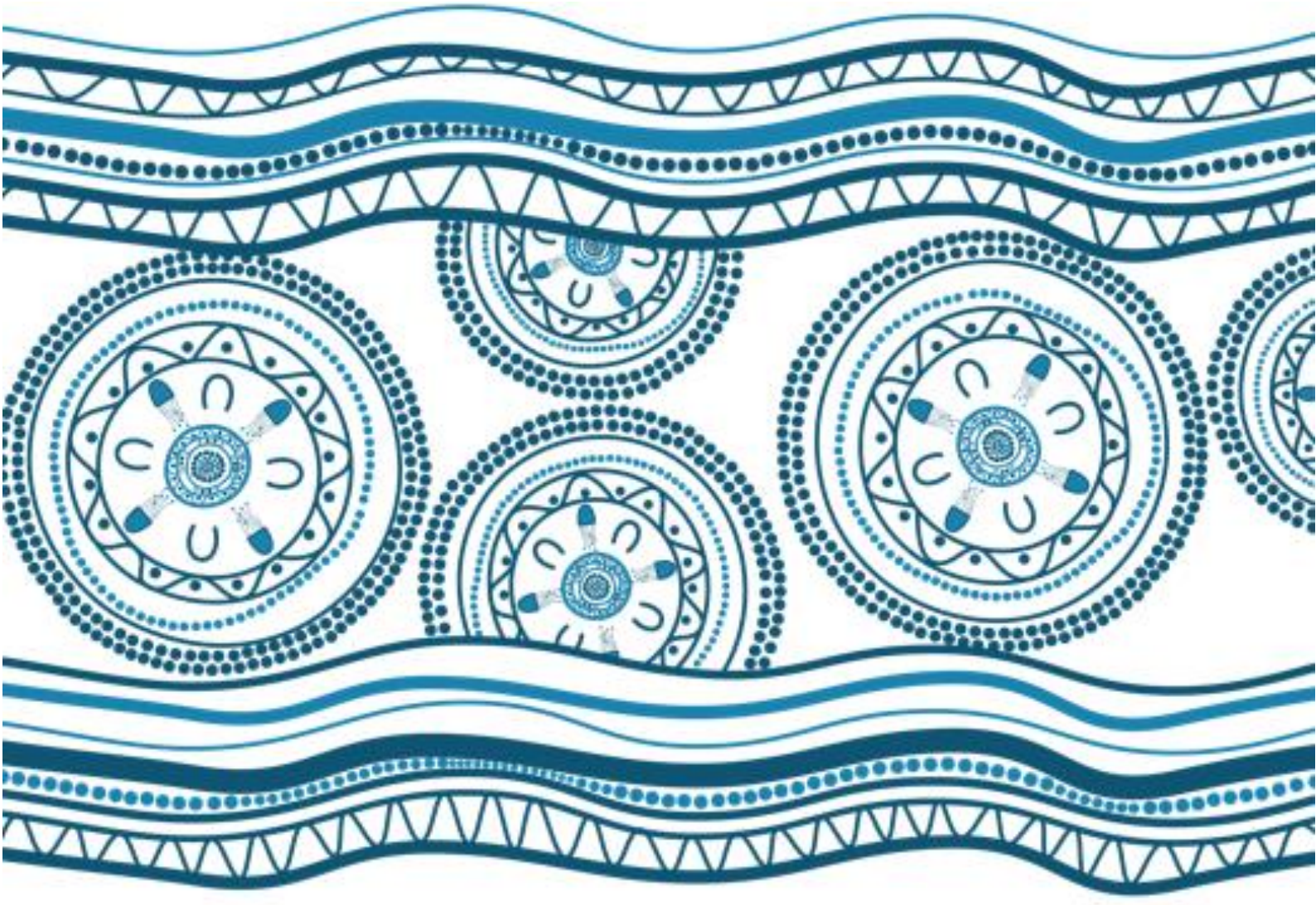
Appendix A

Project synthesis and summary of environmental management measures



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Project synthesis and summary of environmental management measures

This appendix presents a summary of the EIS for the project in response to the Secretary's environmental assessment requirements (SEARs) issued by the Department of Planning, Industry and Environment (DPIE). The appendix also provides a summary of the environmental management measures.

Overview of the project

Transport for NSW is seeking approval to reinstate the ferry wharves at La Perouse and Kurnell in Botany Bay. This would allow for an alternative connection other than by road. The main purpose of this infrastructure would be to enable the return of the public ferry service that operated between La Perouse and Kurnell intermittently for 75 years until the wharves were damaged in 1974 by a heavy storm. The wharves would also provide supplementary temporary mooring for non-ferry commercial vessels (such as whale watching vessels) and recreational boating.

This project is recognised as a priority under the Kamay Botany Bay National Park Plan of Management (NSW DPIE, 2020a) and the associated Kamay Botany Bay National Park Kurnell Master Plan (NSW DPIE, 2019) to deliver improved visitor amenity and access, provide new experiences and acknowledge the diversity of stories associated with place. The project also supports the Kamay 2020 Project which commemorates 250 years since the encounter between Aboriginal people and the crew of the Endeavour and aims to deliver improved visitor amenity and access to the Kamay Botany Bay National Park (the National Park).

The project would be funded by the Australian and NSW Governments. Subject to approval, construction is expected to start in early 2022.

Key features of the project

The project includes:

- Demolition of the existing viewing platform at Kurnell
- Construction of temporary ancillary works including access roads, compound areas, stockpiles, fencing and temporary building platforms (including a temporary causeway at Kurnell and temporary crane platform at La Perouse)
- Relocation of swing moorings at La Perouse
- Construction of two wharves on piles, one at La Perouse and one at Kurnell that would include:
  - A berth for passenger ferries (to cater for ferries between 15 metres to 40 metres in length)
  - A multi-user berth for commercial and recreational vessels (to cater for vessels between two metres and 20 metres long)
  - Sheltered waiting areas and associated furniture located on the wharves
  - Signage and lighting
- Landside paving and landscaping at the entrance to the wharves
- New footpaths connecting the entrance of the wharves to the existing footpaths
- Reconfiguration of existing car parking areas at La Perouse to increase the number of spaces, and associated footpath changes to accommodate these additional car parking spaces
- Bicycle racks near the La Perouse wharf
- Installation of utilities to service the wharves including power and water.

Construction of the project

The total construction period is anticipated to take up to 13 months.

The preferred method is to partly build the project from land (landside) and partly from the water (marine-based). The car parking (at La Perouse), footpaths, approach to the wharves, and part of

the wharf near the foreshore, would be built from the land. The section of the wharves over Botany Bay would be built from the water.

The construction would involve the three steps outlined in Table 1. These steps would overlap as elements of construction would happen at the same time at each location.

Table 1: Construction steps approximate timing

Step	Activities	
	La Perouse	Kurnell
Step 1: Early works and site establishment	Quarter 2 2022 (1 month)	Quarter 2 - 3 2022 (3 months)
	• Install fencing • Set up compound and laydown areas • Set up site offices and access • Form temporary access roads • Form crane and rig platforms at La Perouse.	• Install fencing • Set up compound and laydown areas • Set up site offices and access • Form temporary access roads • Demolish the existing Kurnell viewing platform • Establish the temporary causeway at Kurnell.
Step 2: Main construction	Quarter 2 - 4 2022 (7 months)	Quarter 2 2022 – Quarter 1 2023 (11 months)
	• Piling • Wharf construction • Car parking reconfiguration and footpaths • Installation of utilities • Installation of wharf furniture • Landscaping.	• Piling • Wharf construction • Installation of utilities • Installation of wharf furniture • Landscaping.
Step 3: Site demobilisation	Quarter 2 2022 – Quarter 1 2023 (8 months)	Quarter 3 2022 – Quarter 2 2023 (7 months)
	• Removal of temporary work areas and site offices.	• Removal of temporary work areas and site offices.

Ancillary facilities

Prior to any construction taking place, the landside construction areas would be fenced off to ensure the safety of the public and security of the construction sites.

For the marine based construction, an exclusion zone would be established for the duration of marine construction. This zone would be marked by navigation buoys and solar lights. The extent of this exclusion zone would be confirmed in consultation with the Harbour Master.

Temporary site offices, including toilets, would be established at La Perouse and Kurnell within the designated compound areas. The temporary site offices would occupy an area of around 20 square metres.

A plant laydown area would be established at each landside construction site. The La Perouse plant laydown area would be around 2,250 square metres. The Kurnell plant laydown area would be around 1,750 square metres.

A temporary road would be constructed at:

- La Perouse to provide access from Anzac Parade to the wharf tie-in area. The road would be about five metres wide and 45 metres long. It would be constructed of crushed concrete on top of geotextile material to protect underlying ground conditions
- Kurnell from Cape Solander Drive to Monument Track and along Monument Track to the proposed wharf. The road would be about five metres wide with a passing bay extending to eight metres for a length of 25 metres. It would be constructed of crushed concrete on top of geotextile material.

Once the construction is complete these temporary roads would be deconstructed, the materials recovered or disposed of, and the area reinstated in consultation with National Parks and Wildlife Services.

Temporary crane and rig platform (La Perouse)

A temporary crane platform measuring around 12 square metres would be constructed at La Perouse to provide access for the piling plant needed to install the closest piles to the landside. The crane platform would be constructed using concrete bags and granular material infill wrapped with geotextile on top of the existing rock outcrop. The construction of the temporary crane platform would take around two weeks to set up and would be required for around four months. It would take around two weeks to remove the crane platform.

Temporary causeway (Kurnell)

A temporary causeway would be constructed at Kurnell to provide access for the piling plant needed to install the inshore shallow water and tidal zone piles. The causeway would extend about 85 metres. It would be profiled to be around eight to 12 metres wide at the base and would be high enough to support construction equipment above the water at high tide. It would take about 1.5 months to build the causeway. It would be in place for about four months.

Project uncertainties

The design of the project would continue to be refined during the detailed design. It would be guided by the key principles developed during the concept design and EIS phase. Some flexibility has been provided in the concept design to:

- Allow for refinement during detailed design to consider alternative construction techniques
- Allow for refinement where possible in response to submissions received following the exhibition of this EIS
- Minimise environmental impacts
- Respond to improved technologies or materials
- Improve value for money.

The final design may therefore vary from the concept design described in Chapter 5 (Project description). Any changes to the project would be reviewed for consistency with the assessment contained in the EIS including relevant mitigation measures, environmental performance outcomes and any future conditions of approval. If design refinements are not consistent, approval would be sought from the Minister for Planning and Public Spaces for any such modifications in accordance with the requirements of Division 5.2 of the EP&A Act.

Table 2 outlines key project uncertainties that have been identified as requiring further resolution during detailed design, construction and/or operation and references where these are further described in this EIS.

Table 2: Resolution of project uncertainties

Project uncertainties	Project resolution	Timing	Where addressed in the EIS
Construction methods for the wharves (from land/water)	The project may be constructed by methods from both land and water. The actual construction methods would be confirmed by the contractor once selected. To account for this uncertainty, the EIS has assessed construction from both land and water.	Pre-construction	Chapter 5 (Project description)

Project uncertainties	Project resolution	Timing	Where addressed in the EIS
Ancillary facilities layout	The ancillary facilities layout within the construction boundary would be confirmed once the contractor is selected. To account for this uncertainty, the EIS has assessed a conservative construction compound laydown area.	Pre-construction	Chapter 5 (Project description)
Number of piles and piling method	The number of piles would be confirmed during detailed design. The method for installing the piles would be confirmed by the contractor once selected. To account for this uncertainty, the EIS has assessed the maximum number of piles required and has assessed various types of piling methods.	Detailed design and pre-construction	Chapter 5 (Project description)
Final wharf design and urban design elements	The wharf structure and specific design features would be confirmed throughout the detailed design process. The inclusion of cultural interpretation and incorporation of artwork would be confirmed during detailed design. To account for this uncertainty, the EIS has assessed concept design which is considered a worst case scenario in terms of impact footprint and envelope.	Detailed design	Chapter 5 (Project description)
Landscaping details	The details of proposed landscaping, pavement treatment and seating within the wharf tie-in areas would be confirmed during detailed design in consultation with NPWS and the local community. To account for this uncertainty, the EIS has assessed a conservative area for landscaping.	Detailed design	Chapter 5 (Project description) Appendix L (Landscape Character and Visual Impact Assessment Report)
Final utilities alignment	The location of existing utilities and their proposed alignment would confirmed through further design development and consultation with the relevant service providers. To account for this uncertainty, the EIS has assessed a utilities trench of a size that is required to accommodate all services.	Detailed design	Chapter 5 (Project description)
Marine biodiversity offset details	The details of the marine biodiversity offsets are being developed through a specific strategy. These measures would be confirmed once the strategy complete. They would also be confirmed in consultation with DPI Fisheries. The EIS has assumed worst case impacts to marine biodiversity.	Pre-construction	Chapter 10 (Marine biodiversity) Appendix H (Marine Biodiversity Assessment Report)
Location of maritime heritage within the wharf alignment	The underwater heritage dive survey was carried out based on early concept design. Any changes to the design would therefore need to be accounted for.	Pre-construction	Chapter 9 (Underwater heritage)

Project uncertainties	Project resolution	Timing	Where addressed in the EIS
	Once the final wharf alignment is confirmed, a final dive inspection would determine whether there are any unknown heritage features within the wharf alignment.		Appendix G (Underwater Cultural Heritage Assessment Report)
Ferry wharf operation and timetable	The ferry vessel type and operating timetable would be confirmed once an operator is selected. The wharves have been designed to cater for a variety of vessel types/sizes, and the EIS has assessed a typical operating ferry timetable.	Operation	Chapter 5 (Project description)

Summary of project impacts and environmental management measures

This section summarises the project's predicted impacts. These impacts are discussed in detail in Chapter 7 through to Chapter 25. Many impacts have been avoided through the earlier design and project development, which included input from the community and stakeholders. The initial planning for the project saw alternative locations and design options abandoned due to potential environmental impacts or risks. This resulted in locating the wharves in the same location as previous wharves to avoid impacts to previously undisturbed environments.

The EIS and associated specialist assessments has assessed the potential environmental impacts that may occur because of the project and provides the recommended measures to manage these impacts. Table 3 provides the mitigation measures that will be adopted by Transport for NSW for the design, construction and operation of the Kamay Ferry Wharves.

The construction related management measures would be captured in a Construction Environmental Management Plan (CEMP) and associated sub-plans. The plan would provide a framework for establishing how these measures would be implemented and who would be responsible for their implementation. Additional monitoring or verification checks are also proposed where the effectiveness and suitability of the management measures needs confirming.

Table 3: Summary of environmental management measures

Environmental issue	ID	Environmental management measures	Responsibility	Timing
General				
Construction impacts	G1	A Construction Environmental Management Plan (CEMP) will be prepared in accordance with the Environmental Management Plan Guideline (NSW DPIE, 2020) and Environmental Management Plan Guidelines (Australian Government, 2014). It will be implemented before starting work. As a minimum, the CEMP will include: a. Statutory approval requirements b. How the project will implement the identified mitigation and management measures outlined in the EIS c. Issue-specific environmental management plans d. Roles and responsibilities, including those of sub-contractors e. Communication requirements, including liaison with stakeholders and the community f. Induction and training requirements g. Environmental performance monitoring and evaluation procedures and remedial actions h. Reporting requirements and record-keeping arrangements i. Emergency and incident management procedures j. Audit and review procedures.	Contractor	Pre-construction and construction
Operational impacts	G2	Prior to starting operations, operational environmental management measures will be incorporated into the existing Transport for NSW ferry wharf operational management system.	Transport for NSW	Operation
Consultation				
Community engagement during construction	C1	A Community Liaison Implementation Plan (CLIP) will be prepared and implemented under the CEMP. As a minimum the CLIP will: a. Identify people, community interest groups, businesses, priority groups and stakeholders to be consulted with before and during construction b. Set out procedures and mechanisms for distributing accessible information about, or relevant to, the project's construction c. Provide for the formation of community-based forums that focus on key environmental management construction issues d. Set out procedures and mechanisms to: • Provide updates at key milestones and before starting impacting activities • Allow the community to discuss or provide feedback • To respond to community enquiries or feedback	Transport for NSW Contractor	Detailed design, pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		• To resolve issues and mediate any disputes e. Include the means for Aboriginal community consultation with the La Perouse Local Aboriginal Land Council, Registered Aboriginal Parties and other interest groups. f. Include contact name and number for complaints g. Include information on the actual impacts that can be expected because of the construction of the project and ways in which these will be mitigated h. Include opportunities for community involvement in monitoring impacts.		
Aboriginal heritage				
Heritage considerations in design	AH1	Detailed design will consider opportunities to avoid impacts to significant heritage values and known/discovered intact archaeological remains in consultation with La Perouse Local Aboriginal Land Council and other Registered Aboriginal Parties.	Transport for NSW	Detailed design
	AH2	During detailed design, elements of design such as finishes and treatments as well as heritage interpretation, such as displays and panels, will be informed by the Aboriginal cultural heritage principles in the following policies and plans: a. Kamay Botany Bay National Park: Interpretation and Storytelling Plan (WolfPeak Environment and Heritage, 2020) b. Kamay Botany Bay National Park Kurnell Master Plan (NSW DPIE, 2019). c. Kamay Botany Bay National Park Plan of Management (NSW DPIE, 2020a) d. Meeting Place Precinct: Botany Bay National Park – Kurnell. Conservation Management Plan (Context Pty Ltd, 2008). e. La Perouse Headland Conservation Management Plan (Jill Sheppard Heritage Consultants, 2009).	Transport for NSW	Detailed design
Construction heritage management	AH3	A Construction Heritage Management Plan (HMP) will be prepared and implemented under the CEMP. The HMP will include: a. Construction measures and procedures to minimise and manage impacts on Aboriginal cultural heritage b. Sensitive area maps that identify Aboriginal heritage values, culturally and archaeologically sensitive areas and constraints within the study area c. Unexpected Heritage Items Procedure (NSW Roads and Maritime Services, 2015d)	Contractor	Pre-construction, and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		d. Include consultation with and contact details for the La Perouse Local Aboriginal Land Council, Registered Aboriginal Parties and National Parks and Wildlife Service.		
Aboriginal cultural heritage awareness	AH4	Aboriginal Cultural Heritage Awareness Inductions will be given to all workers during site inductions. This will ensure they are aware of the site's heritage values and context. Updates will be provided based on stakeholder feedback, consultation with the La Perouse Local Aboriginal Land Council, Registered Aboriginal Parties and following any unexpected finds.	Contractor	Pre-construction and construction
Damage to potential buried engravings and midden material at La Perouse	AH5	A Salvage Excavation Program will be developed and be carried out prior to any subsurface impacts within the Low Potential PAD at La Perouse. This includes the jetty tie-in where utilities, wharf piles and landscaping works. Following completion of the archaeological excavation and the subsequent analysis and reporting, further consultation will be undertaken to determine the long-term repository for any retrieved Aboriginal objects.	Contractor	Pre-construction and construction
Potential damage to the rock engravings at La Perouse	AH6	A visual inspection of the potential rock engravings (Site 3, La Perouse [AHIMS ID 45-6-0650] and Site 4, La Perouse [AHIMS ID 45-6-0651]) will be undertaken before setting-up the ancillary facilities and starting construction.	Contractor	Pre-construction
	AH7	Establish exclusion zones for all registered AHIMS rock engraving sites within the construction boundary or directly adjacent and cover with geotextile fabric (or similar) before setting-up the ancillary facilities and creating the construction compound.	Contractor	Pre-construction
Potential damage to AHIMS site at La Perouse	AH8	Archaeological work method statements will be prepared prior to setting up ancillary facilities, construction compounds or construction works to prevent impact and preserve the integrity the rock engraving at La Perouse (AHIMS ID 45-6-0653). During excavation and subsurface works or any other identified high risk activities, archaeological supervision and vibration monitoring will be undertaken at the potential location of the rock engraving at La Perouse (AHIMS ID 45-6-0653). If the engraving is identified and/or the vibration levels would result in damage to the integrity of the sandstone structure, works must cease, the site protected and the construction methodology be reviewed in consultation with a heritage consultant to mitigate further impacts.	Contractor	Pre-construction and construction
Potential damage to AHIMS site at Kurnell	AH9	Archaeological supervision will be undertaken during excavations below 400mm at Kurnell within the Foreshore Midden – Captain Cook's Landing Place (AHIMS ID 52-3-0219). If archaeological material is identified, further archaeological investigations may be required following review and assessment of the archaeological resources identified.	Contractor	Pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
Non-Aboriginal heritage				
Heritage considerations in design	NAH1	Detailed design will consider opportunities to avoid impacts to significant heritage values and known/discovered intact archaeological remains in consultation with Heritage NSW. Options to consider during the detailed design include: a. Excavating the utility trench at Kurnell underneath the buried portion of the course stone sea wall near the wharf tie-in instead of removing a section of the sea wall b. Excavating the utility trench at Kurnell underneath the archaeological remains of the former sea wall near the wharf tie-in instead of impacting the archaeological remains c. Limiting the impact depth of landscape works at La Perouse to reduce impacts to the archaeological remains of the former wharf approach road d. Avoiding impact to remnant Coast Banksia community at La Perouse. Where impact cannot be avoided, offset planting of native vegetation at La Perouse and Kurnell will be provided.	Transport for NSW	Detailed design
	NAH2	During detailed design, elements of design such as finishes and treatments as well as heritage interpretation, such as displays and panels, will be informed by the non-Aboriginal cultural heritage principles in the following policies and plans: a. Kamay Botany Bay National Park Kurnell Master Plan (NSW DPIE, 2019). b. Kamay Botany Bay National Park Plan of Management (NSW DPIE, 2020a) c. Meeting Place Precinct: Botany Bay National Park – Kurnell. Conservation Management Plan (Context Pty Ltd, 2008). d. La Perouse Headland Conservation Management Plan (Jill Sheppard Heritage Consultants, 2009).	Transport for NSW	Detailed design
Non-Aboriginal heritage construction management	NAH3	Non-Aboriginal heritage management measures will be included as part of the Construction Heritage Management Plan (HMP). The HMP will include: a. Construction measures and procedures to minimise and manage impacts on non-Aboriginal cultural heritage b. Sensitive area maps that identify non-Aboriginal heritage values, culturally and archaeologically sensitive areas and constraints within the study area c. Identification of heritage protection zones and protection requirements for heritage items within and in the vicinity of the construction boundary d. An outline of the required archaeological management strategies	Contractor	Pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		e. A heritage register to document the location, condition, significance, storage requirements of any memorials, monuments and interpretive panels which need temporarily relocating and storing during construction including The Captain Cook watering well, The Landing Place Memorial and interpretative panels on the extant wharf. f. Unexpected Heritage Items Procedure (NSW Roads and Maritime Services, 2015d) g. Consultation with National Parks and Wildlife Service, Heritage NSW, Randwick City Council and Sutherland Shire Council.		
Damage to former sea wall at Kurnell and former wharf approach road at La Perouse Preserving the heritage record of the coursed stone sea wall and other listed items impacted by the project	NAH4	An Archaeological Research Design (ARD) will be prepared before work starts. The ARD will confirm the areas within the construction boundaries requiring archaeological investigation, management and any salvage requirements, following detailed design. It will outline the archaeological investigation method. Archaeological Work Method Statements (AWMS) will be prepared prior to construction to support the ARD.	Transport for NSW Contractor	Pre-construction
Heritage awareness and responsibilities	NAH5	Non-Aboriginal Heritage Awareness Inductions will be given to all workers during site inductions. This will ensure they are aware of their obligations under the NSW *Heritage Act 1977* and best practice as outlined in The Burra Charter (Australia ICOMOS 2013). Updates will be provided based on stakeholder feedback and following any unexpected finds and the outcome of the ARD.	Contractor	Construction
Impacts on heritage fabric, views and landscapes at La Perouse and Kurnell	NAH6	A Photographic Archival Recording Program will be undertaken in accordance with the *How to Prepare Archival Recording of Heritage Items* (NSW Heritage Office 1998) and *Photographic Recording of Heritage Items Using Film or Digital Capture* (NSW Heritage Office 2006). Photographic archival recording will be carried out for heritage items that are directly impacted within the construction boundaries and record the setting and views of the heritage items within the study area that will be subject to minor or greater visual impacts based on Table 8-4 of the EIS. The impacted elements include but are not limited to: a. The former sea wall at Kurnell b. The former wharf approach road at La Perouse c. The archaeological potential areas at La Perouse	Contractor	Pre-construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		d. Nearby heritage items subject to minor visual impacts including; Kurnell Peninsula Headland, Kamay Botany Bay National Park (North and South) and Towra Point Reserve, Kurnell Historic Site (in Kamay Botany Bay National Park), Kurnell monuments (in Kamay Botany Bay National Park) and Captain Cook monument.		
Reinstatement of Monument Track to maintain the historical circulation pattern	NAH7	Monument Track will be reinstated in the same location following construction. This will ensure that the historical circulation pattern is maintained in accordance with the policies outlined in section 5.5: Landscape of the Meeting Place Precinct CMP. Specifically: a. The existing concrete slabs will be temporarily removed and reinstated rather than being replaced. If this is not possible, replaced sections will match the existing track b. Care will be taken to remove sections with interpretive text and ensure that they are returned to their original location.	Contactor	Construction
Underwater heritage				
Underwater heritage construction management	UH1	Underwater heritage management measures will be included as part of the Construction Heritage Management Plan (HMP). The HMP will include: a. Construction measures and procedures to minimise and manage impacts on underwater heritage b. Sensitive area maps that identify areas of underwater heritage sensitivity and constraints in the study area c. Artefact management procedures, including identification of approved submerged reburial locations d. Relevant work method requirements, including the installation and removal of the construction platform at La Perouse, temporary causeway at Kurnell and any other temporary structures e. Maritime heritage inductions tailored for underwater work activities including, but not limited to anchoring or trenching f. Restricted zones to be established for the following heritage items; First Slipway at La Perouse, Remains of the sandstone block causeway for La Perouse wharf, Paragon Restaurant / Boat Davits, Holt Jetty / Isaac Smith memorial/ Captain Cook's Landing Site which limit activities and movements ie no tracked machines. g. Archival, baseline and periodic monitoring protocols (before and during construction, including a final site inspection within three months of completion of works) for the heritage items identified in UH1(g) h. Unexpected Heritage Items Procedure (NSW Roads and Maritime Services, 2015d)	Contractor	Pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		i. Consultation requirements with National Parks and Wildlife Service, Heritage NSW, Randwick City Council and Sutherland Shire Council.		
Underwater heritage finds during wharf construction	UH2	An archaeological dive inspection will be carried out within the footprint of the wharves. Where a culturally significant heritage item is present, any movable heritage items will be relocated away from the impact area before starting work.	Contractor	Pre-construction
Unidentified seabed anomalies	UH3	Unidentified seabed anomalies will be avoided through the use of a five metre no-anchoring exclusion zone. If these areas are required for anchoring or mooring, a dive inspection will determine if the item is of low cultural heritage sensitivity to enable these activities to occur.	Contractor	Pre-construction
Marine biodiversity				
Lighting impacts to marine habitat and fauna	MB1	Design and lighting opportunities will be considered during the detailed design, including: a. Use of light permeable materials for the wharves to minimise shading impacts to marine habitats b. Measures in the National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds, and Migratory Shorebirds (Australian Government Department of Environment and Energy, 2020).	Transport for NSW	Detailed design
Marine biodiversity impacts	MB2	A Construction Biodiversity Management Plan (BMP) will be prepared in accordance with the Biodiversity Assessment Method (NSW DPIE, 2020h). It will be implemented under the CEMP. The BMP will detail the measures and procedures to minimise and manage construction impacts on marine biodiversity. The BMP will include: a. Sensitive area maps that identify sensitive habitats, protection areas, no anchoring zones, and exclusion zones to protect seagrass and threatened species b. Define procedures addressing relevant matters specified in the NSW DPI Fisheries Policy and guidelines for fish habitat conservation and management (NSW Department of Primary Industries, 2013). c. Include measures to prevent and monitor: • Water pollution • Sediment disturbance during construction • Construction vessel/barge movements, anchoring, and shading • Impact on known Black Rockcod habitat where possible • Biosecurity risks • Vessel strike by maintaining safe distances and approaches as identified in section 2.3 and 2.5 of the Biodiversity Conservation Regulation 2017 and limiting speeds.	Contractor	Pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		d. Define and implement marine ecology induction to all workers during site inductions e. Consultation with DPI Fisheries, NSW Environment, Energy and Science Group, Randwick City Council, Sutherland Shire Council, National Parks and Wildlife Service for the preparation of the BMP.		
Habitat degradation on sensitive environments related to vessel anchoring and mooring: construction	MB3	Establish no anchoring zones to minimise impacts from anchor points within seagrass meadows of *Posidonia Australis* at Kurnell and La Perouse.	Contractor	Pre-construction and construction
	MB4	Avoid fixed location of barges at locations of *Posidonia australis* outside of the marine habitat impact area within the construction boundary to minimise shading impacts.	Contractor	Pre-construction and construction
Marine pests	MB5	Implement biosecurity management measures applicable and relevant to the project in accordance with relevant NSW DPI Fisheries policies and procedures and National biofouling management guidelines for marinas, slipways, boat maintenance and recreational boating facilities (DAWE, 2021).	Contractor (Construction) Transport for NSW (Operation)	Pre-construction, construction and operation
Habitat degradation and turbidity on sensitive environments related to vessel wash and disturbance: operation	MB6	Establish suitable navigation channels to avoid areas of listed species habitat, including: Kurnell a. Watts reef (likely Black Rockcod habitat) b. Large TEC seagrass meadow of Posidonia Australis La Perouse c. Avoid accessing near reef habitat d. No access over patch of Posidonia Australis to the east of the wharf.	Contractor (Construction) Transport for NSW (Operation)	Pre-construction, construction and operation
Boat strike and vessel impacts on marine fauna	MB7	Vessels are to maintain safe distances and approaches as identified in section 2.3 and 2.5 of the Biodiversity Conservation Regulation 2017.	Transport for NSW	Operation
	MB8	Where possible, areas of known Black Rockcod habitat will be identified in detailed design and avoided during construction and within the ferry swept path during operation.	Transport for NSW	Detailed design, construction and operation
Habitat degradation and turbidity on sensitive environments related to vessel wash and disturbance	MB9	Establish areas of no wash zones in consultation with Port Authority NSW, NSW DPI Fisheries and Transport for NSW at: a. La Perouse to minimise wash effects on the coastal subtidal and intertidal reef areas b. Watts Reef near Kurnell to minimise wash effects on the subtidal habitat on the reef c. Near both wharves to minimise excess wash from the ferry and recreational vessel access.	Transport for NSW	Construction and operation

Environmental issue	ID	Environmental management measures	Responsibility	Timing
Seagrass habitat loss	MB10	A Marine Biodiversity Offset Strategy (MBOS) will be prepared in consultation with NSW DPI Fisheries. As a minimum the MBOS will include: a. Pre and post construction seagrass monitoring program to validate construction impacts b. A seagrass translocation and rehabilitation plan c. Investigation of other offset opportunities which may include artificial marine fauna habitat such as seahorse habitat structures, environmentally friendly moorings or research trials on environmentally friendly moorings.	Transport for NSW	Pre-construction, construction and operation
Terrestrial biodiversity				
Risks to native flora and fauna during construction	B1	Measures to further avoid and minimise the construction footprint, native vegetation or habitat removal will be considered during the detailed design stage and implemented where practicable and feasible. Measures to avoid and minimise impacts should be prioritised in the following order: a. Critical habitat b. Threatened species, endangered ecological communities or their habitat c. Native vegetation and habitat supporting flora and fauna connectivity and/or that supports other environmental objectives such as protecting water quality, hydrology or erosion and sediment controls d. Native vegetation of higher quality condition e. Other native vegetation.	Transport for NSW	Detailed design
Habitat disturbance from light	B2	As a part of detailed design, opportunities to minimise disturbance of foreshore and forested habitats as a result of light spill are to be investigated. This will include: a. Minimising the number of proposed permanent lights and optimising their locations where possible so as to provide maximum setbacks to adjacent habitats b. Where lights cannot be avoided, use of lower impact globes, directional shields, timers, sensors or motion detectors.	Transport for NSW	Detailed design
Terrestrial biodiversity impacts	B3	Terrestrial biodiversity management measures will be included as part of the Construction Biodiversity Management Plan (BMP). As a minimum the BMP will include: a. Sensitive area maps that identify native vegetation, flora and fauna habitat, threatened species and endangered ecological communities b. Maps showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features (eg hollow-bearing trees), and areas for rehabilitation or re-establishment of native vegetation	Contractor	Pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		c. Site inductions and training to ensure awareness of requirements of the BMP and relevant statutory responsibilities. Site-specific training will be given to personnel when working in the vicinity of areas of identified biodiversity value that are to be protected. d. Requirements set out in the Roads and Traffic Authority (RTA) Landscape Guideline e. Procedures addressing relevant matters specified in the Biodiversity Guidelines - Protecting and managing biodiversity on RTA Projects (NSW Roads and Traffic Authority, 2011a) including but not limited to: • Pre-clearing, including the outcomes of final flora and fauna species checks, establishment of exclusion zones and on-ground identification of specific habitat features to be retained (such as hollow-bearing trees) • Vegetation clearing and bushrock removal, including staged habitat removal and any specified seasonal limits on clearing activities • Fauna handling and unexpected threatened species finds • Rehabilitation, revegetation, re-use of soils, woody debris and bushrock, and other habitat management actions • Weed and pathogen management • Unexpected finds procedure. f. Monitoring during construction and post-construction g. Adaptive management measures to be applied if monitoring indicates unexpected adverse impacts.		
Indirect impacts to retained trees through construction activities and placement of permanent infrastructure	B4	A consulting arborist is to carry out an assessment of all trees within the construction boundary that are proposed for retention in accordance with Australian Standard 4970: Protection of Trees on Development Sites. The arborist is to provide a report with recommendations on the viable retention of all native trees within the construction boundary of the mapped PCTs, and include recommendations for amending design or using alternate construction methods to reduce any impacts on retained trees.	Contractor	Pre-construction
Vegetation and habitat loss	B5	A Terrestrial Biodiversity Offset Strategy will be prepared in accordance with the NSW Biodiversity Offset Scheme (NSW Department of Planning, Industry and Environment (DPIE), 2020i). Biodiversity credits are required to be obtained for the following PCTs and fauna species: a. PCT 1823 – Coastal headland cliffline scrub b. PCT 661 – Coastal sand littoral forest c. PCT 772 - Coastal foredune wattle scrub d. Gang-gang Cockatoo	Transport for NSW	Pre-construction, construction and operation

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		e. Large-eared Pied Bat f. Eastern Cave Bat.		
Traffic and transport				
Landside traffic risks during construction	T1	A Traffic Management Plan (TMP) will be prepared in accordance with Traffic Control at Work Sites - Technical Manual (Transport for NSW, 2020h) and QA Specification G10 - Traffic Management (Transport for NSW, 2020i). It will be implemented under the CEMP. The TMP will focus on maintaining general traffic flow, specifying appropriate site accesses, construction parking and construction traffic routes. The TMP will be prepared in consultation with National Parks and Wildlife Service, Randwick City Council and Sutherland Shire Council.	Contractor	Pre-construction and construction
Parking within Kamay Botany Bay National Park	T2	Transport for NSW will continue to liaise with National Parks and Wildlife Services to support its delivery of additional car parking within the Kamay Botany Bay National Park at Kurnell prior to operations.	Transport for NSW National Parks and Wildlife Service	Pre-construction and construction
Construction parking at La Perouse	T3	Construction worker parking along Anzac Parade at La Perouse will be avoided during peak periods (weekends). Consideration of a temporary parking facility at La Perouse will be considered during development of the TMP.	Contractor	Pre-construction
Conflict between cyclists and construction vehicles	T4	Interaction between cyclists and construction related vehicles will be managed and proposed alternative routes provided within the TMP.	Contractor	Pre-construction
Conflict between pedestrians and construction vehicles	T5	Where disruption or closure of pedestrian routes is required during construction, alternate pedestrian routes, appropriate signage and safe access will be provided in consultation with Randwick City Council, Sutherland Shire Council and National Parks and Wildlife Services.	Contractor	Pre-construction
Emergency vehicle access	T6	Emergency vehicle access will be maintained during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.	Contractor	Construction
Conflict between marine construction works and other marine users	T7	A Marine Works Management Plan (MWMP) will be prepared in consultation with the Port Authority NSW (including Harbour Master), Transport for NSW, and other relevant stakeholders. The plan will define exclusion zones, methods of marking the zones, clearance distances, mooring plans, communication protocol, emergency and incident response procedures, vessel movements, contact details of all parties and responsible persons, and transit routes. The MWMP will be consistent with the Biodiversity Management Plan.	Contractor	Pre-construction and construction
Conflict of water users and construction vessels	T8	Maritime exclusion zones will be established to prevent unauthorised vessels entering the area. These zones will be clearly defined to	Contractor	Construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		communicate access for other water users and will be lit to account for the measures in National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds, and Migratory Shorebirds (Australian Government Department of the Environment and Energy, 2020).		
Swing moorings conflicting with construction boundary and operational swept ferry path	T9	Moorings that conflict with construction or the operational ferry swept path will be relocated outside of the construction boundary in accordance with Transport for NSW standard mooring relocation processes. Mooring relocation will be undertaken in consultation with Port Authority NSW and notify any affected stakeholders.	Transport for NSW	Pre-construction
Increase in commercial and recreational vessels using the area	T10	Consultation and notification will be carried out before the commencement of operations to ensure the surrounding maritime operations, including recreational boating, are informed about the project.	Transport for NSW	Operation
Landscape character and visual amenity				
Placemaking	L1	The design will be developed in consultation with National Parks and Wildlife Service, the La Perouse Local Aboriginal Land Council, Registered Aboriginal Parties, Port Authority NSW and Transport for NSW's Maritime and Urban Design Divisions. These reviews will follow Beyond the Pavement (Transport for NSW, 2020a) and Connecting with Country (Government Architect, 2020).	Transport for NSW	Detailed design
Change to existing lighting environment	L2	The lighting will be designed in accordance with AS/NZS 1158:2005 Lighting for Roads and Public Spaces (Australian and New Zealand Standard, 2005), AS/NZS 4282:2019 Control of Obtrusive Effects of Outdoor Lighting (Australian and New Zealand Standard, 2019) and to be guided by the National Light Pollution Guidelines for Wildlife (Australian Government, Department of the Environment and Energy, 2013).	Transport for NSW	Detailed design
Loss of vegetation and landscape character	L3	An Urban Design and Landscape Plan (UDLP) or equivalent for the project will be prepared. It will be implemented under the CEMP. The UDLP will: a. Outline the process to ensure place design principles are implemented b. Outline consultation with relevant stakeholders such as National Parks and Wildlife Service, Local Aboriginal Land Council, Registered Aboriginal Parties and Port Authority NSW c. Include the species and native vegetation to respond to the existing landscape character, including specific: • Planting density and location • Landscape management requirements.	Transport for NSW	Detailed design

Environmental issue	ID	Environmental management measures	Responsibility	Timing
Maintain amenity during construction	L4	All areas and activities in the construction boundary will be managed to ensure the appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials.	Contractor	Construction
Socioeconomic				
Aboriginal land claims	S1	Transport for NSW will consult with Aboriginal land claimants that will be impacted by the project to resolve any outstanding claims.	Transport for NSW	Pre-construction
Access restrictions	S2	Private property access will be maintained. If any temporary access restrictions are needed, those affected will be consulted in accordance with the CLIP.	Contractor	Construction
Employment opportunities over the project's life	S3	A Skills and Employment Strategy will be prepared setting out how the project will promote opportunities for upskilling and training of the local workforce during construction and operation. The strategy will promote and include employment particularly for people with a disability, Aboriginal people, the unemployed and other vulnerable groups. The strategy will include a target for local employment and skills attainment that could be used to monitor success of implementation. The strategy will align with the NSW Government Procurement Board Direction Skills, training and diversity in construction and the NSW Government Policy on Aboriginal Participation in Construction.	Contractor	Pre-construction, construction and operation
Surface noise and vibration				
Construction noise and vibration management	SN1	A Construction Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The plan will generally follow the approach of the Interim Construction Noise Guideline (NSW DECC, 2009) and provide details of construction management measures and procedures. The plan will include: a. An Out of Hours Works Protocol and provision to cover working outside of the standard hours set by the Construction Noise and Vibration Strategy (ST-157/4.1, Transport for NSW, 2020j) b. Identify all potential significant noise and vibration generating activities c. Noise and vibration management measures such as restrictions on working hours, staging, placement and operation of work compounds, parking and storage areas, temporary noise barriers, haul road maintenance, equipment selection and controlling the location and use of vibration generating equipment d. A monitoring and reporting program to assess performance against relevant noise and vibration criteria	Contractor	Pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		e. Consultation arrangements with affected neighbours and sensitive receivers, including notification and complaint handling procedures f. Consultation with NSW EPA, Randwick City Council, Sutherland Shire Council and National Parks and Wildlife Service for preparation of the NVMP g. Contingency measures in the event of non-compliance with noise and vibration criteria.		
Vibration impacts to heritage items	SN2	A pre-construction building condition assessment of Aboriginal and non-Aboriginal heritage items within 70 metres of the construction boundary will be carried out by a suitably qualified person prior to construction. During construction, inspections of the construction activities and work areas will be undertaken to monitor and review the construction methodology and confirm the integrity of the nearby significant structural elements. For heritage items identified at risk during the pre-construction condition assessment, minimum safe working distances will be established and vibration monitoring be carried out prior to the commencement of construction and monitored throughout construction to identify any construction-related impacts. If impacts are detected, work in the area will stop and appropriate environmental management measures will be implemented such as using alternative construction techniques or installing protection structures in collaboration with a heritage consultant.	Contractor	Pre-construction and construction
Unavoidable noise and vibration impacts	SN3	Any noise or vibration affected sensitive receivers will be notified at least five days before starting work. The notification will include details of: a. Construction periods and working hours b. Contact information for project management staff c. Complaint and incident reporting d. How to obtain further information. This excludes emergency works which will be covered under the CLIP.	Contractor	Construction
Underwater noise and vibration				
Construction underwater noise management	UN1	Underwater noise management measures will be included as part of a Construction Noise and Vibration Management Plan (CNVMP). The CNVMP will include: a. Identification of potential significant underwater noise and vibration generating activities b. Management measures that will be guided by section 5 of the SA Underwater Piling Noise Guidelines (Government of South Australia, 2012). This will include:	Contractor	Pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		• Investigating the use bubble curtains to reduce the severity of the energy of the sounds caused by the driving of the piles. • Carrying out observations for 30 minutes before starting work in all zones. • A slow-start process for the piling works that would last for 10 minutes. • Implement a stand-by and shut down process. • Prepare and maintain a compliance and siting report while piling takes place. • Notify the recreational user groups in the area and post notices at the key beaches warning people of the ongoing piling works so that can expect potential underwater noise. • Aim to avoid piling on weekends and during public holidays.		
Underwater noise impacts on humans	UN2	Public communication, including website updates and notices at the project areas, will be carried out before any piling starts. This will be included as part of the CLIP.	Contractor	Pre-construction and construction
Underwater noise impacts on marine fauna	UN3	Underwater noise monitoring may be carried out before the main construction works starts. This will be used to define three zones in accordance with section 5.2 of the Underwater Piling Noise Guidelines (Government of South Australia, 2012): a. Zone 1: stop work b. Zone 2: introduce work restrictions c. Zone 3: use marine spotters. A specialist marine spotter will be responsible for observing and implementing the three zones during piling activities.	Contractor	Construction
Soil, water, and contamination				
Localised stormwater flooding	SW1	All new paved areas will be designed to drain freely.	Transport for NSW	Detailed design
Localised water quality impacts	SW2	All new footpaths will be designed to drain to grassed areas to promote infiltration and cleansing of pollutants.	Transport for NSW	Detailed design
Pollution through discharge of sediment and other pollutants from construction compound and works areas	SW3	A Soil and Water Management Plan (SWMP) will be prepared in accordance with QA Specification G38, Soil and Water Management (Transport for NSW, 2020). It will be implemented under the CEMP. The SWMP will: a. Identify all reasonably foreseeable risks relating to soil erosion, soil contamination, asbestos, acid sulfate soils and water pollution associated with undertaking the activity b. Describe how these risks will be managed and minimised including the management of potential acid sulfate soils and potential contamination	Contractor	Pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		c. Include the required processes/procedures for excavation, handling, storage, and transport of sediment and arrangements for managing pollution risks associated with spillage or contamination. d. Consultation with NSW Environment Protection Authority (EPA), NSW Environment, Energy and Science Group, Sydney Water, Randwick City Council, Sutherland Shire Council and National Parks and Wildlife Service.		
Reduced soil and water quality due to erosion and sediment runoff	SW4	An Erosion and Sediment Control Plan (ESCP) will be prepared in accordance with Managing Urban Stormwater: Soils and Construction – Volume 1 and Volume 2 (Blue Book, Landcom, 2004). It will be implemented under the SWMP. The ESCP will include: a. Detailed measures and controls to minimise erosion and manage sediment control risks to prevent pollution of waterways b. Arrangements for managing wet weather events, including monitoring of potential high-risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.	Contractor	Pre-construction and construction
Pollution through fuel leaks	SW5	Equipment, plant and machinery refuelling and maintenance will be carried out in impervious bunded areas. Vessels and associated plant and equipment will be maintained and refuelled at appropriate facilities offsite or adhere to industry standards, Port Authority NSW and pollution prevention regulations during refuelling, transfer, storage and handling of hazardous materials. Refuelling will always be attended. Machinery will be checked daily to ensure that there are no oil, fuel, or other liquid leaks.	Contractor	Construction
	SW6	Vehicle wash-downs will be carried out offsite or within a designated bunded area with an impervious surface.	Contractor	Construction
Encountering groundwater	SW7	Shallow groundwater will be managed in accordance with the Technical Guideline for Environmental Management of Construction Site Dewatering (NSW Roads and Traffic Authority, 2011b).	Contractor	Construction
Coastal processes				
Wave climate and the increased risk of erosion and reduced longshore drift west of the temporary causeway at Kurnell.	CP1	If a temporary causeway is constructed at Kurnell, temporary causeway armour (ie sandbags, rock) will be selected to account for and withstand the local wave climate.	Contractor	Construction
Turbidity impacts for the temporary causeway	CP2	If construction of the temporary causeway at Kurnell is to occur, a turbidity monitoring specification will be developed and implemented to achieve the limits in the Turbidity Water Quality Standards Criteria Summaries; A Compilation of State/Federal Criteria (USEPA, 1988) and the Australian and	Contractor	Pre-construction and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		New Zealand Guidelines for Fresh and Marine Water Quality Volume 1 (ANZECC& ARMCANZ, 2000). Should the monitoring record an exceedance, measures such as stopping work and rectifying the exceedances will be carried out.		
Scour of the seabed	CP3	Operational restrictions to control approaching, berthing and departing from the wharves will be enforced for all vessels using the wharves to limit scour. These measures will be agreed in consultation with Port Authority NSW (including Harbour Master).	Transport for NSW	Operation
Climate change				
Impacts on wharf and future users from climate change induced events	CC1	The wharves will be designed to account for impacts of climate change, such as sea level rise and severe weather events.	Transport for NSW	Detailed design
Passenger comfort and safety in storms and strong winds or increased extreme temperatures.	CC2	The wharves will be maintained in accordance with the Transport for NSW operational management system to ensure the weather protection measures remain effective over time.	Transport for NSW	Operation
Air quality				
Risks to air quality during construction	A1	Air quality management measures will be incorporated into the CEMP. This will include: a. Dust mitigation and suppression measures such as spraying or covering exposed surfaces, providing vehicle clean down areas, covering of loads, street cleaning, use of dust screens, maintenance of plant in accordance with manufacturer's instructions b. Methods to manage works during strong winds or other adverse weather conditions c. A progressive rehabilitation strategy for exposed surfaces.	Contractor	Pre-construction and construction
Greenhouse gas				
Greenhouse gas emissions	GG1	The wharf design will include materials that have low embodied carbon, are durable (to reduce maintenance), and/ or are highly efficient such as LED lighting.	Transport for NSW	Detailed design
Embodied carbon in construction materials	GG2	Where practicable and feasible, construction materials will be managed to: a. Maximise onsite materials reuse b. Reuse recycled aggregates c. Manage waste to maximise recycling and minimise the percentage sent to landfill d. Incorporate fly ash in concrete e. Procure prefabricated materials to eliminate offcuts onsite	Transport for NSW Contractor	Detailed design and construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
		f. Reduce use of reinforcement bar/steel.		
Greenhouse gas emissions	GG3	The ferry vessels will be operated and maintained in accordance with the Transport for NSW operational management system to ensure optimal operational conditions to minimise fuel use.	Transport for NSW	Operation
Sustainability				
Sustainable development	SU1	The project will implement sustainability objectives driven by the Environmental Sustainability Strategy 2019-2023 (NSW Roads and Maritime Services, 2019) throughout all stages.	Transport for NSW Contractor	Detailed design, construction and operation
Waste				
Avoid, minimise, and sustainably manage waste	W1	A Waste and Energy Management Plan (WEMP) will be prepared in accordance with the Environmental Procedure - Management of Wastes on Roads and Maritime Services Land (NSW Roads and Maritime Services, 2014). It will be implemented under the CEMP. The WEMP will include: a. Measures and controls to minimise the amount of waste b. Measures to store, test, handle, transport, recovery, reuse, dispose of waste. It will also address any recovered material imported to site c. Waste management classification measures d. Measures to ensure organic waste is covered and stored onsite to prevent birds being attracted to the area e. Measure to ensure no construction generated waste is placed in public or residential bins. f. Monitoring, record keeping and reporting, including any documentation management obligations arising from resource recovery exemptions g. Sampling and waste management measures in accordance with the Roads and Maritime Services Environmental Fact Sheet EFS-706 (NSW Roads and Maritime Services, 2015b) h. Measures to reuse and mulch cleared vegetation in accordance with QA Specification R178 (Vegetation).	Contractor	Pre-construction and construction
Existing condition of construction sites	W2	A Pre-Construction Land Condition Assessment will be carried out in accordance with the Environmental Procedure - Management of Wastes on Roads and Maritime Services Land (NSW Roads and Maritime Services, 2014) before starting work. This will also identify any pre-existing wastes.	Contractor	Pre-construction
Condition of site post-construction	W3	A Post-Construction Land Condition Assessment will be carried out in accordance with the Environmental Procedure - Management of Wastes on Roads and Maritime Services Land (NSW Roads and Maritime Services, 2014). This will ensure the site condition is reinstated and suitable for handback in accordance with wider contractor specifications.	Contractor	Construction

Environmental issue	ID	Environmental management measures	Responsibility	Timing
Manage effluent waste	W4	Onsite effluent will either be discharged to the local sewage system or temporarily stored in septic or portable facilities. These facilities will be of sufficient capacity and located away from environmentally sensitive areas such as waterways. The effluent will be regularly collected and disposed of to an appropriately licenced facility. Pit toilets will not be permitted.	Contractor	Construction
Management of waste during operation	W5	Recycling and general waste bins will be installed at the wharves. Note: operational waste will be incorporated into existing management systems operated by Transport for NSW, National Parks and Wildlife Service, Randwick City Council and Sutherland Shire Council.	Transport for NSW	Operation
Hazard and risk				
Construction equipment potential to intrude airspace	HZ1	All equipment used onsite will not exceed the maximum obstacle limit survey height of 50 metres Above Height Datum (mAHD) at La Perouse and 50 to 70 mAHD at Kurnell. Equipment used on site will also not exceed the PAN-OPS limit of 126.4mAHD.	Contractor	Construction
Nearby bird populations startled during construction	HZ2	A gradual start-up of noise generating construction activities will be introduced each day onsite.	Contractor	Construction
Construction vessels impacting submerged cable	HZ3	An exemption certificate will be obtained from the Port Authority NSW to allow construction vessels to anchor within the 200-metre exclusion zone of the submerged Ausgrid power cable. Vessels will not be allowed to anchor on the cable or environmentally sensitive areas.	Contractor	Construction
Accidental spills	HZ4	An Emergency Spill Management Plan (ESMP) will be prepared in accordance with the Code of Practice for Water Management (NSW Roads and Traffic Authority, 1999) and relevant NSW EPA guidelines. It will be implemented under the WEMP. The ESMP will measures to be implemented in the event of a spill, including initial response, containment/cleaning up, and emergency services and relevant authority notifications including Transport for NSW, Port Authority NSW and NSW EPA.	Contractor	Pre-construction and operation
	HZ5	Spill kits will be kept onsite, on vessels and held within all vehicles. Training will be provided in the use and correct disposal of kits.	Contractor	Construction
Accidental spills over water	HZ6	Any significant spill not contained onsite, whether it occurred in water or on land and subsequently entered the water, will be immediately reported to the Harbour Master and Sydney Vessel Traffic Service (VTS).	Contractor	Construction
Operational spill over water	HZ7	Operational spill management environmental mitigation measures will be included in the standard operating procedure for ferries in Sydney managed by Transport for NSW and required by the Harbour Master.	Transport for NSW	Operation

Environmental issue	ID	Environmental management measures	Responsibility	Timing
Cumulative impact				
New approved projects that have not been identified at the time of this EIS	CU1	Collaboration and engagement will take place with the proponents of any new approved projects that will be built or start to operate at the same time as the Kamay Ferry Wharves. This will be used to minimise the cumulative impacts.	Transport for NSW	Construction
Consultation to manage construction fatigue and cumulative impacts	CU2	Consultation will continue with National Parks and Wildlife Service on the development of Stage 1 of the Kamay Botany Bay National Park Kurnell Master Plan that will occur through the development of the project to manage any cumulative impacts.	Transport for NSW	Pre-construction and construction
	CU3	Consultation will continue with Sutherland Shire Council, Randwick City Council and Port Authority NSW through the development of the project to manage any unforeseen cumulative impacts.	Transport for NSW	Pre-construction and construction

Residual impacts

An environmental risk analysis has been carried out to determine potential residual impacts (ie the impacts remaining after the identified management and mitigation measures are applied). This analysis is included in Chapter 26 (Environmental risk analysis) and summarised below.

Table 4: Summary of residual impacts

Impact	Project stage
Aboriginal heritage	
• Potential impact to unknown heritage and archaeology within the Foreshore Midden PAD (Kurnell), Low Potential PAD • Direct impacts to two Aboriginal artefacts at Kurnell • Potential indirect vibration impacts to Aboriginal heritage values.	Construction
Non-Aboriginal heritage	
• Direct impacts to nationally, state and locally listed heritage items including Kurnell Peninsula Headland, Kamay Botany Bay National Park (North and South) and Towra Point Reserve and Kurnell Historic Site (in Kamay Botany Bay National Park) • Direct impacts to the Landscape element of the La Perouse Headland Conservation Management Plan (CMP) • Direct impacts to the coursed stone sea wall, Monument Track, African Olive tree and Coastal Banksia scrub • Indirect visual impacts from construction equipment and activities within heritage curtilages • Access restriction to heritage items within the construction boundaries • Archaeological impacts to the former wharf approach road at La Perouse and the former sandstone sea wall at Kurnell.	Construction
Underwater cultural heritage	
• Direct impacts on second slipway, old wharf approach and potential Aboriginal heritage at La Perouse • Direct impacts on unknown underwater heritage within the wharf alignment • Direct impacts on Trust Wharf remains and potential Aboriginal heritage if present • Temporary visual impacts during construction.	Construction
Marine biodiversity	
• Loss of habitat including intertidal and subtidal reefs and seagrass habitat • Indirect impact to benthic habitat from vessel activity and mooring (causing shading) • Indirect impact to marine fauna due to loss of available habitat for foraging and underwater noise caused by piling and vessel movement • Artificial light impacts on marine fauna and marine birds.	Construction
• Permanent loss of marine habitat. • Loss of connectivity due to fragmentation of seagrass.	Operation
Terrestrial biodiversity	
• Permanent loss of native vegetation, and potential habitat for threatened fauna including Gang-gang Cockatoo, Large-eared Pied Bat and Eastern Cave Bat.	Construction
• Indirect habitat disturbance from lighting and noise.	Operation
Traffic and transport	
• Short-term and minor traffic delays during construction. • Access restrictions to areas within the construction boundaries.	Construction
• Legacy parking and traffic issues would not be resolved.	Operation
Landscape character and visual amenity	
• Temporary visual amenity impacts associated with construction activities.	Construction
• Permanent changes to landscape character and visual amenity.	Operation
Socioeconomic	
• Actual and perceived short-term access and amenity loss for sensitive receivers and recreational activities.	Construction

Impact	Project stage
• No residual adverse impacts during operation are expected. However, different people perceive impacts in different ways, and therefore may perceive residual impacts during operation of the project.	Operation
Noise and vibration	
• Temporary surface noise impacts on nearby sensitive receivers • Temporary underwater noise impacts to sensitive marine fauna and humans • Vibration impacts to unknown land-based and underwater heritage.	Construction
Coastal processes	
• Temporary mobilisation of sediment from construction activities • Temporary changes to sediment and wave movement from temporary causeway at Kurnell.	Construction
• Localised scour from vessel movements in swept path • Localised scour around piles.	Operation

Desired performance outcomes

The project has been designed with consideration of the 'desired performance outcomes' listed in the SEARs. Table 5 outlines how each performance outcome will be achieved.

Table 5: Desired performance outcome and project outcome

Desired performance outcome	Project outcome
Environmental impact assessment process The process for assessment of the project is transparent, balanced, well focussed, and legal.	This EIS has been prepared in accordance with Part 3 of Schedule 2 of the NSW Environmental Planning and Assessment Regulation 2000, with reference to the Commonwealth Environmental Protection and Biodiversity Conservation Regulation, project-specific assessment requirements issued by the Planning Secretary on 4 May 2021 and Significant Impact Guidelines 1.1 Matters of National Environmental Significance. The EIS has been certified by an environmental practitioner in impact assessment. It has also been subject to independent legal review.
Environmental impact statement The project is described in sufficient detail to enable clear understanding that the project has been developed through an iterative process of impact identification and assessment and project refinement to avoid, minimise, or offset impacts so that the project, on balance, has the least adverse environmental, social, and economic impact, including its cumulative impacts.	The EIS provides sufficient detail to clearly understand the impacts from the construction and operation of the project. The impacts have been considered following design refinements, management measures and offsets if required. On balance, the project achieves the project objectives of reinstating the ferry wharves at La Perouse and Kurnell, whilst avoiding, minimising and offsetting adverse impacts. As described in Table 4 above, there are residual impacts, however these are considered acceptable and are outweighed by the benefits of the project.
Assessment of key issues Key issue impacts are assessed objectively and thoroughly to provide confidence that the project will be constructed and operated within acceptable levels of impact.	All key issues have been assessed objectively and thoroughly by specialist technical assessments which are appended to the EIS. Appendix B (Secretary's environmental assessment requirements and Commonwealth assessment requirements) provides a checklist that describes where and how each key issue presented in the SEARs has been assessed. Chapter 26 (Environmental risk analysis) demonstrates that during the EIS process no additional key issues were identified. Table 3 describes the measures that would be introduced to mitigate any negative impacts. Most of the measures are widely used and adopted to manage development impacts because they are proven to be effective. Additional monitoring and management measures are proposed for those measures that are less well-

Desired performance outcome	Project outcome
	defined to check their effectiveness and performance. This is underpinned by the commitment to revise and adjust the mitigation or even stop work to ensure all impacts are acceptable.
Consultation The project is developed with meaningful and effective engagement during its design and preparation of the EIS.	The community and other stakeholders have been regularly engaged during development of the project through measures outlined in Chapter 6 (Consultation). This consultation feedback has influenced the design and constructability, and assessment of the project. Consultation will continue throughout exhibition and construction of the project.
Aboriginal heritage The design, construction, and operation of the project facilitates, to the greatest extent possible, the long-term protection, conservation, and management of the heritage significance of Aboriginal objects and places. The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of Aboriginal objects and places.	The project is designed to avoid impacts on known Aboriginal heritage by avoiding Aboriginal heritage items and limiting ground disturbance. Management measures are recommended to avoid and mitigate any potential impacts during construction through a Heritage Management Plan.
Biodiversity The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity. Offsets and/or supplementary measures are assured which are equivalent to any residual impacts of project construction and operation.	The project has been designed to avoid impacts on terrestrial and marine biodiversity where possible by locating the wharves at the previous wharf sites and limiting land side vegetation clearance. Management measures are recommended to avoid and mitigate any potential impacts during construction through a Biodiversity Management Plan. An offsets package is being prepared to manage residual impacts.
Climate change risk The project is designed, constructed and operated to be resilient to the future impacts of climate change**.**	The project has been designed to account for climate change scenarios including sea level rise and increased severe storm events.
Design, place, and movement The project is well-designed and enhances the environment where it is located, including improved accessibility and connectivity for communities and public spaces.	Design, place, and movement principles have been embedded throughout the design process. These principles include making sure that the design reflects/respects the landscape, character, history of the existing environment. The wharves would provide improved accessibility and connectivity between La Perouse and Kurnell, connecting the National Park.
Environmentally sensitive lands and processes The project is designed, constructed, and operated to avoid or minimise impacts on protected and sensitive lands. The project is designed, constructed, and operated to avoid or minimise future exposure to coastal hazards and processes.	The project has been designed to avoid impacts to protected areas such as Towra Point and sensitive lands within the National Park. The wharves are designed to withstand coastal storm events and avoid changing coastal processes such as shoreline erosion. The wharves are designed to accommodate a ferry service in all-weather conditions, except extreme storm events. Management measures are recommended to avoid and mitigate any potential impacts during construction from coastal hazards.
Noise and vibration Construction noise and vibration (including airborne noise, ground-borne noise, and blasting) are effectively managed to minimise adverse impacts on acoustic	The project has been designed to avoid and minimise noise and vibration impacts on sensitive receivers as much as possible, including impacts to sensitive underwater receivers. During construction there will be some noise and vibration impacts on the nearest sensitive receivers which will be minimised through the implantation of management measures through a Noise and

Desired performance outcome	Project outcome
amenity. Increases in noise emissions and vibration affecting nearby properties and other sensitive receivers during operation of the project are effectively managed to protect the amenity and well-being of the community.	Vibration Management Plan and the use of safe working distances.
Non-Aboriginal heritage The design, construction and operation of the project facilitates, to the greatest extent possible, the long-term protection, conservation, and management of non-Aboriginal heritage. The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage and maritime archaeology.	The project has been designed to avoid impacts to non-Aboriginal heritage items where possible by avoiding known heritage items and limited land disturbance. Where impacts to non-Aboriginal heritage are not able to be avoided, the impacts will be minimised through implementation of management measures by a Heritage Management Plan. The project will not result in significant impacts to Nationally or State listed heritage.
Social and economic The project minimises adverse social impacts and capitalises on opportunities potentially available to affected communities. The project minimises impacts to property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings, and infrastructure.	The project avoids direct impacts to private property by being fully constructed within publicly owned land. During construction there will be temporary restrictions to use of land and marine waters inside the construction boundary. This could impact the way of life for community members and may detour visitors from the area. Once operational, the project will provide a new experience within the National Park.
Soil, water, and contamination The environmental values of land, including soils, subsoils, marine sediments and landforms, are protected. Risks arising from the disturbance and excavation/ dredging of land or marine sediments and disposal of materials are minimised, including disturbance to acid sulfate soils, site contamination and water quality (surface and groundwater).	The project is designed to avoid land and sediment disturbance as much as possible. No dredging is needed. Any disturbed sediment will be managed through the CEMP and sub-plans and disposed of appropriately to avoid contamination or runoff into the receiving environment.
Transport and traffic The safety and efficiency of the transport system (including parking) in the vicinity of the project are managed to minimise impacts. The safety of transport system customers is maintained. Impacts on network capacity and the level of service are effectively managed.	The project will reconfigure parking at La Perouse and additional parking will be provided within the National Park at Kurnell to cater for the additional demand from the operation of the ferry service. The project will not resolve legacy parking issues at La Perouse and Kurnell. The reconfiguration of car parking at La Perouse is designed to ensure the safe operation of the road network. The construction and operation of the project will not change the existing network capacity or level of service at the nearest intersections to the project.

Justification and conclusion

The overall aim of the environmental assessment process is to determine if the residual impacts are acceptable when compared against the benefits the project delivers to current and future generations. The EIS has considered the biophysical, economic, and social considerations, including ecologically sustainability development and cumulative impacts. The project is considered appropriate and justified as the negative impacts are outweighed by the longer-term positive impacts of providing multi-user wharves improving accessibility and providing a connection between the La Perouse and Kurnell headlands within the National Park.