Review of Environmental Factors

Burraneer Sewer Tunnels Rehabilitation (Tunnels 1, 3 & 5)

1 Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of Burraneer Sewer Tunnels Rehabilitation (Tunnels 1, 3 & 5). The REF was prepared under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Sydney Water both the proponent and determining authority.

The Sydney Water Project Manager is accountable for ensuring the proposal is carried out as described in this REF. Additional environmental impact assessment may be required if the scope of work or work methods described in this REF change significantly following determination.

Decision Statement

The main potential construction environmental impacts of the proposal include impacts from noise, to visual amenity and disruption to local traffic and access. During operation impacts are not expected as the proposal involves the maintenance, rehabilitation and construction of underground assets. The proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. Therefore, a Species Impact Statement (SIS) and/or Biodiversity Development Assessment Report (BDAR) is not required.

Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REF, the proposal is unlikely to have a significant impact on the environment. Therefore, we do not require an Environmental Impact Statement (EIS) and the proposal may proceed.

Certification

I certify that I have reviewed and endorsed this REF and, to the best of my knowledge, it is in accordance with the EP&A Act and the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation). The proposal has been considered against matters listed in section 171 (Appendix A) and the guidelines approved under section 170 of the EP&A Regulation. The REF considers how the proposal aligns with the principles of ecologically sustainable development (Appendix B). The information it contains is neither false nor misleading.

Prepared by:	Reviewed by:	Endorsed by:	Approved by:
[redacted]			
Stuart Dawson Environmental Scientist Sydney Water Date: 16/09/2024	John Eames Senior Environmental Scientist Sydney Water Date: 27/09/2024	Farrukh Nazir Project Manager Sydney Water Date: 14/10/2024	Murray Johnson Senior Manager, Environment and Heritage Services Sydney Water Date: 18/10/2024

2 Proposal description

Table 1 Description of proposal

Aspect	Detailed description
Proposal need and objectives	The proposal is required to meet Sydney Water's operational requirements. Routine inspections identified significant rock falls, sludge accumulation and deterioration in an unstable roof section near the downstream outlet to Tunnel 1. Further, rockfalls and rock-bolt deterioration in Tunnel 5 poses a very high risk of a major rockfall and blockage, while sludge and silt accumulation in Tunnel 3 requires removal. Key objectives include: • complying with operational requirements • improving reliability of the wastewater system • eliminating the risk of structural failure along the tunnels and in associated maintenance access structures • ensuring full serviceability is available, including safe access for future inspections, maintenance and rehabilitation works • improving the hydraulic performance of the Burraneer carrier, reducing the potential for sewer discharges and therefore reducing adverse environmental impacts, public health risks, customer complaints and impact to Sydney Water's reputation • extending the life of the rehabilitated assets by 50 years.
Consideration of alternatives/options	The following options were identified for initial consideration in relation to Tunnel 1: • **Base Case –** Defer and monitor – This involves deferral of proposed rehabilitation works and continuation of the current internal inspection and maintenance regime at 5-yearly intervals. • **Option 1 –** Mesh and shotcrete – Arched mesh is installed across the benching and a structural sprayed concrete lining is installed via dry shotcrete. • **Option 2 –** Permanent form panels and high strength grout – Arched mesh and an arched formwork panel is installed, and the void filled with a structural grout. • **Option 3 –** Install circular 1,000 mm diameter liner and grout annulus– glass reinforced plastic (GRP) pipe or a spiral polyvinyl chloride (PVC) pipe is installed over a 40 m length to the outlet bulkhead and the annulus grouted. The base case, or a 'do nothing' scenario would lead to ongoing deterioration that could result in a potential risk to the sewer and could lead to surrounding soil-fines flowing into the sewer resulting in the formation of soil-voids, the weakening of the sub-soil, settlements, and possible local sinkholes at the surface. Access constraints were identified during later planning. Consequently, option 3 was no longer considered feasible. Options 1 and 2 were retained, though improvements to accessibility are required. Therefore, the construction of new maintenance holes (MHs) for Tunnel 1 and 3 was adopted. This would aid delivery by reducing traverse

distances, improving safety and rescue capabilities, and facilitating future inspections and maintenance. Further, to keep the silt, corrosion and overflow risk at an acceptable level, recommendations were made that included tunnel scaling, stabilisation, silt and rock removal in Tunnel 3 and 5.

Proposal description and methodology

The proposal is to rehabilitate 3 unlined rock tunnels of the Burraneer Carrier from Lilli Pilli to Dolans Bay. The Burraneer Carrier drains to the Cronulla Carrier and then onto the Cronulla Water Resource Recovery Facility, under EPL 1728.

Rehabilitation works will be undertaken in Tunnels 1, 3 and 5. The proposal will be carried out via 6 existing MHs as well as via 3 new MHs that will be constructed as part of the proposal. The table below summaries the scope of works associated with each of the existing and proposed assets:

I.D	Asset number	Associated Tunnel	Scope/use
BH01	1029437	5	Tunnel ventilation during rehabilitation
MH01A	1594306	5	Tunnel access for rehabilitation, MH rehabilitation
MH02	1035226	5	Tunnel ventilation during rehabilitation, MH rehabilitation
MH03	1594310	5	Tunnel access for rehabilitation, MH rehabilitation
MH08	1036162	3	Tunnel ventilation during rehabilitation
MH12	1158835	1	Tunnel ventilation during rehabilitation
MH08A	New asset	3	Construction of the new MH to depth of 20 m, tunnel access for rehabilitation.
MH10A	New asset	1	Construction of the new MH to depth of 6 m, tunnel access for rehabilitation.
MH12A	New asset	1	Construction of the new MH to depth of 14 m, tunnel access for rehabilitation.

In preparation for the construction of the new MHs, geotechnical investigations and surveying will be undertaken, and pilot bore holes will be drilled.

The methodology for the construction of the new MH will be as follows:

<u>Geotechnical investigation and pre-construction</u>

- Site establishment.
- Confirmation of underground services and the location of the new access shaft.
- Vertical drilling of pilot holes to confirm the location of new shafts (pilot hole size to be 75- 100 mm diameter).

Drilling of new shaft with the diameter (1800 mm diameter)

- Construction of crane platform.
- Positioning the Piling Rig and commencement of drilling.
- Removal and collection of spoil from the shaft into the tip truck.
- Transportation of the spoil to the approved waste facility for disposal.

Lining and installation of access equipment in the new shaft

- Installation of stainless-steel mesh at the bottom of the shaft.
- Set-up of shotcrete pump and air compressor above ground.
- Application of shotcrete where mesh has been installed.
- Installation of stainless-steel mesh to the top of the shaft (shotcrete not required).
- Construction of reinforced concrete riser and footings.
- Installation of precast cover.
- Installation of plastic encapsulated step irons.
- Installation of stainless-steel vertical ladders and rest platform.

The methodology for rehabilitation works will be as follows:

Ventilation, desilting and descaling of tunnels

- Set up of ventilation system as required.
- Collection of silt samples for testing and waste classification.
- Descaling of loose rocks.
- Desilting using wheelbarrows and shovels inside of tunnel and transported to the base of MH for removal.
- Set up gantry A- Frame and electric winch directly above the MH.
- Silt winched out in buckets using electric winch.
- Collection of silt in a dedicated silt bin adjacent to MH.
- Removal of silt bin and transportation to approved landfill for disposal.

MH rehabilitation

- Remove and replace access equipment (such as steps, platforms, ladders MH hole covers and frames).
- Rehabilitation of MH interior surface.

Mesh installation and shotcreting of tunnels

- Set up gantry A-frame and electric winch over the MH.
- Lowering of stainless-steel mesh down the MH using the winch and transport to repair location using wheelbarrow.

- Installation of the stainless-steel mesh to the walls and ceiling of the tunnel by hand using pins.
- Set-up of shotcrete pump and air compressor above ground.
- Application of shotcrete where mesh has been installed.
- Removal of any waste resulting from the works using wheelbarrows below the MH, where it can be removed using buckets and the winch.
- Disposal of waste in skip bin for transportation to an approved location.

Following the completion of works, areas will be restored to their pre-construction condition.

Location and land ownership

The proposal consists of multiple sites across Sutherland Shire Local Government Area (LGA). The sites comprise the existing or proposed MH and associated construction footprints and/or compounds. The sites occur within or adjacent (if within road corridor or pathway) to the below locations:

Site	Street address	Suburb	Lot and DP	Zoning
BH01	Adjacent to 10 Boomerang Ave	Lilli Pilli, 2229	115/-/1193282	C3
MH01A	Adjacent to 29 Little Turriell Bay Rd	Lilli Pilli, 2229	2/-/208923	C3
MH02	36 Little Turriell Bay Rd	Lilli Pilli, 2229	12/-/203476	C3
MH03	100R Parthenia St	Dolans Bay, 2229	1/-/563175	C4
MH08	164b Gannons Rd	Caringbah South, 2229	4121/-/1036052	C4
MH08A	Adjacent to 40-42 Water St	Caringbah South, 2229	3/-/573216 1/-/1270509	C4
MH10A	Adjacent to: 2 Wren Pl 4 Wren Pl 1 Christopher Pl	Burraneer, 2230	1/-/226093 2/-/226093 2/-/227440	C4
MH12	25 Gunnamatta Rd	Burraneer, 2230	1/-/1143930	SP2
MH12A	Adjacent to: 4 Grosvenor Cres 25 Gunnamatta Rd	Cronulla, 2230 Burraneer, 2230	CP/-/SP 89 1/-/1143930	R2

Site establishment and access tracks	The sites are predominately accessed off local roads, with some sites being within private property (MH02, MH03 MH08, MH12)
Ancillary facilities (compounds)	Six site compounds will be required. These will house site sheds, skip bins construction amenities and materials laydown. An indicative location for the compounds is shown in Figures 2 and 3, and listed below.

Compound ID	Associated tunnel	Location, adjacent
2	4	6 Fernleigh Rd, Caringbah South NSW 2229
3	5	100 Parthenia St, Dolans Bay NSW 2229
4	5	29 Little Turill Bay Rd, Lilli Pilli NSW 2229
5	3	40 Water St, Caringbah South NSW 2229
6	1	4 Wren Pl, Burraneer NSW 2230
7	1	25 Gunnamatta Rd, Burraneer NSW 2230

Work hours

Work and deliveries will generally be scheduled during standard daytime hours:

- 7 am to 6 pm, Monday to Friday
- 8 am to 1 pm, Saturdays.

However, works may be scheduled outside of standard daytime hours to reduce potential impacts to nearby schools. Out of hours work (OOHW) are defined as:

- Out of hours day: Saturday 7am to 8am and 1pm to 6pm, Sunday and public holidays 8am to 6pm
- Out of hours evening: daily 6pm to 10pm

The proposal is not expected to require work outside these hours. However, Sydney Water's Project Manager can approve work outside of these hours. The approval process is described in the mitigation measures in Section 6.

Proposal timing

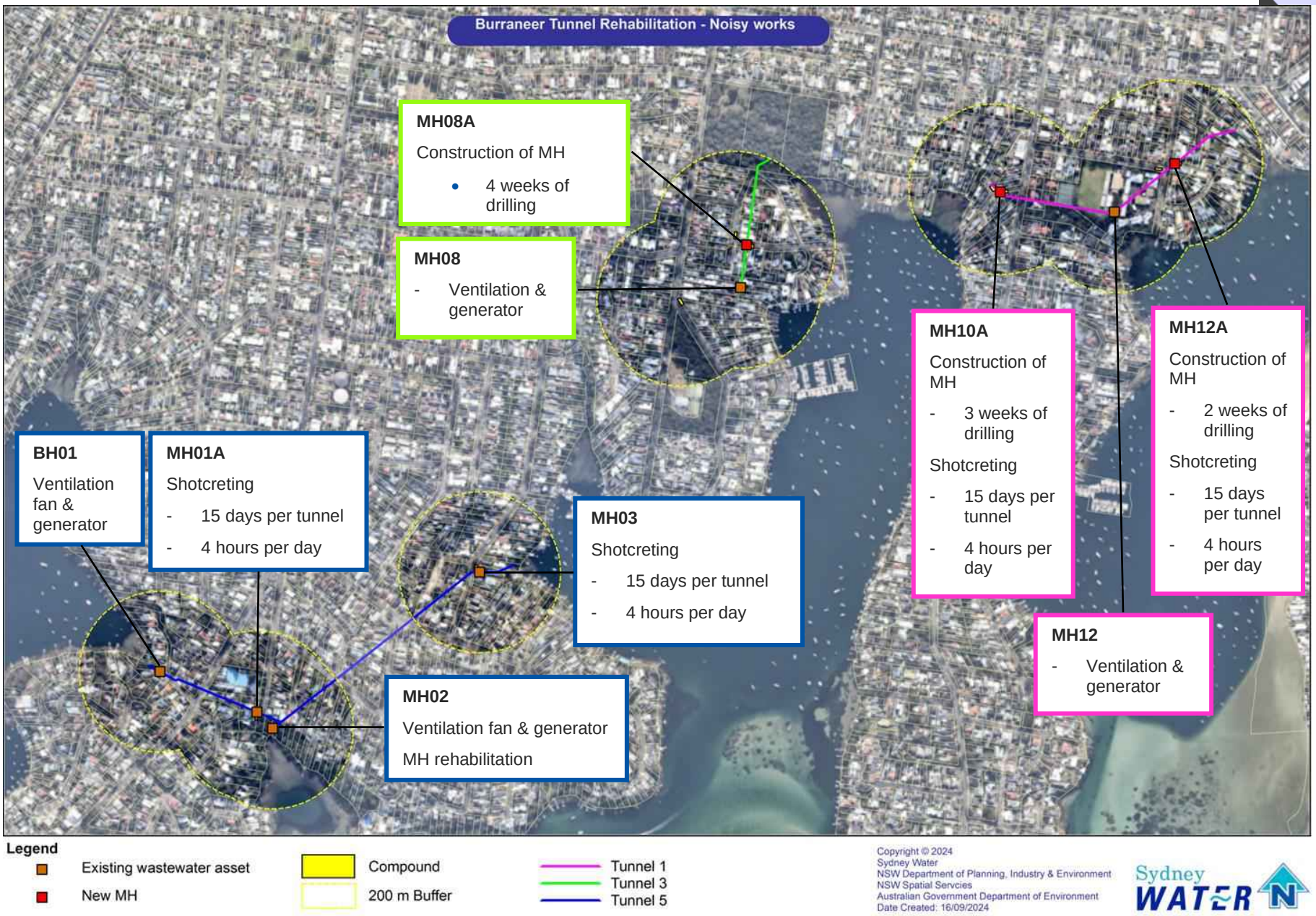
Construction is expected to start early 2025 and take about 21 months, with completion anticipated in September 2026. The duration at each site will vary, ranging from 4 weeks to 10 months (further detail is provided in Table 1-1 of Appendix D).

Figure 1 Location of proposal

Figure 2 Environmental constraints (BH01, MH01A, MH02, MH03)

Figure 3 Environmental constraints (MH08, MH08A, MH10A, MH12, MH12A)

Figure 4 Anticipated noisiest works at each location



3 Consultation

Community and stakeholder consultation

Our approach to community and stakeholder consultation is guided by Sydney Water's community and stakeholder engagement guidelines.

Stakeholder and community engagement is a planned process of initiating and maintaining relationships with external parties who have an interest in our activities. Community and stakeholder engagement:

- enables us to explain strategy, policy, proposals, or programs
- gives the community and stakeholders the opportunity to share their knowledge, issues and concerns
- enables us to understand community and stakeholder views in our decision-making processes alongside safety, environment, economic, technical and operational factors.

The nature, scale and extent of the proposal's potential impact has been evaluated in this REF. We will consult with affected groups throughout the proposal. These include, and are not limited to, nearby schools, colleges, daycare centres and residents. This includes engaging the broader community and stakeholders during plan or strategy development or before making key decisions.

We will also provide local councils with reasonable notice when we would like to commence works. Local council(s) will be consulted about matters identified in environmental planning instruments (refer Section 4.2 below). This includes public safety issues, temporary works on council land, and full or partial road closures of council managed roads.

Consultation required under State Environmental Planning Policies and other legislation

Sydney Water must consult with councils and other authorities for work in sensitive locations or where the work may impact other agencies' infrastructure or land. This is specified in the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP).

Consultation is required under section 2.10 as the proposal involves excavations and enclosure on a road for which council is the roads authority that will disrupt pedestrian or vehicular traffic. Sydney Water contacted Sutherland Shire Council on the 23 September 2024 outlining the proposal. Sutherland Shire Council responded on 30 September 2024 with no objections to the proposal. Further detail is provided in Appendix C.

4 Legislative requirements

Table 2 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Sutherland Shire Local Environmental Plan 2015 (Sutherland LEP)	The proposal is located on land zoned: • C3 Environmental Management • C4 Environmental Living • R2 Low Density Residential • SP2 Infrastructure
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.126 of the TISEPP permits development by or on behalf of a public authority for sewerage system without consent on any land in a prescribed zone. The proposal involves the development of a sewerage system in land zoned C3, C4, R2 and SP2 which are considered prescribed zones. As Sydney Water is a public authority, the proposal is permissible without consent.
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BCSEPP)	**Vegetation in non-rural areas (Chapter 2)** While vegetation removal is not anticipated for the proposal, the proposal is in an area or zone listed in subsection 2.3(1). However, subsection 2.4(1) states: '*This Policy does not affect the provisions of any other SEPP….*', and as the works are permissible under the TISEPP, a council permit to clear vegetation under this SEPP is not required.
State Environmental Planning Policy (Resilience and Hazards) 2021 (RHSEPP)	**Coastal Management (Chapter 2)** The works are on land to which Chapter 2 of this SEPP applies. MH02 is in an area mapped as littoral rainforest (refer to Figure 2). According to section 2.7 of this SEPP, consent is required for works within areas mapped as littoral rainforest. However, section 2.7(4) of the TISEPP 2021 outlines that, 'development for the purpose of emergency works or routine maintenance works can be carried out without consent, only if any adverse effect on the land concerned is restricted to the minimum possible'. Section 2.7(4) of the TISEPP 2021 prevails over section 2.7 of the SEPP (Resilience and Hazards) 2021. Sydney Water has taken into consideration the requirements of section 2.7 of the TISEPP 2021.The descaling and desilting and the installation of mesh and shotcrete works can be considered as routine maintenance works, which are required to restore existing tunnel's structural integrity. MH02, located within mapped littoral rainforest, will be utilised to provide ventilation to the tunnel and will undergo rehabilitation. All works will be undertaken directly on/within the existing asset and inside the existing tunnel. No works will be undertaken above ground and large machinery or equipment will not be used on lands

Environmental Planning Instrument	Relevance to proposal
	mapped as littoral rainforest. No vegetation trimming or clearing is proposed. As such, the works are permitted without consent in this area. MH01A is located within mapped littoral rainforest proximity area under the SEPP (Resilience and Hazards) 2021. No ground disturbance or vegetation removal will be undertaken. Trimming of bracken and weeds may be required. In accordance with section 2.8 of this SEPP, the proposal will not result in significant impacts on: • the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or • the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest. As such, the works are permitted without consent in these areas. Potential impacts are assessed in Section 5.2.3 of this REF

Table 3 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Protection of the Environment Operations Act 1997 (POEO Act)	The proposal is covered by an existing EPL 1728 and meets the EPL compliance requirements. Temporary relaxation or variation of the EPL is not required.	NA	NA
Heritage Act 1977	The Heritage Act 1977 aims to protect and preserve items of state and local heritage significance and outlines processes for approval of development that may impact items of environmental heritage. Impacts to non-Aboriginal heritage items have been assessed in Section 5. No impacts are expected.	NA	NA
National Parks and Wildlife Act 1974 (NPW Act)	The proposal is not on National Parks land. Under Section 86 of this Act, it is an offence to harm or desecrate an Aboriginal place or object unless authorised by an Aboriginal Heritage Impact Permit. Section 87(2) provides a defence if the defendant exercised due diligence to determine whether the act or omission constituting the alleged offence would harm an Aboriginal object and reasonably determined that no Aboriginal object would be harmed.	NA	NA

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	A review of the Aboriginal heritage sites near (within 200 m) of the proposal was undertaken. Based on the proposal and the location of the sites, no harm to an Aboriginal object or site is expected.		
Water Act 1912/ Water Management Act 2000	Dewatering activities require an approval under Section 91B of the Water Management Act 2000. In accordance with Schedule 4 of the Water Management (General) Regulation 2018, a Water Supply Work Approval (WSWA) is required for all activities that involve dewatering (pumping) of groundwater. While some groundwater maybe encountered during drilling activities, this is expected to be as a result of seepage through rock, and the rate of seepage is expected to be low. Due to the drilling methodology, dewatering (pumping) of the drill holes during construction will not be undertaken. Any accumulated groundwater will drain into the opening of the tunnel when drilled through. Currently, there is no requirement for an approval or licence for activities that intercept groundwater and that do not require dewatering.	NA	NA
Roads Act 1993	This Act regulates works in, on or over a public road. Approval under Section 138(1) of this Act is required for carrying out works in, digging up, or disturbing a classified road. The works do not occur on a classified road or within 100 m of traffic lights. Therefore, consultation with TfNSW and a Road Occupancy Certificate issued by TfNSW are not required. However, the proposal occurs in and adjacent to local roads under the control and management of Sutherland Shire Council. Road closures and the occupation of public places require permits from Sutherland Shire Council.	Council permits	Post-REF, delivery contractor

5 Environmental assessment

The environmental impacts checklist (SWEMS0019.01) was completed for the works which considers all environmental aspects. Table 4 includes only the potentially impacted aspects.

Table 4 Key environmental aspects and potential impacts of construction and operation

Aspect	Potential impacts
Topography, geology and soils	Topography surrounding the proposal features slopes and ridges and is defined by the surrounding bays. The proposal is situated in Gymea and Hawkesbury soil landscapes. Both soil landscapes are interpreted as shallow soils with high erosional hazard. The underlaying geology consists of Hawkesbury Sandstone. The proposal does not occur within mapped Acid Sulfate Soils (ASS). The estuarine sediments of the surrounding bays are considered to have a high probability of ASS occurrence and are within 200 m of the proposal (about 70 m at its closest point (MH02)). An ASS Assessment Report (Stantec. September 2023) assessed soils at the proposed MH locations. The results indicate that Actual ASS or Potential Acid Sulfate Soils (PASS) are not present within the soils analysed. Excavation is required in three locations and involves pilot drilling and the drilling of access shafts for the construction of MH8A, MH10A and MH12A. The depth for each of these shafts will be 20 m, 6 m, and 14 m respectively with each penetrating into the underlaying rock. For the remaining components of the proposal ground disturbance will be limited to the movement of staff and vehicles around MHs and the site compounds. Access to the sites is predominately via local roads minimising ground disturbance. In some instances, MHs are within private property (MH02, MH03, MH08 and MH12) which may require movement across softer ground which may be subject to minor ground disturbance. Potential impacts from excavation, drilling and ground disturbance associated with the proposal include: • soil erosion and generation of sediment laden run-off of soil and material stockpiles into drainage lines • inadvertent transfer of soil off-site by work vehicles • rutting from vehicle tyres sinking into wet soils causing trenching or furrows and erosion • mismanagement of unexpected, contaminated soil during excavation which could cause impacts and dust impact to nearby receivers • mismanagement of unexpected ASS, resulting in the leaching of acid and metal from exposed ASS. Grass areas, including compound areas will be reinstated after the completion of works and will be returned to their pre-disturbance condition Considering the nature and scale of the works and with the implementation of mitigation measures outlined in Section 6, potential impacts to topography, geology and soils can be adequately managed and are considered minor.

Water and drainage

The proposal is surrounded by the waters of Port Hacking and is bounded by Little Turriell Bay to the west and Gunnamatta Bay to the east. In between are Burraneer Bay, Dolans Bay and Great Turriell Bay.

The nearest waterways are unnamed creeks about 185 m north of MH08A and 35 m south of MH12. These drain into Burraneer Bay and Gunnamatta Bay respectively.

The proposal sits in the Sydney Basin Central Groundwater source. Six previously registered groundwater (GW) bores occur within 1 km of the proposal. These bores indicate that the GW level ranges from 1 m to 3.2 m below ground. Geotechnical investigations were undertaken (Stantec, 2023) which included 3 boreholes at the proposed MH locations. The geotechnical report notes that groundwater was not encountered in any boreholes during drilling. Three groundwater monitoring wells were installed at the borehole locations for long-term monitoring. Groundwater levels varied from 2.36 to 3.12 m below ground.

The extraction (pumping out) of groundwater is not required due to the drilling methodology. Currently, there is no requirement for an approval or licence for activities that intercept groundwater and that do not require dewatering. Any accumulated groundwater will drain into the opening of the tunnel created when drilled through.

Potential impacts to water and drainage from the proposal include the:

- increase in turbidity and a reduction in water quality of receiving waters due to the mobilisation of sediment during heavy rain
- reduction in water quality of receiving waters due to fuel or chemical spills from equipment or vehicles.

With the implementation of mitigation measures in Section 6 potential impacts to water and drainage can be adequately managed and are considered minor.

Flora and fauna

A review of the NSW State Vegetation Type Map (SVTM) indicates that four plant community types (PCT) occur within 200 m of the proposal, two of which have an associated threatened ecological community (TEC):

PCT ID	PCT name	TEC listing
3099	Sydney Coastal Lilly Pilly-Palm Gallery Rainforest	BC Act, EPBC Act
3176	Sydney Enriched Sandstone Moist Forest	BC Act
3592	Sydney Coastal Enriched Sandstone Forest	No associated TEC
3594	Sydney Coastal Sandstone Foreshores Forest	No associated TEC

Several components of the proposal are within mapped TEC associated vegetation (PCT 3099):

- Compound 4
- MH02

Both mangrove and seagrass habitats are present in the nearby bays.

Littoral rainforest mapped under the RHSEPP has a patchy distribution throughout Port Hacking and occurs in the proposal area. MH02 sits within littoral rainforest, while MH01A and Compound 4 are within the littoral rainforest proximity area.

A review of the NSW Atlas of Wildlife returned 16 recorded sightings of threatened fauna species within 200 m of the proposal, including:

- Grey-headed Flying Fox
- Eastern Curlew
- Black Falcon
- Red-crowned Toadlet
- Powerful Owl.

No threatened flora species are recorded within 200 m of the proposal.

No vegetation removal is proposed. Minor trimming of vegetation, such as bracken, around MH01A, or overhanging branches may be required. No trimming or impacts to TEC vegetation is proposed.

MH02 will provide ventilation for Tunnel 5 rehabilitation works. No above ground works, ground disturbance or vegetation removal is proposed at this site. Access to this site is through private property. No vegetation removal is required for access. No impact to littoral rainforest is proposed or permitted.

Potential impacts to estuarine vegetation include:

- a reduction in photosynthetic potential due to sedimentation
- disruption to community structure due to the burial of seed banks
- excess sedimentation of mangroves and root smothering leading to death of trees.

The mobilisation of sediment and potential impacts to waterways are discussed above and can be adequately managed. No impacts to estuarine vegetation or habitats are anticipated.

Potential impacts to threatened fauna include disruption from excessive noise. One record of the Eastern Curlew, dated March 2020, occurs within 200 m of the proposed access shafts where noisy works will be undertaken. The Eastern Curlew does not breed in Australia and considering the available habitat outside of the proposal area, and the scale and duration of the proposed noisy works, this species and other threatened fauna species are unlikely to be significantly impacted.

	Considering the nature, scale and duration of the works and with the implementation of mitigation measures outlined in Section 6, potential impacts to fauna and flora can be adequately managed and are considered minor.
Heritage	The proposal will occur in areas that have already been highly disturbed. **Aboriginal Heritage** The proposal is in a high-risk landscape for Aboriginal heritage (<200 m from waters). A basic search of the Office of Environment and Heritage Aboriginal Heritage information System (AHIMS) was conducted on 10 September 2024. Fifteen AHIMS sites are registered within 200 m of the proposal. Available site cards were reviewed and are summarised below. Site card [redacted] was not available, however the registered location has been confirmed as being [redacted]

Site ID	Site name	Site description	Location
This information has been redacted to protect sensitive Aboriginal heritage information			

This information has been redacted to protect sensitive Aboriginal heritage information

Most sites are associated with shelters, with many containing middens. No AHIMS sites occur within the proposed work areas or access routes.

The proposal occurs in a disturbed environment. Works involving ground disturbance are largely associated with the construction of the new MHs. These components of the proposal occur within existing road corridors.

Upon reviewing the locations of the AHIMS sites in relation to the proposal, and considering the existing disturbed environment, the nature and scale of the proposal, impacts to Aboriginal heritage are not anticipated.

Non-Aboriginal Heritage

No state heritage items occur within 200 m of the proposal. Seven LEP listed heritage items occur within 200 m of the proposal, as listed below and shown in Figures 2 and 3:

Item Name	Listing ID	Within 200 m	Address
House and garden	602	MH10A site, MH12	7 Bermuda Place
Alignment of first road in Sutherland Shire	631	MH10A site	1–483 Woolooware Road
The Terraces—house, former stables and garden	812	MH08A site, MH08	28-32 Water Street, Caringbah South

House and garden	1027	MH12A site	28–30 Grosvenor Crescent
Wharf, sandstone steps and walling	1029	MH12A site, MH12	End of Gunnamatta Road
House	1101	MH03	92 Parthenia Street
Southern end of Gunnamatta Road on foreshore—remains of bath walls (including the bush setting, the simple form and construction of the jetty and the sea wall)	A0630	MH12A site	Gunnamatta Road

The proposal does not occur within the curtilage of any heritage listed item.

The nearest heritage listed item, ID 812, is around 65 m from the MH08A site. This and all other listed items shown above are outside of the minimum working distances for the vibratory equipment that will be used during the proposal. No vibration impacts to heritage items is expected. Potential vibration impacts are discussed in more detail in the Noise and vibration section below.

Considering the nature, scale and duration of the works and with the implementation of mitigation measures outlined in Section 6, potential impacts to heritage items can be adequately managed and are considered negligible. .

Noise and vibration

A construction noise and vibration assessment memo (Appendix D) was produced for the proposal. The assessment is summarised below.

Noise

The areas surrounding the proposal are subject to relatively low background noise levels, influenced by distant road traffic noise and relatively low volumes of traffic on local roads.

Based on the EPA's Draft Noise Construction Guideline (2020) a quantitative assessment was undertaken to assess the potential noise and vibration impacts of the proposal (Appendix D).

The noisiest works anticipated to occur at each location are shown in Figure 4.

Noise impacts were assessed by assigning a noise area category to the environment surrounding the proposal. This applies typical background noise levels and noise management levels. Where the assessment identifies noise impacts above the noise management level, reasonable and feasible mitigation measures have been identified and should be applied (see Section 4 of Appendix D)

Nearby non-residential noise sensitive receivers include:

- De la Salle Catholic College, adjacent (southwest) of site MH12A
- Little Darlings Childcare, about 90 m southeast of site MH10A
- Our Lady of Mercy Catholic College, about 300 m northeast of site MH08A

- Burraneer Park, about 160 m north of site MH08A
- Wattlebird Bushland Reserve, about 190 m west of site MH08A
- Bonnie View Street Reserve, about 260 m northwest site MH08A
- Lilli Pilli Public School, about 35 m north of MH01A

Being situated within a suburban area, most receivers are residential. The nearest residential receiver at each work location is listed below:

MH ID	Address	Distance to nearest building
MH10A	4 Wren St, Burraneer, 2230	11 m
MH12A	4 Grosvenor Cres, Cronulla, 2230	6 m
MH12	25 Gunnamatta Rd, Burraneer, 2230	15 m
MH08A	42 Water St, Burraneer, 2230	16 m
MH08	164B Gannons Rd, Caringbah South, 2229	5 m
BH01	10 Boomerang Ave, Lilli Pilli, 2229	15 m
MH02	36 Little Turriell Bay Rd, Lilli Pilli NSW 2229	23m
MH01A	29 Little Turill Bay Rd, Lilli Pilli, 2229	12 m
MH03	100 Parthenia St, Dolans Bay, 2229	15 m

The affected areas, and the predicted level of impact are shown in Appendix D.

Generally, the proposal will occur during standard construction hours. For the noisiest works, residential receivers within 215 m may be noise impacted. Receivers within 45 m of construction works are predicted to be highly affected by noise impacts. Beyond this area, most residential buildings are shielded from the proposal, and do not have line of site. While some receivers up to 85 m are predicted to experience highly intrusive noise impacts, for many the substantial barriers provided by surrounding residential buildings means that the predicted noise impacts would likely be moderately intrusive.

De La Salle Catholic College is adjacent to the MH12A site, and MH12 is located within the school grounds. Multiple buildings of the college are within 45 m of the proposal. It is predicted that this college will be highly affected by noise impacts. Lilli Pilli Public School is about 35 m north of MH01A, where tunnel rehabilitation, including shotcrete works would occur. Most of the school does not have line of site to MH01A and is predicted to experience moderately to highly intrusive noise impacts. However, it is possible that parts of the school would be highly affected.

To minimise potential noise impacts to the schools, noisy works will be scheduled during school holidays, and limited to non-school hours. For noisy works that cannot be completed during this period, or to provide additional

hours during the school holidays, out of hours works (OOHW) will be considered. As such the noise assessment includes OOHW day and evening. Noise impacts during OOHW day are generally similar to those during standard construction hours, but impacts are expanded to include clearly audible noise impact up to a distance of 500 m from the proposal. For OOHW evening, noise impacts extend further afield, and include highly intrusive noise impacts up to 140 m from the proposal and moderately intrusive impacts up to 330 m depending on line of sight.

The duration of the noisy works varies at each location, with drilling activities ranging from 2 to 4 weeks. Shotcreting will occur for periods of up to 3 days as rehabilitation works progress along sections of the tunnel. Up to 5 sections of each tunnel will require mesh installation and shotcreting. Therefore, for locations where shotcreting has been identified, the associated noisy works will occur for up to 15 days in total. However, as there are multiple MH via which shotcreting will occur for each tunnel, any one location is unlikely to experience the full 15 days of shotcreting noise impacts. More likely, each such location will experience 6-9 days of shotcrete noise impacts, for around 4 hours per day.

Vibration

The use of vibratory plant and equipment will be primarily associated with the construction of new MHs (MH08A, MH10A, MH12A) and road restoration. Vibratory plant and equipment that may be used is listed below, alongside indicative minimum working distances.

Equipment	Description	Minimum working distance	
		Cosmetic damage (light-framed structures)	Human response
Vibratory roller	1-2 tonnes	5 m	15 m to 20 m
Vibratory roller	2-4 tonnes	6 m	20 m
Pile Boring	<800 mm	2 m (nominal)	7 m
Jackhammer	Handheld	1 m (nominal)	3 m

The minimum working distances are indicative and will vary depending on the particular item of plant, local geological conditions and the dominant frequency of the construction vibration levels.

The diameter of the drilling rig will be 1800 mm and there may be a slight increase in the vibration output compared to the piling rig of <800mm that is listed in the noise estimator. Minimum working distances should be maintained to avoid cosmetic damage to structures.

In relation to human comfort (response), the minimum working distances in the above table relate to continuous vibration. The use of plant and equipment with the greatest vibratory output will be intermittent and generally for relatively short periods. However, there may be some impact to comfort levels during

	drilling activities, particularly where distances to the nearest building are less than 10 m, i.e., during the construction of MH12A. Mitigation measures such as respite and attended vibration monitoring will be employed to monitor and manage potential vibration impacts. A Sydney Water Community Engagement Advisor and the construction team determined reasonable and feasible mitigation measures. These are outlined and discussed in Appendix D and have been incorporated into the mitigation measures in section 6. With the application of mitigation measures in Section 6, noise and vibration impacts can be adequately managed and are not anticipated to be significant.

Air and energy	The air quality of the surrounding environment is expected to be typical of its suburban setting, and primarily influenced by vehicle emissions. A search of the National Pollution Inventory indicates that the nearest industrial facility to the proposal is over 3 km northeast at the Cronulla Wastewater Treatment Plant.
	
	During construction, the proposal has the potential to impact on air quality by generating:
	• dust during general construction and excavation/drilling, including ground disturbance, and from stockpiles
	• emissions including greenhouse gas emissions from machinery, equipment and vehicles used during construction, including:
	  ○ construction equipment
	  ○ delivery vehicles transporting materials to construction sites
	  ○ vehicles removing waste materials from construction sites
	  ○ staff vehicles
	• odour generated by construction and maintenance activities including:
	  ○ works connecting to the existing wastewater network
	  ○ the collection and temporary storage of silt and debris removed from the wastewater network.
	
	If inadequately controlled, this could result in air quality impacts at nearby sensitive receivers. Potential impacts on air quality could be readily managed by implementing standard mitigation measures.

Waste and hazardous materials	The proposal has the potential to generate the following wastes: • general construction waste such as excess concrete, redundant pieces of pipe/fittings • domestic waste including food scraps, aluminium cans, glass bottles, plastic and paper containers, and putrescible waste generated by site construction personnel • sewage waste and grey water from temporary amenities.

	• spoil from drilling that is not suitable for backfilling • wastewater and drilling fluid generated from drilling activities. The largest volume of waste generated by construction would be excess spoil from drilling activities. Wherever possible, suitable excavated spoil would be re-used on site for backfilling. If spoil is unable to be re-used on site, opportunities for off-site re-use would be investigated. If re-use opportunities are unable to be identified, or the spoil is unsuitable for re-use due to its geotechnical or contamination characteristics, spoil would be tested and classified according to the Waste Classification Guidelines (NSW EPA, 2014) and disposed of at an appropriately licenced facility. No hazardous wastes are expected to be generated. It is not expected that the proposal will involve managing hazardous waste or HBM. Should the works uncover asbestos or any other hazardous or contaminated material, it will be managed through an unexpected finds procedure. Opportunities to reduce, recycle and reuse on this project would be sought with the Contractor and documented in the Waste Management Plan or CEMP
Traffic and access	The proposal occurs within private property and on council land, in the form of road corridors and pathways. The proposal has the potential to cause traffic and access impacts from • road closures • reduced parking availability • reduced pedestrian access • reduced private property access. Temporary road closures are required to access existing infrastructure and during the construction of the new MHs. Alternative routes/access will be established where possible. Access to private property will be maintained wherever possible but will likely by temporarily reduced. Road closures, work vehicles, compounds and construction footprints will reduce local street parking availability. However, work vehicles will be parked in locations that reduce impacts wherever possible. Bin collections may be impacted during the proposal. Sutherland Shire Council request all bins be placed for collection before 4 am. It is expected that bins will be collected by council before road closures are in place. Bus stop ID 2229117 (Parthenia St opp Wisteria St) is serviced by the 978 bus and is about 30 m north of the Compound 3. This compound services MH03, which will be used for access to Tunnel 5. Work vehicles and equipment required at this location will not interfere with the operation of this bus stop and access will be maintained. Considering the duration of the proposal it is possible that impacts to traffic and access will occur during busy periods at some locations. The boat ramp at the end of Water St may be subject to greater use during weekends, or holiday

	periods that could possibly result in more demand for local street parking that may be occupied by the proposal or associated vehicles. There may be potential impacts to traffic during school drop off and collection times near De La Salle College and parking availability around the site may be reduced. Access gates to along Cross Road and Gunnamatta Road are unlikely to be impacted. While some impacts to traffic and access are expected, with the application of mitigation measures in Section 6, potential impacts to traffic and access can be adequately managed and are not expected to be significant.
Social and visual	Social impacts relating to noise, vibration, traffic and odour have been addressed above. The proposal does not require the interruption of existing wastewater services to the community. Work trucks, equipment and material within residential areas are a potential source of visual impact. Similarly, the use of lights during potential evening work has the potential to result in light spill impacts if not managed appropriately. The nearest potentially impacted receives are listed above in the noise and vibration section, and visual impacts may extend to other surrounding receivers. In general, while there would be some negative impacts, with the application of mitigation measures in Section 6, potential social and visual impacts can be adequately managed and are not expected to be significant.

6 Environmental mitigation measures

Table 5 Mitigation measures

Mitigation measures
General
Sydney Water's Project Manager (after consultation with the environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities: • limit proximity to sensitive receivers • do not disrupt property access • have no impact to known items of non-Aboriginal and Aboriginal heritage • are outside high risk areas for Aboriginal heritage • use existing cleared areas and existing access tracks • have no impacts to remnant native vegetation or key habitat features • have no disturbance to waterways • do not require additional safeguards beyond those included in the EIA • do not disturb contaminated land or acid sulfate soils • will be rehabilitated at the end of construction. The Delivery Contractor must demonstrate in writing how the proposed ancillary facilities meet these principles. Any facilities that do not meet these principles will require additional environmental impact assessment. The agreed location of these facilities must be shown on the CEMP site plan and appropriate environmental controls installed.

Should the proposal change from the EIA, no further environmental assessment is required provided the change:
• remains within the assessment area for the REF and has no net additional environmental impact or
• is outside the assessment/study area for the REF but:
  ○ reduces impacts to biodiversity, heritage or human amenity or
  ○ avoids engineering (for example, geological, topographical) constraints and –
  ○ after consultation with any potentially affected landowners and relevant agencies.
The Delivery Contractor must demonstrate in writing how the changes meet these requirements, for approval by Sydney Water's Project Manager in consultation with the environmental and community representatives.

Prepare a Construction Environmental Management Plan (CEMP) addressing the requirements of this environmental assessment. The CEMP should specify licence, approval and notification requirements. Prior to the start of work, all project staff and contractors will be inducted in the CEMP. The CEMP must be readily available on site and include a site plan which shows: • go/no go areas (mark the boundary with highly visible non-ground-disturbing and 'environmental protection zone' signs) and boundaries of the work area including locations of lay-down and storage areas for materials and equipment • location of environmental controls (such as erosion and sediment controls, fences or other measures to protect vegetation or fauna, spill kits) • location and full extent of any vegetation disturbance. The CEMP will identify appropriate delineation with (eg metal fencing for AHIMS, white flagging for construction corridor, red flagging for no go zones etc). Delineate approved work areas before construction.

Prepare an Incident Management Plan (IMP) outlining actions and responsibilities for:

- predicted/onset of heavy rain during works
- spills
- unexpected finds (eg heritage and contamination)
- other potential incidents relevant to the scope of works.

All site personnel must be inducted into the IMP.

To ensure compliance with legislative requirements for incident management (eg Protection of the Environment Operations Act 1997), Follow SWEMS0009 and attach SWEMS0009 to the CEMP.

Complaints to be managed in accordance with Sydney Water's Complaints Procedure and relevant Community Engagement Plan.

Assign single person with accountability for coordinating communication and information flow across contractors and consultants and provide the contact details of this person in the EWMS and/or CEMP.

Topography, geology and soils

Prevent sediment moving offsite in accordance with Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A (Landcom 2004 and DECC 2008), including, but not limited to:

- divert surface runoff away from disturbed soil and stockpiles
- install sediment and erosion controls before construction starts
- reuse topsoil where possible and stockpile separately
- inspect controls at least weekly and immediately after rainfall
- rectify damaged controls immediately
- remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines.

Minimise ground disturbance and stabilise disturbed areas progressively.

Stop work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic material within fill, asbestos, chemical or petrol odours and leachate. Contain disturbed material on an impermeable surface and cordon areas off. Notify the Sydney Water Project Manager and the Environmental Representative (who will contact Contamination and Hazardous Materials team) to agree on proposed management approach.

Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site.

Manage acid sulfate soils in accordance with the Acid Sulfate Soils Management Advisory Committee: Acid Sulfate Soils Assessment Guidelines (ASSMAC, 1998). Prepare an Acid Sulfate Soils Management Plan (ASSMP) (if required).

Waterways and Drainage

Bund open maintenance holes if there is a risk of wastewater spills.

Bund potential contaminants and store on robust waterproof membrane, away from drainage lines.

Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills Keep the spill kits stocked and located for easy access

Keep stockpiles to a minimum and ensure adequate contingency measures are in place to prevent sedimentation of waterways in the event of a large flood event.

Locate portable site amenities, chemical storage and stockpiles of erodible materials away from watercourses, drainage lines and flood prone areas.

If the potential for intercepting groundwater and the need to extract (pump) groundwater is identified after the REF is determined, Sydney Water will obtain a groundwater Water Supply Works Approval. Where dewatering is >3ML per water year, Sydney Water will also obtain a Water Access Licence. The Delivery Contractor is responsible for:

- Preparing all application materials including but not limited to:
    - a Dewatering Management Plan
    - dewatering calculations, with appropriate justifications (i.e., groundwater assessment report or memo, expert hydrogeological technical information)
    - approval application form/s.
- complying with the conditions of the approvals

If wastewater bypass is required:

- pressure test hoses before, and monitor during bypass
- monitor wastewater flows to ensure critical flows are not reached
- stop bypass if leaks occur
- bund access chambers
- contain wastewater spills and pump back to wastewater system or disposal tanker.

Conduct refuelling, fuel decanting and vehicle maintenance in compounds where possible. If field refuelling is necessary, designate an area away from waterways and drainage lines with functioning spill kits close by.

Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.

Prepare Drilling Fluid Management Plan, including measures to:

- contain and monitor drilling fluids at entry/exit points
- identify and manage frac-outs
- re-use and/or dispose of drilling fluids (checking waste classification).

Flora and flora

Provided it is essential for delivering the project, Sydney Water's Project Manager can approve the following vegetation removal and tree trimming, without additional environmental assessment (but only after consultation with the Environmental and Community Representatives and affected landowners). Sydney Water considers vegetation removal in these circumstances has minimal environmental impact.

- Any minor:
    - vegetation trimming or
    - removal of exotic vegetation or
    - removal of planted native vegetation
    - where the vegetation is not a threatened species (including a characteristic species of a threatened community or population), heritage listed, in declared critical habitat or in a declared area of outstanding biodiversity value.
- Any removal of remnant vegetation where there is no net change to environmental impact (eg a different area of vegetation is removed but the total area is the same or less than assessed in the EIA).

Written explanation of the application of this clause (including justification of the need for trimming or removal and any proposed revegetation) should be provided when seeking Project Manager approval. Any impacts to native vegetation and trees must be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13).

Protect trees in accordance with the requirements of Australian Standard 4970-2009 for the Protection of Trees on Development Sites. Do not damage tree roots unless absolutely necessary, and engage a qualified arborist where roots >50mm are impacted within the Tree Protection Zone

Carry all equipment into the work site of MH02 by hand or trolley. No vegetation trimming or removal is permitted within the littoral rainforest surrounding MH02.

Inspect vegetation for potential fauna prior to trimming. If fauna is present, or ecological assessment has determined high likelihood of native fauna presence (including hollow bearing trees), engage WIRES or a licenced ecologist to inspect and relocate fauna before works.

If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage WIRES or a licenced ecologist if assistance is required to move fauna.

If any threatened species (flora or fauna) is discovered during the works, stop work immediately and notify the Sydney Water Project Manager. Work will only recommence once the impact on the species has been assessed and appropriate control measures implemented

Air and Energy

Use alternatives to fossil fuels where practical and cost-effective

Minimise the potential for odours (eg minimise the number of open access chambers, close maintenance holes overnight, use deodorising spray).

Maintain equipment in good working order, comply with the clean air regulations of the Protection of the Environment Operations Act 1997, have appropriate exhaust pollution controls, and meet Australian Standards for exhaust emissions.

Switch off vehicles/machinery when not in use.

Implement measures to prevent offsite dust impacts, for example:

- Water exposed areas (using non-potable water source where possible such as water from excavation pits).
- Cover exposed areas with tarpaulins or geotextile fabric.
- Modify or cease work in windy conditions.

Waste Generation

Manage waste in accordance with relevant legislation and maintain records to show compliance eg waste register, transport and disposal records. Record and submit SWEMS0015.27 Contractor Waste Report.

Provide adequate bins for general waste, hazardous waste and recyclable materials.

Minimise stockpile size and ensure delineation between different stockpiled materials.

Minimise the generation of waste and sort waste streams to maximise reuse/recycling in accordance with the legislative requirements.

Manage waste and excess spoil in accordance with the NSW EPA Resource Recovery Orders and Exemptions (if applicable) and / or Waste Classification Guidelines. Where materials are not suitable or cannot be reused onsite or offsite, recycle where appropriate. Recycle soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility.

If fibro or other asbestos containing material is identified, restrict access and follow Sydney Water's Asbestos Management – Minor Works procedure, Document Number 746607 and SafeWork NSW requirements. Contact Sydney Water Project Manager, who will consult with Contamination and Hazardous Materials team

Heritage

Do not make publicly available or publish, in any form, Aboriginal heritage information on sites / potential archaeological deposits, particularly regarding location.

Repeat the basic AHIMS search if it is older than 12 months. Conduct additional assessment if new sites are registered and could be impacted by the works.

Stop work if access requires vegetation impacts in unassessed areas, traversing rock outcrops, under or working in rock shelter/cave and/or walking over ground containing old shells is required.

If any Aboriginal object or non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with SWEMS0009.

All site personnel must be inducted by a heritage specialist (or delegate) before starting work on site. The induction should include clear explanation of heritage constraints, go and no-go areas, measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed.

Noise and Vibration

Works must comply with the EPA Construction Noise Guideline (Draft, 2021), including scheduling work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. The potential need for out of hours work (day and evening) has been identified and assessed in this REF. No work to be scheduled outside of the periods assessed in this REF.

The Proposal will also be carried out in accordance with:

- Sydney Water's Noise Management Procedure SWEMS0056

All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts.

Incorporate standard daytime hours noise management safeguards into the CEMP, including but not limited to:

- Identify and consult with the potentially affected residents prior to commencement of works. This should:
    - describe the nature of works, the expected noise impacts, approved hours of work, duration, complaints handling and contact details
    - determine need for, and appropriate timing of respite periods (eg times identified by the community that are less sensitive to noise such as mid-morning or mid-afternoon for works near residences).
- Implement a noise complaints handling procedure.
- Do not warm-up plant or machinery near residential dwellings before the nominated working hours.
- Select appropriate plant for each task, to minimise the noise impact (eg all stationary and mobile plant will be fitted with residential type silencers).
- Do not use engine brakes when entering or leaving the work site(s) or within work areas.
- Regularly inspect and maintain equipment in good working order.
- Arrange work sites where possible to minimise noise (eg generators away from sensitive receivers, site set up to minimise use of vehicle reversing alarms, site amenities and/ or entrances away from noise sensitive receivers).
- Use natural landforms/ mounds or site sheds as noise barriers.
- Schedule noisy activities around times of surrounding high background noise (local road traffic or when other noise sources are active).

If works beyond standard daytime hours are needed (beyond those identified in this REF), the Delivery Contractor would:

- justify the need for out of hours work (OOHW) and why it is not possible to carry out the works during standard daytime hours
- consider potential noise impacts and implement the relevant standard daytime hours safeguards, follow Sydney Water's Noise Management Code of Behaviour (SWEMS0056.01) and document all reasonable and feasible management measures to be implemented

- identify additional community notification requirements and outcomes of targeted community consultation

seek approval from the Sydney Water Project Manager in consultation with the environment and communications representatives

Out of hours work will be considered to minimise noise impacts during school times. Residents will be notified at least ten days in advance of work starting and an Out of Hours Work Plan (OHWP) will be completed in advance of work starting.

Community engagement will occur as early as possible, and at least 28 days prior to works for key stakeholders, i.e., directly impacted residents and schools. This will include face to face engagement and door knocks. Consultation will include an explanation of mitigation measures to be adopted.

Ongoing engagement will continue on an ad-hoc basis. For sensitive receivers / highly impacted residents, regular follow-up will be done (i.e. one-on-one meetings, emails, texts, phone discussions).
Engagement during construction will be ongoing and include proactive management of issues to minimise complaints. Where complaints and enquiries arise, action will be taken to address these with appropriate mitigation adopted.

Regular project updates such as notification letters/newsletters will be sent to surrounding community and emailed to key stakeholders.

Community complaints will be managed by a Community Engagement Advisor assigned to the project, and in accordance with Sydney Water's Customer Complaints Policy. All consultation with community and stakeholders will be recorded on Sydney Water's Consultation Manager database.

A daily register is to be incorporated as part of site diary entry and pre-start meetings to discuss and record potential community and environmental issues and impacts. Mitigation measures to be adopted will be discussed, based on planned construction activities, weather and site conditions. Mitigation measures will be put in place in advance to address potential issues.

Consider less noise and vibration intensive methodologies where practicable and use only the necessary sized and powered equipment.

Attended monitoring is required to evaluate construction noise and where appropriate, vibration levels. Recordings will be measured to evaluate whether mitigation measures are adequate or require revision, and to address complaints.

Monitor compliance with the recommended vibration levels in DIN 4150-3 1999: Structural Vibration – Part 3; Effects of vibration on structures.

Continuous monitoring should be considered if complaints are received.

Noise barriers are to be erected around the work sites where shotcrete works, drilling or any other noisy works are to occur.

Perform respite during noisy works (e.g., continuous blocks of up to 3 hours work, followed by at least one hour break).

For high impact noise affected residents, identified during community engagement consultation, the following provisions may apply:

- earplugs
- vouchers/gift cards to allow respite away from the property
- alternative accommodation.

Delay the start of the noisiest activities and/or limit them to a certain period of the day to minimise impacts to nearby residential receivers (e.g., drilling to commence after 8 am (or later) and conclude by 4 pm)

Stage works to limit noise impacts on nearby schools, i.e., schedule works during school holidays or outside of school hours. Noisy works are to be limited to non-school hours where there is potential to impacts educational facilities.

Conduct a dilapidation survey / asset condition assessment prior to works which have potential to damage existing structures.

Traffic and access
Prepare a Traffic Management Plan (TMP) in consultation with Sutherland Shire Council.
Develop management measures to minimise traffic impacts near residential properties, schools and businesses by consulting with them (e.g., no major material deliveries at school drop off or pick up times etc).
Manage sites to allow people to move safely past the works, including alternative pedestrian, bicycle, pram and wheelchair access.
Obtain necessary permits and approvals from Sutherland Shire Council for works and associated compounds in or adjacent to council managed roads.
Consult with Sutherland Shire Council about managing impacts to pedestrian traffic, signposting, meters, parking, line-marking or if traffic control or pavement restoration is required.
Erect signs to inform road users of the proposed works and any temporary road closures.
Ensure work vehicles do not obstruct vehicular or pedestrian traffic, or private driveway, public facility, public transport facilities or business access unless necessary and only if appropriate notification has been provided.
Undertake works in accordance with Sydney Water Communications policies and requirements including: • Notify impacted residents and businesses. • Erect signs to inform the public on nature of work. • Treat community enquiries appropriately.
Restore work sites to pre-existing condition or better.
Minimise visual impacts (e.g., retain existing vegetation where possible).
Direct artificial light away from sensitive receivers where possible (ie residents, fauna or roadways).
Maintain work areas in a clean and tidy condition.

References

Environmental Protection Agency (November 2020) Draft Construction Noise Guideline

Stantec (September 2023) Burraneer Sewer Tunnel, Indicative Waste Classification and Preliminary Acid Sulfate Soil Assessment Report.

Stantec (September 2023) Geotechnical Interpretive Report, Burraneer Sewer Tunnel Rehabilitation.

Sydney Water (September 2024) Burraneer Sewer Tunnels Rehabilitation (Tunnels 1, 3 & 5) Construction noise and vibration assessment memo

Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may be temporary impacts on the community from noise and visual amenity. However, there will be environmental improvements by providing a reliable wastewater service to the local community.
Any transformation of a locality	The proposal will not result in the transformation of a locality.
Any environmental impact on the ecosystems of the locality	The proposal will not result in environmental impacts to ecosystems of the locality. The proposal will lead to environmental improvements by ensuring a reliable wastewater service to collect and treat wastewater, minimising any impacts on the ecosystem.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	During construction and rehabilitation works, the proposal may reduce environmental quality due to potential noise impacts. Once completed, the operation of the wastewater assets will not reduce the aesthetic, recreational, scientific or other environmental quality or value of the locality.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal will not have any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposal will not have any impact on the habitat of protected animals.
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not be endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.
Any long-term effects on the environment	The proposal will not have any long-term impacts on the environment but will have a long-term benefit by providing a reliable and modern wastewater service for the area
Any degradation of the quality of the environment	The proposal will not cause the degradation of the quality of the environment.
Any risk to the safety of the environment	The proposal will not increase risk to the safety of the environment
Any reduction in the range of beneficial uses of the environment	The proposal will not reduce the range of beneficial uses of the environment.

Section 171 checklist	REF finding
Any pollution of the environment	No pollution of the environment is expected. Disruption to existing wastewater services is not expected. The proposal will help reduce overflow risk and provide ongoing compliance with EPL 1728.
Any environmental problems associated with the disposal of waste	Waste disposal will be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not increase demand on resources, that are, or are likely to become, in short supply.
Any cumulative environmental effect with other existing or likely future activities	The proposal will not have any cumulative environmental effect with other existing or likely future activities.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposal will not have any impact on coastal processes or hazards, and coastal processes and coastal hazards will not have any impact on the proposal.
Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act, Division 3.1	There are no applicable strategic planning statements or plans, as the proposal forms part of a maintenance program
Any other relevant environmental factors.	The proposal has been assessed against the factors listed above, and there are no other relevant environmental factors to consider.

Appendix B – Consideration of principles of ecologically sustainable development (ESD)

Principle	Proposal alignment
Precautionary principle - *if there are threats of serious or irreversible environmental damage, lack of scientific uncertainty should not be a reason for postponing measures to prevent environmental degradation. Public and private decisions should be guided by careful evaluation to avoid serious or irreversible damage to the environment where practicable, and an assessment of the risk-weighted consequences of various options.*	The proposal will not result in serious or irreversible environmental damage and there is no scientific uncertainty relating to the proposal.
Inter-generational equity - *the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*	The proposal will help to meet the needs of future generations by providing a reliable wastewater service.
Conservation of biological diversity and ecological integrity - *conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.*	The proposal will not significantly impact on biological diversity or impact ecological integrity.
Improved valuation, pricing and incentive mechanisms - *environmental factors should be included in the valuation of assets and services, such as 'polluter pays', the users of goods and services should pay prices based on the full life cycle costs (including use of natural resources and ultimate disposal of waste) and environmental goals*	The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment.

Appendix C – Consideration of TISEPP consultation

TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		✓
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		✓
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		✓
Connect to, and use a substantial volume of water from a council owned water supply system?		✓
Require temporary structures on, or enclose, a public space under council's control that will disrupt pedestrian or vehicular traffic that is not minor or inconsequential?	✓	
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?	✓	
Section 2.11, local heritage – consultation with council		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		✓
Section 2.12, flood liable land – consultation with council		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and will works alter flood patterns other than to a minor extent?		✓
Section 2.13, flood liable land – consultation with State Emergency Services		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? * (e) Div.14 (Public admin buildings), (g) Div.16 (Research/ monitoring stations), (i) Div.20 (Stormwater systems)?		✓
Section 2.14, development with impacts on certain land within the coastal zone– council consultation		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		✓
Section 2.15, consultation with public authorities other than councils		
Will the proposal be on land adjacent to land reserved under the *National Parks and Wildlife Act 1974* or land acquired under Part 11 of that Act*? If so, consult with DPE (NPWS).*		✓
Will the proposal be on land in Zone C1 National Parks and Nature Reserves or on a land use zone that is equivalent to that zone? *If so, consult with DPE (NPWS).*		✓
Will the proposal include a fixed or floating structure in or over navigable waters? *If so, consult TfNSW.*		✓
Will the proposal be on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*? *If so, consult with Subsidence Advisory NSW.*		✓
Will the proposal be on land in a Western City operational area specified in *the Western Parkland City Authority Act 2018,* Schedule 2 and have a capital investment value of $30 million or more? *If so, consult the Western Parkland City Authority*.		✓
Will the proposal clear native vegetation on land that is not subject land (ie non-certified land)? *If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).*		✓

Appendix D – Noise and vibration assessment memo

Title:

Burraneer Sewer Tunnels Rehabilitation (Tunnels 1, 3 & 5) Construction noise and vibration assessment memo

Prepared by:

Stuart Dawson

Environmental Scientist

Sydney Water

Date:

16 September 2024.

Reviewed by:

John Eames

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Sydney Water

Date:

27 September 2024.