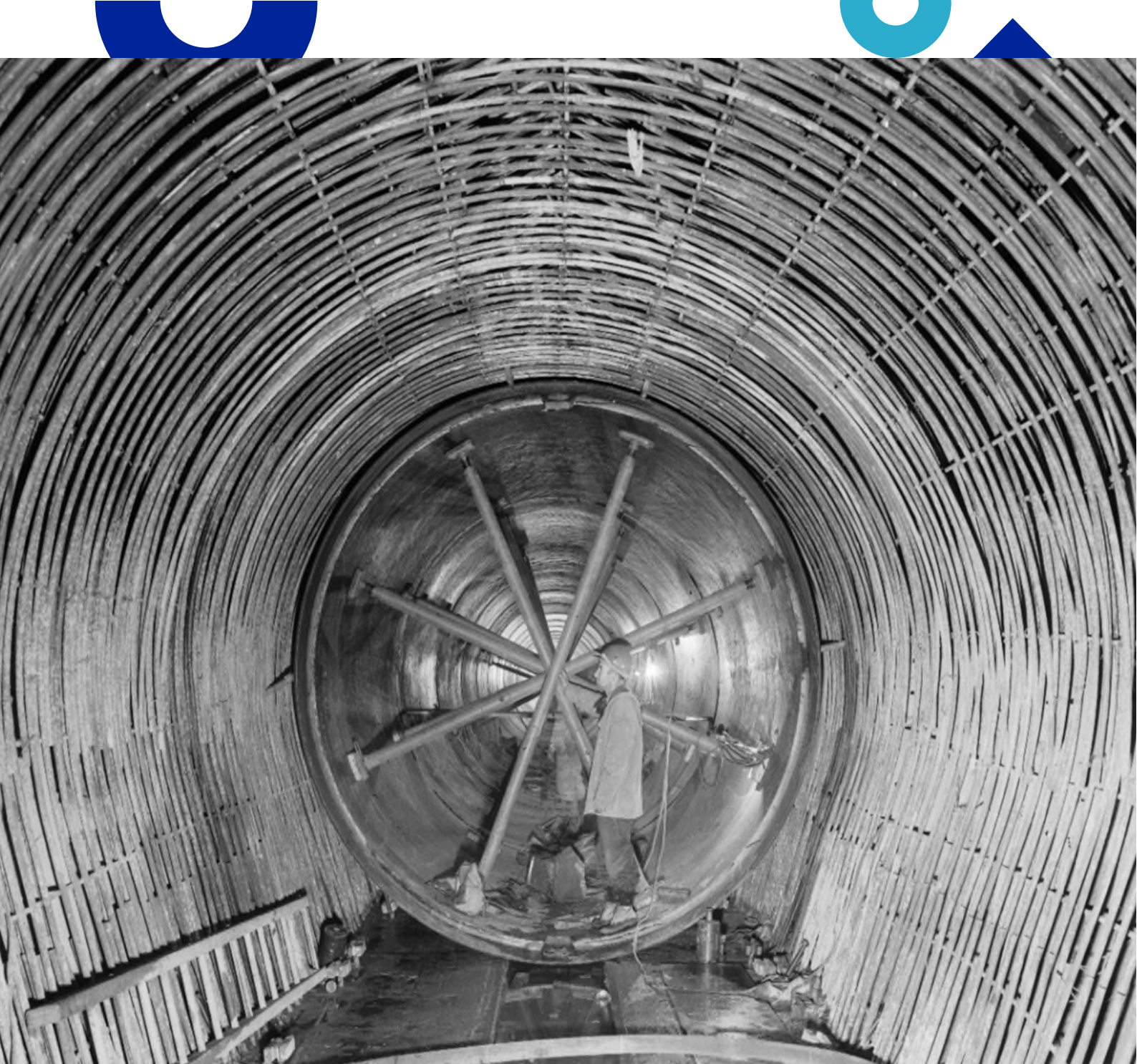




Review of Environmental Factors

Pressure Tunnel Inspection (August, 2025)

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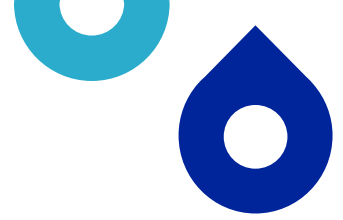
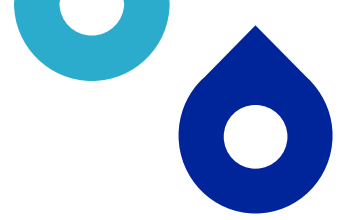


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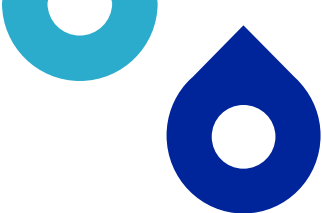
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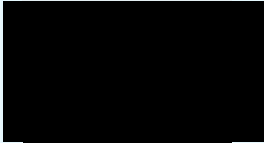
Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of the Pressure Tunnel inspection. 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.

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 information it contains is neither false nor misleading.

Prepared by:	Reviewed and endorsed by:	Endorsed by:
 Emma McIntyre Senior Environmental Scientist Sydney Water Date: 29/8/2025	 Samantha Prior Principal Environmental Scientist Sydney Water Date: 29/8/2025	 Sameed Ejaz Project Manager Sydney Water Date: 05/09/2025

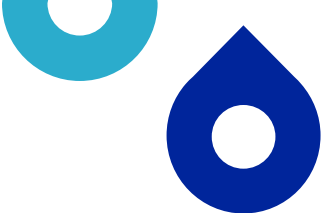
Decision Statement

The main potential construction environmental impacts of the proposal include groundwater and surface water impacts, noise and heritage impacts. No operational impacts are expected.

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.

Determined by:	Murray Johnson, Senior Manager Environment and Heritage, Water and Environmental Services, Sydney Water	Date: 5/09/2025 
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1. Introduction

1.1 Context

Sydney Water provides water, wastewater, recycled water and some stormwater services to over five million people. We operate under the *Sydney Water Act 1994* and have three equal objectives to protect public health, protect the environment and be a successful business.

We are a statutory State-owned corporation and are classified as a public authority, and a determining authority for the proposal under Division 5.1 of the EP&A Act. This REF assesses the potential environmental impacts associated with the Pressure Tunnel inspection and identifies mitigation measures that avoid or minimise potential impacts.

1.2 Proposal background and need

Table 1-1 summarises the proposal need, objectives and consideration of alternatives.

Table 1-1 Proposal need, objectives and consideration of alternatives

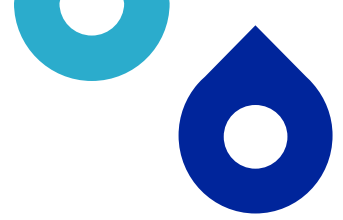
Aspect	Relevance to proposal
Proposal need	The Pressure Tunnel was built in the early 1900s and is a significant and important asset supplying potable water to around three million people. An inspection of the Pressure Tunnel is required every 30 years. The next inspection is planned for Winter 2026. Inspection of the Pressure Tunnel requires shutdown and dewatering of the tunnel. Dewatering of potable water from within the tunnel as well as groundwater surrounding the tunnel is required.
Proposal objectives	The proposal objective is to assess the condition of the pressure tunnel and to install monitoring equipment.

1.3 Consideration of Ecologically Sustainable Development

Table 1-2 considers how the proposal aligns with the principles of ecologically sustainable development (ESD).

Table 1-2 Consideration of principles of ecologically sustainable development (ESD)

Principle	Proposal alignment
Precautionary principle – <i>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</i>	The proposal will not result in serious or irreversible environmental damage and there is no scientific uncertainty relating to the proposal. The potential impacts of tunnel dewatering on groundwater have been assessed by a specialist study and a conservative estimate is used.



Principle	Proposal alignment
<i>practicable, and an assessment of the risk-weighted consequences of various options.</i>	
Inter-generational equity – <i>the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.</i>	The proposal will help to meet the needs of future generations by providing a reliable water service.
Conservation of biological diversity and ecological integrity – <i>conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.</i>	The proposal will not significantly impact on biological diversity or impact ecological integrity.
Improved valuation, pricing and incentive mechanisms — <i>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</i>	The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment.

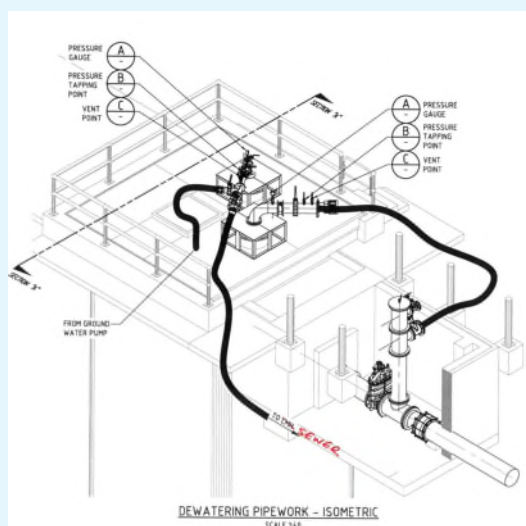
2. Proposal description

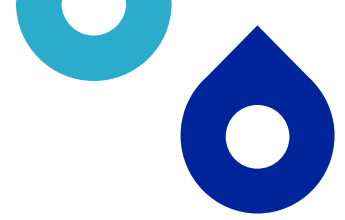
2.1 Proposal details

Table 2-1 describes the proposal and Figure 2-1 shows the location of the Pressure Tunnel.

Table 2-1 Description of proposal

Aspect	Detailed description
Proposal description	The proposal is an inspection of the Pressure Tunnel which is a 17km underground tunnel from Potts Hill to Waterloo (see Figure 2-1). The proposal includes: • shutdown of the Pressure Tunnel • dewatering of potable water from the Pressure Tunnel via shafts 5 and 11, as well as some minor dewatering from shaft 1 if required • dewatering of groundwater via shafts 5 and 11 • installation of temporary pipework to connect to the nearest stormwater canal for disposal of dewatered potable water • installation of temporary pipework to connect to the nearest wastewater maintenance hole for disposal of dewatered groundwater • temporary site compounds at additional shaft sites along the Pressure Tunnel alignment • internal inspection and condition assessment of the Pressure Tunnel • recharging the Pressure Tunnel. The typical dewatering pump arrangement at shafts 5 and 11 is shown below. Potable water will be discharged to stormwater following chlorine neutralisation by addition of ascorbic acid. Groundwater will be discharged to the wastewater network.





Aspect	Detailed description
--------	----------------------

Location and land ownership

The Pressure Tunnel alignment is in the Local Government Areas of Canterbury-Bankstown, Strathfield, Burwood, Inner West and City of Sydney.

The majority of the dewatering of potable water from the Pressure Tunnel will occur via shafts 5 and 11. Some minor dewatering may occur via shaft 1.

Dewatering of groundwater will occur via shafts 5 and 11.

Most of the dewatering works will be contained within Sydney Water property. Some pipework connections and dechlorination equipment may be required outside of Sydney Water property at shafts 1 and 11 to connect dewatering pipework to the nearest wastewater connection points. The location and land ownership of each dewatering shaft site is outline in Table 2-2 below.

Table 2-2 Location of dewatering works and land ownership

Shaft site	Sydney Water owned land	Land owned by others
Shaft 1	Lot 1446 DP132224, Rookwood Road, Yagoona	Lot 3 DP1102984: Temporary pipework and discharge of potable water to Cooks River Canal (stormwater).
Shaft 5	Lot 1 DP613377, Therry Street, Strathfield South Discharge of potable water to Cooks River Canal (stormwater), Lot 2 DP613377 Discharge of groundwater to wastewater maintenance hole within shaft site	Nil
Shaft 11	Lots 14, 15, 16 and 17, Section 2 DP1576 and Lot 1 DP187816, Weston Street, Dulwich Hill	Lot 19 DP1220375: - Temporary pipework and discharge of potable water to Hawthorne Canal (stormwater) - Temporary pipework and discharge of groundwater to maintenance hole.

Some temporary compounds will be established at additional shaft sites along the Pressure Tunnel alignment to monitor potable water and groundwater during the dewatering process.

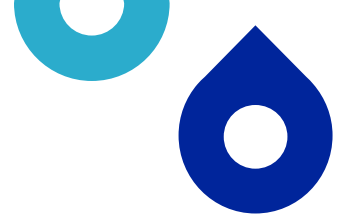
Site establishment and access tracks

Site establishment would include site setup and preparation of dewatering equipment. Notification of the proposed works would be provided to affected customers and councils.

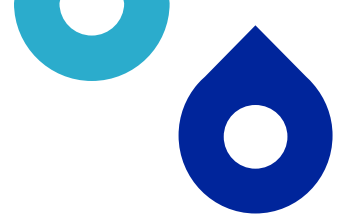
Ancillary facilities (compounds)

Temporary compounds are required at the dewatering shafts (1, 5 and 11) and at additional monitoring shaft sites along the Pressure Tunnel alignment.

All compounds will be contained within Sydney Water owned land.



Aspect	Detailed description
	The exact location of these will be chosen by the Delivery Contractor and approved by Sydney Water's Project Manager as described in the mitigation measures in Section 5.
Methodology	Pressure Tunnel inspection works include: • Site establishment: ○ Pressure Tunnel shutdown ○ generators placed at shafts 5 and 11 for dewatering groundwater ○ installation of CCTV for inspection of shafts and monitoring water levels within the pipeline at Shaft 6 • Dewatering the Pressure Tunnel: ○ dewatering of up to 90 ML of potable water from the pressure tunnel via shafts 5 and 11, with potential minor dewatering via shaft 1 ○ dewatering of 3.23 ML of groundwater from the pressure tunnel's crown drain via shafts 5 and 11 • Discharge of extracted potable water and groundwater: ○ installation of temporary pipework from groundwater pumps at shafts 5 and 11 to nearest wastewater connection points ○ installation of temporary pipework to connect to the nearest wastewater maintenance hole for disposal of dewatered groundwater ○ chlorine neutralisation of potable water by addition of ascorbic acid ○ discharge of dewatered potable water to the stormwater network in accordance with Sydney Water's <i>Water Quality Management During Operational Activities Procedure</i> • Internal inspection of the Pressure Tunnel including: ○ condition assessment ○ minor repairs to tunnel lining ○ installation of monitoring sensors to be welded/glued/fixed to the interior of the tunnel and shafts ○ installation of optic fibre along the tunnel to monitoring sensors ○ detailed survey of the tunnel alignment and grade. • Recharging of the Pressure Tunnel.
Restoration	All work sites will be restored to the pre-existing condition following construction, in consultation with landowners where relevant.
Materials/ equipment	The equipment required for works include: • pumping equipment • dosing equipment for dechlorination



Aspect	Detailed description
	- flexible hose piping - monitoring equipment for flow rate and water quality - generators - ventilation fans - vehicles.
Work hours	Work and deliveries will be scheduled to occur during standard daytime hours of: 7am to 6pm, Monday to Friday 8am to 1pm, Saturdays. The proposal is expected to require work outside these hours for dewatering and re-pressurising of the tunnel, where pumps would run 24 hours a day. Sydney Water's Project Manager can approve additional work outside of standard daytime hours, following the approval process described in the safeguards in Section 6.
Proposal timing	Construction is expected to start in July 2026 and take approximately four weeks from dewatering to re-pressurisation.

2.2 Field assessment area and changes to the scope of work

The proposal shown in this REF is indicative and based on the latest concept design at the time of REF preparation. The final proposal may change based on detailed construction planning. The general mitigation measures outline when changes to the proposal trigger supplementary environmental impact assessment. If required, further assessment must be prepared in accordance with SWEMS0019.

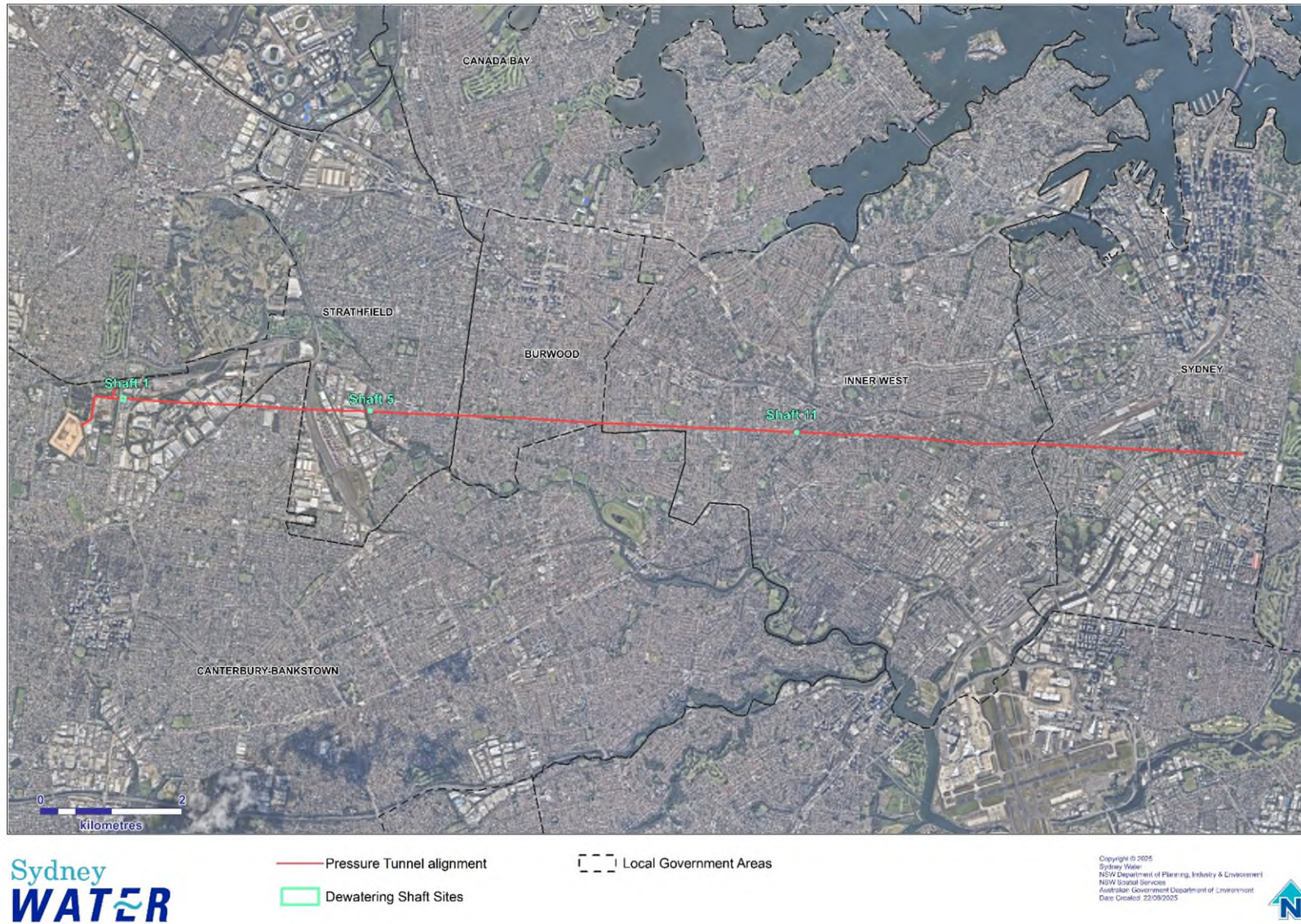
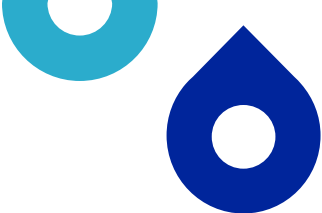


Figure 2-1 Location of proposal



3. Consultation

3.1 Community and stakeholder consultation – general

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, proposal 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. If our work impacts the community in some way, we will consult with affected groups throughout the proposal. 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 such as public safety issues, temporary works on council land, and full or partial road closures of council managed roads (refer below).

3.2 Community and stakeholder consultation – proposal

Sydney Water will provide the City of Canterbury-Bankstown, Strathfield and Inner West councils with updated communication regarding this proposal and its potential impacts prior to the commencement of works.

Partial road closures may be required near Shaft 11 to allow discharge of dewatered groundwater to the wastewater network. The wastewater maintenance hole to be accessed is at the end of Edward Lane, Dulwich Hill. Edward Lane is a Council owned road. Sydney Water will consult with Inner West Council if access to the road or to private residences is affected.

3.3 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. The proposed works do not trigger any of the TISEPP consultation requirements (refer Appendix B).

4. Legislative requirements

4.1 Environmental legislation

Sydney Water is the proponent and determining authority under the EP&A Act. The proposal does not require development consent and is not classified as State significant infrastructure. We have assessed this proposal under Division 5.1 of the EP&A Act. This REF has concluded that the proposal is unlikely to have a significant impact on the environment.

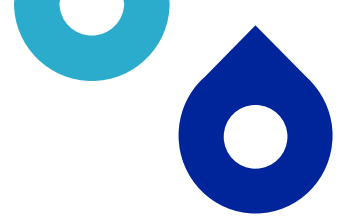
The following environmental planning instruments (Table 4-1) and legislation (Table 4-2) are relevant to the proposal. Table 4-2 also documents any licences and permits required, and timing and responsibility for obtaining them.

Table 4-1 Environmental planning instruments relevant to the proposal

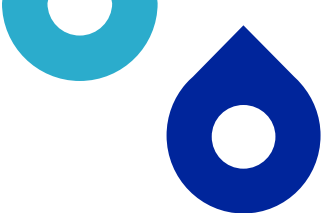
Environmental Planning Instrument	Relevance to proposal
Canterbury-Bankstown Local Environmental Plan 2023	Shaft 1 is located on land zoned SP2 Infrastructure.
Strathfield Local Environmental Plan 2012	Shaft 5 is located on land zoned SP2 Infrastructure.
Inner West Local Environmental Plan 2022	Shaft 11 is located on land zoned SP2 Infrastructure.
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.159(1) of the TISEPP permits development by or on behalf of a public authority for water reticulation systems without consent on any land. The proposal meets the definition of a “water reticulation system”. As Sydney Water is a public authority, the proposal is permissible without consent.

Table 4-2 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>Protection of the Environment Operations Act 1997 (POEO Act)</i>	The proposal has the potential to pollute waters through discharge of potable water, however this will be avoided by appropriate treatment prior to discharge. Dewatered potable water will be dechlorinated and discharged to the stormwater networks, as per Sydney Water’s <i>Water Quality Management During Operational Activities Procedure</i>.	No EPL is required.	Pre-construction and/or prior to operation, Sydney Water



Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>Sydney Water Act 1994</i>	Groundwater will be discharged to the wastewater network to avoid potential contamination of waterways.	Approval to discharge to wastewater network	Pre-construction, Sydney Water
<i>Heritage Act 1977</i>	The Pressure Tunnel and shafts are State Heritage listed. Sydney Water's Heritage Advisor has reviewed the proposal and provided a s57 exemption for the inspection and minor repairs.	N/A (s57 exemption applies)	N/A
<i>National Parks and Wildlife Act 1974 (NPW Act)</i>	No impact to Aboriginal Heritage is expected and an AHIP is not required.	N/A	Pre-construction, Sydney Water
<i>Water Act 1912/ Water Management Act 2000</i>	The proposal requires dewatering of 3.23ML of groundwater. Liaison with DCCEEW has been undertaken and determined that a Water Supply Works Approval (WSWA) is required.	WSWA	Pre-construction, Sydney Water



5. Environmental assessment

Section 5.2 describes the existing environment and assesses direct and indirect impacts of construction and operation. It also identifies mitigation measures to minimise impacts. These will be incorporated into contract documents and a Construction Environmental Management Plan (or similar) prior to starting work.

Additionally, a Dewatering Management Plan has been prepared for groundwater extraction and is provided in this REF (Appendix D).

5.1 Existing environment

The Pressure Tunnel runs underground from Potts Hill to Waterloo. The Pressure Tunnel shafts are located mainly within residential areas although some shafts are capped below ground. All shafts are within Sydney Water property.

Most works occur within the shaft buildings or within the Pressure Tunnel.

Most of the above ground works occur at Shaft 1, Shaft 5 and Shaft 11. All shaft sites comprise of grassed areas, pavement and buildings associated with operation of the shaft. Shaft 5 is within St Annes Reserve.

The stormwater canals where potable water will be discharged are concrete lined.

5.2 Environmental aspects, impacts and mitigation measures

5.2.1 Topography, geology and soils

Existing environment and potential impacts

Shaft 1, Shaft 5 and Shaft 11 sites are located on soils within the Blacktown (bt) soil landscape unit. During construction, we will not disturb ground, remove vegetation, excavate, or stockpile soils. While sediment movement offsite is unlikely, work should be stopped in periods of heavy rainfall.

None of the shaft sites are identified within acid sulfate soils (ASS) risk mapping, however the discharge location for Shaft 5 into Cooks River Canal is mapped as Class 4 acid sulfate soils risk (refer Figure 5-2). Disturbance and/or inappropriate management of ASS has the potential to impact surrounding land and waterways from off-site leaching of acid soils. The proposed works do not involve ground disturbance or excavation, and no impacts to topography, geology or soils are expected. As such, acid sulfate soils are unlikely to be disturbed.

The southern portion of Shaft 11 site contains potential asbestos, polycyclic aromatic hydrocarbons (PAH) and heavy metals in soils. This area is identified as a “No-Go” area for the proposed works (refer Figure 5-4), and there will be no soil disturbance as part of the proposal. Therefore, it is unlikely that contaminated soils will be disturbed.

Mitigation measures

With the implementation of the mitigation measures below, impacts to topography, geology and soils can be adequately managed, and residual impacts are expected to be minor.

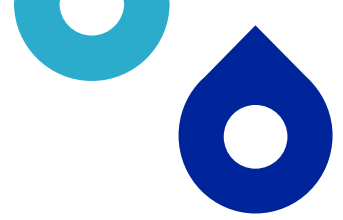


Table 5-1 Environmental mitigation measures — topography, geology and soils

Mitigation measures
Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site.
Sweep up any sediment/soil transferred off site at least daily, or before rainfall.

5.2.2 Water and drainage

Existing environment and potential impacts

Surface Water

The proposal has the potential to impact surface waters through the discharge of up to 90 ML of potable water to the nearby stormwater network over a period of 21 days. The majority of the discharge will occur at shafts 5 and 11 into the Cooks River Canal and Hawthorne Canal respectively. Some minor dewatering of potable water may also occur via Shaft 1, with discharge to Cooks River Canal. Sydney Water's *Water Quality Management During Operational Activities Procedure* will be applied. All potable water will be dechlorinated prior to discharge.

Cooks River Canal is a concrete lined stormwater channel that flows in a southeast direction towards Cooks River and then to Botany Bay. Hawthorne Canal is a concrete lined stormwater channel that flows north to Iron Cove in Sydney Harbour. As both canals are concrete lined, no erosion is expected to occur.

Dewatered groundwater from shafts 5 and 11 will be discharged to the nearest wastewater connection points. This is to prevent potential contamination of local waterways.

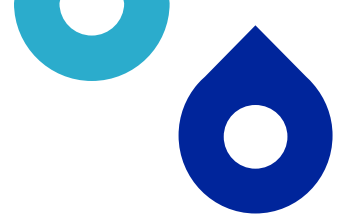
Shafts 5 and 11 are adjacent to 1 in 100 year flood hazard zones (refer Figure 5-2 and Figure 5-3).

Groundwater

The majority of the Pressure Tunnel alignment is within the Sydney Basin Central groundwater source, with a small section at the eastern end in the Botany Sands groundwater source (refer Figure 5-1). The Pressure Tunnel contains a 'crown drain' designed to drain groundwater from outside of the Pressure Tunnel's steel liner to relieve groundwater pressure on the Pressure Tunnel and avoid collapse. The crown drain is partially open to surrounding groundwater in these sources.

A groundwater assessment was completed by GHD in June 2025 (refer Appendix C). The assessment found that ecological criteria was exceeded at Shaft 5 and Shaft 11 for turbidity, nitrogen (total), and ammonia as N. At Shaft 11, the ecological criteria for phosphorus was also exceeded. The report concluded that:

- the effects of dewatering induced drawdown on surrounding groundwater receptors would be minimal, however groundwater monitoring is recommended to verify that the drawdown effects are acceptable.
- groundwater discharge to surface waters could result in adverse impacts to downstream aquatic receptors. As such, disposal to the wastewater network is recommended.



There are no Groundwater Dependent Ecosystems (GDEs) within 500 m of shafts 5 or 11 (Figure 5-1). There is a GDE within 500 m of shaft 1 (Figure 5-2), where only minor dewatering of potable water from the Pressure Tunnel will occur. This is further discussed in section 5.2.3.

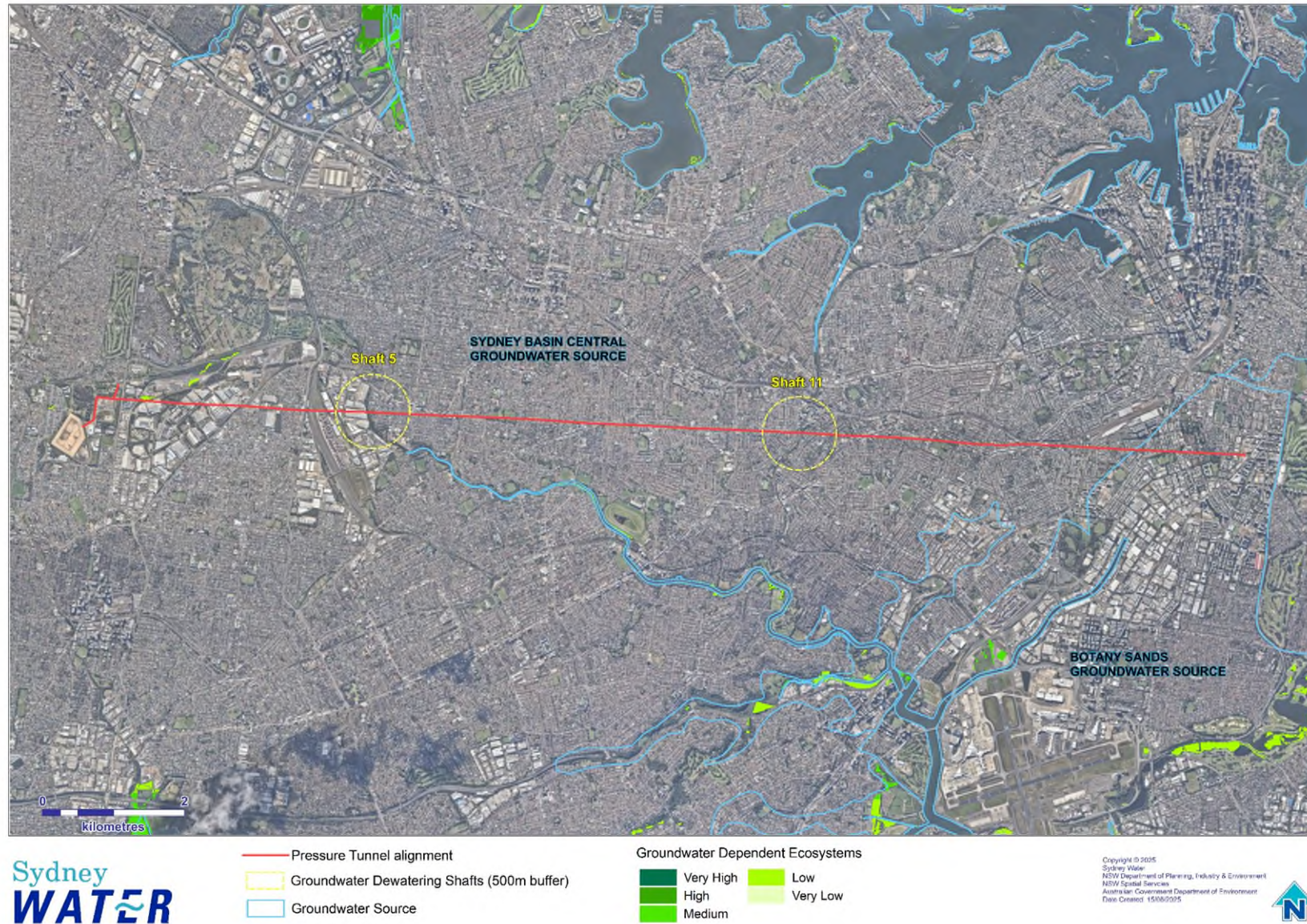
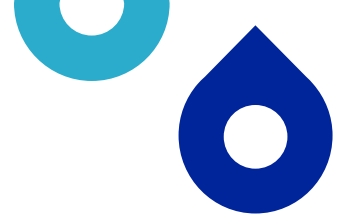


Figure 5-1 Groundwater Sources and Groundwater Dependent Ecosystems



The proposal has the potential to impact groundwater by:

- reducing the groundwater available for other users
- mobilising contaminated groundwater plumes
- spills or leaks from fuels and chemicals.

Groundwater wells used for commercial and water supply purposes may experience some drawdown associated with the dewatering of the Pressure Tunnel. Impacts are expected to be minimal due to the short duration of dewatering. Additionally, water levels are expected to recover once dewatering has ceased.

Mitigation measures

With the implementation of the mitigation measures below, impacts to water and drainage can be adequately managed, and residual impacts are expected to be minor.

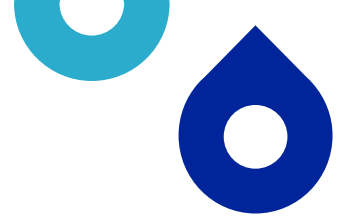
Table 5-2 Environmental mitigation measures — water and drainage

Mitigation measures
Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills. Keep the spill kits stocked and located for easy access.
Locate portable site amenities, chemical storage and stockpiles of erodible materials away from watercourses, drainage lines and flood prone areas.
Store all chemicals and fuels in accordance with relevant Australian Standards and Safety Data Sheets. Record stored chemicals on site register. Ensure bunded areas have 110% capacity of the largest chemical container, or an additional 25% capacity of the total volume stored within (whichever is greater). Tightly secure chemicals and fuels in vehicles. Clearly label all chemicals.
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.
No wash down of equipment permitted onsite.
Discharge all potable water in accordance with Sydney Water's Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable water where possible.
Seek approval and discharge criteria from the relevant Sydney Water Network Area Manager prior to discharge of groundwater to the wastewater system. Otherwise tanker by a licensed waste contractor and dispose off-site to an appropriately licensed facility.
Obtain a groundwater Water Supply Works Approval from DCCEEW and comply with any relevant conditions (such as minimising aquifer extraction volumes, monitoring extraction with flow meters and recording volumes).

5.2.3 Flora and fauna

Existing environment and potential impacts

There is no native vegetation mapped within 500 m of shaft 5 or 11. Some patches of native vegetation occur within 500 m of shaft 1 (Figure 5-2). The proposal does not require clearing or modification of any



vegetation. It is therefore unlikely that any Threatened Ecological Communities or habitat for terrestrial threatened species would be impacted by the proposal.

There are no GDEs within 500 m of shaft 5 or 11, where groundwater dewatering will occur. There is a GDE associated with the SEPP Coastal Wetland mapped to the east of Shaft 1 (Figure 5-1). Only minor dewatering of potable water from the pressure tunnel will occur at Shaft 1, and all dewatered potable water will be treated and discharged to the stormwater system downstream of the GDE and Coastal Wetland area. The proposal is unlikely to impact the GDE or the Coastal Wetland.

Key Fish Habitat is mapped in Cooks River, approximately 900 m downstream of Shaft 5 (refer Figure 5-2) and in Hawthorne Canal, approximately 1.2 km downstream of Shaft 11. There is the potential for the discharge of potable water to impact aquatic ecology in downstream environments. However, due to the managed flow rate, potable water quality and concrete lined channel it is considered unlikely that aquatic ecology and/or key fish habitat would be impacted.

Threatened flora and fauna species have been recorded within 500 m of the shaft sites. As no vegetation clearing or modification is required, and there will be no impacts to downstream aquatic environments, there will be no impacts to threatened flora species or fauna species.

Mitigation measures

With the implementation of the mitigation measures below, impacts to flora and fauna can be adequately managed, and residual impacts are expected to be minor.

Table 5-3 Environmental mitigation measures — flora and fauna

Mitigation measures
Do not remove any vegetation or disturb the ground surface.
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.

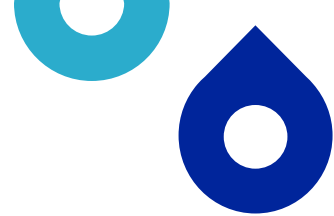


Figure 5-2 Shaft 1 – Biodiversity, soils and waterways

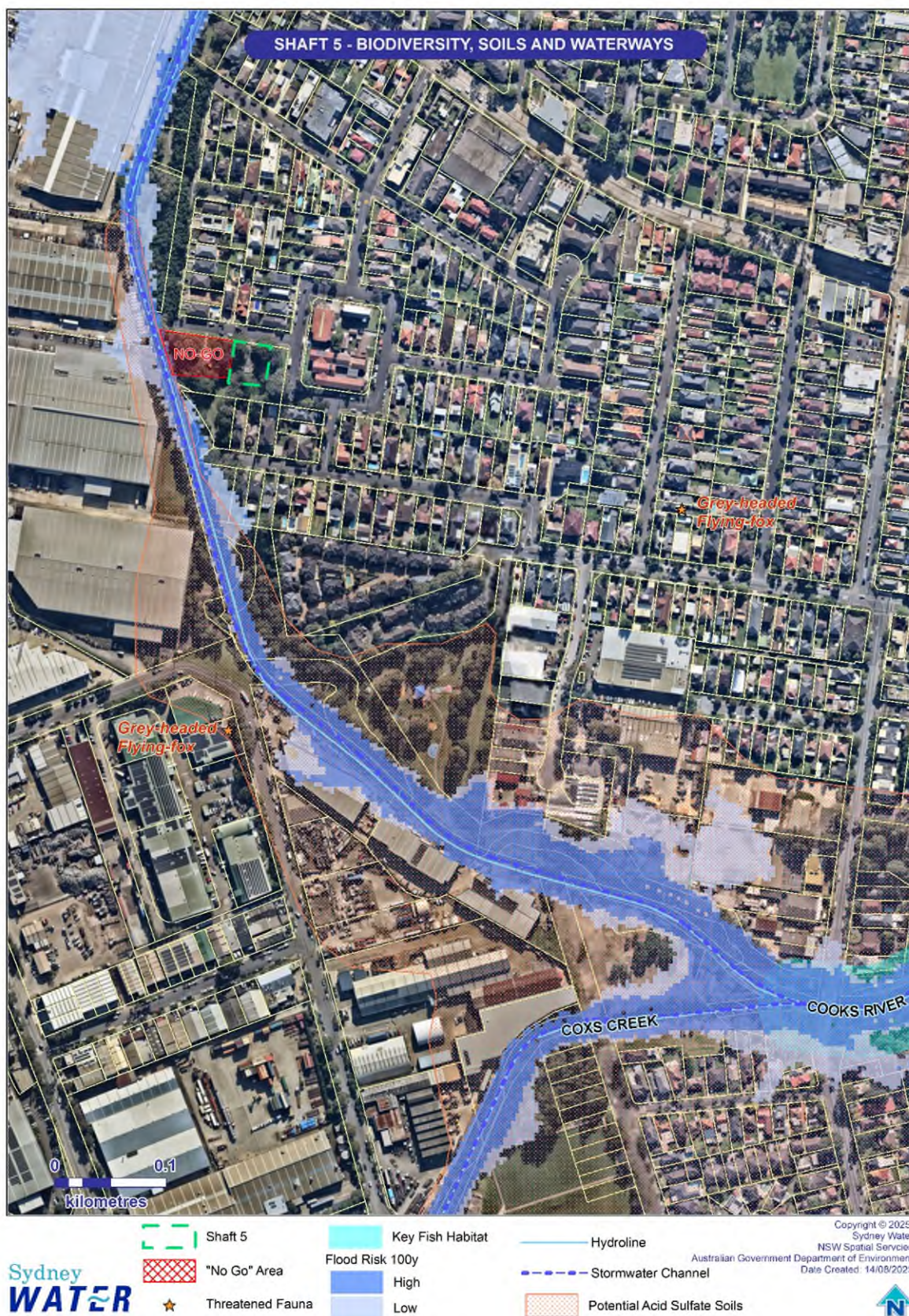
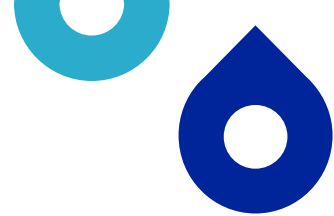


Figure 5-3 Shaft 5 - Biodiversity, soils and waterways

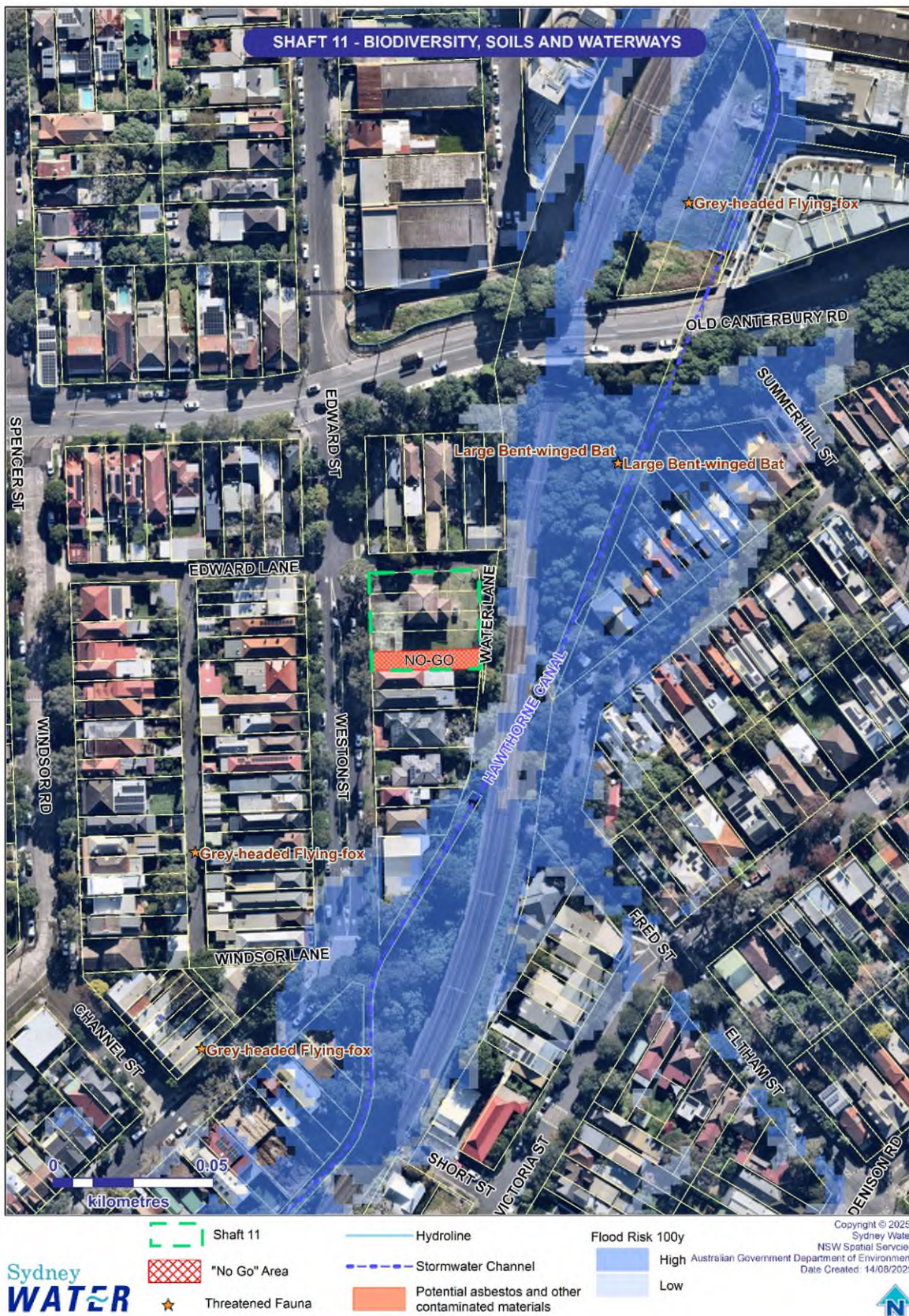
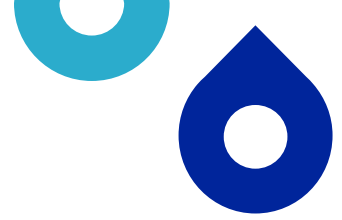


Figure 5-4 Shaft 11 – Biodiversity, soils and waterways

5.2.4 Heritage

Existing environment and potential impacts

Aboriginal heritage:

Shafts 5 and 11 are in a high risk landscape for Aboriginal Heritage, being within 200m of a waterway. A search of the Aboriginal Heritage Information Management System (AHIMS) was complete on 28th May 2025. [REDACTED]

Non-Aboriginal heritage

The proposal is within the curtilage of the following heritage listed items:

- Pressure Tunnel and Shafts listed on the State Heritage Register (SHR #01630) and Sydney Section 170 Heritage and Conservation (s170) Register
- Pressure Tunnel Shaft No 1 and associated infrastructure listed on the State Heritage Register (SHR #01334), s170 and Canterbury-Bankstown LEP (I106)
- Pressure Tunnel Shaft (Shaft 11) listed on Inner West LEP (I1026)
- Hawthorne Canal is listed as s170 heritage item.

The proposal will not have an adverse impact on the significance of heritage items. A s57 heritage exemption applies to State Heritage Register items (Appendix E). There will be no impacts to the heritage value of Hawthorne Canal from the temporary discharge of dewatered potable water.

Mitigation measures

With the implementation of the mitigation measures below, impacts to heritage can be adequately managed, and residual impacts are expected to be minor.

Table 5-4 Environmental mitigation measures — heritage

Mitigation measures
Do not make publicly available or publish, in any form, Aboriginal heritage information on sites / potential archaeological deposits, particularly regarding location.
The area west of the playground in St Annes Reserve (Shaft 5) is a no-go area. Install appropriate barricades and signage defining the no-go area prior to commencement of works.
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 .

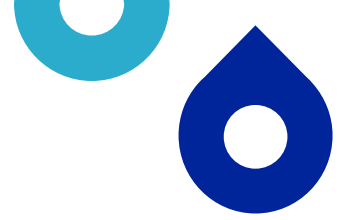
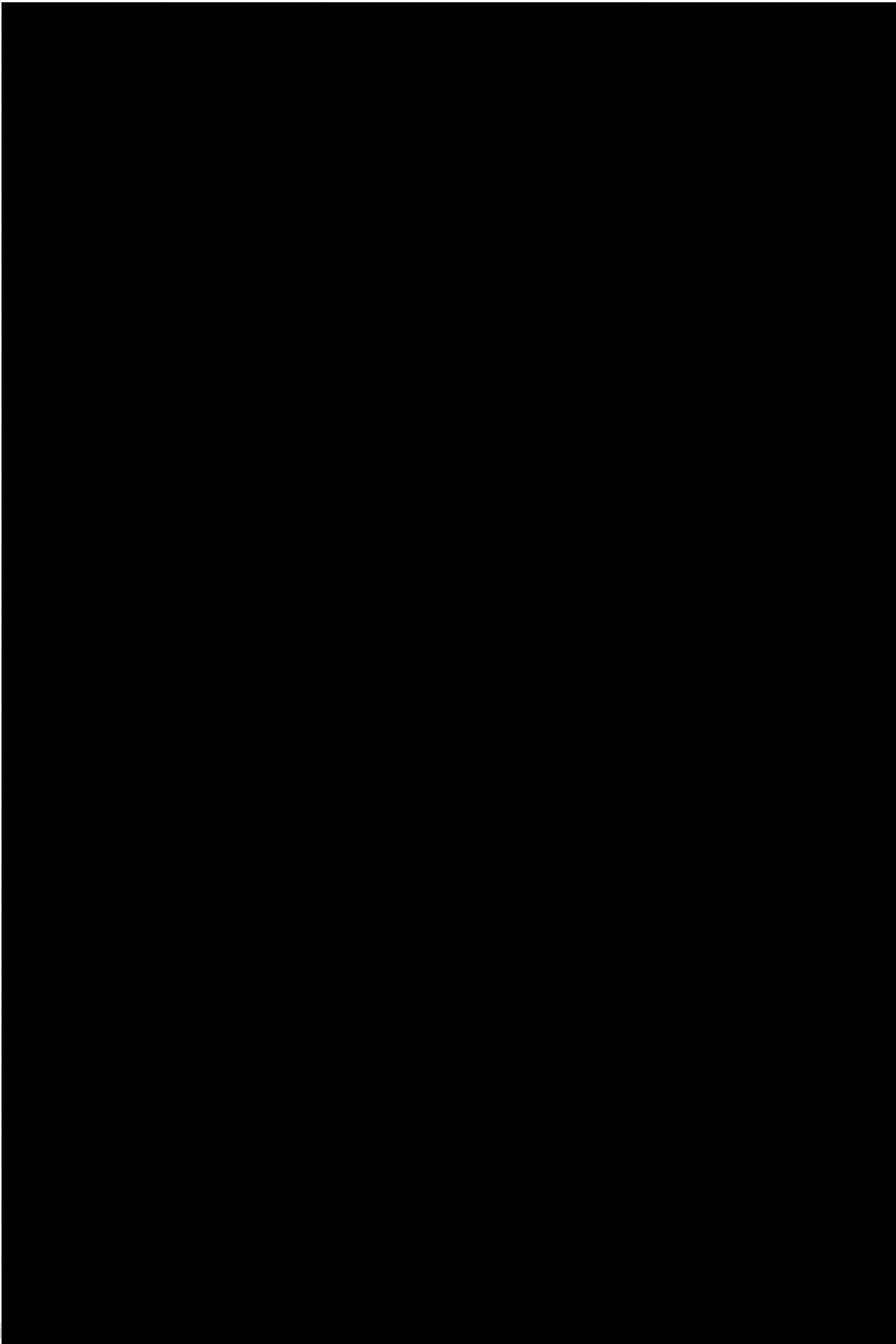
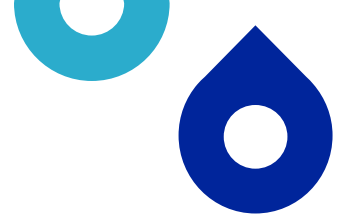


Figure 5-5 Shaft 1 - Heritage



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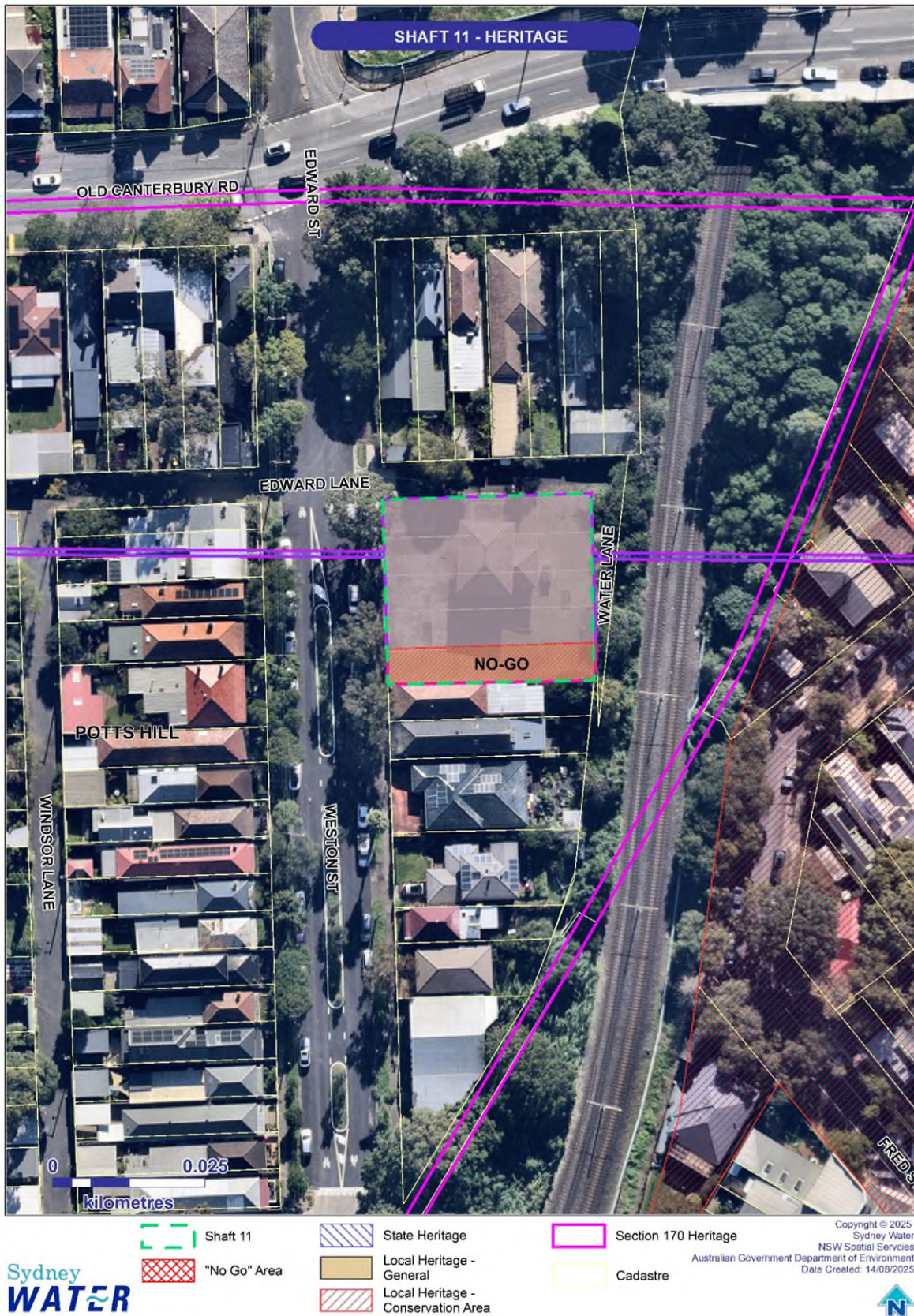
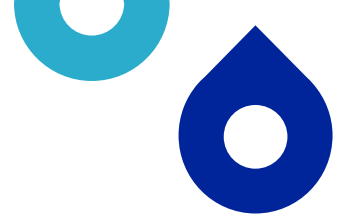


Figure 5-7 Shaft 11 - Heritage

5.2.5 Noise and vibration

Existing environment and potential impacts

Sensitive receivers include residential, commercial and industrial properties close to the shaft sites.

Additionally shaft 5 is within St Annes Reserve and next to St Annes Catholic Primary School and St Annes Catholic Church. The proposal may generate noise from generators and dewatering pumps.

Works will be required outside of standard daytime hours as dewatering and re-pressurising the tunnel will occur 24 hours a day. These works have the potential to exceed the Interim Construction Noise Guideline and impact on sensitive receivers. However, works are of short duration and can be effectively managed by implementing the mitigation measures outlined below.

The proposal will not generate vibration during construction and operation.

Mitigation measures

With the implementation of the mitigation measures below, impacts to noise and vibration can be adequately managed, and residual impacts are expected to be minor.

Table 5-5 Environmental mitigation measures — noise and vibration

Mitigation measures
Where possible, schedule work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. No work to be scheduled on Sunday nights or public holidays. Any proposed work outside of these hours (apart from works described in this REF) must be justified. The Proposal will also be carried out in accordance with: • Sydney Water's Noise Management Procedure SWEMS0056 • Noise Policy for Industry (EPA, 2017) All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts.

Incorporate noise management safeguards into the CEMP:

- identify and consult with the potentially affected residents prior to commencement of works:
 - notify all potentially impacted residents and sensitive noise receivers not less than one week prior to commencing night work
 - 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 complaint handling procedure
- appropriate plant will be selected for each task, to minimise the noise impact (eg all stationary and mobile plant will be fitted with residential type silencers)
- regularly inspect and maintain equipment in good working order
- arrange work sites where possible to minimise noise (eg generators away from sensitive receivers, minimise use of vehicle reversing alarms)
- briefing workers on the need to minimise noise
 - no unnecessary loud voices (eg using CB radios, mobile phones or conversing)

Mitigation measures

- extra care taken while loading or unloading trucks
- additional monitoring or acoustic barriers if required.

5.2.6 Air and energy

Existing environment and potential impacts

Above ground works will occur at shafts 1, 5 and 11. Potential sensitive receivers include residential, commercial and industrial properties close to the shafts. Additionally Shaft 5 is within St Annes Reserve and adjacent to St Annes Catholic Primary School and St Annes Catholic Church.

The proposal has the potential to produce emissions from machinery, equipment and vehicles used during construction, including generators to be located at shafts 5 and 11 for dewatering. However, emissions will be minor and temporary in duration.

There is the potential for odour impacts from open maintenance holes. However, impacts will be temporary and are considered minor with implementation of mitigation measures.

Mitigation measures

With the implementation of the mitigation measures below, impacts to air and energy can be adequately managed, and residual impacts are expected to be minor.

Table 5-6 Environmental mitigation measures — air and energy

Mitigation measures

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.

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

Switch off vehicles/machinery when not in use.

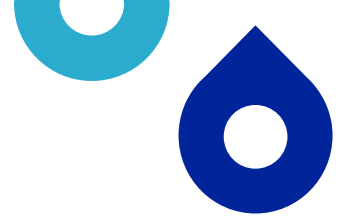
5.2.7 Waste and hazardous materials

Existing environment and potential environmental impacts

Our corporate objectives include to be a resource recovery business with an increasing portfolio of circular economy products and services. This includes reducing waste through recycling and re-use, and encouraging our suppliers to minimise waste.

The proposal requires the disposal of potable water to the stormwater system following dechlorination, and disposal of groundwater to the wastewater system due to contamination levels.

There are hazardous building materials including asbestos, lead paint, synthetic mineral fibres (SMF) and poly-chlorinated biphenyls (PCB) known to be present in shafts 1 and 11. Additionally lead contaminated



dust may be present on all surfaces inside the shaft houses. Due to the scope of works this is considered unlikely to pose an environmental risk.

Mitigation measures

With the implementation of the mitigation measures below, impacts to waste and hazardous materials can be adequately managed, and residual impacts are expected to be minor.

Table 5-7 Environmental mitigation measures — waste and hazardous materials

Mitigation measures
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.
Hazardous building materials registers are to be consulted prior to the commencement of works. • 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 the Contamination and Hazardous Materials Team for advice). • Manage lead paint in accordance with the WHS Regulation (2017) Part 7.2 and the Australian Standard Lead Paint Management Guidelines. Contact Sydney Water Project Manager (who will consult with the Contamination and Hazardous Materials Team for advice). • Work plans and SWMS documents should be reviewed by the Sydney Water Project Manager and Occupational Hygienist.

5.2.8 Traffic and access

Existing environment and potential impacts

The proposal would be accessed via existing roads and confined to Sydney Water property in most instances.

Works would be undertaken in the shaft buildings, except for the dewatering and laying of temporary dewatering pipework.

The proposal will not impact access to nearby private properties adjacent to the shaft sites.

Partial road closures may be required near Shaft 11 to allow discharge of dewatered groundwater to the wastewater network. The wastewater maintenance hole to be accessed is at the end of Edward Lane, Dulwich Hill. Edward Lane is a Council owned road. Sydney Water will consult with Inner West Council. Any impacts to local residents would be mitigated by appropriate traffic control.

The availability of street parking at the shaft sites would be temporarily impacted for the duration of works by construction vehicles.

Mitigation measures

With the implementation of the mitigation measures below, impacts to traffic and access can be adequately managed, and residual impacts are expected to be minor.

Table 5-8 Environmental mitigation measures — traffic and access

Mitigation measures
Ensure work vehicles do not obstruct vehicular or pedestrian traffic, or private driveway, public facility or business access unless necessary and only if appropriate notification has been provided.
Erect signs to inform road users of the proposed works and any temporary road closures.
Consult with the relevant traffic authority about managing impacts to pedestrian traffic, signposting, meters, parking, line-marking or if traffic control or pavement restoration is required.
Manage sites to allow people to move safely past the works, including alternative pedestrian, bicycles, pram and wheelchair access.
Discharge of dewatered groundwater to wastewater at Shaft 11 may require a Traffic Management Plan to be prepared in consultation with Inner West Council. If these works are within 100 m of a TfNSW road or within 100 m of traffic signals, the Delivery Contractor will obtain a Road Occupancy Licence (ROL) from TfNSW.

5.2.9 Social and visual

Existing environment and potential impacts

The proposal will require the use of generators within Sydney Water property at shafts 5 and 11 for the duration of works. Additionally, temporary dewatering pipes will be laid between shafts 1, 5 and 11 to the stormwater and wastewater connection points.

There is the potential for visual impacts from equipment or odour impacts from open maintenance holes. However, impacts will be temporary and are considered minor with implementation of mitigation measures.

Mitigation measures

With the implementation of the mitigation measures below, social and visual impacts can be adequately managed, and residual impacts are expected to be minor.

Table 5-9 Environmental mitigation measures — social and visual

Mitigation measures
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.
Minimise the potential for odours (eg minimise the number of open access chambers, close maintenance holes overnight.)
Maintain work areas in a clean and tidy condition.
Restore work sites to pre-existing condition or better.

5.2.10 Cumulative and future trends

Potential environmental impacts

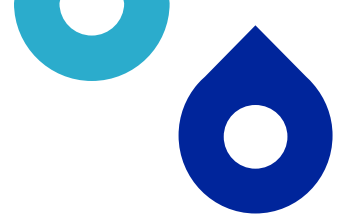
Sydney Water is not aware of any other works occurring in the area within the same timeframe (winter 2026). No specific mitigation measures are recommended. Existing community liaison mitigation measures should adequately manage potential impacts.

5.2.11 General environmental management

Table 5-10 Environmental mitigation measures — general environmental management

Mitigation measures
Prepare a Construction Environmental Management Plan (CEMP) addressing the requirements of this environmental assessment. The CEMP should specify licence, approval and notification requirements including the Dewatering Management Plan provided in Appendix D and any conditions of the WSWA to be issued by DCCEEW. 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: • “No-Go” areas and boundaries of the work area • 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. 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, individual mature trees 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. 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.

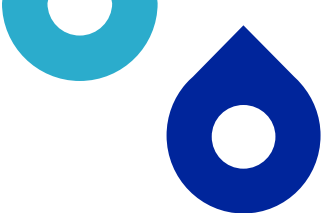
To ensure compliance with legislative requirements for incident management (eg *Protection of the Environment Operations Act 1997*), Follow [SWEMS0009](#) and attach [SWEMS0009](#) to the CEMP.



Mitigation measures

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.



6. Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of the Pressure Tunnel Inspection. An inspection of the Pressure Tunnel is required every 30 years. The next inspection is planned for Winter 2026.

The main potential construction environmental impacts of the proposal are:

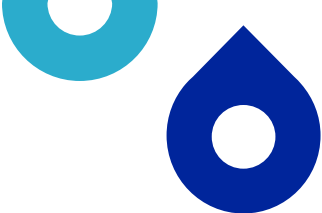
- groundwater impacts due to dewatering
- surface water quality impacts due to discharge of potable water to Cooks River Canal and Hawthorne Canal
- noise during the dewatering procedure.

These impacts are anticipated to be minor with implementation of the environmental safeguards and mitigation measures outlined in this REF.

There are no potential operational environmental impacts.

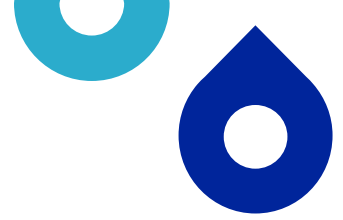
Given the nature, scale and extent of impacts and implementation of the mitigation measures outlined in this REF, the proposal is unlikely to have a significant impact on the environment. Therefore, an environmental impact statement is not required under Division 5.1 of the EP&A Act.

The REF considers how the proposal aligns with the principles of ESD. The proposal will result in positive long-term environmental improvements. The proposal will not result in the degradation of the quality of the environment and will not pose a risk to the safety of the environment.



Appendix A – Section 171 checklist

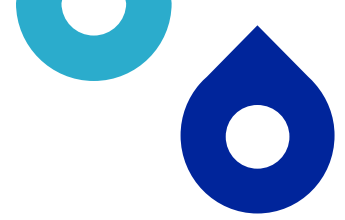
Section 171 checklist	REF finding
Any environmental impact on a community	There may be short-term impacts on the community from noise generated during the works. There will be environmental improvements by providing a reliable water service to the local community.
Any transformation of a locality	The 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
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposal will not reduce these factors.
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 an adverse impact on the significance of heritage items. A s57 heritage exemption applies to State Heritage Register items (Appendix E). There will be no impacts to the heritage value of Hawthorne Canal from the temporary discharge of dewatered potable water.
Any impact on the habitat of any protected animals (within the meaning of the <i>Biodiversity Conservation Act 2016</i>)	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 endanger any species.
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 water service for the area.
Any degradation of the quality of the environment	The proposal will maintain the quality of the environment.
Any risk to the safety of the environment	The proposal will ensure the safety of the environment.



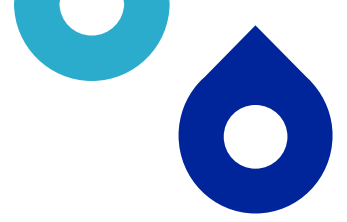
Section 171 checklist	REF finding
Any reduction in the range of beneficial uses of the environment	The proposal will maintain the range of beneficial uses of the environment.
Any pollution of the environment	Environmental mitigation measures will mitigate the potential for the proposal to pollute the environment. No pollution of the environment is expected.
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 affect demand on resources.
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 these factors.
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 for water infrastructure.
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 TISEPP consultation

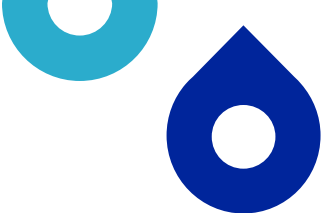
TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		N
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		N
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		N
Connect to, and use a substantial volume of water from a council owned water supply system?		N
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?		N
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?		N
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?		N
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?		N
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)?		N
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?		N
Section 2.15, consultation with public authorities other than councils		



TISEPP section	Yes	No
Will the proposal be on land adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i> or land acquired under Part 11 of that Act? <i>If so, consult with DPE (NPWS).</i>		N
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? <i>If so, consult with DPE (NPWS).</i>		N
Will the proposal include a fixed or floating structure in or over navigable waters? <i>If so, consult TfNSW.</i>		N
Will the proposal be on land in a mine subsidence district within the meaning of the <i>Coal Mine Subsidence Compensation Act 2017</i> ? <i>If so, consult with Subsidence Advisory NSW.</i>		N
Will the proposal be on land in a Western City operational area specified in the <i>Western Parkland City Authority Act 2018</i> , Schedule 2 and have a capital investment value of \$30 million or more? <i>If so, consult the Western Parkland City Authority.</i>		N
Will the proposal clear native vegetation on land that is not subject land (ie non-certified land)? <i>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).</i>		N



Appendix C – Groundwater Assessment



Appendix D – Dewatering Management Plan

This Dewatering Management Plan is required as part of Water Supply Works Approval (WSWA) application to NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) and will form part of the project Construction Environmental Management Plan (CEMP).

Dewatering Method

During the dewatering event, gravity scours are to be opened at Shafts 5 and 11, which will dewater the majority of the tunnel. Additional, potable dewatering will be achieved using pumps placed within Shaft 1.

As the Pressure Tunnel is emptied, dewatering of groundwater from the tunnel's crown drain occurs to minimise pressure differential (the water load) on the pipeline. Once the stored groundwater in this crown drain is depleted, there would be an inflow into the drain from the aquifer owing to the driving head of the overlying water table. Complete dewatering of the overlying water table is not required, but rather depressurisation at the face of the steel lining which is achieved by the crown drain.

In order to dewater the pressure tunnel the groundwater above the tunnel will be dewatered to maximum depths of approximately 1 m above the tunnel elevation. This approximates groundwater elevations of -32 m AHD.

Current groundwater levels

The standing water level (SWL) within the risers of the crown drain were gauged on 29 May 2025 and are shown in Table 1.

The SWL was measured as the depth in metres from the top of casing (TOC).

Table 1 also includes previous groundwater levels, with the current SWL observations being similar to the previous gauging in 2023.

Table 1 Groundwater Levels

	Groundwater level in monitoring wells		Groundwater level in Shaft (tunnel)	
Location	1993	2018	2023	May 2025
Shaft 5	~7 m bTOC	~7m bTOC	~14.2 m bTOC	~13.495m bTOC
Shaft 11	~3.5 m bTOC	Not assessed	~15.3 m bTOC	~14.510m bTOC

Source: GHD (2025). Notes: bTOC = below top of casing

Volume and duration of dewatering

The volume of groundwater being discharged over a three week period is estimated to be 3.23 ML. A constant rate of potable plus groundwater discharge has been assumed at 68 litres per second over 24 hours for the first seven days, before decreasing to 5.4 litres per second of groundwater for the two weeks of tunnel inspection. The maximum depth of the Pressure Tunnel is around 120 mbgl. The Groundwater Assessment in Appendix C outlines the assumptions for this estimate.

How dewatering will be measured

The dewatered groundwater will be monitored by flow meters. Groundwater will be discharged into the wastewater network due to contamination levels.

Details of predicted impacts

Predicted impacts detailed in the Groundwater Assessment (Appendix C) are summarised below:

- Groundwater level drawdown impacts:
 - Groundwater drawdown in the shallow aquifer system is expected to be minor, based on previous groundwater monitoring data.
 - Whilst dewatering will reduce hydraulic head in the deeper aquifer system, upon cessation of dewatering, water levels will recover. This has been confirmed by groundwater monitoring of historical dewatering procedures.
- Contaminated sites:
 - The risk of groundwater plume migration of contaminated sites within the pressure tunnel alignment is recognised but is considered minor based on previous groundwater quality monitoring during historic dewatering events.
 - The proposed dewatering duration is short and it is expected that plumes would disperse as groundwater levels recover.
- Groundwater quality:
 - Groundwater quality has been assessed and identified exceedances of ecological criteria for a number of parameters. As such, dewatered groundwater will be discharged to the wastewater network. See below.

Details of monitoring during dewatering

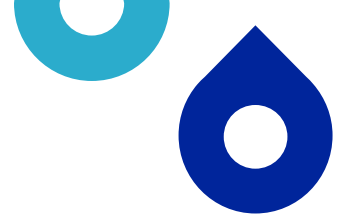
The rate of dewatering will be monitored by a flow meter and water quality samples are to be taken intermittently for the duration of dewatering.

Details of groundwater quality and any treatment

Field parameters for groundwater sampling and analysis in March 2025 are presented in Table 2.

Table 2 Groundwater quality

Field Parameter	Units	Shaft 5	Shaft 11
pH (field)	pH units	7.06	6.8
Electrical conductivity (field)	µS/cm	7433	4952
Dissolved Oxygen (field, filtered)	mg/L	0.24	0.93
Redox (field)	mV	-323.7	-286.3
Temperature (field)	°C	18.3	17.9



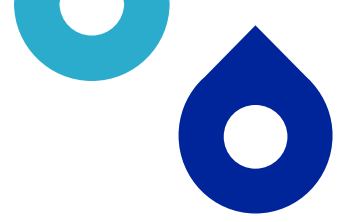
Exceedances of nominated Teir 1 ecological criteria (ANZG, 2018; ANZECC, 2000):

- Shaft 5: Turbidity, nitrogen (total), ammonia as N, and phosphorus.
- Shaft 11: Turbidity, nitrogen (total), ammonia as N

Groundwater quality is not suitable for discharge to surface water. Disposal to wastewater/ trade waste is likely to be the most practical option, subject to approval being obtained from Sydney Water.

Details of reporting

Sydney Water will record daily groundwater dewatering volumes. The data will be collated and sent to the DCCEEW at the end of the first week, and weekly until dewatering is complete.



Appendix E – s57(2) Heritage Exemption

Section 57(2) Exemption Record of Use

Standard Section 57(2) Exemption

Pressure Tunnel & Shafts Dewatering, Inspection, Repairs & Monitoring Equipment Installation

Exemption Ref: 2526_S57_0001

1. Purpose

This document has been prepared as a record of the heritage impact assessment undertaken for proposed works to a heritage item listed on the NSW State Heritage Register, in accordance with the **Standard Exemptions** under Section 57(2) of the *Heritage Act 1977* in Government Gazette No 262, 17 June 2022.¹

This document has been prepared for the following Sydney Water representative:

Name: Emma McIntyre

Title: Senior Environmental Scientist

Contact: emma.mcintyre@sydneywater.com.au

2. Heritage Context

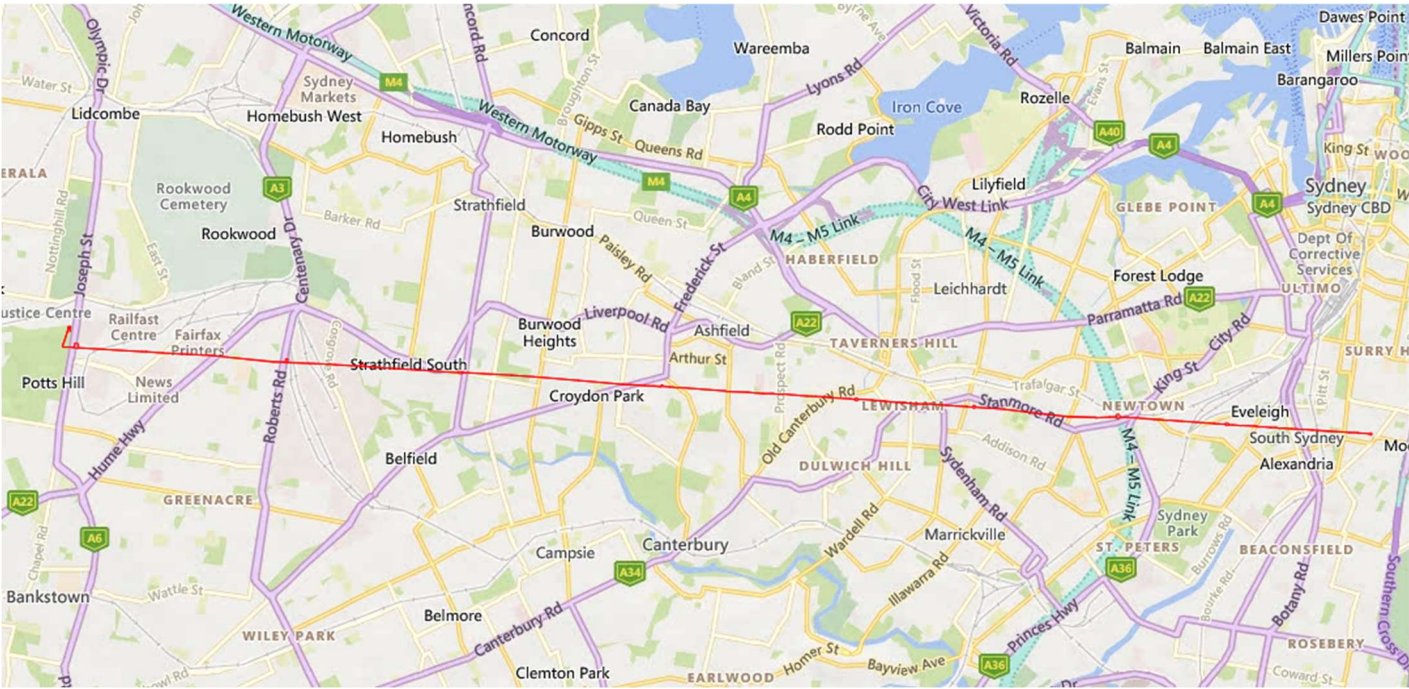
The proposed works relate to the heritage item described as *Pressure Tunnel and Shafts*, which is listed on the NSW Heritage Register as Item #01630, and comprises a 16km-long subterranean water supply pipeline extending from Potts Hill in the west to Waterloo in the east. The current Statement of Significance for the heritage item is included hereunder:

*The Pressure Tunnel is of high historical and technical significance as it represents a successful engineering response to the difficulties of increasing the volume of water from the Potts Hill Reservoir to the Pumping Station at Waterloo, a historically critical link in the water supply of Sydney. It is the third largest pressure tunnel in the world, representing a significant achievement in the provision of a dependable water supply by the Government and Water Board during the inter-war period.*²

An extract of Sydney Water's GIS Spatial system is included below, showing the location and curtilage of the subject heritage item.

¹ <https://gazette.nsw.gov.au/gazette/2022/6/2022-262.pdf>

² <https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5053868>



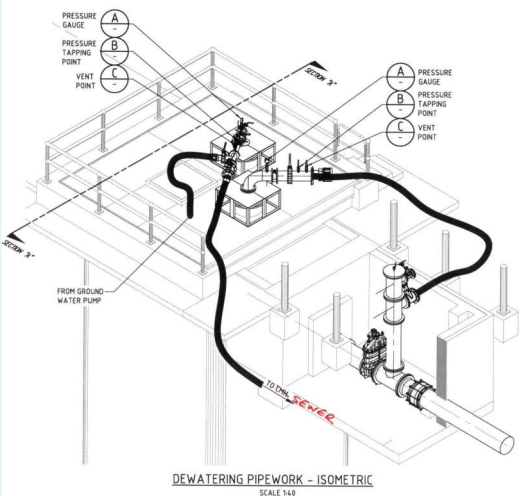
Above: Extract of heritage map showing the subject heritage item in red line (Source, Sydney Water Spatial Hub)

3. Proposal

The Pressure Tunnel was built in the early 1900s and is a significant and important asset supplying potable water to around three million people. An inspection of the Pressure Tunnel is required every 30 years. The next inspection is planned for Winter 2026. Inspection of the Pressure Tunnel requires shutdown and dewatering of the tunnel. Dewatering of potable water from within the tunnel as well as groundwater surrounding the tunnel is required. The table below describes the proposal.

Table 1 Proposal Description

Aspect	Detailed description
Proposal description	The proposal is an inspection of the Pressure Tunnel which is a 17km underground tunnel from Potts Hill to Waterloo (see Figure 2-1). The proposal includes: • shutdown of the Pressure Tunnel • dewatering of potable water from the Pressure Tunnel via shafts 5 and 11, as well as some minor dewatering from shaft 1 if required • dewatering of groundwater via shafts 5 and 11 • installation of temporary pipework to connect to the nearest stormwater canal for disposal of dewatered potable water • installation of temporary pipework to connect to the nearest wastewater maintenance hole for disposal of dewatered groundwater • temporary site compounds at additional shaft sites along the Pressure Tunnel alignment • internal inspection and condition assessment of the Pressure Tunnel • recharging the Pressure Tunnel.

Aspect	Detailed description
	The typical dewatering pump arrangement at shafts 5 and 11 is shown below. Potable water will be discharged to stormwater following chlorine neutralisation by addition of ascorbic acid. Groundwater will be discharged to the wastewater network.  

Location and land ownership

The Pressure Tunnel alignment is in the Local Government Areas of Canterbury-Bankstown, Strathfield, Burwood, Inner West and City of Sydney.

The majority of the dewatering of potable water from the Pressure Tunnel will occur via shafts 5 and 11. Some minor dewatering may occur via shaft 1.

Dewatering of groundwater will occur via shafts 5 and 11.

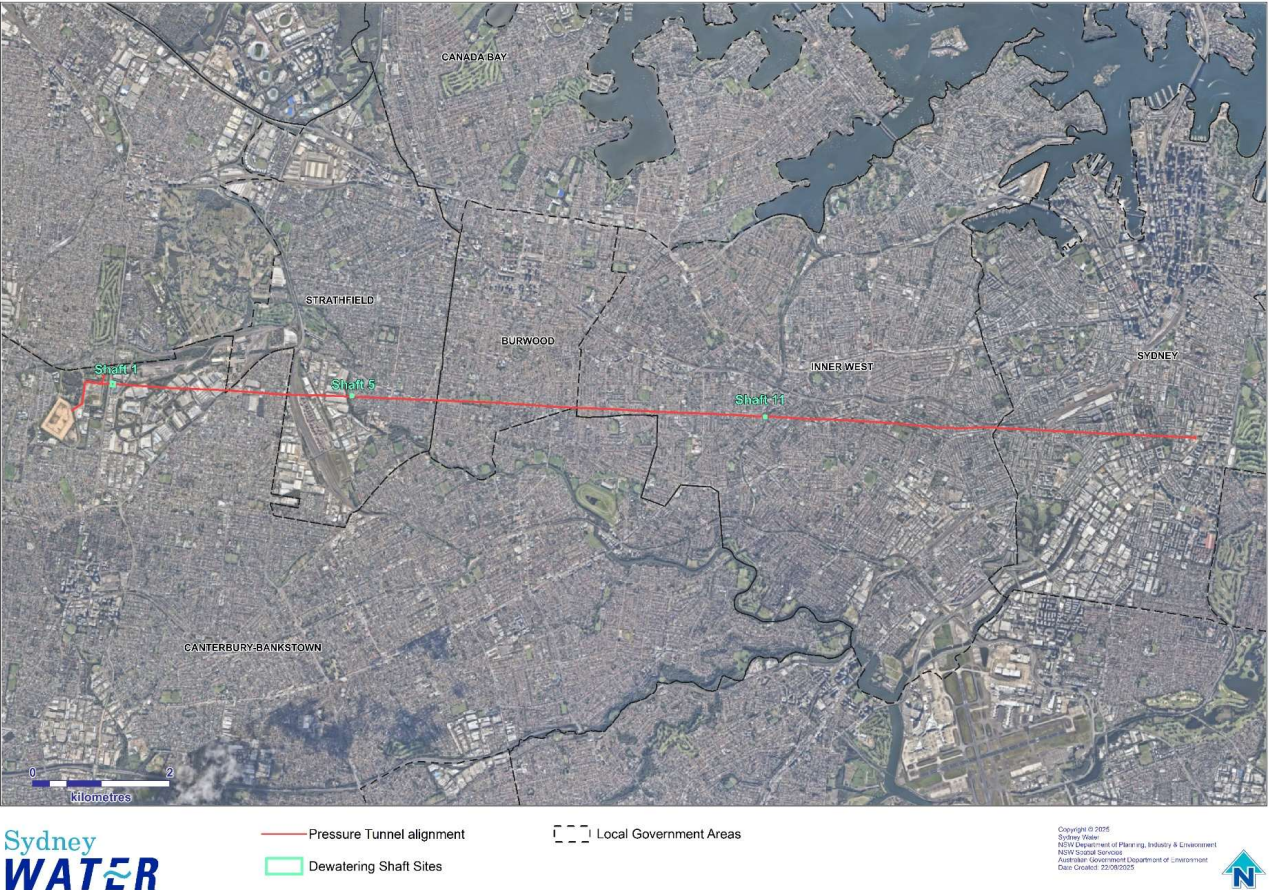
Most of the dewatering works will be contained within Sydney Water property. Some pipework connections and dechlorination equipment may be required outside of Sydney Water property at shafts 1 and 11 to connect dewatering pipework to the nearest wastewater connection points. The location and land ownership of each dewatering shaft site is outline in the table below.

Location of dewatering works and land ownership

Shaft site	Sydney Water owned land	Land owned by others
Shaft 1	Lot 1446 DP132224, Rookwood Road, Yagoona	Lot 3 DP1102984: Temporary pipework and discharge of potable water to Cooks River Canal (stormwater).
Shaft 5	Lot 1 DP613377, Therry Street, Strathfield South Discharge of potable water to Cooks River Canal (stormwater), Lot 2 DP613377 Discharge of groundwater to wastewater maintenance hole within shaft site	Nil
Shaft 11	Lots 14, 15, 16 and 17, Section 2 DP1576 and Lot 1 DP187816, Weston Street, Dulwich Hill	Lot 19 DP1220375: - Temporary pipework and discharge of potable water to Hawthorne Canal (stormwater) - Temporary pipework and discharge of groundwater to maintenance hole.

Aspect	Detailed description
Site establishment and access tracks	Some temporary compounds will be established at additional shaft sites along the Pressure Tunnel alignment to monitor potable water and groundwater during the dewatering process. Site establishment would include site setup and preparation of dewatering equipment. Notification of the proposed works would be provided to affected customers and councils.
Ancillary facilities (compounds)	Temporary compounds are required at the dewatering shafts (1, 5 and 11) and at additional monitoring shaft sites along the Pressure Tunnel alignment. All compounds will be contained within Sydney Water owned land. The exact location of these will be chosen by the Delivery Contractor and approved by Sydney Water's Project Manager as described in the mitigation measures in Section 5.
Methodology	Pressure Tunnel inspection works include: • Site establishment: ○ Pressure Tunnel shutdown ○ generators placed at shafts 5 and 11 for dewatering groundwater ○ installation of CCTV for inspection of shafts and monitoring water levels within the pipeline at Shaft 6 • Dewatering the Pressure Tunnel: ○ dewatering of up to 90 ML of potable water from the pressure tunnel via shafts 5 and 11, with potential minor dewatering via shaft 1 ○ dewatering of 3.23 ML of groundwater from the pressure tunnel's crown drain via shafts 5 and 11 • Discharge of extracted potable water and groundwater: ○ install pipework from groundwater pumps at shafts 5 and 11 to nearest wastewater connection points ○ chlorine neutralisation of potable water by addition of ascorbic acid ○ discharge of dewatered potable water to the wastewater network in accordance with Sydney Water's <i>Water Quality Management During Operational Activities Procedure</i> • Internal inspection of the Pressure Tunnel including: ○ condition assessment ○ minor repairs to tunnel lining ○ installation of monitoring sensors to be welded/glued/fixed to the interior of the tunnel and shafts ○ installation of optic fibre along the tunnel to monitoring sensors ○ detailed survey of the tunnel alignment and grade. • Recharging of the Pressure Tunnel.
Restoration	All work sites will be restored to the pre-existing condition following construction, in consultation with landowners where relevant.
Materials/ equipment	The equipment required for works include: • pumping equipment • dosing equipment for dechlorination • flexible hose piping

Aspect	Detailed description
	• monitoring equipment for flow rate and water quality • generators • ventilation fans • vehicles.
Work hours	Work and deliveries will be scheduled to occur during standard daytime hours of: • 7am to 6pm, Monday to Friday • 8am to 1pm, Saturdays. The proposal is expected to require work outside these hours for dewatering and re-pressurising of the tunnel, where pumps would run 24 hours a day. Sydney Water's Project Manager can approve additional work outside of standard daytime hours, following the approval process described in the safeguards in Section 6.
Proposal timing	Construction is expected to start in July 2026 and take approximately four weeks from dewatering to re-pressurisation.



4. Approval Framework & Assessment

The proposal is located within the curtilage of a heritage item listed on the NSW State Heritage Register, and therefore approval under the *Heritage Act 1977* is required. If the proposal meets particular exemption criteria, the works may be considered as exempt from requiring heritage approval under the *Heritage Act 1977*.

The proposal has been assessed against the specified activities and relevant standards of the following Standard Exemption/s, issued under Section 57(2) of the *Heritage Act 1977* (Government Gazette No. 262, 17 June 2022):

- **Standard Exemption 1: Maintenance and Cleaning**
- **Standard Exemption 3: Alteration to Non-Significant Fabric**

A complete list of the Standard Section 57 Exemptions is located here

<https://gazette.nsw.gov.au/gazette/2022/6/2022-262.pdf>.

The following table provides a detailed assessment of the works against the Exemption criteria.

Table 2 Assessment of works against Standard Exemption 1: Maintenance & Cleaning

Specified Activity / Relevant Standard	Discussion
<u>Specified activities/ works:</u> a) <i>The maintenance of an item to retain its condition or operation.</i>	Complies. The Pressure Tunnel was built in the early 1900s and is a significant and important asset supplying potable water to around three million people. Given its age and importance of its ongoing function, an inspection of the Pressure Tunnel is required every 30 years. The proposed dewatering activities are required to enable this regular inspection and to maintain the integrity and functionality of the heritage item.
b) <i>Application of protection coatings such as limewash, polish, oils and waxes to an item.</i>	Not applicable to this scope.
c) <i>Cleaning to remove surface deposits, organic growths or graffiti from an item.</i>	Not applicable to this scope.
<u>Relevant standards:</u> d) <i>Specified activities/ works must not involve removal of or damage to significant fabric.</i>	Complies. No significant fabric will be damaged or removed during the activities. Following dewatering of the tunnel and visual inspection, it may become apparent that some minor patch repairs are needed to ensure the ongoing integrity of the asset. Any such repairs will be undertaken applying a like for like methodology for concrete render to the interior of the tunnel lining. This work will not damage or remove any significant fabric, and if required, is critical to ensure the ongoing functionality of the asset.
e) <i>New materials or finishes may only be introduced to non-significant fabric where this does not impact the significance of the item, uses a colour sympathetic to the item, does not detract from the item and does not reduce the ability to appreciate the item.</i>	Complies. While the tunnel fabric itself is significant, the principal significance of the item lies in its technical and historical values. Minor patch repairs may need to be undertaken to the interior lining of the tunnel, however this cannot be confirmed until dewatering activities are completed. Repair works, if required, will involve the minor introduction of new patch render to the interior tunnel lining to replace or repair any fabric which has spalled or deteriorated. This works if require would

Specified Activity / Relevant Standard	Discussion
	have no adverse impact on the significance of the item, and would instead enhance its significance by ensuring its ongoing functionality.
<i>f) Protective coatings may only be applied to surfaces which have previously had these coatings. Existing finishes such as oils and waxes for timber must continue to be used rather than modern alternative protective coatings.</i>	Not applicable to this scope.
<i>g) Surface patina important to the item's heritage significance must be preserved during maintenance and cleaning.</i>	Not applicable to this scope.
<i>h) Cleaning of significant fabric may only use low-pressure water less than 100 psi and neutral detergents.</i>	Not applicable to this scope.

Table 3 Assessment of works against Standard Exemption 3: Alteration to Non-Significant Fabric

Specified Activity / Relevant Standard	Discussion
<u>Specified activities/ works:</u> <i>a) The alteration of an item involving the introduction of new fabric and/or the removal of non-significant fabric.</i>	Complies. The scope of works includes the temporary installation of pipework to facilitate the dewatering of potable water and ground water to enable the inspections. The works will also include the erection of small, temporary compounds at various shaft locations along the length of the heritage item, at ground surface level. Some of these works will be included within the curtilage of the SHR item, whilst some of this infrastructure will be located outside of the SHR. The works also include the installation of monitoring sensors to be welded/glued/fixed to the interior of the tunnel and shafts, and the installation of optic fibre along the tunnel to monitoring sensors.
<u>Relevant standards:</u> <i>b) The specified activities/ works must not impact the heritage significance of the item.</i>	Complies. The works will not impact the significance of the item as the majority of new fabric being introduced is of a temporary nature above ground, which will be entirely dismantled at the end of inspection works. The pipework, pumps and compounds will be removed from site and the site made good to previous condition. No permanent impacts will occur as a result. The introduction of monitoring equipment internally to the shafts and tunnel will facilitate the ongoing remote monitoring of the tunnel operations, which will only have a positive heritage impact on the item as this is critical to enable ongoing appropriate reactive and proactive repair and maintenance works. The monitoring equipment will be fixed to the internal lining of the tunnel, where it will not be visible and therefore will not have any adverse visual impacts. The equipment will be entirely reversible and will not result in permanent damage to significant elements of the item. Most importantly, it will not impede the functionality of the asset which is the principal component of its significance.

Specified Activity / Relevant Standard	Discussion
<i>c) Significant fabric of the item must not be impacted.</i>	Complies. As discussed, the proposed minor works will not adversely impact the significant fabric of the item. All new fabric being introduced is either of a temporary nature for the duration of inspection works, or is entirely reversible.
<i>d) Relics must not be impacted.</i>	Complies. No excavation into soil is proposed. All works are confined to existing tunnel and shaft spaces.
<i>e) Work must not involve construction of extensions or additions where these may impact the item's setting, views to or from the item, obscure existing significant fabric, impact relics and/or impact significant landscape layout, landscape elements or vegetation.</i>	Complies. No extensions or above ground structures are proposed to be built.
<i>f) The positioning and size of walls, windows and doors is not altered.</i>	Not applicable to this scope.
<i>g) Significant finishes, surfaces (including flooring) and fixtures must not be impacted.</i>	Not applicable to this scope.
<i>h) Any new fabric must be sympathetic to but can be distinguished from the appearance, composition, detailing, size, position and finish of existing fabric.</i>	Complies. The monitoring equipment will be readily identifiable as new fabric and will be distinguished from original tunnel fabric.
<i>i) Non-significant fabric must be identified as non-significant fabric in the listing on the State Heritage Register or the gazetted Interim Heritage Order, or a Conservation Management Plan, Conservation Management Strategy, Heritage Collections Plan, Archaeological Management Plan or Aboriginal Place Management Plan or identified as non-significant fabric in written advice prepared by a suitably qualified and experienced heritage professional before it can be removed.</i>	Complies. New fabric being introduced is not significant. The installation will not adversely impact the tunnel fabric and is reversible. No tunnel fabric is being removed.
<i>j) Installation of new fabric must be in accordance with the policies of a Conservation Management Plan, Conservation Management Strategy, Heritage Collections Plan, Archaeological Management Plan or Aboriginal Place Management Plan or in written advice prepared by a suitably qualified and experienced heritage professional before installation.</i>	Complies. The new monitoring equipment is being installed in accordance with advice provided by Sydney Water's heritage team and the recommendations and assessment outlined in this Exemption.
<i>k) Any new fabric must not impact setting or views to or from the item, obscure existing significant fabric or limit access to existing fabric for future maintenance.</i>	Complies. The nature of this heritage item is that there are limited views and setting as it is an underground operational asset. The works will not impact the setting or views of the item as the majority of new fabric being introduced is of a temporary nature above ground, which will be entirely dismantled at the end of inspection works. The pipework, pumps and compounds will be removed from site and the site made good to previous condition. No permanent impacts will occur as a result.

Specified Activity / Relevant Standard	Discussion
	The monitoring equipment will be fixed to the internal lining of the tunnel, where it will not be visible and therefore will not have any adverse visual impacts.
<i>l) Any new penetrations must be:</i> <i>i. limited in number; and</i> <i>ii. made through non-significant fabric or mortar joints only.</i>	Complies. Fixings internally to the tunnel lining for new equipment are acceptable to help facilitate the ongoing monitoring and maintenance of the asset, which conserves its significance.
<i>m) Any excavation must comply with Standard Exemption 8: Excavation relevant standards.</i>	Not applicable to this scope. No excavation works are proposed as part of this dewatering, inspection and repair scope of works.
<i>n) Any new fabric must not exacerbate the decay of existing fabric or risk the destruction of existing significant fabric due to chemical incompatibility, vibration, percussion or explosive flammability.</i>	Complies. New fabric being introduced will not have any adverse impacts on the functionality or significance of the asset.

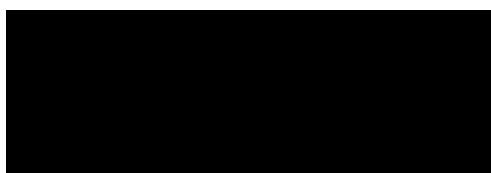
5. Conclusion & Recommendations

This assessment confirms that the proposed works located within the curtilage of the **Pressure Tunnel and Shafts** heritage item will not have an adverse impact on the significance of the heritage item, will comply with the relevant standards and specified activities of Standard Exemption/s No. 1 and No. 3, and are therefore permissible without approval under Section 57(2) of the *Heritage Act 1977*.

The works must be undertaken in accordance with the Specified Activities and Relevant Standards of the applicable Standard Exemption/s, and in accordance with any recommendations included in this assessment. This record meets the requirements for record keeping under General Condition 10 of the Standard Exemptions Gazettal.

This Exemption considers the proposal from a heritage perspective only and does not provide an assessment of or qualify as a record of any other environmental consideration that may be required, including statutory planning approval.

This Exemption assessment has been prepared by the following Sydney Water Heritage Advisor:



Ashleigh Crisp
Natural Asset & Heritage Team Manager
4 September 2025