stepping) is to centre the BHD with the pontoon, bucket lowered to the seabed, and hydraulics put into float. The forward spud is then lifted and travelled back to the start position and lowered. Once this has been done the two main spuds are lifted, and the forward spud now pulls the BHD back approximately 7 metres. The BHD is then centred, and the two main spuds are lowered. For normal dredging operations the two main spuds are raised first, the forward spud is then retracted in increments that suit the dredging sequence. The main spuds are then lowered, and dredging continues.

9.2.3 Relocating BHD assisted

When the assisted relocation of the BHD is required, a tug will assist. The Tug Master and Dredging Principal Contractor Marine Superintendent shall communicate the best arrangement for the tow and barge combination depending on relocation distance. The tug may hip-up or be connected via a tow line. The SHB may or may not be attached to the BHD during this process.

9.2.4 Configuration

Current configuration of the Machiavelli is with a 16-metre boom, 8-metre stick and a 5.6 m^3 GP bucket. The configuration of the BHD can be changed to suit different conditions and production requirements. It is not envisaged that the stick or boom will be changed for the dredging works. Changes of buckets and or rippers may be required dependent on material strengths and wear factors.

A change of setup will only be undertaken when the increased productivity justifies the down time required to make the change.

9.2.5 SHB loading

The dredged material will be loaded in the SHB moored alongside the BHD. The loading is controlled by the operator of the BHD who will communicate directly with the Tug Master that has control of the tug if required. These communications are carried out via radio and are to direct the shifting of the SHB, the checking of draft marks and letting go once it is full.

Once the SHB has been fully loaded, the mooring ropes will be released, and the tug will manoeuvre the SHB out to sail to the Emplacement Cell disposal site.

The barges have safety systems in place and available on board, including training for crews (refer to Section 14), ensuring vessels are not overloaded, loads are stable, centre of gravity and stability are maintained and there is no loss of material to the environment.

9.2.6 SHB changes

The coordination of SHBs and tugs will be at the discretion of the BHD operator. Barges returning from the Emplacement Cell to the MBD Site Compound will slow or hold off until contacted by the BHD operator. Once permission has been given the tug will push the SHB over to the MBD Site Compound dredge area. Approach will be controlled to enable deck crew to transfer lines and secure the SHB. Positive radio communication is maintained at all times between the BHD, tug and deck operators and personnel.

When the SHB has been positioned and securely fastened, the BHD will start loading. Whilst berthing and departing the dredge area, the 1,200m^3 barges will also be assisted using a remotely controlled thruster. Once a SHB is confirmed loaded the BHD will wash down any spillage off the sides of the SHB in the dredge area. The BHD operator will communicate with the tugs and instruct the crew to drop the lines and sail to the Emplacement Cell site.

9.3 PASS materials

PASS material has been identified in Unit 2 material and HM and HS. Localised lenses of PASS have also been found in Unit 1. While the HM and HS will be contained within the Emplacement Cell, the larger volume of Unit 2 material requires planning to ensure that it is placed below RL+0.9m PKHD. Key to the management of PASS material is identification, material tracking and maintaining saturation of the material. Unit 1 materials will be utilised for the Emplacement Cell bund given the PASS lenses, will be neutralised by the Acid Neutralising Capacity of the larger Unit 1 volume (Fox, 2022). Bunding and/or capping of the Emplacement Cell with Unit 1 material is subject to ASS neutralising capacity verification testing. Further detail is provided in the Stage 2A and Stage 2B ASSMP. All identified PASS material is located below RL-10m PKHD within the dredge footprint, which allows for dredging of adequate clean material, Fill, Unit 1A and Unit 1B to be excavated and placed to form the containment bund.

The Stage 2A and Stage 2B dredging works will requires two SHBs that will take the dredged material from the MBD Site Compound dredge footprint to the Emplacement Cell disposal area. Transport from the MBD Site Compound to the Emplacement Cell will, on average, take less than 30 minutes. Once inside the Emplacement Cell site, unloading will commence immediately. Dredged material within the SHB will effectively remain saturated during transport to the disposal point. Under normal operating activities there is little opportunity for these materials to oxidise and generate acid.

In the event of equipment breakdown or severe weather events preventing the safe transportation of SHBs, temporary stockpiling of materials in barges may be required. Temporary stockpiling of untreated materials has the potential for acid to build up in the dredged materials. The *Queensland Acid Sulfate Soils Technical Manual: Soil Management Guidelines* (DSITIA, 2014) outlines the recommended maximum time that materials comprising of coarse, sands to loamy sands and peats can be temporarily stockpiled without treatment is 18 hours. Contingency measures for equipment breakdown of longer than 12 hours are required to address the potential for dredged material oxidisation in the SHB. Measures would include a continuous system of spraying water onto the dredge material to maintain saturation. Additional contingency measures related to PASS materials are included in the Stage 2A and Stage 2B ASSMP.

Tracking of all material types from the MBD Site Compound to the Emplacement Cell will be completed for every load. PASS material will only be placed in a pre-determined area within the Emplacement Cell. Daily reports will

provide evidence of the placed material including track plots, print screens, tug reports and all backed by daily hydrographic survey.

9.4 Contaminated material

HS and HM have been identified as being contaminated within the Project area and are to be contained and capped within the Emplacement Cell. Dredging of the HS and HM materials will be programmed to occur when a suitable cell has been created within the Emplacement Cell. This will require an area with capacity to contain the entire volume of HS/HM behind a section of the Emplacement Cell bund.

Dredging of contaminated material is to take place prior to lowering the adjacent dredge to level lower than the contaminated level to reduce the risk of HS/HM being able to migrate during the dredging process. It will also aid in the positive identification and tracking of the contaminated material. Underlying PASS and/or rock will be removed as part of this process and disposed of in the same area within the Emplacement Cell.

Tracking of all material types from the MBD Site Compound to the Emplacement Cell disposal area will be completed for every load. Contaminated material will only be placed in a pre-determined cell within the perimeter bund. Daily reports will provide evidence of the placed material including track plots, print screens, tug reports and all backed by daily hydrographic survey.

9.5 Asbestos containing materials

In the event any ACM is encountered at depth during dredging activities, the UFP included in Section 6.5 of the Stage 2A and Stage 2B CSP will be enacted. Naturally occurring ACM at depth is highly unlikely and is not anticipated to occur during the dredging activities.

10. Sequence of works

Demolition of the existing MBD Site Compound wharf and excavation of fill materials down to RL-2.5m has been undertaken during the Stage 1 Early Enabling Works. Approximately 45,000 of materials has been excavated and stockpiled within the MBD Site Compound and Emplacement Cell Construction Site (refer to Figure 2.3 and Figure 2.4). The excavated materials stockpiled at the MBD Site Compound comprise of:

– Approximately 9,700m³ of demolished concrete crushed to nominal 70mm minus.
– Approximately 12,500m³ of heavily bound base course crushed to nominal -150mm minus.
– Approximately 33,900m³ of mixed slag, general fill, and coal nominally < 150mm in size.
– Approximately 10,700m³ of predominantly sand material.
– Approximately 8,600 m³ of asbestos impacted soils.

The excavated materials stockpiled at the Emplacement Cell Construction Site includes approximately 44,000 m³ of sand material.

Additional land-based works will be undertaken prior to the commencement of dredging. Once the new wharf construction at the MBD Site Compound has progressed to a stage that the dredging can proceed continuously, the Machiavelli dredge and MHB will mobilised to site. Subject to mobilisation, timing review sequencing of the dredge works may be dependent on the release of material within the exclusion zone running 20 metres off and parallel to the new wharf capping beam.

A brief outline of the sequencing is described in the sections below for the following activities:

– Silt curtain installation at both the MBD Site Compound and surrounding the Emplacement Cell.
– Excavation of the toe trench for the Emplacement Cell bunds (split program).
– Removal of the existing armour rock from RL2.5m down, loading into barges and unloading at the Emplacement Cell.
– Dredging of remaining fill, Type 1A and B materials and placing in the Emplacement Cell bunds.
– Progressively dredging wedges of material within the exclusion zone to within 0.5 metres of the pile face (subject to mobilisation timing review).
– Potentially washing of material trapped within the pile line to provide clearance.
– Clean up cut and possible sweeping of the dredge area.

10.1 Silt curtains installation

The installation of silt curtains will be carried out prior to dredging activities, including revetment rock removal, at the MBD Site Compound and surrounding the Emplacement Cell. It is proposed to use a heavy duty curtain piled and / or anchored to the seabed. Sea state and water conditions at Port Kembla Outer Harbour varies according to prevailing weather and vessel traffic. Generally, conditions are comparable with ‘open water’ conditions and the calibre of silt curtain and turbidity controls are to be designed and manufactured accordingly to best withstand the conditions.

Anchoring of the silt curtains may require input from PANSW to determine the level of and requirement for navigation and special markers to alert vessels operating in the port area of the presence of the marine hazard.

A entrance / exit gate will be maintained for barges to enter and exit the disposal area.

Figure 10.1 Example of similar installations

In the event of silt curtain failure, operations will cease until silt curtains are repaired / replaced. The Dredging Principal Contractor will implement a maintenance program and a substantial inventory of replacement curtain and fittings. Silt curtains will be inspected initially on a weekly basis with ongoing inspections determined by local weather conditions. Storms and heavy rainfall will trigger additional inspections to be undertaken.

An inspection checklist and photographic records will be taken on completion of the silt curtain inspection. Records will include information on:

– Installed navaids and lights.
– Anchoring position.
– Fatigue and effectiveness.

Visual inspection of the above will aid in identifying any silt curtain failures requiring repair / replacement, and to ensure no spillage of any materials from above the water surface into waters outside of the silt curtain occurs.

The silt curtain is being designed by a specialist. Specifications will be documented, and the specification sheet provided as required. The silt curtain will be deep enough to provide sufficient disruption to the water flow (current), remain clear from the seabed of the Port at low tide, and adhere to any other requirements issued by the NSW EPA. The silt curtain will be installed and maintained to ensure that there are no gaps at the ends, or in the fabric, or in the floating boom.

The silt curtains will only be removed following written approval from the EPA.

10.2 MBD Site Compound revetment armour rock removal

The existing revetment armour rock is to be removed and stockpiled for either disposal or reuse if meeting the Project specifications. Armour rock down to approximately RL-PKHD 2.5m will be removed using a land-based 80 tonne Longreach excavator and stockpiled on the construction site (refer to Figure 2.3).

The balance of the armour rock will be removed by the BHD and SHBs to the Emplacement Cell Construction Site. Armour rocks will then be unloaded in a position for reuse once construction of sections of the bund wall have been finalised around the Emplacement Cell area.

A demolition bucket will be used on the dredge to recover the existing revetment rock, this allows the recovery of the rock without removing the underlying sediments (refer to Appendix A for specification sheet). The BHD will operate parallel to the existing wharf alignment with the barge on the outside. Rocks will be carefully placed in the SHB by the BHD operator. Each SHB load would contain approximately 1,800 tonnes of rock once loaded.

Transportation of revetment armour rock via barges will reduce the need for road transportation. The majority of revetment armour rock transport will be via barge. Some road transportation may be required.

Figure 10.2 Demolition bucket

10.3 Pile management

Any remaining steel piles that are above the proposed dredging level within the MBD Site Compound will be cut off to a level suitable for dredging.

Any remaining timber piles that are within the proposed dredging level in the MBD Site Compound will be removed as part of dredged material and to be managed and disposed of appropriately.

Any materials such as former timber pile remnants encountered during the dredging of the Emplacement Cell bund footing will be managed as unexpected finds.

Unexpected finds and any materials to be disposed offsite will follow the process stipulated in Section 8.3 of the Stage 2A and Stage 2B SMP and Section 6.5 of the Stage 2A and Stage 2B CSP.

10.4 Pre-dredging Outer Harbour toe trench

Once the silt curtain has been installed surrounding the Emplacement Cell and the turbidity monitoring is in place, the Machiavelli BHD will be mobilised to the Outer Harbour to commence dredging of the toe trench.

The BHD will start at approximately chainage 75 and continue around to approximately chainage 400 in the first instance. Construction of the bund will then commence to avoid leaving the trench opened for too long and risk having to rework the profile. Continued excavation of the toe trench may be driven by construction sequence of the wharf. If dredging is delayed at the MBD Site Compound, it can be optimal to have an alternative dredge area to avoid time delays.

The trench design will be input into the SeaTools dredge computer, and a full calibration of survey control completed by the surveyor. As the trench is excavated, the dredged material will be placed in the barge alongside the BHD, rather than side-casting the material. Once barges are full, they will be taken to a position within the Emplacement Cell and the load placed. Additional information on the construction of the Emplacement Cell is provided in the ECR (SMEC, 2022).

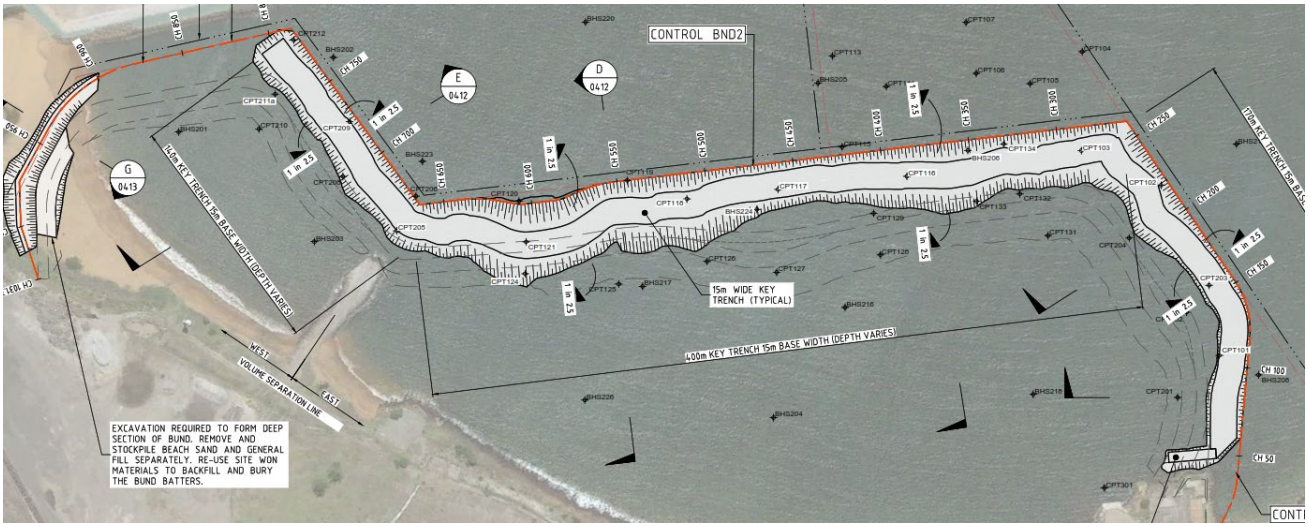


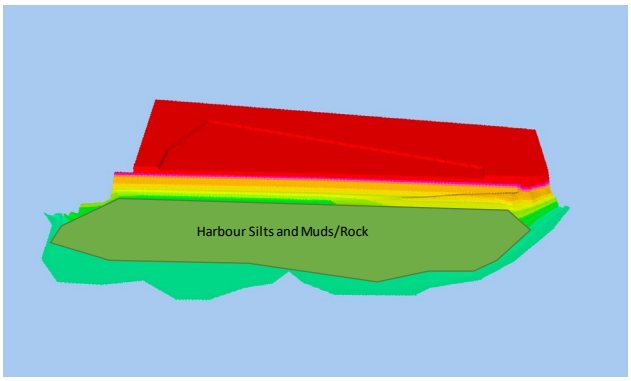
Figure 10.3 Required scope of trench for bunds

10.5 Dredging sequence

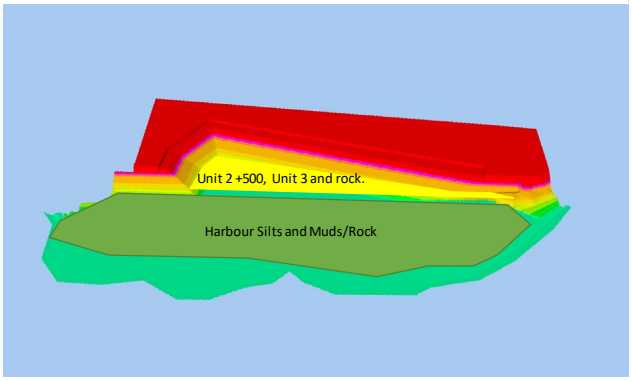
A number of elements dictate the sequencing of the dredging of the new FSRU berth. This dredging sequence may change depending on various reasons including material types, construction sequence of the new wharf and the availability of suitable containment areas within the Emplacement Cell.

The SeaTools system enables for effective dredging of a defined model. The proposed dredging sequence is shown in Figure 10.4 . Balancing works with the disposal of the material in the Emplacement Cell may result in the sequencing below needing to be adjusted at short notice, and thus the sequencing diagrams are subject to change. This is to ensure that any PASS or contaminated material is placed below RL0.9m PKHD and that the construction of the revetment can continue progressively protecting the bunds.

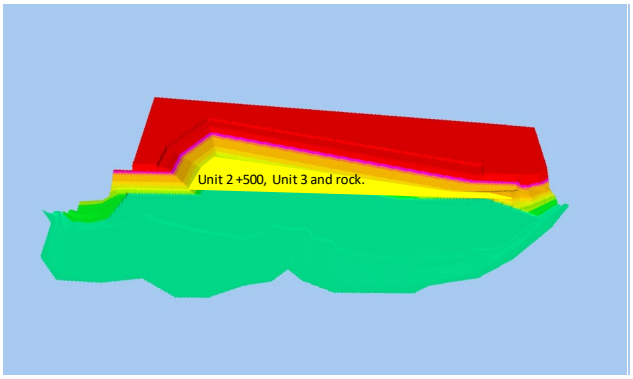
HM and HS will be deposited in the Emplacement Cell early in the dredging campaign. Once the Emplacement Cell bund construction is advanced sufficiently to provide containment, and, in most cases, in advance of the ASS/PASS materials, HM/HS materials will generally be deposited lower than -1.0m PKHD and in no instances above the LAT (~-0.02 m PKHD).



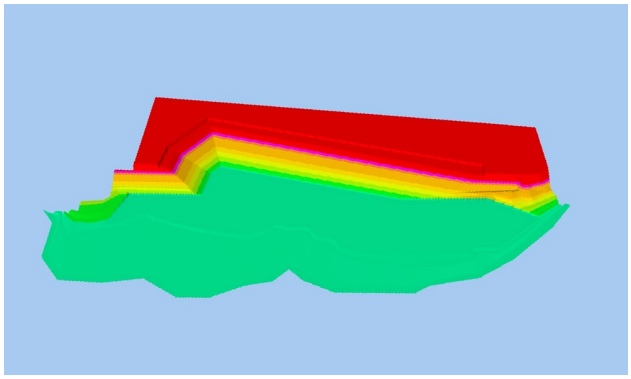
1. Pre-dredge - fill removed to RL2.5m PKHD



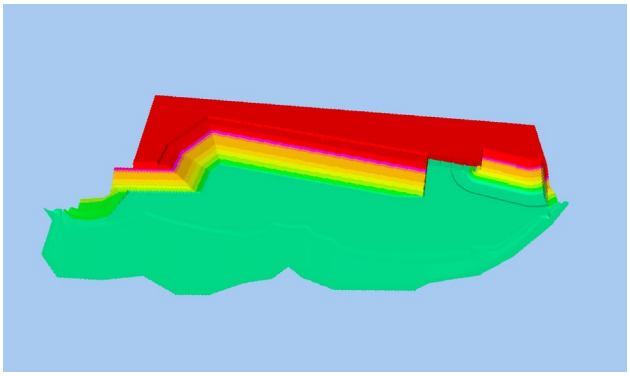
2. Dredge Unit 1A/B material to 20m exclusion zone



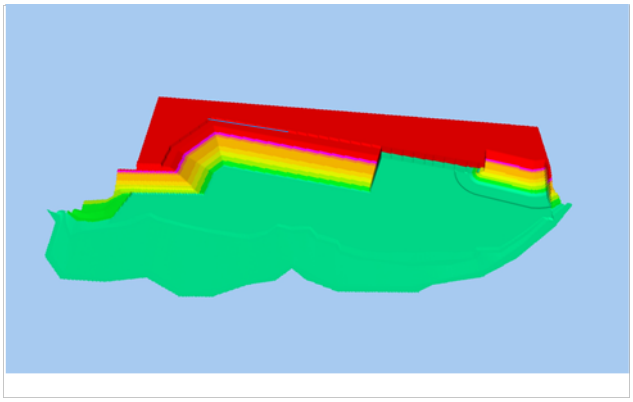
3. Dredge HS/HM, rock and over dredge



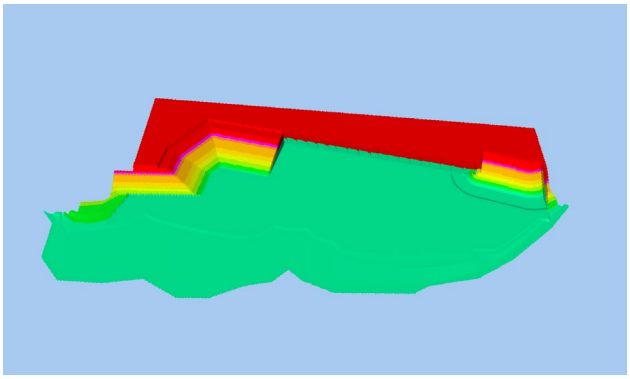
4.Dredge Unit 2/3 and rock in 20m exclusion zone



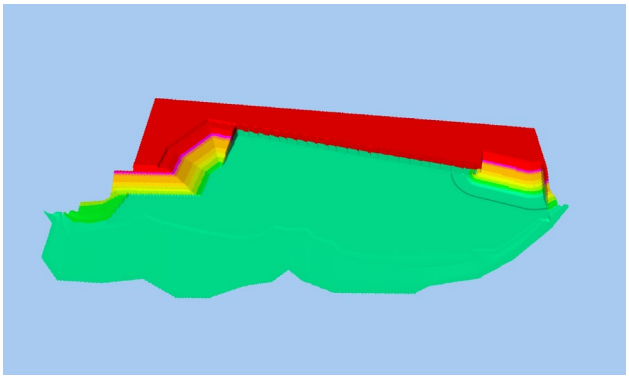
5.Dredge from Ch-50 to 50. Area for revetment south



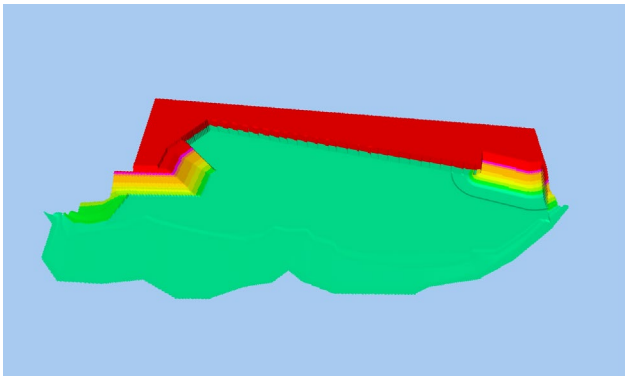
6.Dredge from CH 50 to Ch 150 all units



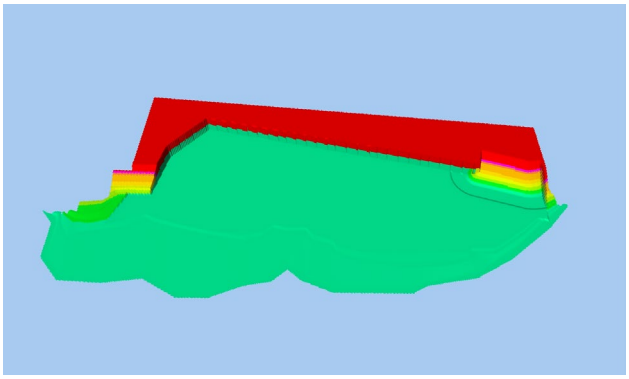
6. Dredge form Ch 150 to Ch 250 all units



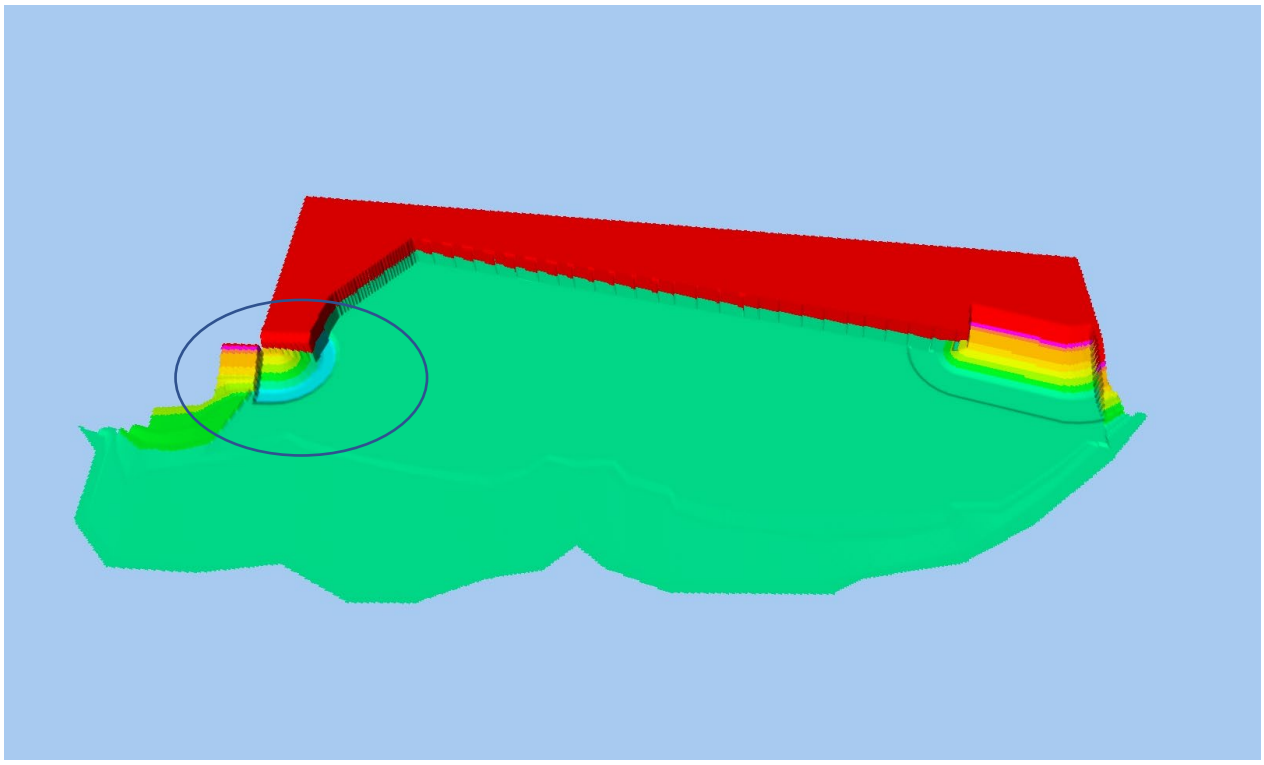
7. Dredge form Ch 250 to Ch 300 all units



8. Dredge form Ch 300 to Ch 300+50 all units



9. Dredge form Ch 300+50 to end all units



10. Dredge revetment section and place revetment

Figure 10.4 Proposed dredging sequence

10.6 Dredging adjacent to structures

The Dredging Principal Contractor will be required to dredge within 500 millimetres of the new MBD Site Compound piles and revetment during the Stage 2A and Stage 2B works. The Machiavelli BHD has a lockout system installed on the hydraulics system for dredging close to or over structures. The system is controlled by the Seatools Dipmate dredge computer and aids the operator while dredging close to structures is undertaken.

Prior to the commencement of dredging, surveyed data of the wharf, piles and capping beam will be input into the dredge computer allowing for boundaries to be placed around structures to within 0.5 metres. No part of the BHD, including the bucket, boom, and stick, is then able to enter this area as the computer overrides the hydraulic system. A full description of the system is detailed in Section 11.2.

10.7 Sweeping operations

Sweeping or blading of the dredge area may be required to remove excess material if the design level is exceeded, or areas require levelling during the final survey. This operation is carried out using a tug with a suspended “grader blade” which is lowered to a required depth and dragged along the seabed. While these operations are being conducted, continuous adjustment and survey is undertaken with the onboard survey equipment.

Sweep vessels will be fitted with a calibrated depth monitoring system and positioning system that accurately displays the position of the vessel continuously. Track plots are to be recorded and supplied to AIE if required.

10.8 Revetment installation

Rock revetments will be constructed at the MBD Site Compound and Emplacement Cell bund.

10.8.1 MBD Site Compound

Two rock revetments will be constructed using igneous rock for protection of each end of the newly constructed MBD Site Compound wharf. The southern revetment will be completed shortly after dredging has been completed in the area. The northern revetment will be completed at the end of the dredging campaign.

Revetment design includes the following works to be undertaken:

– Placement of a Texcel 1200R geotextile.
– Thick quarry run with a D_{50} of 190 millimetres.
– An underlay rock with a D_{50} of 40 millimetres, and
– an amour rock with a D_{50} of 900 millimetres.

Locations of the MBD Site Compound revetments is shown in Figure 10.5 and a typical revetment cross section is shown in Figure 10.6.

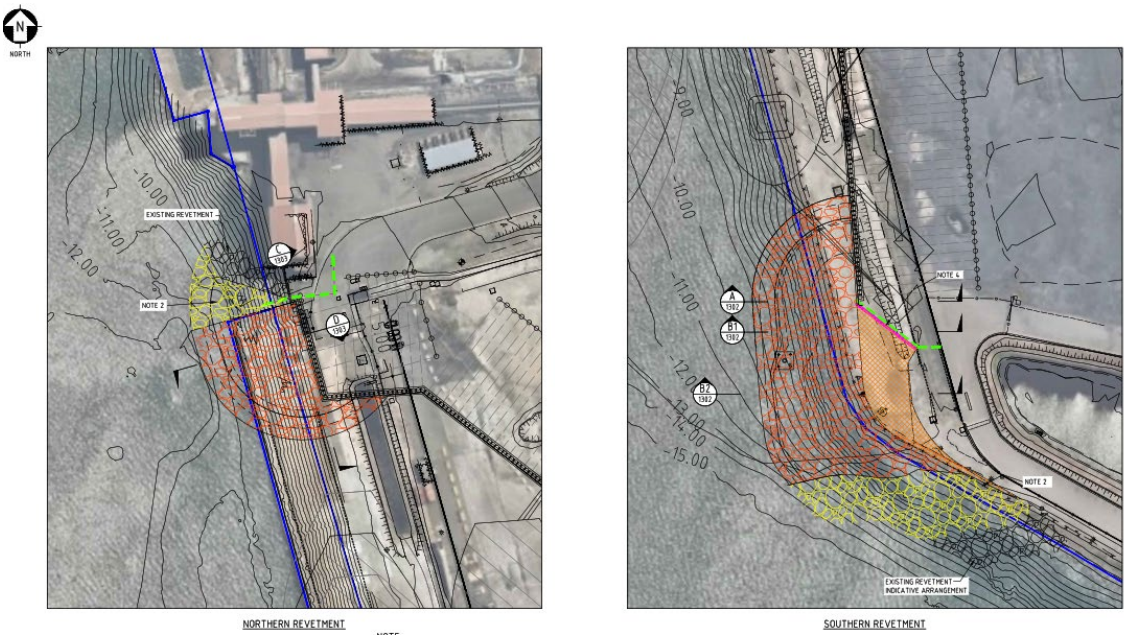


Figure 10.5 MBD Site Compound revetment locations

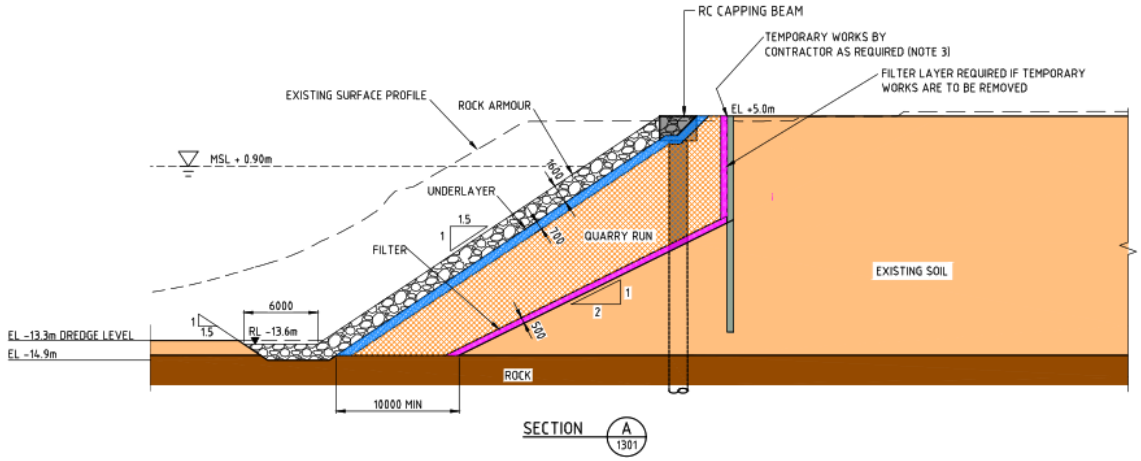


Figure 10.6 Typical revetment section

10.8.2 Emplacement Cell bund

The Emplacement Cell rock revetment will provide protection to the bund structure from coastal processes such as wind, waves, currents, and varying water levels, and loading from propellor wash. The rock revetment will comprise of:

- Placement of geotextile filter to provide separation and filtration between the Emplacement Cell bund material and rock revetment.
- A riprap 'underlayer' over the geotextile of a sufficiently small size to avoid damage to the geotextile.
- A riprap armour layer of sufficient size to ensure hydraulic stability.
- A rock toe to reinforce the slope against slumping in response to any geotechnical instability due to soft material beneath the seabed.

Four revetment sections with different riprap armour thickness and size will be constructed along the bund alignment. Armour differences are in response to the identified environmental and water considerations such as hydraulic stability under waves, propellor wash from tugs, water depth and wave presence. The revetment segments have been defined as shown in Figure 10.7.

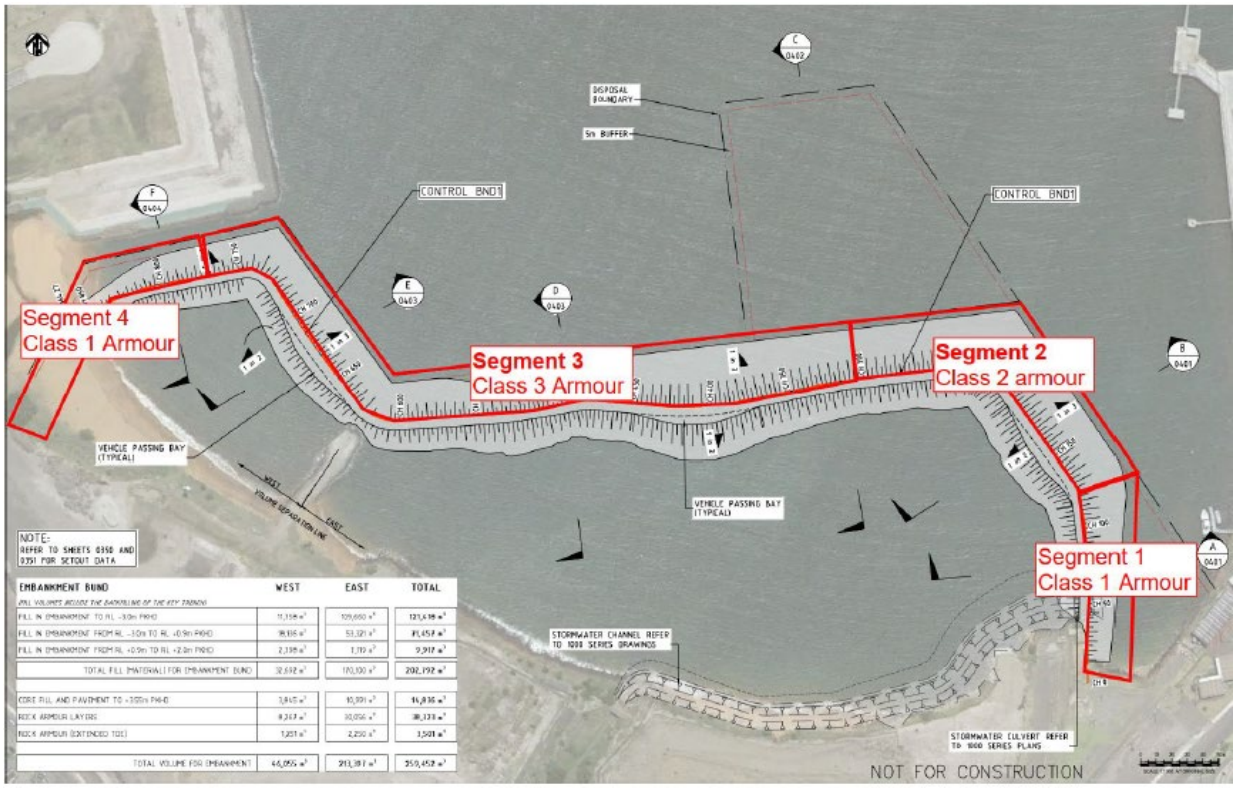


Figure 10.7 Emplacement Cell bund rock revetments

10.9 Rock stockpiles

Stockpiles of rock will be required at both the MBD Site Compound and Emplacement Cell Construction Site. Transport of revetment rock materials will be transported by barge and road trucks to the designated laydown areas. These rock materials are from the former Berth101 revetment structures or sourced externally. These materials are clean and uncontaminated materials that will be stockpiled in a designated area in the Outer Harbour laydown area to avoid cross contamination from the known existing contamination in the Outer Harbour site.

The recovered rock will not be used as armour protection for the Emplacement Cell bund above water level but will be used at the bottom of the trench for the bund. The rock will be removed using a demolition bucket which will minimise the amount of additional sediment collected with the rock. The rock will then be transported to the Emplacement Cell area and placed in the designated area below LAT in the same manner as other dredged materials. Records of revetment removal, transport and placement to the Emplacement Cell will be maintained to ensure recovered rock can be tracked for validation purposes.

10.10 Rock transport

The majority of revetment rock will be transported to the MBD Site Compound via barges. Rocks will be loaded from the Outer Harbour and then transported to the MBD Site Compound for unloading.

Rocks being delivered via the road to the MBD Site Compound will be transported to the excavator in 40 tonne ADTs, as required to reduce the area required for the revetment operations. Additional information related construction traffic is included in the Stage 2A and Stage 2B CTMP.

Where safe and practicable, a visual inspection of rocks will be undertaken to check for contaminated materials to ensure rocks transported are free from contamination.

10.11 Geotextile installation

Geotextile will be installed using a combination of the marine-based material handling barge and a land-side Longreach excavator with a rollout frame attached to their stick's arm. The excavators use the SeaTools system to accurately place the geotextile. This program allows the operator to accurately determine the position of the excavator's rollout frame, boom, and stick. The information the operator receives from the monitor is in real time so the position, angle, depth and reach of the bucket are known at any stage throughout the excavation cycle. In addition to the elevation view, a plan view of the dredge is also provided showing the actual position of the excavator in relation to the bund, and where the last piece of geotextile was placed ensuring the correct overlap is maintained.

Measured pre-cut lengths of geotextile will be placed at the top of the bund and rolled down the batter to the seabed or design level. Each section will have a minimum overlap of 1,000 millimetres and be weighted using rebar, rock, or sandbags. The leading edge will be buried in a small trench to prevent it moving, ensuring that there is no sag in the fabric. An example of a Longreach excavator placing geotextile is shown in Figure 10.8.

Figure 10.8 Longreach assisting in geotextile installation

10.12 Rock placement

Rocks will be transported to the designated work area from the stockpile sites using 40t ADTs. Smaller rocks will be tipped near the required placement area while larger rocks will be unloaded individually with a grab. All grades of rock will be placed using either a bucket or grab fitted to a GPS-controlled 50t excavator or MHB. This will allow for accurate placement to ensure that the requirements of the technical specifications are met.

A grid system will set up over the extent of the bund wall showing the operator of the excavator where rock is required and how many dumps are required to achieve the profile. This model will be updated following

hydrographic survey of the revetment. Figure 10.9 shows the grid system used to place rock. The numbers indicate the number of rocks required to fill the area.

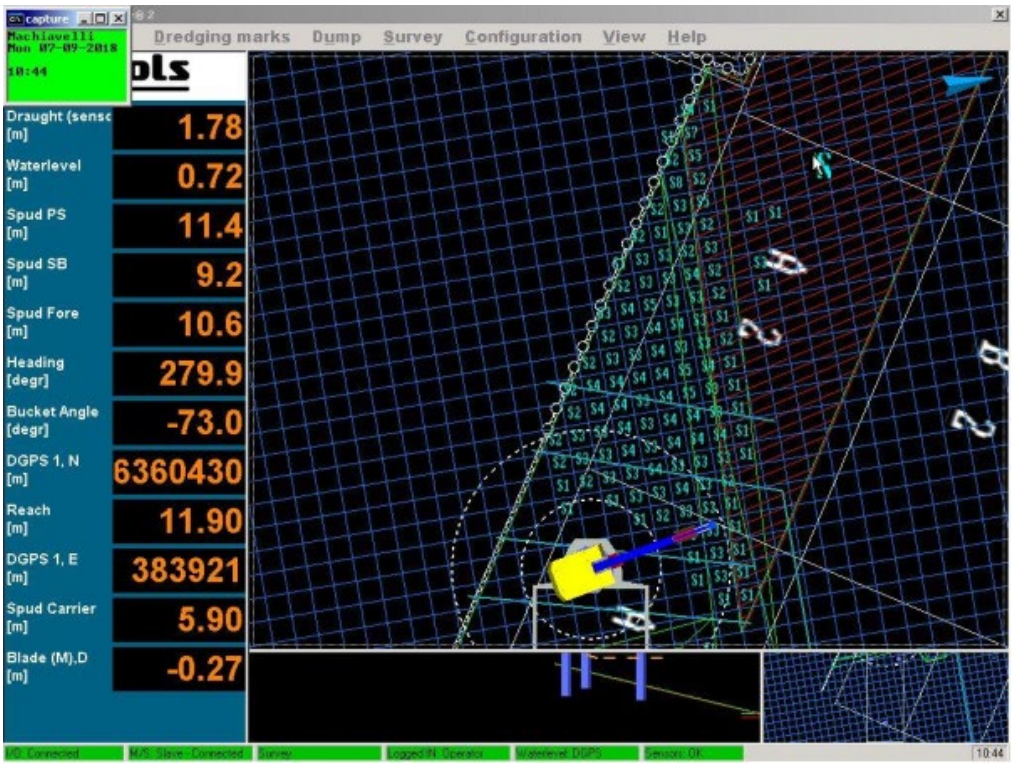


Figure 10.9 Excavator operators view of placement plan

11. Dredge positioning, control and calibration

11.1 Dredging controls

The Machiavelli uses a SeaTools electronic dredging program called DipMate. This program allows the operator to accurately determine the position of the excavator's bucket, boom, and dipper. The information the operator receives from the monitor is in real time so the position, angle, depth and reach of the bucket are known at any stage throughout the excavation cycle. In addition to the elevation view, a plan view of the dredge is also provided showing the actual position of the dredge and excavator in relation to the Project coordinate system (refer Figure 11.1).

The dredging monitor receives data from rotation sensors mounted on the excavator's attachments and from real-time kinematic (RTK) Global Navigation Satellite System (GNSS) receivers mounted on-board the vessel. Both the rotation sensors and the GNSS receivers supply data to the electronic monitor meaning that any time the x, y, z position of the bucket is known.

A feature of the SeaTools system is the ability to data log or "map" the movement of the bucket in x,y,z positions. This information can be downloaded from the dredging computer via a simple ASCII format file. The data can be used to create long sections and cross sections to prove that the bucket has achieved the design dredge profile.

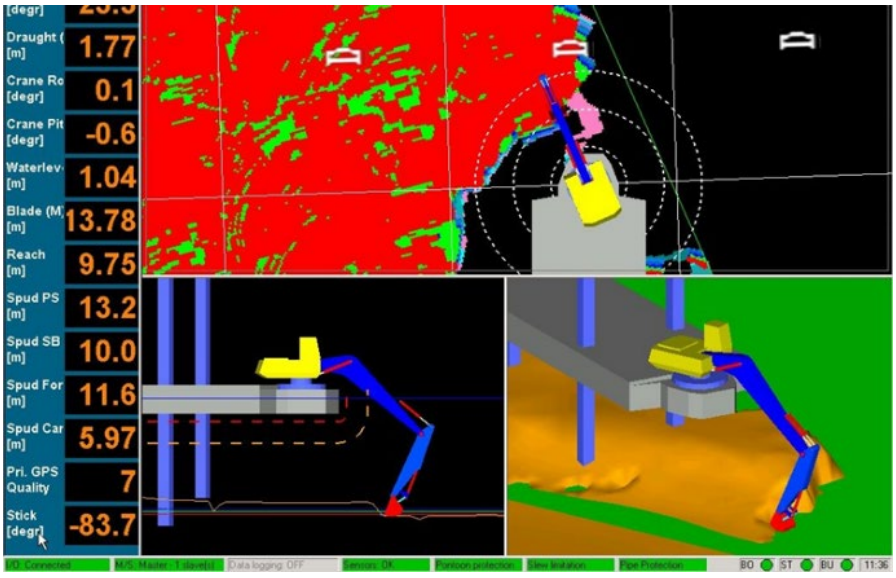


Figure 11.1 Dredge operators screen

11.2 Excavator automation

Excavators are powerful machines, which can damage objects very quickly. A number of protection aids are installed to prevent damaging the excavator, the pontoon, and structures such as pipelines and wharfs. The functionalities will monitor the movement of the excavator and will intervene when required by reducing or even disabling the output to the control valves in order to slow down or stop the hazardous movements.

The pipe protection function is intended to prevent the operator damaging pre-defined structures. When a part of the crane (i.e., boom, stick or bucket) comes too close to one of these structures, the protection will intervene by slowing down and/or stopping the movement of the excavator.

Using the SeaTools software, structures can be defined using the same coordinate system used by the DGPS devices. When the objects are added to the software, the system can calculate the distance between each excavator part and the structure. When the distance to the nearest object becomes lower than the outer/warning limit (orange), the output to the control valves is proportionally reduced to slowdown the movement of the excavator. When distance becomes smaller than the inner/safety limit, the pipe protection will disable all output to the control valves, disabling any movement by the excavator. This system can be used for the controlling the spud

system as well. If the operator lowers the spud onto a predefined object or pipeline, the protection will intervene by slowing down and/or stopping the movement of the spud.

In Figure 11.2 an example of a screen lockout is shown. The excavator bucket has become closer to the wharf than the inner/safety limit, which has alarmed the pipe protection turning the status red, and automatically disabling any movement by the excavator.

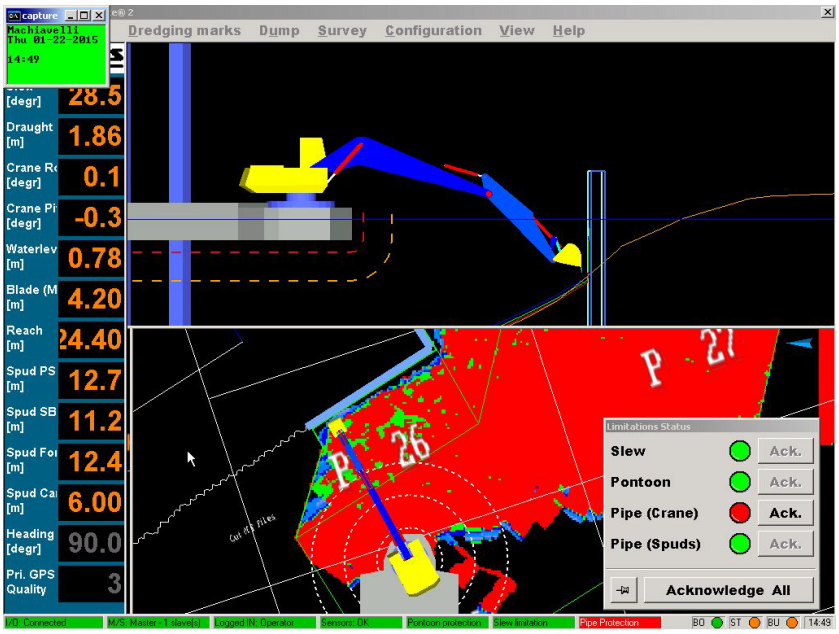


Figure 11.2 Operator screen showing lockouts

11.3 Dredge profile model

The dredge profile model combines the dredge design and the pre-dredge survey to create a comparison between what exists and what is required (refer to Figure 11.3). Dredge profiles are designed using a computer aided design (CAD) package, then imported into SeaTools as a DXF file. Due to the ability to utilise CAD, these profiles can be made to be as complex as the design surface requires.

Once the profile is imported into DipMate, the dredging margins are assigned. These margins are set to suit the soil conditions and accuracy requirements specific to the dredge areas. The over-dredge limit will be set as the lower margin. The operator then targets the gap between the design depth and the lower margin.

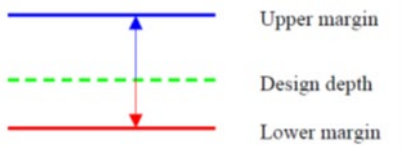


Figure 11.3 Model margins

The model is used throughout the dredging activity by both the surveying equipment and the Machiavelli BHD. The Machiavelli BHD can use the model in two distinct ways:

– The model can be used by the operator as a guide with the BHD tracking excavation against the design. In this setting, the operator has total control of the dredge, and
– Alternatively, the model can be used to limit the movement of the excavator. The operator has free reign within set boundaries however, the excavator will not let the bucket go beyond.

11.4 Calibration

11.4.1 Error budget

The error budget for the dredge is calculated as 100 millimetres (horizontal) and 100 millimetres (vertical).

In the event that the precision of the dredging system falls outside acceptable limits, the system will alarm, and the operator ceases dredging until the problem is remedied.

11.4.2 Redundancy

- **Dredging Software:** Software breakdowns/glitches are generally remedied by the Dredging Principal Contractor Surveyor who has remote access to the dredging computer. For anything outside of the Dredging Principal Contractor Surveyor capabilities, SeaTools also have remote access to the dredging computers.
- **Dredging Hardware:** The Machiavelli carries a set of spare sensors on board, as well as a spare dredging computer, and an array of spare components for the Dipmate2 system.
- **Horizontal & Vertical Positioning:** The Machiavelli carries a spare GPS antenna, and GPS Radio Antenna on board. If required an alternate Trimble SPS855 GNSS RTK Receiver, with SPS555H Heading Receiver can either be sourced from the Trimble agent in Melbourne or removed from one of the SHBs.

11.5 Calibration, audits and checks

When the plant arrives on site a full calibration of the dredging controls is conducted using the techniques described below and is logged using the applicable Dredging Principal Contractor BHD calibration form. Audits on the calibration will be conducted weekly for the duration of the Stage 2A and Stage 2B and logged.

Daily visual checks will also be conducted. This will involve putting the bucket onto the water and comparing it with the Dipmate display (refer to Figure 11.4).

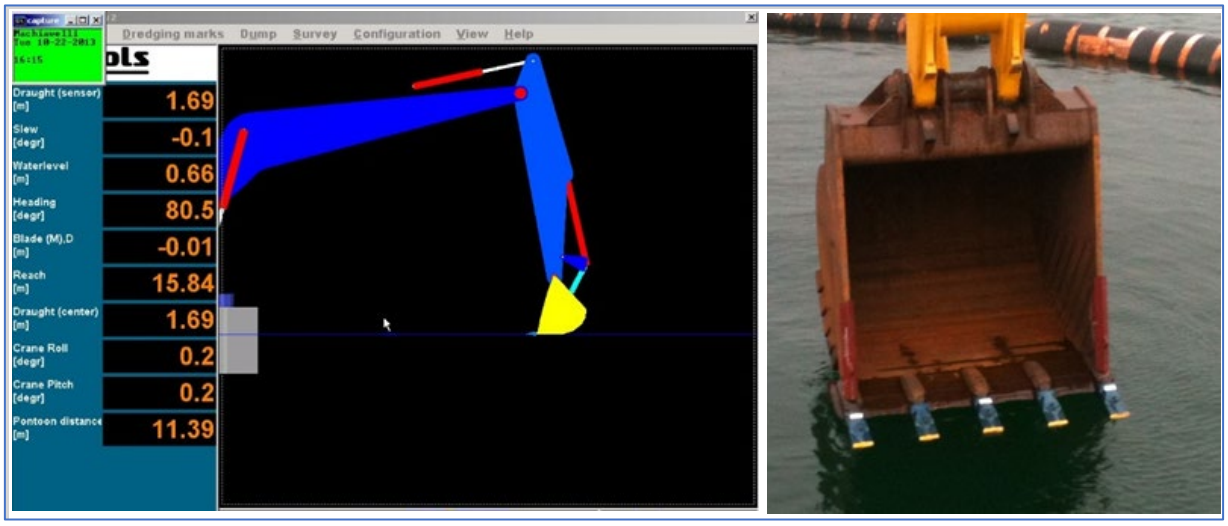


Figure 11.4 Bucket calibration (visual)

11.6 SHB dumping

Discharging in the Emplacement Cell will primarily be undertaken with the SHBs remaining hipped up. The tug, prior to discharging the SHB, will reduce speed, maintain Cetacean spotting, and place the load of dredged material in the required cell. The Tug Master will generally hold the SHB into the weather and, once positioned correctly, discharge the load. SHB positional accuracy of +/- 2 metres is achievable.

If material remains in the SHB after it has been discharged, the SHB will be closed prior to leaving the Emplacement Cell and returned to the MBD Site Compound dredge site. Depending on the size of the remaining material build-up, the excavator may be used to dislodge it within the SHB, or the SHB simply reloaded, and the additional material used to drag the build-up out during the next discharge.

All SHBs will be fitted with low pressure flashing strobe lights to alert dredge operators if the SHB is not properly closed.

11.7 SHB tracking

The BHD, SHBs and tugs continuously record position in an x, y, z format. Tug and SHB activities are monitored, and track plots are recorded during their transition to and from the Emplacement Cell.

Real time telemetry logging of the SHBs shows location and time of movements, which is backed up to the cloud. Additionally, SHBs are fitted with DGPS and data logger systems. This provides track plots for the SHBs and records the position, elevation, and time that the SHB opened and closed. Tugs and the BHD are equipped with an automatic identification system (AIS).

Print screens of the SHB opening and placing its load are recorded prior to opening, and once they have been closed, they also show the position of all previous placed loads. Figure 11.5 below provides an overview of the information provided on each print screen.

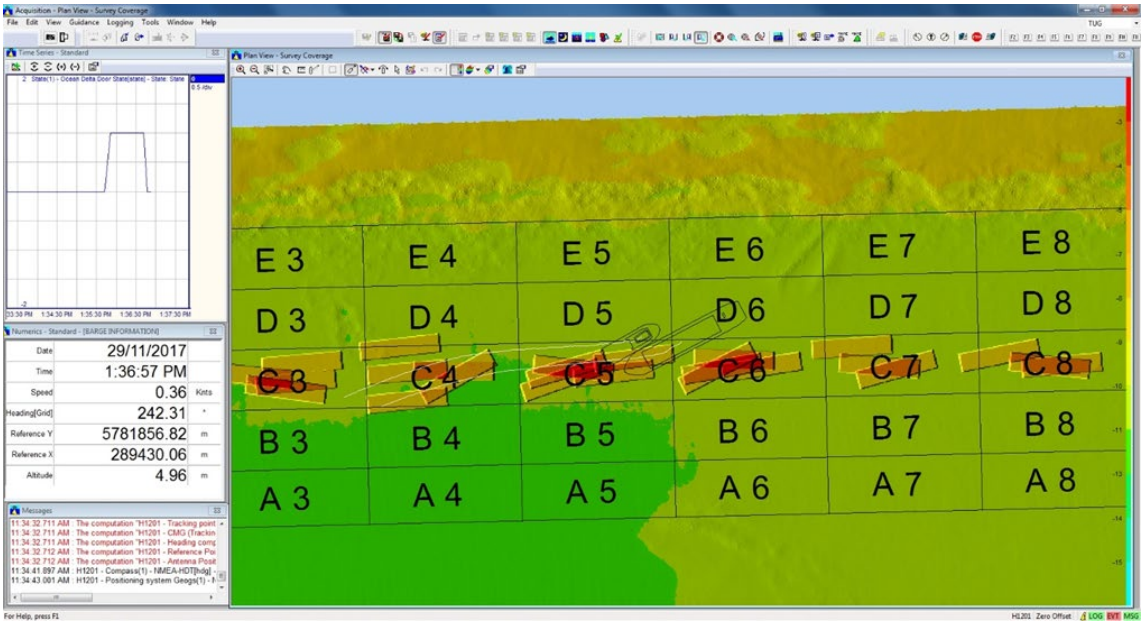


Figure 11.5 SHB opening and placing print screen

SHB track plots are produced in different colour tracks to show their exact movements as they transit between the dredge area and disposal area as indicated in Figure 11.6.

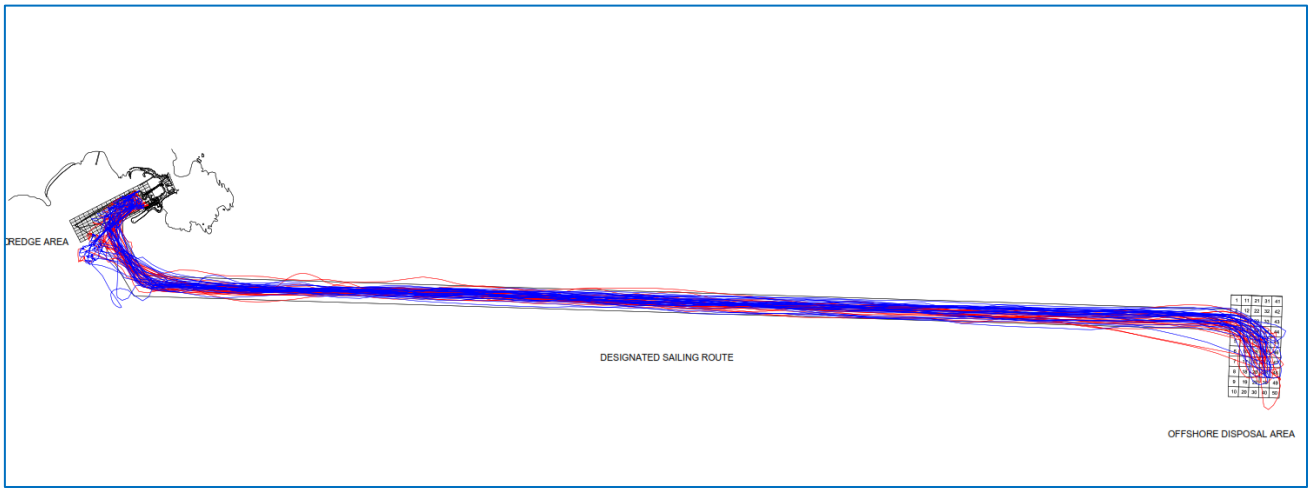


Figure 11.6 SHB track plots

When the SHB is open it also produces a track that show where it has been while open as shown in Figure 11.7.

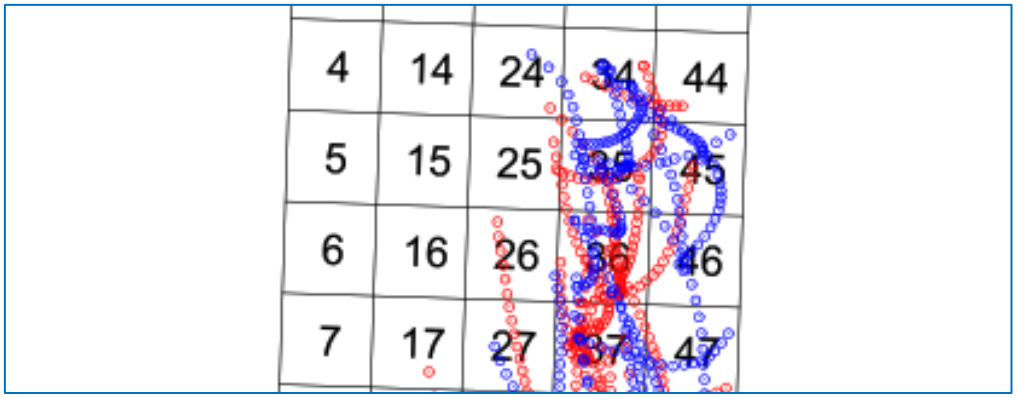


Figure 11.7 SHB open tracks

12. Surveys

Survey forms a critical component of the Stage 2A and Stage 2B dredging works. A Survey Project Management Plan will be developed by the Dredging Principal Contractor to inform specific technical information required when undertaking the various surveys discussed below.

All surveys will be carried out using a high resolution Multi Beam Echo Sounder system capable of achieving the required accuracy, precision, bottom coverage, and object detection as required by the specifications. Detailed information regarding equipment specifications, calibrations and Quality Assurance (QA) are included in the Principal Contractor's Survey Project Management Plan.

12.1 Pre-dredge survey

The pre-dredge survey will be undertaken using the survey vessel, Kaiwea (refer to Appendix A) by the Dredging Principal Contractor team. Valid calibration procedures are conducted prior to commencing pre-dredge surveys, as detailed in the Survey Project Management Plan.

The pre-dredge survey will establish the existing surface layers and be used to calculate volumes of material removed from the dredge area and unloaded into the Emplacement Cell.

Once verified, the pre-dredge surface layer will be input into all project dredge computers and used for navigation and excavation purposes.

12.2 Interim survey

Regular surveys will be conducted by the Dredging Principal Contractor team to monitor progress by comparing current profile to the original benchmark survey. Interim surveys also form the basis for scheduling and payment.

This survey will have full bottom coverage and survey plans in both PDF and 3D DWG formats will be prepared and submitted to the AIE Project team in electronic copy form. The Dredging Principal Contractor will allow for a period of 24 hours for the AIE Project team to review and approve the design.

Interim surveys will extend to the sailing route from the MBD Site Compound dredge area to the Emplacement Cell which will be subjected to the same survey requirements as the dredging areas.

12.3 Clearance survey

On completion of all dredging works a clearance survey will be undertaken of the dredge area by the Dredging Principal Contractor team.

13. Environmental management

This section outlines the specific environmental management strategies to address potential risks that may arise during the Stage 2A and Stage 2B dredging and excavation works.

13.1 Port operations

13.1.1 Interface management

AIE and the Dredging Principal Contractor recognise that the Stage 2A and Stage 2B works have the potential to disrupt port operations and other port users if not carried out in a planned and controlled manner. The following initiatives will be undertaken to ensure the construction works will not significantly impact on port operations:

- Pre-planning and coordination of operations during project initiation phase, e.g., Survey of the site, meetings with stakeholders, acceptance of the management plans approved by DP&E, NSW EPA and PANSW.
- Remaining flexible and able to modify access arrangements, work methods, and/or reschedule works as required, so as not impede the port operations.
- Communication and management of Simultaneous Operations throughout the Stage 2A and Stage 2B delivery e.g., regular meetings.
- Dredging activities are always to remain within the construction area.
- Marine-based activities to be approved and coordinated with the Harbour Master.
- Daily coordination meetings will be held with the AIE HSE Manager and/or Project Manager.
- Where required, Simultaneous Operations meetings will be conducted on a regular basis to provide visibility into work being performed and provide an opportunity for discussion among all stakeholders
- All marine activities will be coordinated through the PANSW VTS, and Project vessels are to be conscious of not interfering with the commercial traffic in the port.
- All marine activities will be carried out in accordance with the approved CTMP and Notice to Mariners and are to be adequately planned and performed safely while the port is operational.

To ensure interface management it is important to effectively manage the timely flow of accurate information across identified interfaces. This requires ensuring that all interface information is properly requested/received and promptly distributed to ensure complete coverage of all interfaces, and that the works of both Contractors involved for Stage 2A and Stage 2B works will be executed in the safest, most efficient, and convenient manner.

13.1.2 Vessel movements

All procedures for vessel movements undertaking dredging activities carried out by the Dredging Principal Contractor will be managed in accordance with the Stage 2A and Stage 2B CTMP.

13.2 Underwater obstructions

AIE have identified that underwater obstructions and debris may be encountered during the dredging of the toe trench in the Outer Harbour of a previously demolished wharf. If an obstruction is identified, the AIE Construction Manager and HSE Manager will be immediately notified and the UFP included in the Stage 2A and Stage 2B CSP will be followed. The GPS location of the obstruction and photographs of the obstruction, if possible, will be provided. Records will also detail the date of removal and approximate location where the item was encountered.

Recovery of all debris and obstructions shall be in accordance with the PANSW guidelines and/ or the applicable Statutory requirements. Solid objects, debris and obstructions encountered during dredging may not be disposed of back into the dredge area or any other navigable water, including waters outside of the declared shipping channels.

All obstructions and debris encountered by the dredge are to be placed in designated bins onboard for disposal or recycling. All materials recovered must be disposed of in accordance with the Stage 2A and Stage 2B SMP.

13.3 Water quality

Dredging activities have the potential to impact on water quality of the Port Kembla harbour during the Stage 2A and Stage 2B works. Additional information on impacts and mitigation measures related to water quality monitoring is included in the Stage 2A and Stage 2B WQMP.

13.4 Fauna interactions

There is potential for marine fauna species (e.g., whales, dolphins, seals, etc.) to be present with the harbour waters during dredging activities being undertaken. Vessel movements have the potential to impact on marine fauna present through collision, accidental release of waste/chemicals and artificial noise emissions. Additional information on impacts and mitigation measures related to marine fauna is included in the Stage 2A and Stage 2B FFMP.

13.5 Spoil and waste

As per EPL No. 21529 Condition O5.11, excavated materials and dredged spoil must not be stockpiled in the Emplacement Cell Construction Site except for re-use within the Emplacement Cell.

Mitigation measures to be implemented to manage waste materials generated during dredging activities include the following:

– Hazardous/chemical waste:
  - No waste materials will be disposed of overboard of vessels, all non-biodegradable and hazardous wastes will be collected, stored, processed and disposed of in accordance with the vessel's Garbage Management Plan (as required under Regulation 9 of MARPOL Annex V).
  - Hazardous wastes will be separated, labelled and retained in storage onboard within secondary containment (e.g. bin located in a bund). Solid non-biodegradable and hazardous wastes will be collected and disposed of onshore at a suitable waste facility.
  - Vessel operators will have an up to date SOPEP and SMPEP. All shipboard chemical and hydrocarbon spills will be managed in accordance with these plans by trains and competent crew.
  - Any contaminated material collected will be contained for appropriate onshore disposal. Any equipment or machinery with the potential to leak oil will be enclosed in continuous bunding or will have drip trays in place where appropriate
  - Chemicals and hydrocarbons will be packaged, marked, labelled and stowed in accordance with MARPOL Annex I, II and III regulations. These include provisions for all chemicals (environmentally hazardous) and hydrocarbons to be stored in closed, secure and appropriately bunded areas.
  - All liquid waste to be stored for discharge to an appropriate onshore facility.
  - A Materials Safety Data Sheet (MSDS) will be available for chemicals and hydrocarbons in locations nearby to where the chemicals / wastes are stored.
– General/all other wastes:
  - Appropriate waste containment facilities will be included on site and on board vessels and managed to avoid overflow or accidental release to the environment. All recyclable and general wastes to be collected in labelled, covered bins (and compacted where possible) for appropriate disposal at a regulated waste facility.
  - Following rainfall events, bunded areas on open decks of the vessels or within any construction laydown areas will be cleared of rainwater. All hoses for pumping and transfers will be maintained and checked as per the PMS.
  - All marine vessels will be operated and maintained in accordance with the South Australian Government's Code of practice for vessel and facility management (marine and inland waters) 2008.

Vessels used during dreding operations have the potential to spill fuel/oil and impact the natural environment. The following mitigation measures will be implemented to prevent fuel/oil spill impacts occuring:

– Vessels transporting materials to the Emplacement Cell will be inspected regularly to ensure that no dredged spoil materials leak or are released into water during construction activities.

– Visual observations will be maintained by watch keepers on all vessels and plant/moving machinery.
– All vessels must comply with relevant marine navigation and safety standards (refer to Section 4).
– Marine diesel oil compliant with MARPOL Annex VI Regulation 14.2 (i.e. sulphur content of less than 3.50% m/m) is the only diesel engine fuel to be used by the vessels.
– Oil spill responses will be executed in accordance with the vessel's SOPEP, as required under MARPOL.
– Emergency spill response procedures would be developed and implemented when required (refer to Stage 2A and Stage 2B Emergency Spill Plan).

Additional information on impacts and mitigation measures related to spoil management is included in the Stage 2A and Stage 2B SMP.

14. Risk management and emergency response

14.1 Risk management

Hazard identification, risk assessment, requirements and controls will be managed in accordance with the Dredging Principal Contractor Workplace Health and Safety Management Plan.

Prior to the commencement of dredging works, a risk workshop will be completed in conjunction with this DEMP, and all relevant parties identified in Table 3.1. This will include, but is not limited to:

– Dredging Principal Contractor team
– AIE HSE Manager
– AIE Environmental Representative
– All construction personnel and subcontractors undertaking dredging work.

Following the risk workshop**,** Safe Work Method Statements (SWMS) will be developed in consultation with the relevant parties to cover specific risks and controls.

Table 14.1 outlines the SWMS that may be required for the Stage 2A and Stage 2B dredging works. The Dredging Principal Contractor is the responsible party for SWMS development and implementation for the Stage 2A and Stage 2B dredging works.

Table 14.1 Safe work method statement

SWMS Title	Activity description
001	Dredging Operations
002	Towing non-propelled barges
003	Confined Space
004	Deck crane operations
005	Working at heights
006	Transfer of personnel
007	Maintenance
008	Hot works
009	Working at heights on boom
010	Hydrographic surveying
011	Bunkering & Transfer of Liquid
012	Changing out Hydraulic Cylinder
013	Use of Liquid Nitrogen
014	Changing out Hydraulic Cylinder on HB
017	Refuelling HB 1201 & 1202
018	Sweep Bar and General Vessel Operations

All personnel will be required to complete the site induction prior to the commencement of works. Operator competency will be recorded, and plant inspections will be undertaken prior to any activity commencing. Daily start up meetings will be conducted and documented by supervisors to ensure all safety measures are in place for the day's activities. Additional information related to international communications and inspections is outlined in Section 15.1 and Section 16.1.

14.2 Standard operating procedures

The Workplace Health and Safety Management Plan will outline the procedures, processes and tools required to effectively manage health and safety matters related to the dredging works.

During the risk workshop these controls will be assessed and, where applicable, additional risk controls will be implemented to reduce the risk in so far as reasonably practicable. The additional risk controls will be documented in the Workplace Health and Safety Management Plan .

Table 14.2 details the SOP for the Stage 2A and Stage 2B activities, specifically relating to the dredging works.

Table 14.2 Safe operating procedures

Activity	Specific Activity	System Controls
Machiavelli operations	General Operations	SOP-HSE-001
	Anchoring	SOP-HSE-002
	Generators	SOP-HSE-003
	Bunkering & Refuelling	SOP-HSE-004
	Bilge Pumping	SOP-HSE-005
	Fire Response	SOP-HSE-006
	Isolation	SOP-HSE-007
	MOB	SOP-HSE-008
	Abandon Ship	SOP-HSE-009
	Changing Bucket Teeth	SOP-HSE-010
	Environmental Spill Response	SOP-HSE-011
	Emergency Fire Pump	SOP-HSE-012
	Emergency Response	SOP-HSE-013
	Taking Slack out of Spud Wires	SOP-HSE-014
	Hydraulic System	SOP-HSE-015
	Split Hopper Operations	SOP-HSE-016
	Transfer of Personnel	SOP-HSE-017
	Configuration Change	SOP-HSE-018
	Bucket Change	SOP-HSE-020
	Mooring Vessels	SOP-HSE-021
Tug operations	Transfer of Personnel	SOP-HSE-017
	Mooring Vessels	SOP-HSE-021
	Split Hopper Operations	SOP-HSE-016

14.3 Emergency response

The Dredging Principal Contractor has developed an Emergency Response Plan for the Stage 2A and Stage 2B works related to dredging activities. Specific rescue and retrieval plans will be developed and implemented into the Emergency Response Plan .

Crews of all vessels will participate in regular drills for all emergency scenarios. Applicable vessels will have an approved SOPEP developed and implemented. The following sections outline the various drills and emergency responses construction personnel will participate in and will be included in the Emergency Response Plan .

14.3.1 Vessel emergency response

Applicable vessels have an on-board detailed safety plan as per survey requirements. The plan indicates the positions, quantities and types of safety and emergency response equipment located on-board the vessel. This safety plan is displayed in dedicated positions on-board that is accessible to all crew and visitors.

All lifesaving, firefighting and other emergency equipment will be supplied and in accordance with the vessels survey requirements. All equipment required will be maintained and inspected in accordance with applicable international standards, requirements of survey authorities and State legislative regulations. All personnel that have been through the induction process will be supplied with the applicable instructions and make themselves fully conversant with these instructions.

Drills will be conducted in accordance with each vessels SMS manual.

In the event of an emergency on any vessel, the most senior person on board is responsible for implementing emergency procedures. The most senior person on the tug is the Vessel Master and on the Machiavelli BHD is the Dredge Superintendent /Supervisor.

14.3.2 Emergency drills

The following drills will be undertaken during the Stage 2A and Stage 2B dredging activities:

– Person overboard drill.
– Medical emergency drill.
– Marine pollution drill.
– Collision drill.
– Abandon ship drill.

Emergency drills will be undertaken during the first week of the dredging activities and then ongoing as per the drill schedule. Drill information will be recorded on the Dredging Principal Contractor Emergency Drill Record Form to capture information related to drills such as timing and any actions requiring to be undertaken following the drill. Additional information on emergency drills is included in the POMP.

14.3.3 Diving

Diving activity may be required to be carried out during the Stage 2A and Stage 2B works, to carry out vessel repairs and cleaning, pile removal, cleaning of the quay wall, rock placement and as required during construction activities. A risk assessment will be undertaken and the Dredging Principal Contractor and AIE HSE Manager will ensure all applicable statutory requirements and approvals are strictly applied to and finalised prior to the diving activity being undertaken. Any diving required will be undertaken in accordance with the AS/NZS 2299.1 -2007 Occupational Diving Operations Part 1: Standard Operational Practice.

No diving activities will be undertaken in shipping areas without the prior approval from the Harbour Master and PANSW. The Port Kembla Authority to Dive Form will be submitted to the PANSW. Prior to the commencement of diving work a Dive Safety Plan will be prepared and submitted to the AIE HSE Manager and other applicable agencies.

15. Communication and complaints

Effective communication between the Project Director, Project team, contractors and external stakeholders will be undertaken throughout the Project to ensure effective implementation of this DEMP and associated Sub - plans.

Project communication can be categorised into internal and external communications, as well as communications specifically dealing with complaints. The specific communication methods for each category are discussed below.

15.1 Internal communications

Communication on environmental issues within the Project team will be maintained, as a minimum, through the following forums (organiser as noted):

– Weekly project construction team meetings (AIE Construction Manager or delegate).
– Periodic Environmental management team meetings with relevant contractors (AIE HSE Manager or Delegate).
– Toolbox talks and daily pre-start briefings (Principal Contractor Project Manager or delegate).
– Minutes of formal meetings will be taken and distributed to record issues raised and actions required, with action status established at subsequent meetings.
– Monthly review of the internal AIE Environmental Compliance Tracking register (AIE HSE Manager or delegate).

All internal meetings include appropriate documentation in the form of agenda and formal distribution via the Project's document system.

In addition to the above, the AIE Environment Team will also undertake informal planning sessions and resource review meetings to plan and forecast for upcoming key construction dates, critical issues and other relevant matters associated with environmental planning and approvals.

15.2 External communications

AIE is committed to keeping the local community and relevant agencies informed about the development of the Project. The principal external communication objectives are, therefore, to:

– Continue to maintain open communication with relevant stakeholders.
– Minimise environmental impacts.
– Be proactive in addressing any concerns that the community / external stakeholder may express.

AIE will build upon the stakeholder and community engagement phase undertaken during project development including multiple group or one on one briefings. A Project website (www.ausindenergy.com) has been developed and provides comprehensive, clear, and accessible information that is updated on a regular basis.

As well as the local Port Kembla and broader community of the Wollongong region, extensive engagement was also undertaken with a range of other interested key stakeholders, such as local commerce organisations, the PANSW and local and state government.

Consultation with key stakeholders and the wider community on the Project will continue throughout Stage 2A and Stage 2B and subsequent construction phases. These measures will ensure the stakeholders, including the wider community, remain informed of the Project's progress.

Key methods of engagement are provided in the Stage 2A and Stage 2B EMS.

15.3 Complaints management

All complaints where a third party has identified a construction activity as being unsatisfactory or unacceptable will be dealt with promptly and efficiently in accordance with the complaint and dispute response outlined in the Project's Stage 2A and Stage 2B EMS.

AIE will operate a free 24-hour Community Information Line (1800 789 177) where members of the community can leave details about an inquiry they may have regarding construction activities and this message will be passed on to site personnel and/or the Stakeholder Engagement Team, as appropriate. The phone number is listed on the AIE website (**https://ausindenergy.com/contact-us/**) and will be provided on all community newsletters. The AIE HSE Manager has notified the Port Kembla Harbour Environment Group of the Community Information Line.

Initial responses to complaints will be provided within 24 hours of the complaint being received. As part of the response, a review of the activity will be undertaken. If required and possible, immediate changes will be made to reduce any impact on the community. In some cases, the issues cannot be resolved immediately, and ongoing actions might be required to resolve the issue.

All complaints will be recorded in a Complaints and Disputes Register. The following information will be recorded for each complaint:

1. The date and time of the complaint.
2. The method by which the complaint was made.
3. Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect.
4. The nature of the complaint.
5. The action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant.
6. If no action was taken by the licensee, the reasons why no action was taken.

The Complaints and Disputes Register will be maintained by the Project's HSE Manager or delegate, and will detail what the issue was, initial response provided, how and when the issue was resolved, and by whom. Records will be kept for at least four years after the complaint was made and will be produced on request by any authorised officer of the EPA.

Where resolving a complaint with a third party is protracted or develops into a dispute, the AIE HSE Manager shall escalate proactively to Senior Project Leadership (e.g., AIE Project Manager and/or Project Director) to assist with resolution. AIE will work proactively with the complainant to resolve the dispute including having face to face meetings, site familiarisation sessions and agreeing on actions to resolve the dispute. All communications and agreed actions shall be documented.

For the management and reporting of corrective actions (which may be required in response to a complaint), refer to the Project's Stage 2A and Stage 2B EMS.

16. Inspections, monitoring and audits

Monitoring and auditing will be undertaken to determine the impact on the environment and identify opportunities for improvement. Monitoring to be implemented for specific actions or environmental issues (e.g., water quality monitoring, air quality monitoring) will be detailed in their relevant Sub - plan and will specifically address the monitoring requirements for those issues.

16.1 Environmental inspections

16.1.1 AIE and Principal Contractor joint environmental inspection

As a minimum, the AIE HSE Manager (or nominated delegate) will undertake periodic inspection of the work sites with the relevant Principal Contractor's environmental personnel (Environmental Representative or similar) to evaluate the effectiveness of environmental controls (inclusive of erosion and sediment control measures) and general compliance with the implementation of the EMS (and associated Sub - plans) for site-based activities.

If any maintenance and / or deficiencies in environmental controls or in the standard of environmental performance are observed, they will be recorded on the checklist form. Records will also include details of any maintenance required, the nature of the deficiency, any actions required and an implementation priority.

Actions raised during inspections will be documented on the *Environmental Site Checklist* and will be issued formally through the Project's document management system to the relevant Contractor for action. If they represent an actual or potential significant environmental risk, these issues shall be reviewed at the Project Planning meetings and will have non - compliances raised if not closed out in the nominated timeframe (Non-compliance Report).

16.1.2 Contractor environmental inspections

In addition to the joint periodic environmental site inspection with AIE, the Principal Contractors will be required to undertake daily site environmental inspections, targeting key environmental risks commensurate with the activity being undertaken. The daily environmental site inspection will be documented on a checklist or similar to be prepared and completed by the Principal Contractors.

Copies of the environmental site inspection records are to be provided to AIE on request.

The HSE Manager is responsible for the initial reporting of significant non-compliances with the DEMP or relevant legislation to the AIE Project Director and government authorities (refer to Section 17).

16.1.3 EPL inspection requirements

In accordance with Condition O4.4 of the EPL No 21529, the Contractors will undertake wet-weather inspections daily during periods of rainfall and within 24 hours of cessation of a rainfall event causing runoff to occur on or from the premises (based on site observation, this equates to 20 millimetres of rainfall in a 24-hour period).

Daily inspections of water pollution controls will be undertaken in accordance with Condition M.10.1 of the EPL No 21529 and recorded. Records will include the date and time of inspection, location of dredging operations and conditions of silt curtains and other water pollution controls. Records will be produced to an EPA authorised officer on request.

The Principal Contractors must record all such inspections including observations and works undertaken to repair and / or maintain erosion and sediment controls.

16.2 Monitoring

Monitoring will be undertaken to validate the impacts predicted for the work, to measure the effectiveness of management plans, environmental controls, and implementation of this DEMP, and to address approval requirements.

Monitoring requirements applicable to the DEMP include:

– Odour and air quality during handling of sediments and stored materials.
– Condition of silt curtains and water pollution controls.

16.3 Auditing

AIE will conduct internal audits at frequencies as determined in the risk-based auditing schedule. The purpose of auditing is to verify compliance with:

– This DEMP.
– Compliance with the requirements of relevant components to this DEMP, including but not limited to, site inspection compliance, document control / management, non-compliance, and incident management etc.
– Monitoring and reporting requirements as set out under EPL No. 21529.

The undertaking of the internal audits will be in accordance with the Project's risk-based internal audit schedule, developed to assess the risk associated with various audit elements with an assigned auditing frequency based on perceived risk.

A brief audit report / table will be prepared for each internal audit, documenting the audit outcome and compliance status against each of the key elements of the audit. The purpose of the internal audits is to assist in the identification of non-conformances and environmental management gaps, with an overall objective of identifying improvement opportunities and driving a process of continual improvement. Any observed non-conformances and improvement opportunities will be managed in accordance with Section 16.6.

On completion of the Stage 2A and Stage 2B dredging, excavation and disposal works, AIE will advise the site auditor, Melissa Porter of Senversa, and a Section A Site Audit Statement will be issued confirming the suitability of the site for its intended use.

16.4 Environmental reporting

16.4.1 DP&E reporting

Regular reports on compliance and other matters will be provided during the construction phase of the Project. This will include reporting to DP&E in accordance with Schedule 4, Conditions 7 and 8 of the Infrastructure Approval (SSI 9471), with specific reference to the *Compliance Reporting Post Approval Requirements* (2020).

In addition, DP&E will be notified in writing of the date of commencement of each of the relevant phases of the Project in accordance with Schedule 2, Condition 8 of the Infrastructure Approval (SSI 9471).

Reporting applicable to this DEMP will consist of:

– Water and air quality monitoring results.
– Requirements of EPL No. 21529.
– Construction works progress and appraisal of water, air, and spoil management quality controls.
– Environmental Incident Report(s), as required.
– Annual returns, as required by EPL No. 21529.

16.4.2 Other reporting requirements

A monthly environmental monitoring report will be developed for each calendar month which will include details of the monitoring results and frequencies and inclusion of any exceedance of EPL No. 21529 limits / criteria. A copy of the monthly environmental monitoring report will be made available on the AIE Project website.

Further reporting requirements are provided in Section 16.6 and Section 17.

16.5 Compliance tracking register

A Compliance Tracking Register has been developed as a monitoring tool to assist with the compliance reporting requirement as set out under Condition 7, Schedule 4 of the Infrastructure Approval (SSI 9471).

The compliance tracking register includes a breakdown of the requirements from the following key approval and Project documents:

– Infrastructure Approval (SSI 9471).
– EPL No. 21529.
– EMS and Sub - plan requirements.
– *Compliance Reporting Post Approval Requirements* (DPIE, 2020), or its most recent edition.

The Compliance Tracking Register includes tabulation of reference conditions, the requirements, responsibility, status (i.e., ongoing, close - out, not triggered, etc.) and supporting evidence where required.

A routine review of the Compliance Tracking Register is undertaken by the AIE HSE Manager (or delegate) with input sought from the relevant contractors as required. The Compliance Tracking is a live document which is kept up to date for each stage of the construction works.

16.6 Non - compliance, corrective, and preventive actions

Non - compliances or potential non - compliances are situations or events that do not comply with the safeguards and procedures stipulated in the EMS or this DEMP.

Non - compliances or potential non-compliances may be identified in any of the following situations:

– As part of site inspections, supervision or monitoring of construction activities.
– During internal audits.
– Following justified / supported verbal or written third party complaints.

All non - compliances related to dredging and disposal activities will be managed and reported using the non - compliance function of the Project's document management system. Each non - compliance event and follow-up action will be documented and traceable, including identification of key dates and responsible personnel.

Additional details regarding corrective and preventative actions are outlined in the Project's Stage 2A and Stage 2B EMS.

The Department must be notified in writing via the Department's Major Projects Website within seven days after the identification of any non - compliance issue. The notification must identify the development, including the application number, set out the condition of approval that the development is non - compliant with, the way in which it does not comply, the reasons for the non - compliance (if known) and what actions have been taken, or will be taken, to address the non - compliance.

17. Incident management and emergency response

17.1 Incident management

17.1.1 Overview

Incidents are defined as an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance. The consequences of such incidents may result in material environmental harm, damage, or asset loss. 'Near misses' are extraordinary events that could have reasonably resulted in an incident.

All incidents related to dredging and disposal, including those of the Principal Contractors, its subcontractors, and visitors that occur during the undertaking of the construction works for the Project will be managed to satisfy the requirements of AIE's Incident Reporting and Investigation System Requirements. Whilst it is noted that key Contractors will be implementing their own environmental management system procedures and processes, AIE will be responsible for ensuring that these systems and processes satisfy the requirements of the AIE EMS, including the incident management components. The Principal Contractors will be responsible for providing all necessary documentation with regards to the incident investigation and close - out actions where required. The timing of the provision of this documentation is to align with the AIE requirements.

The AIE HSE Manager must be notified immediately of any environmental incident or near miss related to dredging and disposal. These may include, but are not limited to the following:

– Silt curtain failure.
– Exceedance of monitoring criteria as required under the Project EPL (EPL No. 21529) (refer to the individual Sub - Plans for specific criteria and incident reporting requirements for individual environmental aspect such as air quality, water quality, traffic management, waste and resource management and noise and vibration management).
– Spill of any dangerous goods or hazardous substance to ground or water.
– Substantiated complaints received from members of the community or regulatory authorities.
– Regulatory breaches such as fines, prosecutions, improvement notices, breaches of licence conditions.
– All incidents of third-party property damage or loss.
– Incidents involving impact or potential damage to items or places of cultural heritage significance.
– Land-based off-site sediment loss to the environment, including sediment tracking onto the roadway.

The AIE HSE Manager will be responsible for regulatory notification of all notifiable environmental incidents (refer to Section 17.1.1 for notifiable incidents). All environmental incidents will be reported immediately to DP&E in writing via the Department's Major Projects Website after AIE becomes aware of the incident, as per Schedule 4 Condition 5 of the Infrastructure Approval (SSI 9471). The notification must identify the development, including the application number, and set out the location and nature of the incident.

In the event of a notifiable non - compliance incident arising, the Principal Contractors will notify the AIE HSE Manager immediately to allow the AIE HSE Manager to notify DP&E in writing via the Department's Major Projects Website within seven days of AIE becoming aware of the non - compliance, as per Schedule 4 Condition 6 of the Infrastructure Approval (SSI 9471).The notification must identify the development, including the application number, set out the condition of approval that the development is non - compliant with, the way in which it does not comply, the reasons for the non - compliance (if known) and what actions have been taken, or will be taken, to address the non - compliance.

17.1.2 Notifiable incident under the POEO Act

In the event of a Notifiable Incident as defined under the POEO Act, AIE is responsible for immediately notifying the EPA, and any other relevant authority, of pollution incidents on or around the site via the EPA Environment

Line (telephone 131 555) in accordance with Part 5.7 of the POEO Act. The circumstances where this will take place include:

– *If the actual or potential harm to the health or safety of human beings or ecosystems is not trivial.*
– *If actual or potential loss or property damage (including clean-up costs) associated with an environmental incident exceeds $10,000.*

Follow-up written notification to the EPA and any other relevant authorities will be required in accordance with the POEO Act and requirements of the EPA. This includes the provision of written details of the notification to the EPA within seven days of the date on which the incident occurred.

All notifiable incidents will also be managed, documented, and reported in accordance with the AIE *Incident Reporting and Investigation System Requirement*.

In addition, an authorised officer of the EPA has the right to request a written report (in accordance with Condition R3 of the EPL No. 21529) if they suspect on reasonable grounds that an event has occurred at the licensed premises which has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies). The written report is to address all the requirements under Condition R3 of the EPL.

17.1.3 Notifiable incident under the Infrastructure Approval (SSI-9471)

In accordance with Condition 5 of Schedule 4, DP&E must be notified in writing via the Department's Major Projects Website immediately after AIE becomes aware of an incident on site.

Additional details regarding notifiable incidents and procedures are outlined in the Project's Stage 2A and Stage 2B EMS.

17.2 Emergency response

Actual or potential emergency situations will vary in type and severity. The required level of response and notification will be at the discretion of the AIE Construction Manager in consultation with the AIE HSE Manager.

Any emergency situation may require only isolated containment and control or may require the complete evacuation of the site and notification of relevant emergency services. Consideration should be made of the response requirements for different situations. If at any time there is uncertainty on how to proceed, response should be for the worst possible scenario. Ultimately, the AIE Construction Manager or representative has authority and responsibility to instigate an evacuation if he/she feels it is warranted.

In the event of an emergency, the following plans listed in Table 17.1 shall be consulted and implemented, as relevant.

Table 17.1 Emergency plans

Plan	Reference	Application
Principal Contractor Local Emergency Response Plan	-	Principal Contractor's emergency response plan implemented in the event of any incident occurring during a Project activity as per the Contractor's policies and management framework.
AIE Port Kembla Gas Terminal Emergency Spill Plan	PKGT-AIE-PRO-039	Developed as a Sub - plan to the EMS to be implemented detailing: – Response plans in the event of land or water-based spill events. – Inspections, notification, and incident management requirements in accordance with the Infrastructure Approval (SSI 9471) and EPL No 21529 in relation to spills.
PIRMP	PKGT-AIE-PRO-007	Implemented immediately in the event of a pollution incident occurring during a Project activity. The PIRMP: – Outlines the actions to be taken during or immediately after a pollution incident.

Plan	Reference	Application
		– Lists details of relevant authorities to be notified, as required. – Outlines community and neighbour notification details, as required.
AIE Emergency Management Procedures	PKGT-AIE-PRO-014	Implemented immediately in the event of any emergency incident occurring during the Project. Procedures include: – Types of emergencies and the detailed steps to be taken in response. – Notification details to relevant authorities and AIE Project team. – Incident response to follow up from incident and preventative actions to be implemented, if applicable.

18. Document management and review

18.1 Record management

Records and registers specified in this DEMP for Stage 2A and Stage 2B shall be maintained. Records to be kept may include but will not be limited to the following:

– Environmental Inspection Checklist.
– Environment Reporting.
– Environmental Monitoring Reports / Records.
– Fauna and Weed Register.
– Internal Audit Reports.
– Incident Reports and Register.
– Toolbox Talk Records.
– Induction Presentation and Register.
– Environmental Activities SWMS.
– Corrective Actions Register.
– Waste and Resource Register.
– Material Tracking Register.
– Training Register / Matrix.
– Complaints Register.

18.2 Review and revision of DEMP

This DEMP will be reviewed and updated, as required under Condition 3 of Schedule 4 of Infrastructure Approval (SSI 9471) to ensure the objectives of the applicable approval conditions contained within are being met throughout Stage 2A and Stage 2B.

In addition, as required under Condition 4 of Schedule 4 of Infrastructure Approval (SSI 9471), the EMS and associated Sub - plans must be reviewed, and if necessary, revised within three months (unless otherwise agreed with DP&E) for any of the following:

– Following the submission of an incident report as per Condition 5, Schedule 4 in Infrastructure Approval (SSI 9471) (refer to Section 17).
– Following approval of any modification to the conditions of approval outlined in Infrastructure Approval (SSI 9471).
– At the direction of the Planning Secretary as per Condition 4, Schedule 2 in Infrastructure Approval (SSI 9471).

Where a review leads to a revision of this plan, within four weeks the revised DEMP will be submitted to the Planning Secretary for approval unless otherwise agreed with the Planning Secretary.

18.3 Access to information

AIE will make the following information publicly available on the PKGT website, as per Schedule 4, Condition 12 of the Infrastructure Approval (SSI 9471) and the requirements as set-out under the Project EPL (No. 21529):

– The PKGT EIS.
– Current statutory approvals for the Project.
– Approved strategies, plans or programs required under the conditions of Infrastructure Approval (SSI 9471).

– A comprehensive summary of the monitoring results of the development, reported in accordance with the specification of any conditions, or any approved plans and programs relating to Infrastructure Approval (SSI 9471).
– A summary of complaints (updated monthly).
– Any independent environmental audit, and responses to the recommendations in any audit.
– The approved premises map (EPL No. 21259, Condition A2.4).
– PIRMP (EPL No. 21529, Condition E2).
– Any other matter required by the Planning Secretary.

This information will be kept up to date by AIE when required.

References

AMSA 2020, National Plan for Maritime Environmental Emergencies.

AS/NZS 2299.1 -2007 Occupational Diving Operations Part 1: Standard Operational Practice.

BOM 2021, Mean High Water and Mean Low Water f rmonthly sea levels for Port Kembla 1975 – 2021, http://www.bom.gov.au/ntc/IDO70000/IDO70000_60420_SLD.shtml.

DAWE 2020, Australian Ballast Water Management Requirements.

DAWE 2009, National biofouling management guidelines for non-trading vessels.

DPIE 2020, Compliance Reporting Post Approval Requirements.

DSITIA 2014, Queensland Acid Sulfate Soils Technical Manual: Soil Management Guidelines.

Environmental Protection Licence No. 21529, dated 3 December 2021.

GHD 2018, Port Kembla Gas Terminal Environmental Impact Statement.

GHD 2018a. Contamination Assessment Report for Berth 101, Proposed Port Kembla Gas Terminal.

GHD 2021a, Baseline Contamination Assessment. Southern Part of Lot 22 DP 1128396, Port Kembla.

GHD 2021b, Port Kembla Gas Terminal. Additional Targeted Investigation – Berth 101.

GHD 2021c, Environmental Condition Report (Outer Harbour Laydown Areas) Site 2 and Site 3.

Heron 2021, Port Operations Management Plan.

ICSM 2018, Australian Tides Manual Special Publication No 9 Version 5.

IMO 1990, International Convention on Oil Pollution Preparedness, Response and Co-operation.

IMO 2000, Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances.

IMO 2011, Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species Resolution MEPC.207 (62).

Infrastructure Approval SSI 9471 dated 13 October 2021.

Roads and Maritime Services 2016, NSW State Waters Marine Oil and Chemical Spill Contingency Plan.

SMEC 2022, Port Kembla Gas Terminal Development – Emplacement Cell Report.

UN General Assembly 1982, Convention on the Law of the Sea.

Appendices

Appendix A

Dredging plant and equipment specification sheets

A-1 Plant and equipment specifications

A-1-1 Machiavelli Backhoe dredge

A-1-2 Non-propelled Split Hopper Barges

A-1-3 PT May (Tug)

A-1-4 Mesenge unloading barge

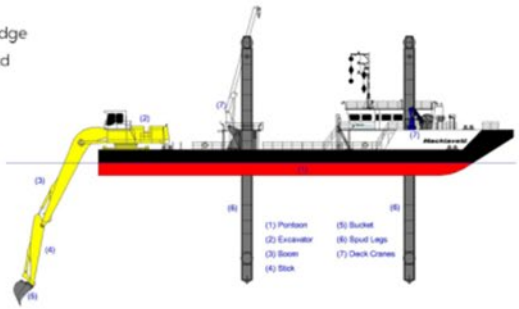
A-1-5 Kaiwea (survey vessel)

This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by law, GHD disclaims any responsibility or liability arising from or in connection with this draft document.

MACHIAVELLI

Backhoe Dredger

Name:	Machiavelli
Type:	De Donge 'D' Type Backhoe Dredge
Operators:	Heron Construction Company Ltd
Port of registry:	Auckland, New Zealand
Class:	Lloyd's Register
MNZ #:	131883
Official Number:	876411
Year built:	2005
Gross tonnage:	648
Displacement:	1,200 tonne
Length overall:	53.0m
Breadth:	15.0m



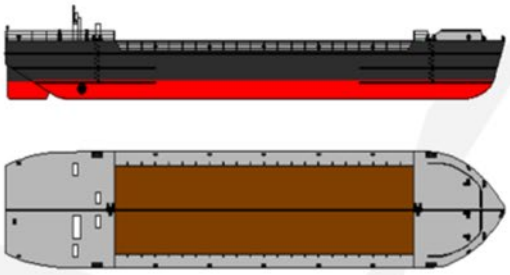
Excavator:	Liebherr P994
Max dredge depth:	23.0m
Monobloc (boom) length:	16.0m, 19.0m
Stick (dipper) lengths:	4.0m, 5.6m, 8.0m and 9.5m
Bucket sizes:	4.0m³, 5.0m³ and 5.7m³,6.0 m³
Clamshell sizes:	3.5 m³ Heavy duty and 6.0m³ Environmental
Dredging control:	DipMate v3 by Seatools
Position and height control:	Twin 5700 Trimble RTK GPS
Aft spuds:	Two @ 30m long x 60 tonne each
Forward spuds:	One @ 30m long x 60 tonne in carrier
Spud carrier stroke:	7.5m
Jackup capacity:	780 tonnes

Heron Construction Co. Ltd.

H1201 & H1202

Non-propelled Split Hopper Barges

Names:	H1201 & H1202
Type:	Non propelled, Split Hopper Barge
Class:	Lloyd's Register
Official Numbers:	876380 & 876384
MNZ Numbers:	135367 & 135368
Operators:	Heron Construction Company Ltd
Port of registry:	Auckland, New Zealand
Year Built:	2015
Manoeuvring:	Stern tunnel thruster
Thruster Power:	Cummins QSM 11 (425hp)
Hopper capacity:	1200m^3
GRT:	1148
Length overall:	66.2m
Breadth moulded:	12.0m
Draft loaded:	4.25m
Draft lightships:	1.5m
Displacement lightships:	750 tonne
Hopper dimensions at coaming:	39.6m x 9.0m
Hopper bottom opening:	3.6m (max.)



Heron Construction Co. Ltd.

Pacific Tug

P.T. MAY

PRINCIPAL PARTICULARS	
Vessel Type	**Twin Screw Tug**
Year Built	**2011**
Flag	**Australian**
Operational Area	**AMSA 2B**
Class	**GL**
GRT / NRT	**54 / 14**
Speed (free run)	**10 Kts**
Accommodation	**4 persons. All spaces air con**
Bollard Pull	**17.0 tonne (continuous) 18.9 tonne (maximum)**
Length OA	**15.0 mtrs**
Breadth	**6.50 mtrs**
Depth	**2.75 mtrs**
Summer Draft	**2.00 mtrs**
Summer Displacement	**114 tonnes**
Light Ship	**82 tonnes**
Fuel Capacity	**21,000 ltrs**
Fuel Consumption	**4m^3 / day**
F/water Capacity	**2,800 ltrs**

PROPULSION MACHINERY	
Main Engines	**2 x Cummins KTA-19-M3**
Power Rating	**2 x 447 kW (1200 HP)**
Gearboxes	**6.10 : 1 ratio**
Propellers	**1800mm 4 blade Manganese Bronze**
Steering Gear	**Independent steering nozzles – Electro hydraulic**

AUXILIARY EQUIPMENT	
Generator	**1 x 180 kW (6CT Cummins), 1x 80kW (6BT Cummins)**
Capacity	**80 kW 415/230 volts**
Fuel Transfer p/p	**1 x 15m^3 / hr**

DECK EQUIPMENT	
Towing Hook	**Fitted with emergency release**
Towing Winch	**10T line pull Electric with 65t brake, remote opp, full electronic control**
Drum Capacity	**36mm WRC x 600 mtrs**
Capstan	**5T on bow**
Stern Roller	**400mm with towing pins and Shark Jaws 65T SWL**

COMMENTS

Compact design with a large amount of flexibility and function, built to Australian standard and classed by GL for USL 2B.
Independent steering nozzles, highly manoeuvrable and high horsepower for length. Very effective for in close operations, including smaller ship assist roles. Effective towing vessel, construction and dredging support vessel, setup for anchor relocation. Electronic chart system, AIS equipment.

Pacific Tug

P.T. MARY

PRINCIPAL PARTICULARS	
Vessel Type	**Twin Screw Tug**
Year Built	**2011 / 2012**
Flag	**Australian**
Operational Area	**AMSA 2B**
Class	**GL**
GRT / NRT	**54 / 14 (est)**
Speed (free run)	**10 Kts**
Accommodation	**4 persons. All spaces air con**
Bollard Pull	**17.0 tonne (continuous) 18.9 tonne (maximum)**
Length OA	**15.00 mtrs**
Breadth	**6.50 mtrs**
Depth	**2.75 mtrs**
Summer Draft	**2.00 mtrs**
Summer Displacement	**114 tonnes**
Light Ship	**82 tonnes**
Fuel Capacity	**21,000 ltrs**
Fuel Consumption	**4m^3 / day**
F/water Capacity	**2,800 ltrs**

PROPULSION MACHINERY	
Main Engines	**2 x Cummins KTA-19-M3**
Power Rating	**2 x 447 kW (1200 HP)**
Gearboxes	**6.10 : 1 ratio**
Propellers	**1800mm 4 blade Manganese Bronze**
Steering Gear	**Independent steering nozzles – Electro hydraulic**

AUXILIARY EQUIPMENT	
Generator	**1 x 180 kw (6CT Cummins), 1x 80 kw (6BT Cummins)**
Capacity	**80 kW 415/230 volts**
Fuel Transfer p/p	**1 x 15m^3 / hr**

DECK EQUIPMENT	
Towing Hook	**Fitted**
Towing Winch	**10T line pull Electric with 65t brake, remote opp, full electronic control**
Drum Capacity	**36mm WRC x 600 mtrs**
Capstan	**5T on Bow**
Stern Roller	**400mm with towing pins and Shark Jaws 65T SWL**

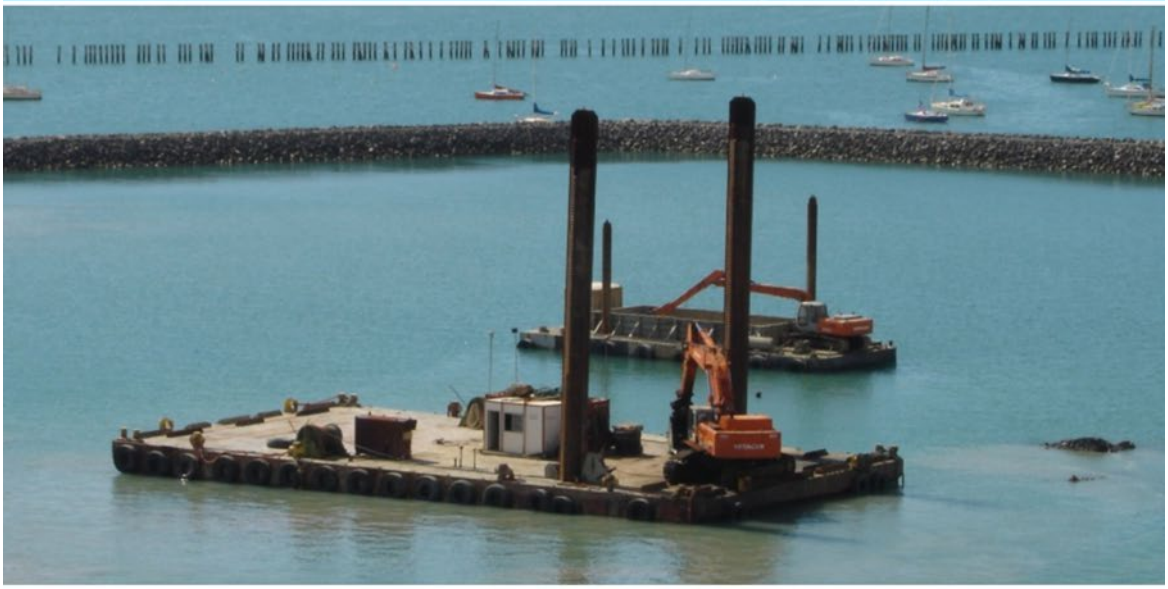
COMMENTS

Sister vessel to the PT May.

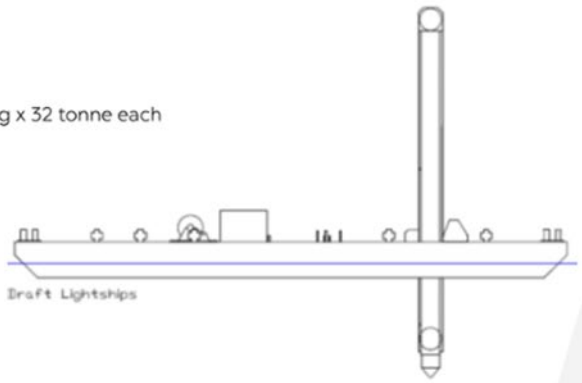
Compact design with a large amount of flexibility and function, built to Australian standard and classed by GL for USL 2B.
Independent steering nozzles, highly manoeuvrable and high horsepower for length. Very effective for in close operations, including smaller ship assist roles. Effective towing vessel, construction and dredging support vessel, setup for anchor relocation. Electronic chart system, AIS equipment.

MESENGE

Flat Top Construction Barge



Name:	Mesenge
Type:	Flat Top Barge
Operators:	Heron Construction Company Ltd
Class:	MNZ Barge Safety Certificate
Official Number:	MNZ 133374
Gross tonnage:	396
Nett tonnage:	118
Displacement:	460 tonne
Length overall:	35.2m
Breadth:	19.4m
Depth:	2.3m
Fuel capacity:	90,000 litres
Aft spuds:	Two @ 24m long x 32 tonne each
Jackup capacity:	140 tonnes



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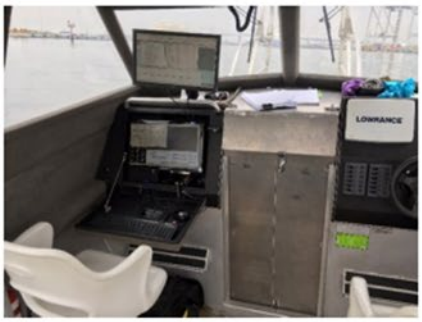
KAIWEA

Hydrographic Survey/Crew Change Vessel

Name:	Kaiwea
Type:	Hydrographic Survey/Crew Change Vessel
Year built/place:	2010, Gisborne New Zealand
Displacement:	1.52 tonne
Length overall:	5.8m
Breadth:	2.8m
Max draft:	0.75m
Power:	160hp
Main engines:	2 x Yamaha 4 Stoke Outboards
Auxiliary Power:	2400W 240V generator
	600W 240V Sine wave inverter
VHF radio:	2 x ICOM VHF's
GPS/Plotter/sounder:	Lowrance 8.4 LCX37C Plotter/Sounder



HYDROGRAPHIC SURVEY EQUIPMENT

Survey RTK GPS:	POS MV Wavemaster
Single Beam Echosounder:	Reson Navisound Dual Frequency NS210
Transducers:	Dual frequency transducer 200kHz @ 8° and 33kHz @ 19°
Multi Beam Echosounder:	Reson T50
Attitude Sensor:	POS MV Wavemaster
Sound Velocity Probe:	AML Base X
Data logging:	Reson PDS2000
	Trimble HydroPro Navigation v6.06

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