Review of Environmental Factors

Southern and Western Suburbs Ocean Outfall Sewer 2 – Desilting and Rehabilitation Works (Package A4)

Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of desilting and rehabilitation works on the Southern and Western Suburbs Ocean Outfall Sewer 2 (SWSOOS2). 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:
[redacted]	[redacted]	[redacted]
Sam Campbell Sydney Water Date: 14/08/2026	John Eames Senior Environmental Scientist Sydney Water Date: 17/08/2026	Haydn Chellew Project Manager Sydney Water Date: 18/08/2026

Decision Statement

The main potential construction environmental impacts of the proposal include impacts associated with waste and non-Aboriginal heritage. During operation, it is unlikely that any adverse impacts would be experienced. 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: [redacted]

Elissa Howie, A/Senior Manager Environment and Heritage, Sydney Water

Date: 6 October 2026

1 Proposal description

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

Aspect	Relevance to proposal
Proposal need and objectives	The Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) is a major trunk sewer serving the southern and western areas of Sydney. It contains three sections: a single barrel (SWSOOS1) and a twin barrel (SWSOOS2), and transports wastewater from Arncliffe to the Malabar Water Resource Recovery Facility. Silt accumulation within the SWSOOS tunnel affects the capacity and performance of the SWSOOS and increases risk of wet and dry weather overflows. The primary objective of the proposal is to remove accumulated silt and undertake rehabilitation activities within the SWSOOS2 tunnel to preserve its structural integrity and environmental compliance. Rehabilitation will include internal repairs, reinforcement and removal of degraded materials. This would maintain the operational and environmental performance of the wastewater system. An overview of the proposal is provided in Figure 1.
Proposal description and methodology	Key features of the proposal are outlined below and shown in the below figures. The works will require desilting and rehabilitation of the SWSOOS2 asset, and are as follows: **Site establishment** • set up of a site compound including site offices, lunchrooms and bathrooms • set up of a silt extraction station including equipment, parking, storage containers, silt skip bins and a silt-dewatering facility • installation of protective fencing and necessary signage. **Desilting** • set up of a lifting frame (crane) over the SWSOOS2 at the existing wide openings • loading of mini skid steers into the SWSOOS2 tunnel • removal and transfer of silt into bulker bags and loading into sealed silt skip bins using the lifting frame, or using a vacuum truck and vacuum transfer into sealed silt skip bins • transfer of silt skip bins to a licensed waste facility for appropriate disposal. **Rehabilitation** • repairing the internal concrete walls, roof slabs, central walls, and other structural elements: surface preparation including pressure blasting, removal of unsound or deteriorated concrete, and the treatment of exposed reinforcement and repairs with mortar or shotcreting

Aspect	Relevance to proposal
	• repairing the reinforcements: replacement, supplementing, and anchoring into sound concrete • removing and replacing degraded expansion joints: sealing cracks, construction joints and other defects • application of Calcium Aluminate Cement (CAC) protective coating to the internal sewer surfaces (walls and roof) via shotcrete pump and air compressor. **Restoration** • demobilisation and removal of all plant and equipment • restoration of the sites to pre-existing condition or better. **Equipment** • confined spaces safety equipment (e.g. gantry/davit) • skip bins • CAC equipment • air compressors • generators • concrete saws • concrete trucks • jackhammers • site facilities and amenities • storage containers • excavators • tip trucks • street sweepers • light vehicles • cranes • hand tools • mini skid steers • sediment tank • vacuum trucks.
Consideration of alternatives/options	The proposal is necessary to prevent the risk of wet and dry weather overflows into the environment. A do-nothing approach was not considered suitable as it increases the risk of potentially causing damage to the surrounding environment and causing safety and human health implications.

Aspect	Relevance to proposal
	No alternative options have been explored as desilting and rehabilitation works form part of the routine SWSOOS wastewater system maintenance and rehabilitation programs.
Location and land ownership	The proposal involves works at three sites along the SWSOOS2: • Site 1 is located on Tupia Street, Botany (Lot 1, DP 1019183) • Site 2 is located on The Esplanade, Botany (Lot 1, DP 533321 and Lot 1, DP 225508) • Site 3 is located on Botany Road, Banksmeadow (Lot 1 and Lot 3, DP 792499). The proposal is located within the Bayside Local Government Area on Sydney Water and Bayside Council land.
Site establishment and access tracks	As described above, site establishment is required to enable the works. **Site 1** Access to SWSOOS2 at Site 1 will be via existing full width openings, which are located off Hale Street. Vegetation clearing and trimming would take place under a separate REF titled 'Southern and Western Suburbs Ocean Outfall Sewer 2 – Desilting Works' (27/09/2024), to establish an access track and turning circle for large machinery and vehicles. **Site 2** Access to SWSOOS2 at Site 2 will be via existing full width openings, which are located off The Esplanade and accessed through Hayden Place or Tupia Street. Tree removal and trimming is required for access. The placement of the site office amenities and storage container is over several parking spaces along The Esplanade, adjacent to the desilting equipment compound. **Site 3** Access to SWSOOS2 at Site 3 will be via existing stopboard openings, which are accessed through Exell Street. The first placement option for small amenities and the storage container is in the industrial complex. The second placement option for small amenities and the storage container is over several parking spaces along Exell Street. Consultation with Bayside Council will determine which option is selected.
Ancillary facilities (compounds)	A construction compound at each proposed site would be required to house site sheds, construction amenities and materials laydown. The site compound would also comprise of site offices, lunchrooms and bathrooms. Indicative compound locations at each site are shown in the below figures.
Work hours	Work and deliveries will be scheduled during standard daytime hours: • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturdays.

Aspect	Relevance to proposal
	The proposal is not expected to require work outside these hours. However, Sydney Water's Project Manager can approve work outside of standard daytime hours. The approval process is described in the mitigation measures in Table 3-.
Proposal timing	Construction is expected to start in February 2027 and take about 27 months.
Operational requirements	There are no changes to the existing operational requirements of the SWSOOS.

Figure 1 - Location of proposal

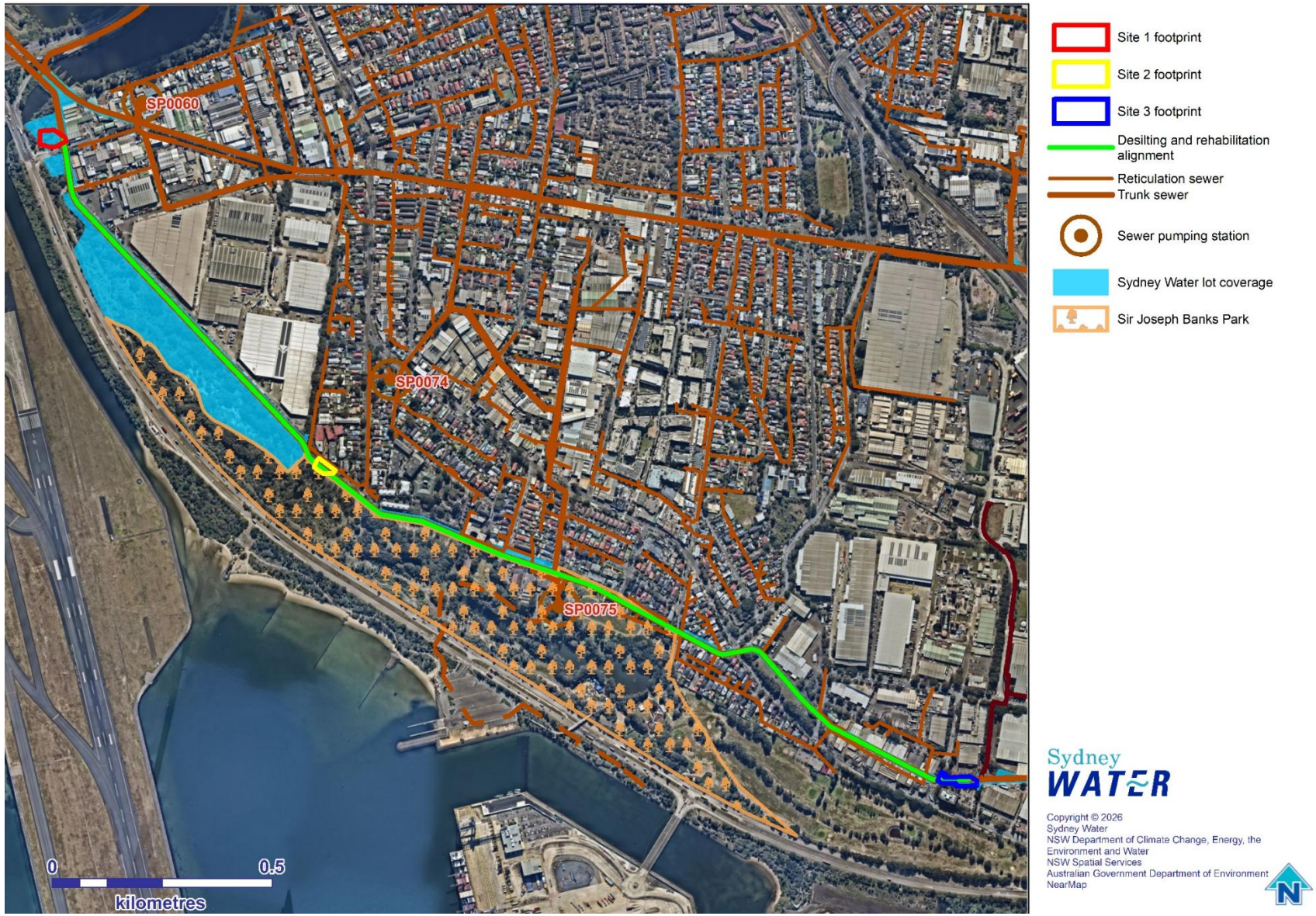


Figure 2 - Site 1 key environmental constraints

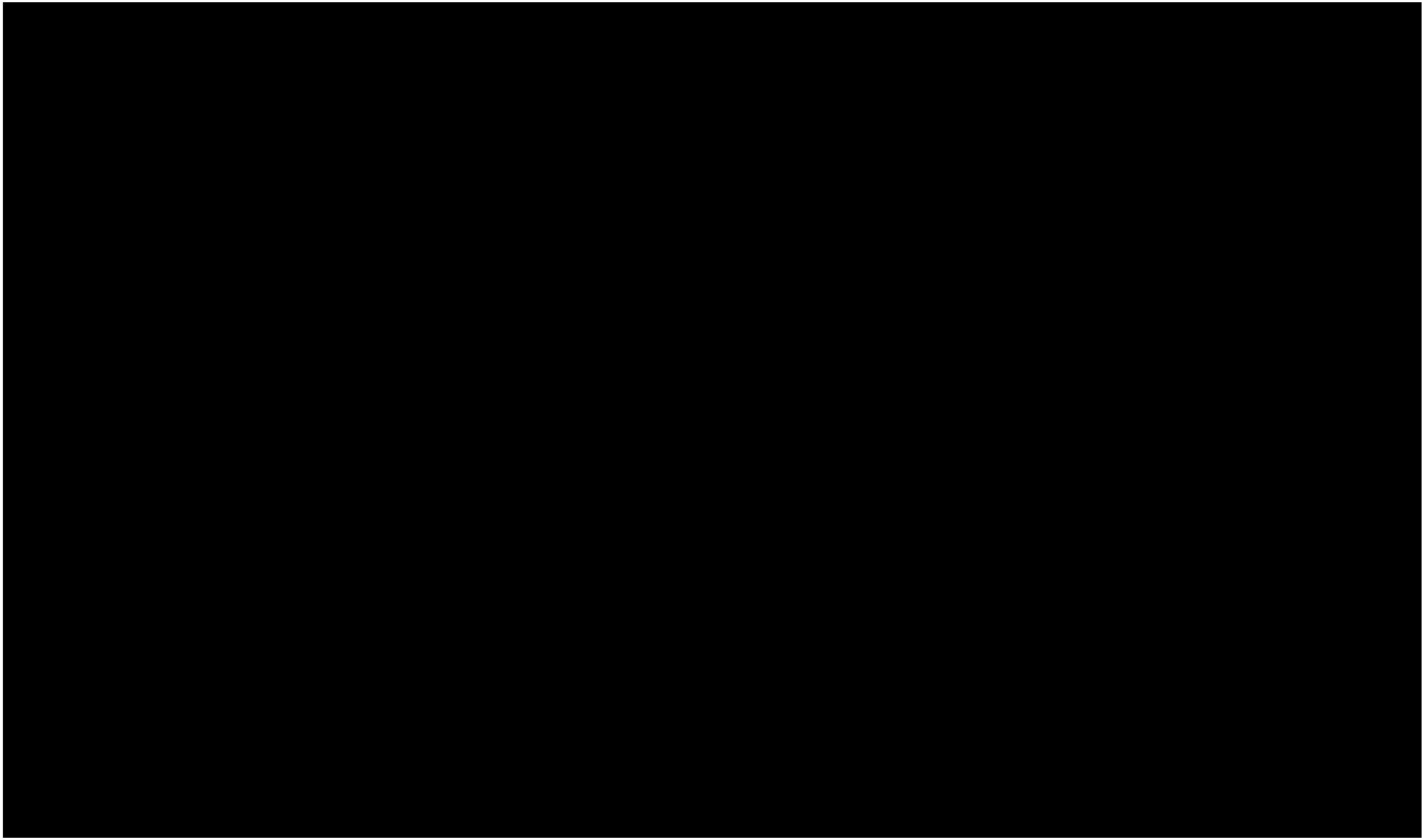


Figure 3 - Site 2 key environmental constraints

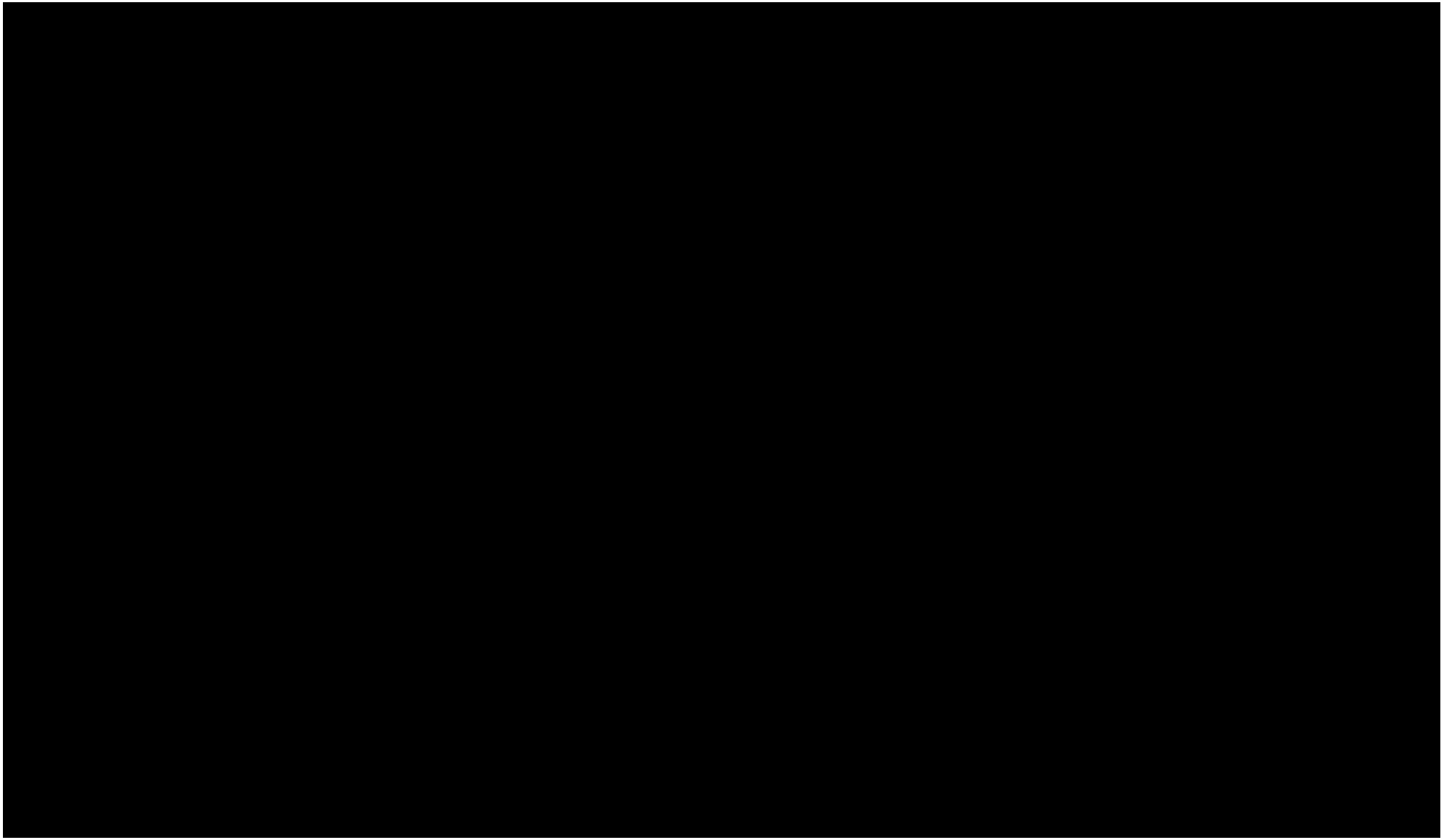


Figure 4 - Site 3 key environmental constraints

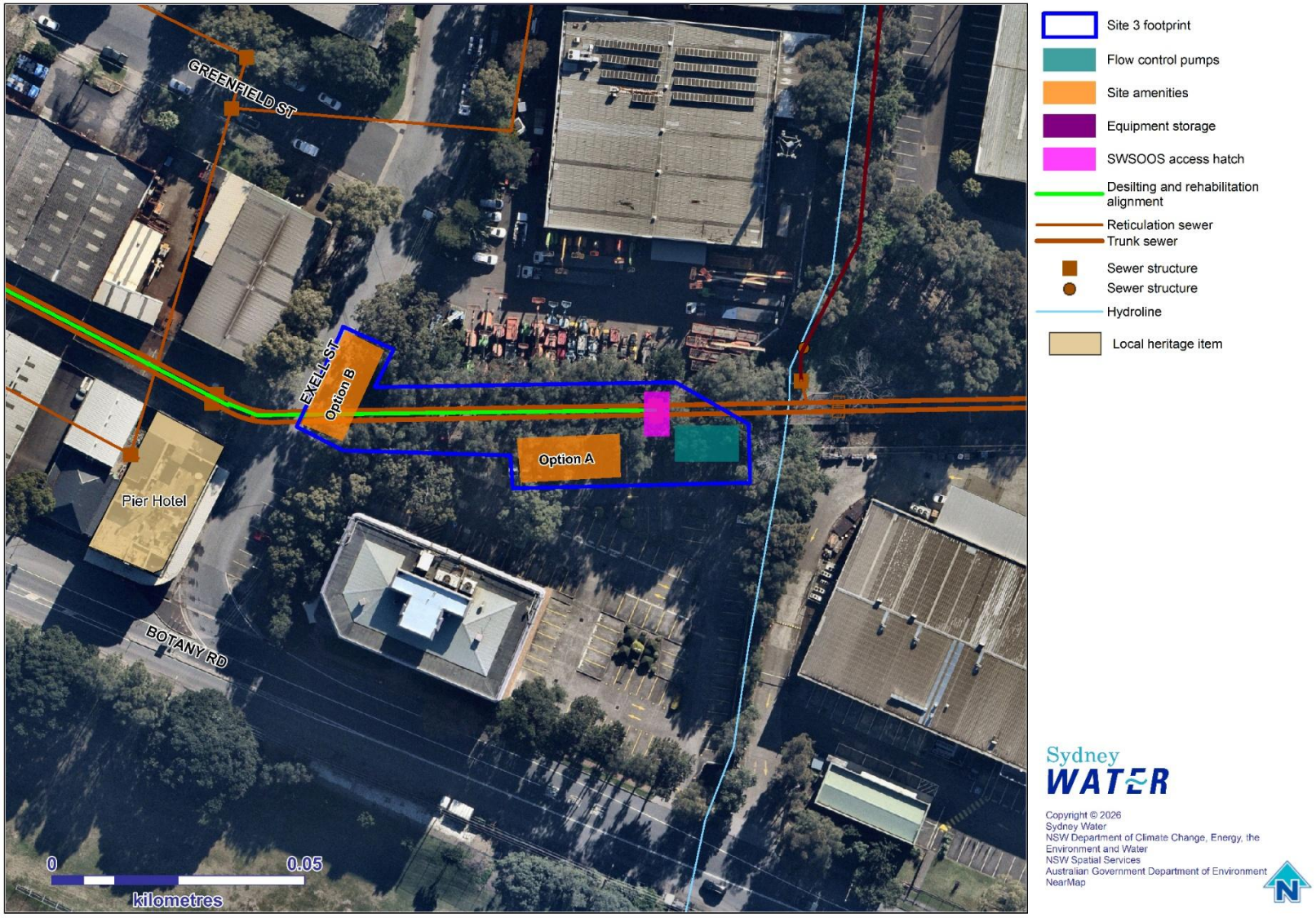
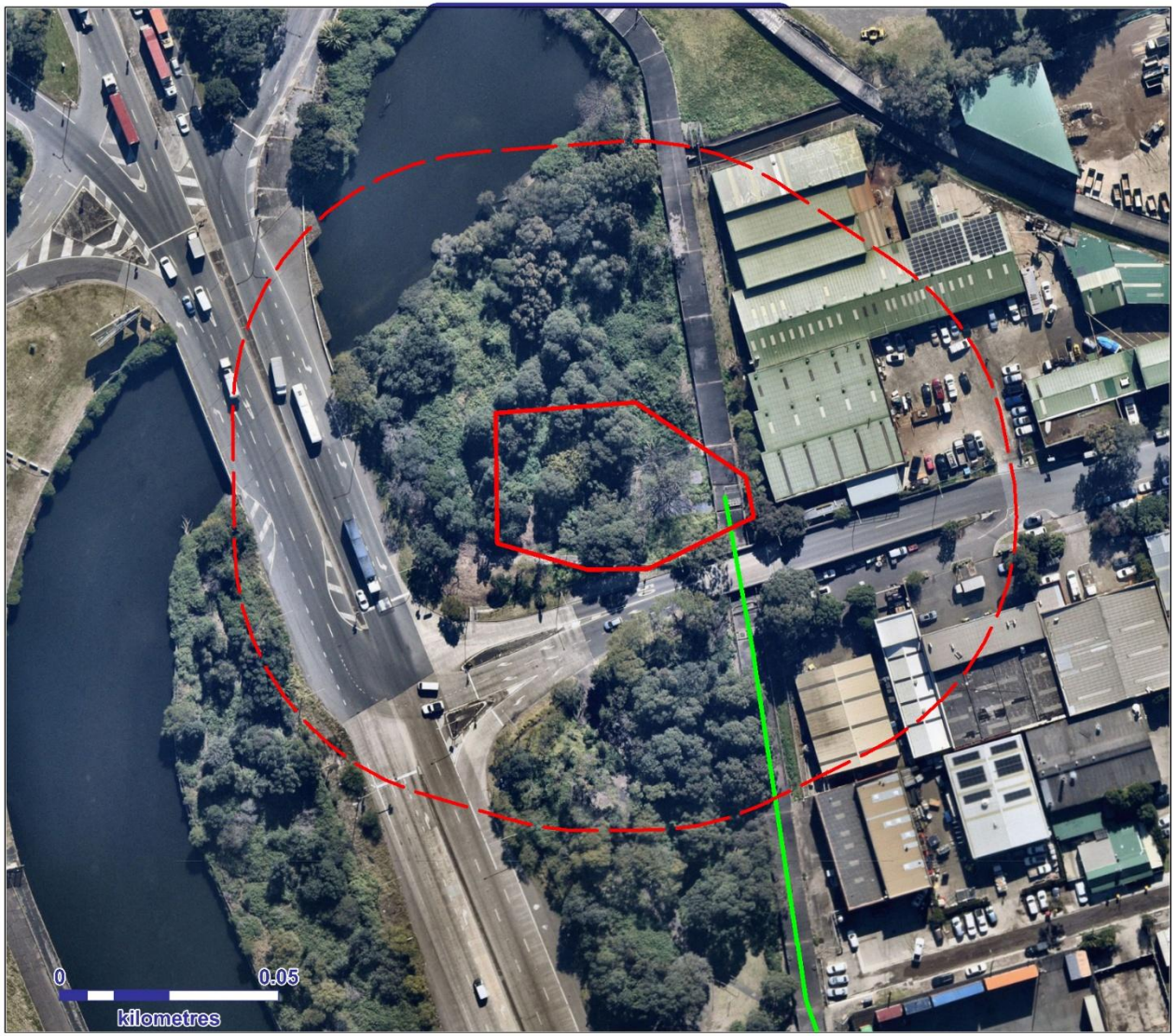


Figure 5 - Site 1 predicted noise impacts, standard daytime hours



60 m - highly affected - 75dB(A): N, PC, RO

Site 1 footprint

Desilting and rehabilitation alignment

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Figure 6 - Site 2 predicted noise impacts, standard daytime hours



Site 2 footprint

60 m - highly affected - 75dB(A): N, PC, RO

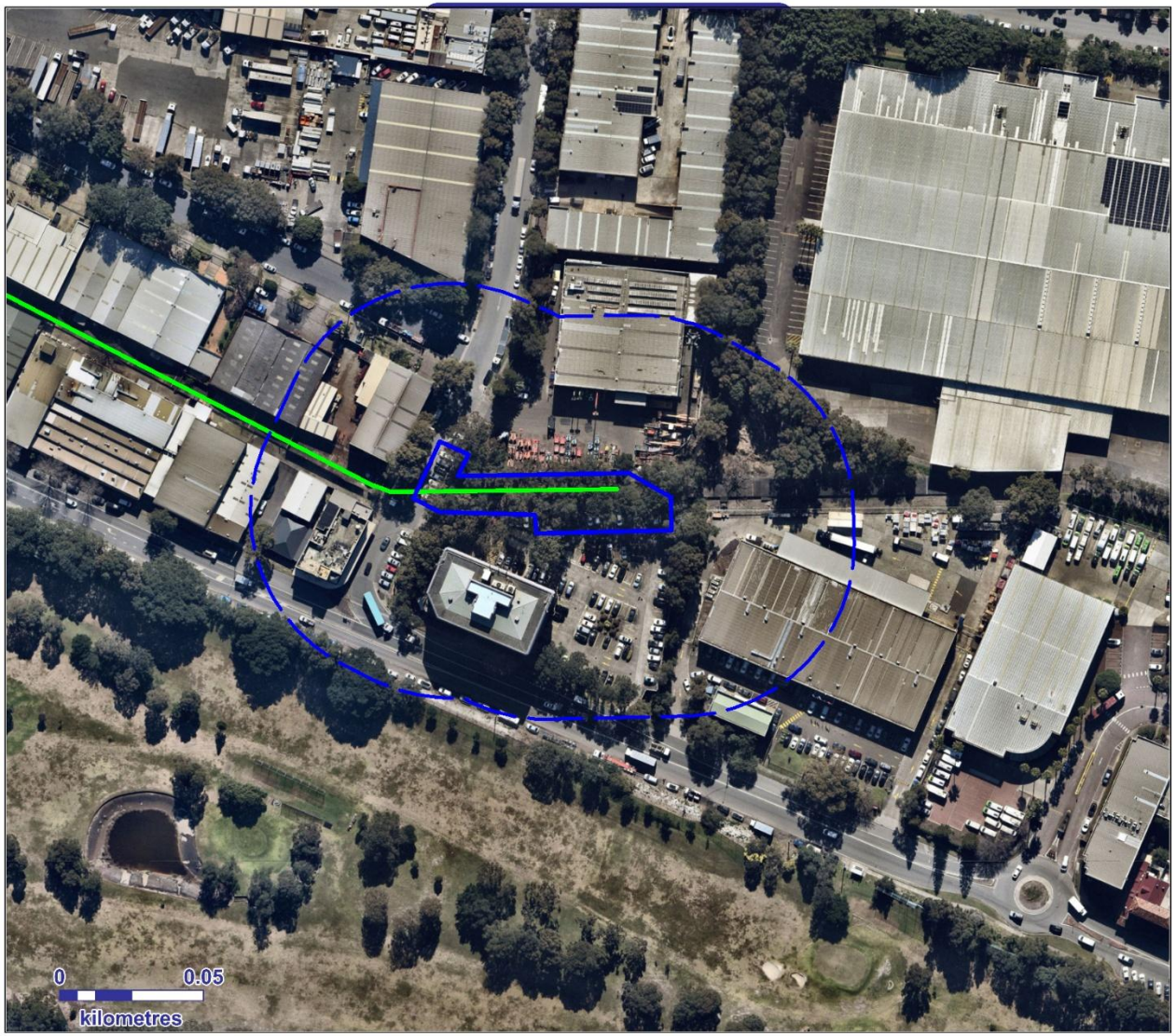
Desilting and rehabilitation alignment

Sydney WATER

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Figure 7 - Site 3 predicted noise impacts, standard daytime hours



60 m - highly affected - 75dB(A): N, PC, RO

Site 3 footprint

Desilting and rehabilitation alignment

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2 Consultation

2.1 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, 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 Bayside Council with reasonable notice when we would like to commence works. Bayside Council 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).

The landowners of 1753 Botany Road (if 'Option B' is selected for Site 3) will also be notified about the proposal and the potential occupation of some of their private parking spaces. We will provide the landowners with reasonable notice when we would like to commence works and any feedback received would be considered.

2.2 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 with Bayside Council was required under section 2.10 (e) of the TISEPP, as the proposal requires temporary site amenities on public parking spaces under council's control that may disrupt pedestrian or vehicular traffic that is not minor or inconsequential. A notification was sent to Bayside Council on 29 September 2026 about the proposal, and any feedback will be incorporated, provided it is reasonable and feasible. Further detail is provided in Appendix C.

Table 2-1 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Bayside Local Environmental Plan 2021 (498 LEP)	The proposal is located on land zoned General Industrial (IN1), Public Recreation (RE1), Low Density Residential (R2), and Infrastructure (SP2).
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.126(6) of the TISEPP permits development for the purpose of sewage reticulation systems without consent on any land in prescribed circumstances. Development carried out by or on behalf of a public authority is a prescribed circumstance under clause 2.126(1)(a). As Sydney Water is a public authority, the proposal is permissible without consent.

Table 2-2 Consideration of key environmental legislation

Legislation	Relevant 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 (372). Temporary relaxation of the EPL 372 is not required during construction. A variation to EPL 372 is not required for operation.	n/a	n/a
Heritage Act 1977	SWSOOS2 is listed on Sydney Water's s.170 Heritage Register (Item 4572729; local significance). The s.170 heritage curtilage is about 3 m wide, parallel to the existing structure. The proposal involves modifications of the heritage item. A heritage assessment was completed by Sydney Water on in August 2026 (Appendix D). No approval or exemption is required under the Heritage Act.	REF	Pre-construction, Sydney Water

3 Environmental assessment

The environmental impacts checklist (SWEMS0019.01) was considered for the proposal. Table 3-1includes only the potentially impacted aspects and

Table 3-3 lists mitigation measures.

Table 3-1 Review of environmental aspects

Aspect	Potential impacts
Topography, geology and soils	During construction, there will be minor disturbance of topsoil to a maximum depth of 0.1 m at Site 1 to level the ground surface and facilitate site establishment. This could result in potential offsite erosion and sedimentation of surrounding land and waterways. Given the shallow excavation depths, the proposal is unlikely to generate large amounts of excavated spoil. Appropriate sediment control measures would be implemented to minimise the movement of spoil off-site. Previous detailed site investigations at Site 1 indicated that chrysotile asbestos exists about 2 m below ground surface and there is the potential for groundwater contamination due to offsite contamination sources including the airport and adjacent industrial land uses. Borehole and hand auger investigations across the site confirmed friable asbestos is present in one location on the western side of the site. A Contaminated Land Management Plan (CLMP) is in place for the site and its requirements will be strictly adhered to (see Appendix E). A review of soil mapping identified that Acid Sulfate Soils (ASS), classified as disturbed terrain, are likely to be found between 2-4 m of the natural ground surface within the site footprint. Inappropriate management of Acid Sulfate Soils (ASS) during excavation and handling has the potential to impact surrounding land and waterways from off-site leaching of acid and contaminants. However, this is not expected as topsoil disturbance is anticipated to be minor and will not exceed 2 m where ASS is likely to be encountered, so the risk of environmental harm is considered low. If ASS is encountered, mitigation measures in Table 3.3 would be implemented. No operational impacts are expected.
Water and drainage	Mill Pond and Mill Stream are adjacent to Site 1 and an unnamed waterway is adjacent to the eastern boundary of Site 3. Mill Pond and Mill Stream are classified as Key Fish Habitat (KFH). No works are proposed within waterways, water bodies or KFH. Minor ground disturbance activities including removal of topsoil are proposed to level the ground surface. However, as the works are small-scale and localised, with no works being undertaken within waterways, no impacts to waterways are expected provided the mitigation measures are followed.
Flora and fauna	Two planted native trees positioned along the alignment require removal. Site inspections and assessment from a Sydney Water Ecologist identified these species as a *Casuarina glauca* and a *Banksia integrifolia* (Figure 3). Consultation with Bayside Council will be undertaken regarding the removal of these trees. The trees removed would be replaced in accordance with the consultation undertaken upon completion of the works. The removal of these locally native trees would also need to be offset in accordance with the Sydney Water Biodiversity Offset Guideline (SWEMS0019.13) at a ratio of 3:1.

Aspect	Potential impacts
	Any potential impacts to flora and fauna would be adequately managed through mitigation measures in Table 3-3 of this REF and no operational impacts are expected. Vegetation disturbance at Site 1 Hale Street site will be completed under the separate REF titled 'Southern and Western Suburbs Ocean Outfall Sewer 2 – Desilting Works' (27/09/2024). If greater disturbance is required, then additional environmental assessment will be required.
Heritage	**Aboriginal heritage** A search of the Aboriginal Heritage Information Management System (AHIMS) database was performed on 25 June 2026. [redacted] A due diligence assessment completed by Sydney Water (Appendix F) indicated a low likelihood of in situ Aboriginal objects or sites being located within the proposed work area. Historical aerial photos confirm widespread ground disturbance from past infrastructure development, and the only form of ground disturbance proposed are levelling activities of topsoil at Site 1. No Aboriginal places have been declared in or near the proposal. Impacts to Aboriginal heritage are unlikely during construction and operation. **Non-Aboriginal heritage** Appendix D includes a heritage assessment prepared for the proposal. Key findings of that assessment are provided below. The proposal is located within the s.170 heritage curtilage of heritage items potentially impacted by the proposal (SWSOOS2). The curtilage is described in the s.170 Register as 'all original fabric from Eve Street, Rockdale to the Ocean Outfall at Malabar with a 3 m buffer zone parallel to the existing structure'. The primary significance of the SWSOOS network is the function it serves the community of the Southern and Western areas of Sydney by channelling and managing its wastewater, and in the careful and precise engineering methods to achieve it. The proposed work to the SWSOOS2 involves repairing and CAC lining, protecting the fabric from further degradation. These works are not expected to adversely impact the heritage fabric or significance of the SWSOOS network and will protect its heritage value by prolonging its operational functionality.

Aspect	Potential impacts
	With mitigation measures in place (refer to Table 3-3), the proposal is assessed as having minor and positive impacts. The proposal will enhance the operational integrity of the SWSOOS2, aligning with its functional significance.
Noise and vibration	**Existing environment** The land use surrounding the proposal sites include General Industrial (IN1), Public Recreation (RE1), Low Density Residential (R2) and Medium Density Residential (R3). The existing noise environment is characterised by the neighbouring Sydney Airport, surrounding industrial premises, passive recreation from Sir Joseph Banks Park, commercial and warehouse operations such as storage facilities, and other support services. The nearest sensitive receivers are residents adjacent to Site 2. There are no sensitive receivers within 100 m of Sites 1 and 3. **Equipment and timing of work** The proposal will generate temporary noise and vibration during the proposed activities. Equipment, vehicles and machinery that would typically be used during the proposal and that have potential to generate noise include: • air compressors • generators • concrete saws • jackhammers • shotcrete pump • ventilation fans • concrete trucks • tip trucks • light vehicles • vacuum trucks. • Excavators The proposal is expected to take about 27 months, with all the work carried out during standard daytime construction hours. Noise impacts would vary across the duration of the proposal as works transition from desilting to rehabilitation. Noisiest activities will be non-continuous and not every shift. **Noise impact assessment** The likelihood of noise impact was assessed using Table 2 of the Draft Construction Noise Guideline (EPA 2020). After consideration of the existing environment, equipment and timing of work, noise impact was assessed to be low/medium risk. Therefore, a quantitative noise impact assessment was completed using the Transport for NSW (TfNSW) Construction and Maintenance noise estimator tool (TfNSW, 2022). <u>Noise assessment input</u> The purpose of the noise assessment was to assess the predicted worst-case noise impacts. This identified recommended mitigation measures for impacted receivers at different distances from the works. These are in addition to the standard mitigation measures and they guide the proposal's community engagement. R4 was chosen as representative of the baseline noise environment as it aligns with the Urban residential setting of the project area with the nearby Sydney Airport, industrial estates and State Roads (Foreshore Road). The background noise level for the assessment of standard daytime works in an R4 setting is 55 dB(A). The noise propagation type was identified as 'Residential receiver-developed settlements (urban and suburban)'.

Aspect	Potential impacts

A receiver may have line of sight (LOS), or no line of sight (NLOS), to the proposal. LOS is the straight line between the noise source and the receiver. The worst-case scenario for the proposed work is the operation of a jackhammer. The estimator was run twice to capture noise impacts from the proposal on LOS and NLOS receivers.

Noise assessment output

The predicted worst-case noise impacts for sensitive receivers are summarised in Table 3-2. The output comprises distance-based noise impact contours, which provide a visual representation of how sound levels from a source vary across an area.

Refer to Figures 5 to 7 for representative noise contour mapping. These outputs also include recommended mitigation measures at different distances from sensitive receivers, as identified by the noise estimator tool. Mitigation measures are to be implemented where reasonable, feasible and requested by nearby sensitive receivers.

Daytime operation of a jackhammer is anticipated to be highly intrusive for sensitive receivers within 60 metres (up to 12 sensitive receivers at Site 2) (see Figure 6).

The proposal would elevate the noise environment temporarily and would moderately impact up to 15 residential receivers. The noise impact would move incrementally along the alignment from one site to the next, for a period of about 9 months at each site. Mitigation measures identified in Table 3-2 would be implemented and would be essential to managing noise impacts. This would be assisted by considering the differing needs of the community.

Table 3-2 Mitigation measures – Standard daytime hours

		LAeq (15 minute) noise level above background LA90)				LAeq (15 minute) 75dB or greater
Scenario	Activity	**5 to 10 dB(A) Noticeable**	**10 to 20 dB(A) Clearly audible**	**20 to 30 dB(A) Moderately intrusive**	**>30 dB(A) Highly intrusive**	**Highly affected**
Residential receiver-developed settlements (urban and suburban)	Jackhammering (LOS)	n/a	n/a	60 m	60 m	60 m
Recommended mitigation measures		n/a	n/a	Notification (N), Phone	Notification (N), Phone	Notification (N), Phone

Aspect	Potential impacts			
		Calls (PC), Respite offer (RO)	Calls (PC), Respite offer (RO)	Calls (PC), Respite offer (RO)
	Vibration impacts The vibratory threshold vibration limits for velocity (PPV) on a brittle pipe asset such as those subject to the proposal are 10 mm/s for intermittent vibrations and 5 mm/s for continuous vibrations as per Sydney Water's *Specialist Engineering Assessment Procedure* dated February 2021. Vibration monitoring would be undertaken to assess the impact of vibration on the structural integrity of SWSOOS2 and inform additional protection measures if required. Due to the localised nature of the work and the absence of sensitive receivers near the proposal, vibration impacts of the proposal are considered minor. No additional noise and vibration impacts are expected during operation.			
Air and energy	There is the potential for air quality impacts from construction vehicle and equipment emissions, and dust caused by vehicle movements and ground disturbance works. Potential odour emissions are associated with the SWSOOS2 openings and the desilting process. Access to all SWSOOS2 maintenance holes along the alignment will be required to install ventilation fans upstream of the working area for the full duration of in-sewer works, and extraction fans will be installed downstream to maintain adequate airflow. Odour Control Units (OCUs) may also be deployed to manage potential odour issues by treating air from the wastewater network. Silt removed from the SWSOOS2 will be stored and transported in sealed skip bins to prevent any additional odour issues. Given the localised nature of the works, absence of sensitive receivers near the proposal, and the use of appropriate odour control methods, impacts to air quality are expected to be temporary and minor in nature. No operational impacts are expected.			
Waste and hazardous materials	Desilting works would generate waste including silt and debris material removed from the SWSOOS2 tunnel, topsoil removed to flatten the ground surface at Site 1, and organic matter from tree removal. Silt and debris material would be removed from the SWSOOS via a vacuum truck and then vacuum transferred into sealed silt skip bins before being transported off site to a licensed waste facility for appropriate disposal. The proposal would also generate waste including structurally unsound or deteriorated concrete, reinforcements and joints during rehabilitation works. These materials would be transferred into sealed bins before being transported offsite to a licensed waste facility. The total amount of waste to be generated during silt and debris removal is anticipated to be 3700 tonnes, and none of this waste will be stored on site. When the sealed skip bins reach capacity, they would be removed as soon as reasonably practicable for appropriate disposal. Additionally, the proposal has the potential to encounter contamination in topsoil caused by PFAS, fuel leaks, other hazardous materials or illegal waste dumping. The spoil generated from levelling works at each rehabilitation site would be tested and disposed of at an appropriately licensed facility if it cannot be reused onsite.			

Aspect	Potential impacts
	Due to the localised nature of the works, and the use of appropriate waste storage and disposal methods, impacts associated with waste and hazardous materials are expected to be minor. A Contaminated Land Management Plan (CLMP) is in place for Site 1, and its requirements will be strictly adhered to (see Appendix E) during desilting and rehabilitation works. All works that involve site set up, with its associated ground disturbance and vegetation removal will be completed under the separate REF titled 'Southern and Western Suburbs Ocean Outfall Sewer 2 – Desilting Works' (27/09/2024). No operational impacts from waste and hazardous materials are expected to occur.
Traffic and access	The proposal would result in increased localised traffic movements to establish the sites, and for ongoing desilting and rehabilitation works including regular removal of silt and debris by silt skip bin trucks. No road or footpath closures are proposed as part of the works, and there will be no impacts to public or active transport and access to neighbouring properties. Light and heavy vehicle movements will vary depending on work staging. Initial works and major activities, such as desilting and CAC lining, are expected to have a higher number of vehicle movements across all sites. Vehicle movements as a daily average across the three sites are approximately 20 light vehicles and 5 heavy vehicles. The proposal would require use of existing access roads and tracks to the rehabilitation sites. Light vehicle access to Site 2 and SWSOOS2 maintenance holes will be via existing access tracks in Sir Joseph Banks Park off Hayden Place, Botany. Construction parking would be provided within the footprint of Site 1 (shown in Figure 2). Some on-street parking spaces will be occupied at Sites 2 and 3. Approximately 7 to 14 public parking spaces would be temporarily removed to store equipment and house site amenities along The Esplanade for Site 2 (Figure 3). Up to 4 parking spaces would be occupied at Site 3 to house site amenities and would either be along Exell Street or in the carpark, Banksmeadow (Figure 4). Workers will park within the site footprints where possible. Traffic, parking and plant movements will be managed in accordance with the proposed mitigation measures and are to minimise the impact on parking availability in areas surrounding the proposal. The proposal would result in short-term increased localised traffic movement to establish the sites, and for ongoing rehabilitation works. However, due to the small volume of vehicle movements and localised nature of the works, impacts to traffic and access as a result of the proposal are considered minor. No operational impacts to traffic and access are expected to occur.
Social and visual	The proposal lies within an industrial and infrastructure setting. It will be visible to a range of nearby receivers, including residential and non-residential properties, users of public spaces and people travelling along roads. However, visibility is limited from nearby receptors due to surrounding vegetation and structures such as fences. These temporary visual impacts are considered negligible. Potential social impacts during construction are expected to be limited and would primarily relate to temporary noise, traffic and visual impacts. The presence of plant machinery and construction vehicles (trucks and utes) on site and ground disturbance including excavation would cause temporary short-term visual impacts. All construction equipment would be removed at the completion of work. Where the ground surface is disturbed, it would be stabilised and reinstated to its pre-disturbed state at the completion of works.

Aspect	Potential impacts
	Social and visual impacts are not expected during the operation of the proposal.
Cumulative and future trends	Works are not anticipated to substantially contribute to any cumulative adverse environmental impact at either a local or regional scale. The work would improve the operation of the wastewater system and are intended to prevent asset failure, improving the health and amenity of the environment in the long-term, and reducing the risk of wastewater overflows into the environment.

Table 3-3: 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 proposal area and has no net additional environmental impact or • is outside the proposal area 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 (e.g. heritage/AHIP zones professionally surveyed. Mark the boundary with highly visible non-ground-disturbing and 'environmental protection zone' signs) and boundaries of the sites 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 (e.g. metal fencing for AHIMS, white flagging for construction corridor, red flagging for no go zones etc). Delineate approved proposal area before construction.

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

- predicted/onset of heavy rain during works
- spills
- unexpected finds (e.g. 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 (e.g. *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 the 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.
Sweep up any sediment/soil transferred off site at least daily, or before rainfall.
Eliminate ponding and erosion by restoring natural landforms to the pre-works condition.
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).
Delivery Contractor to ensure imported material is Virgin Excavated Natural Materials (VENM) or meets a relevant NSW EPA Resource Recovery Order and Resource Recovery Exemption, or is a commercially supplied material that is not waste. If using materials that are subject to a NSW EPA Resource Recovery Order/Exemption the Delivery Contractor must ensure the conditions in that Order/Exemption are strictly adhered to.
All site workers are required to sign the Environmental Management Checklist and Workplace Health and Safety Checklist for works including ground disturbance and non-intrusive maintenance works at Site 1 in accordance with Section 8 of the Contaminated Land Management Plan for Hale Street and Foreshore Road in Botany (refer to Appendix E).
Water and drainage
Use appropriate controls to avoid potential sedimentation to waterbodies.
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.
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.
Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.
Flora and fauna

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 (e.g. 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).

Offset residual impacts to native vegetation and trees in accordance with the Biodiversity Offset Guideline (SWEMS0019.13).

Minimise vegetation clearance and disturbance, including impacts to standing dead trees and riparian zones. Where possible, limit clearing to trimming rather than the removal of whole plants.

Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing.

Adjust methodology (e.g. avoid area, hand excavate, implement exclusion fencing) to protect sensitive areas where possible (such as mature trees, known threatened species, populations or ecological communities).

Inspect vegetation for potential fauna prior to clearing or 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.

If any damage occurs to vegetation outside of the trees assessed (as shown in the CEMP), notify the Sydney Water Project Manager and Environmental Representative so that appropriate remediation strategies can be developed.

If replanting near Sydney Water pipelines refer to '*Which trees can damage wastewater pipes?*' link from Sydney Water website to help identify suitable species.

In TOBAN period:

- check specific TOBAN notice to confirm whether the work can be carried out under standard exemptions (Govt Gazette No18 Feb 2018)
- if the work is not covered by a standard exemption, apply to RFS for specific exemption.

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.

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 project team members, including contractors, should be informed about the Aboriginal and non-Aboriginal heritage significance of the site as part of the general site induction packages. The inductions should identify why SWSOOS2 is significant, the statutory obligations relating to heritage and the protection methods to be used during works to prevent accidental damage from the works.

Physical works within SWSOOS2 curtilage include above ground activities that will not impact the heritage significance of the item and those activities generally described in Table 3-1 above. The SWSOOS2 must be clearly indicated on plans and identified on site.

Conduct a dilapidation survey/asset condition assessment of the SWSOOS2 before commencing work which may damage existing structures.

All hazardous materials/fuel utilised for the works must be appropriately stored and managed to ensure the materials do not spread beyond the laydown area/generator location. Measures must be in place for accidental spills.

A copy of the Local Heritage Assessment Form (Appendix D of this REF) must be retained on file for record keeping purposes and as evidence that a heritage assessment has been prepared for the works.

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. No work to be scheduled on Sunday nights or public holidays. Any proposed work outside of these hours 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) (include if relevant).

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 (e.g. 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 (e.g. 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 (e.g. 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.

If **night works are needed (beyond those identified in this REF),** the Delivery Contractor would:

- justify the need for night works
- consider potential noise impacts and implement the relevant standard daytime and out of hours safeguards and document consideration of all reasonable and feasible management measures
- identify community notification requirements (i.e. for scheduled night work (not emergency works))
- notify all potentially impacted residents and sensitive noise receivers not less than one week prior to commencing night work
- seek approval from the Sydney Water Project Manager in consultation with the environment and communications representatives.

If works on **Sundays or public holidays are required**, the Delivery Contractor would:

- justify why all other times are not feasible
- consider potential noise impacts and implement relevant standard daytime, out of hours and night-time safeguards and other reasonable and feasible management measures
- identify community notification requirements

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

Monitor compliance with the recommended vibration levels in DIN 4150-3 1999: Structural Vibration – Part 3; Effects of vibration on structures and Sydney Water's *Specialist Engineering Assessment Procedure* dated February 2021.

Consider the additional noise mitigation measure recommendations identified in Table 3-2.

Air and energy

Use alternatives to fossil fuels where practical and cost-effective.

Track energy use as per SWEMS0015.28 Contractor NGER template.

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

Ensure odour control measures (e.g. sealed skip bins, extraction fans, and if required OCU's) are available and ready to use during the works.

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.
- Modify site layout (place stockpiles away from sensitive receivers).
- Vegetate exposed areas using appropriate seeding.

Cover all transported waste.

Waste and hazardous materials

Manage waste in accordance with relevant legislation and maintain records to show compliance e.g. 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 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.

Prevent pollutants from escaping including by covering skip bins.

Dispose excess vegetation (non-weed) that cannot be used for site stabilisation at an appropriate green waste disposal 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 the Contamination and Hazardous Materials team propertyenvironmental@sydneywater.com.au).

Traffic and access

Develop management measure to minimise traffic impacts near residential properties, schools and businesses by consulting with them (e.g. no major materials 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.

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.

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.

Social and visual

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).

Maintain work areas in a clean and tidy condition.

4 Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of desilting and rehabilitation works on the Southern and Western Suburbs Ocean Outfall Sewer 2 (SWSOOS2). The proposal is required to maintain the structural integrity and environmental compliance of the SWSOOS2.

The main potential construction environmental impacts of the proposal include impacts associated with waste and non-Aboriginal heritage. During operation, it is unlikely that any adverse impacts would be experienced. 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.

The REF considers how the proposal aligns with the principles of Ecologically Sustainable Development (ESD) (Appendix B). 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 construction works associated with noise, odour, and occupation of public parking spaces. Impacts to the community are considered minor due to the temporary nature of the works and limited number of sensitive receivers near the proposal. Temporary visual impacts associated with tree removal at Site 2 may be experienced by passing traffic and visitors to the area. There would be environmental improvements by providing a reliable wastewater service to the local community.
Any transformation of a locality	The proposal would result in a minor and temporary transformation of a locality. The proposal involves works on and in existing Sydney Water assets with the removal of two trees proposed. Impacts are not anticipated to be significant due to the minimal amount of vegetation removed and previous historic clearance and ground disturbance at this location. No new infrastructure or above ground structures are proposed, cleared vegetation would be offset and site will be restored to pre-existing condition or better.
Any environmental impact on the ecosystems of the locality	The proposal would not result in environmental impacts to ecosystems of the locality. Although the removal of two trees is proposed, impacts are not anticipated to be significant due to the minimal amount of vegetation removed and previous historic clearance and ground disturbance at this location. No significant impacts are expected and cleared vegetation would be offset. Works adjacent to waterbodies would follow mitigation measures to limit impacts to the water and sediment quality. The proposal would lead to environmental improvements by ensuring a reliable wastewater service to collect and treat wastewater and reduce likelihood of wastewater overflows, minimising any impacts on ecosystems.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposal would not reduce the aesthetic, recreational, scientific or other environmental quality or value of the locality. There may be temporary aesthetic impacts due to the presence of construction vehicles and machinery and tree removal. Impacts would be temporary and short term as the construction equipment would be removed, and the area restored to pre-existing conditions once construction is complete. The removal of 2 planted native trees may cause temporary visual impacts for passing traffic and visitors to the area, however, these are unlikely to significant due to the minimal amount of vegetation removed, previous historic clearance and ground disturbance.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or	The proposal would not have any effect upon these factors. [redacted]

Section 171 Checklist	REF finding
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*)	Two planted native trees would need to be removed to facilitate site establishment. However, these are the only vegetation impacts proposed and the impact on the habitat of protected animals is considered negligible. Any unanticipated impacts would be managed in accordance with the mitigation measures listed in Table 3-3.
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 unanticipated impacts would be managed in accordance with the mitigation measures listed in Table 3-3.
Any long-term effects on the environment	The proposal would not have any long-term impacts on the environment but would have a long-term benefit by providing a reliable wastewater service for the area and reducing environmental risks such as wastewater overflows during storm events.
Any degradation of the quality of the environment	The proposal would not cause the degradation of the quality of the environment.
Any risk to the safety of the environment	The proposal would not increase risk to the safety of the environment, public health, contamination or bushfire risk and would improve the safety of the environment and public health by reducing the risk of wet and dry weather overflows.
Any reduction in the range of beneficial uses of the environment	The proposal would not reduce the range of beneficial uses of the environment.
Any pollution of the environment	Environmental mitigation measures would mitigate the potential for the proposal to pollute the environment. No pollution of the environment is expected as a result of the proposal. The works would improve the operability of the wastewater system and reduce the likelihood of pollution from wastewater overflows.
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 would not increase demand on resources, that are, or are likely to become, in short supply.

Section 171 Checklist	REF finding
Any cumulative environmental effect with other existing or likely future activities	The proposal would 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 would not have any impact on coastal processes or hazards, and coastal processes and coastal hazards would 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 Ecologically Sustainable Development

Principle	Proposed 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. The proposal equipment and methodologies are proven and will be delivered by experienced contractors. Potential impacts have been assessed and minimised to the greatest extent possible during the concept design phase. There is minimal 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. The proposal will enable improvements to reliability and performance of the wastewater network
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 biological diversity or impact ecological integrity. Vegetation clearing has been minimised to the greatest extent possible and limited to two planted native trees. This minimises the impact to threatened species and habitat features. The proposal will improve protection against wastewater overflows by maintaining SWSOOS2 functionality.
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 is an essential maintenance activity and would 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?		X
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		X
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		X
Connect to, and use a substantial volume of water from a council owned water supply system?		X
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?	X	
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?		X
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?		X
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?		X
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)?		X
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?		X

TISEPP section	Yes	No
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).*		X
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).*		X
Will the proposal include a fixed or floating structure in or over navigable waters? *If so, consult TfNSW.*		X
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.*		X
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*.		X

Appendix D – Local Heritage Assessment Form

s170 Heritage Assessment Form

For works to Sydney Water s170 local heritage items

s170 HAF Date	13/08/2026
Heritage Team Folder Ref	HP0142
s170 HAF Document Ref	2627_s170_0004
SWIM Location	Folders \ Contribution Folders \ Govern Sydney Water \ Manage Environment \ Heritage \ Approvals

This s170 Heritage Assessment Form (HAF) is to be completed by a qualified Sydney Water heritage advisor, when works are proposed to or within the curtilage of, a Sydney Water Section 170 Heritage & Conservation Register (s170) item of local significance. Note: if the item is <u>also</u> on the SHR, an approval under the Heritage Act is needed instead of this s170 HAF

This s170 HAF <u>does not</u> assess impacts to Aboriginal Objects or Aboriginal Cultural Heritage values (refer SWEMS0031). This s170 HAF is an internal assessment document only – not for public release or inclusion in REF or EIS assessment documents.

The relevant project details for this s170 HAF are included in the following table.

Table 1 Project Summary

Project Name	**SWSOOS 2 Package rehabilitation of Package A4**
Address	General Holmes Drive MASCOT NSW 2020
Estimated Cost of Works	$40 million
Estimated Timing	**Start Date:** August 2026 **End Date:** December 2028
Sydney Water Representatives	**SW Project Manager:** Haydn Chellew Haydn.Chellew@sydneywater.com.au **SW Environment Rep:** Sam Campbell Sam.Campbell@sydneywater.com.au

1. Heritage significance review

When works/activities are proposed to or within the curtilage of a Sydney Water s170 local heritage item, an assessment must be undertaken to understand the potential impact on the heritage significance of that item.

The proposed works relate to the following Sydney Water s170 local heritage item/s (and equivalent Environmental Planning Instrument listing where applicable) in the table below:

Table 2 Applicable Heritage Listings

Heritage List	Details
State Agency Section 170 Heritage & Conservation Register	**Register:** Sydney Water Section 170 Heritage & Conservation Register **Item Name:** Southern and Western Suburbs Ocean Outfall Sewer 2 (SWSOOS2) **Item Number:** 4572729 **Level of Significance:** Local **Statement of Significance:**[1] *The boundary and curtilage of SWSOOS 2 is to include all original fabric from Eve Street, Rockdale to the Ocean Outfall at Malabar with a 2 metre buffer zone parallel to the existing structure where this owned by Sydney Water.*

SWSOOS Curtilages: The SWSOOS heritage curtilages are not currently mapped on the Sydney Water spatial information system. The curtilages is mapped on Figure 1 and described in the s.170 Register[2] as:

- **SWSOOS2:** The curtilage is defined as all original fabric from Eve Street, Rockdale to the Ocean Outfall at Malabar with a 3 metre buffer zone parallel to the existing structure.

An extract of Sydney Water's GIS Spatial system is included below (Figure 1), showing the s170 heritage item location and curtilage.

[1] NSW State Heritage Inventory record for the s170 heritage item
[2] https://www.sydneywater.com.au/water-the-environment/what-we-are-doing/heritage-conservation/heritage-search.html, accessed 10 December 2025.

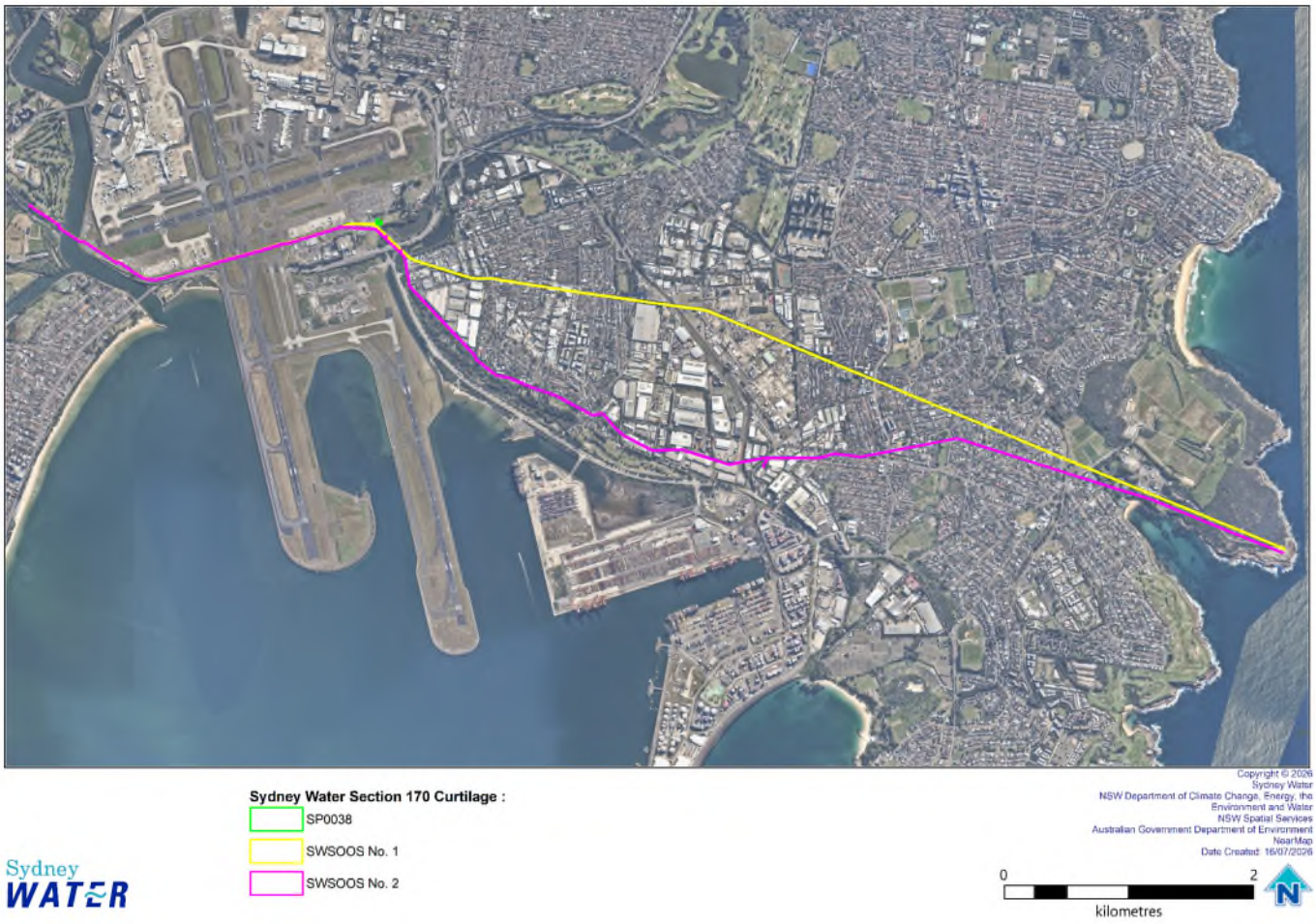


Figure 1 Aerial with mapping of the s.170 heritage item SWSOOS 2 (pink). The s.170 listing provides a 3m curtilage the structure).

2. Project description

2.1 Scope of works

The Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS) is a major trunk sewer serving the southern and western areas of Sydney. It comprises three sections: a single barrel (SWSOOS1) and a twin barrel (SWSOOS2), and transports sewage from Arncliffe to the Malabar Water Resource Recovery Facility.

Silt accumulation within the SWSOOS tunnel affects the capacity and performance of the SWSOOS, increasing the risk of wet and dry weather overflows.

It is proposed to undertake desilting and rehabilitation works within the SWSOOS 2 (Package A4) – Figure 2. The proposal is necessary to prevent the risk of wet and dry weather overflows into the environment with its primary objective being to remove accumulated silt and undertake rehabilitation activities within the SWSOOS2 tunnel to preserve its structural integrity and environmental compliance. Rehabilitation will include internal repairs, reinforcement and removal of degraded materials. This would maintain the operational and environmental

performance of the wastewater system. There are no changes to the existing operational requirements of the SWSOOS.

The works comprise:

Site establishment

- set up site compounds including site offices, lunchrooms and bathrooms.
- set up silt extraction stations including equipment, parking, storage containers, silt skip bins and a silt-dewatering facility.
- installation of protective fencing and necessary signage.

Desilting

- set up lifting frame (crane) over the SWSOOS2 at the existing wide openings.
- loading mini skid steers into the SWSOOS2 tunnel.
- removal and transfer of silt into bulker bags and loading into sealed silt skip bins using the lifting frame or using a vacuum truck and vacuum transfer into sealed silt skip bins.
- transfer of silt skip bins to a licenced waste facility for appropriate disposal.
- the use of light vehicle access to all manholes (traversing either side of the SWSOOS) for inspection and ventilation equipment (i.e. fans for confined space setup).

Rehabilitation

- repairing the internal concrete walls, roof slabs, central walls, and other structural elements:
    - surface preparation including pressure blasting, removal of unsound or deteriorated concrete, and the treatment of exposed reinforcement and repairs with mortar.
- repairing the reinforcements:
    - replacement, supplementing, and anchoring into sound concrete.
- removing and replacing degraded expansion joints:
    - sealing cracks, construction joints and other defects.
- application of Calcium Aluminate Cement (CAC) protective coating to the internal sewer surfaces (walls and roof) via shotcrete pump and air compressor.

Restoration

- demobilisation and removal of all plant and equipment.
- restoration of the sites to pre-existing condition or better.

Equipment

- confined spaces safety equipment (e.g. gantry/davit)
- skip bins
- excavators
- tip trucks
- street sweepers

- CAC equipment
- air compressors
- generators
- concrete saws
- jackhammers
- site facilities and amenities
- storage containers
- light vehicles
- cranes
- hand tools
- mini skid steers
- sediment tank
- vacuum trucks

Site Compounds

The proposal involves construction compounds at three sites along the SWSOOS2, one site (Site 3) and one option (Site 2b) are currently out of scope for the proposal. Compound could include house site sheds, construction amenities and materials laydown along with site offices, lunchrooms and bathrooms. Indicative compound locations at each site are shown in Figures 2-5 below.

- Site 1 - Tupia Street, Botany (Figure 2 & 3)
  Access to SWSOOS2 at Site 1 will be via existing full width openings, which are located off Hale Street. Vegetation clearing and trimming are proposed including an access track and turning circle for large machinery and vehicles (this will be the subject of a separate environmental assessment).
- Site 2 - The Esplanade, Botany (Figure 2 & 4)

  Access to SWSOOS2 at Site 2 will be via existing full width openings, located off The Esplanade and accessed through Hayden Place or Tupia Street. Tree removal and trimming is required for access. Option A will comprise site office amenities and the storage container across several parking spaces along The Esplanade, and immediately adjacent to the desilting equipment compound. The second placement option (B) is currently out of scope.
- Site 4 - Botany Road, Banksmeadow (Figure 2 & 5)

  Access to SWSOOS2 at Site 4 will be via existing stopboard openings, accessed through Exell Street. The first placement option for small amenities and the storage container is in the industrial complex. The second placement option for small amenities and the storage container is over several parking spaces along Exell Street. Consultation with Bayside Council will determine which option is selected.

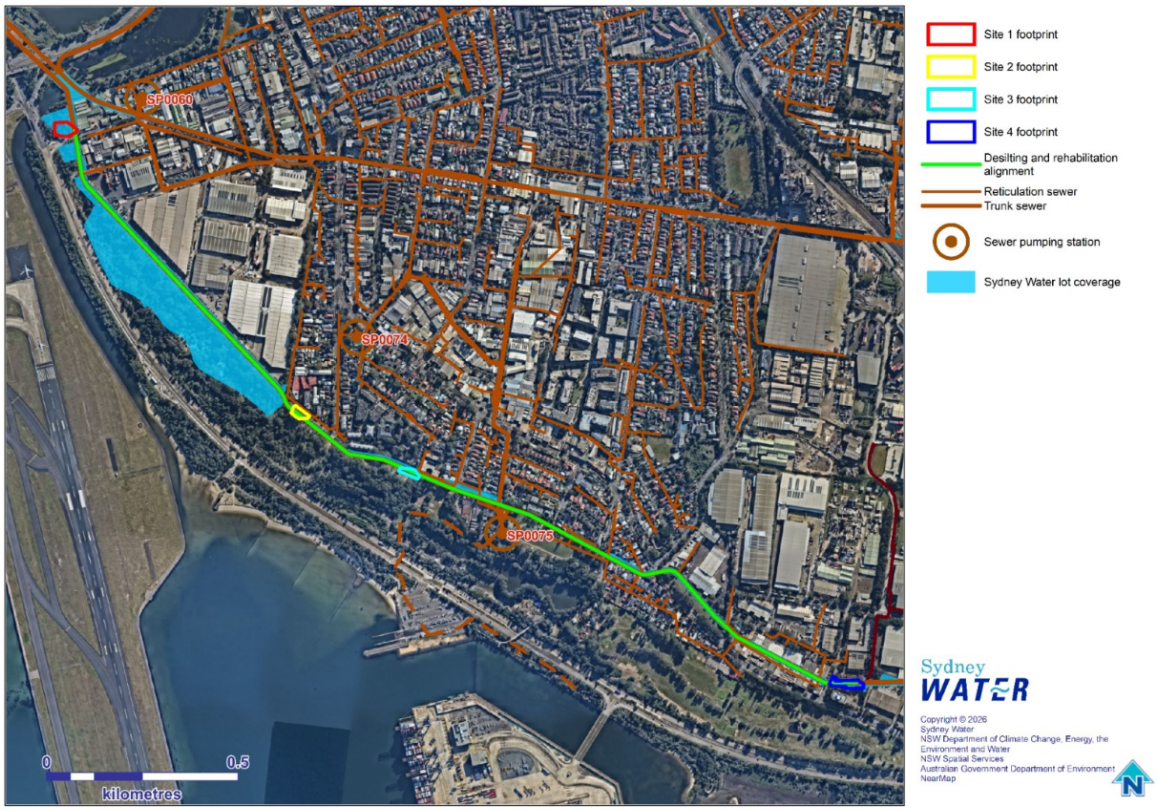


Figure 2: Plan of construction locations, compounds, spoil, parking areas and rehab works in relation to the SWSOOS2 (green line). Note site 3 is currently out of scope. Source: Sydney Water REF (Draft), July 2026.



Figure 3: Construction Compound Site 1. Source: Sydney Water Source: Sydney Water REF (Draft), July 2026.



Figure 4: Construction Compound Site 2. Option B is currently out of scope. Source: Sydney Water Source: Sydney Water REF (Draft), July 2026.

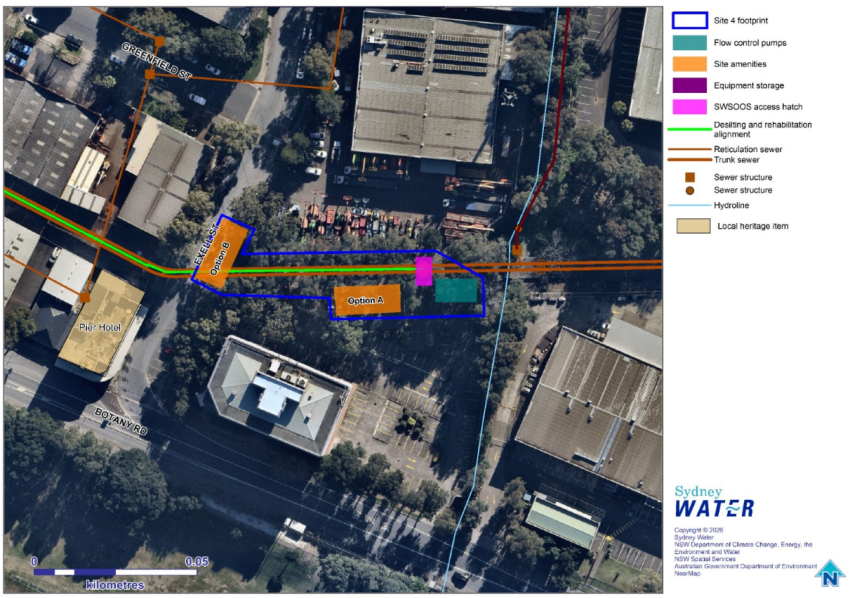


Figure 5: Construction Compound Site 4. Source: Sydney Water Source: Sydney Water REF (Draft), July 2026.

3. Heritage impact assessment

3.1 Site inspection

Were any inspections undertaken? Yes: ☒ No: ☐

Table 3 Site inspections

Date of inspection	Attendees (name & organisation)	Purpose of inspection	Findings
31 July 2026	Kylie Seretis, Haydn Chellew, Sam Campbell, Emma Ross, John Eames, Caitlin Cole, Ellison Bak (all SWC)	Look at/familiarise with project area.	NA

3.2 Sydney Water Heritage Advisor Assessment

The heritage item - **SWSOOS 2** – are part of a larger functioning sewage system. The proposal – described in section 3 above –forms one part of package of works to prevent the risk of wet and dry weather overflowing into the environment. The works are essential for routine maintenance to ensure the ongoing operation of the SWSOOS.

SWSOOS2: The proposal is located above and adjacent to SWSOOS2 and includes works to desilt and rehabilitate to the item and ensure its ongoing operation.

A suite of recommendations to manage any potential harm to the heritage items, associated with the proposal, are provided in Section 6 of this document. These safeguards include:

- Toolbox training around the significance of the heritage items.
- Identification of the heritage items on plans and on site.
- Dilapidation surveys to understand the assets condition prior to works.

Within these recommendations in place, the impacts are considered positive, and minor, as a key part of the heritage value lies in the functioning of the asset which will be addressed by through with works, with the relining increasing the life of the asset for an additional 20-40 years.

4. Conclusion & Recommendations

An assessment of the proposal has been undertaken by a qualified Sydney Water heritage advisor. Overall, the impacts of the proposal are considered positive and will have **no more than a minor or inconsequential impact** on the heritage significance of the local heritage item.

The following heritage recommendations must be adopted in undertaking the works in and around the heritage curtilages of **SWSOOS2**:

- All project team members, including contractors, should be informed about the heritage significance of the site as part of the general site induction packages. The inductions should identify why **SWSOOS2** is significant, the statutory obligations relating to heritage and the protection methods to be used during works to prevent accidental damage from the works.

- Physical works within **SWSOOS2** curtilage include above ground activities that will not impact the heritage significance of the item and those activities generally described in Section 3 above. The **SWSOOS2** must be clearly indicated on plans and identified on site.
- Conduct a dilapidation survey / asset condition assessment of the heritage items before commencing work which may damage existing structures.
- All hazardous materials/fuel utilised for the works must be appropriately stored/managed to ensure the materials do not spread beyond the laydown area. Measures must be in place for accidental spills.

A copy of this s170 HAF must be retained on file for record keeping purposes and as evidence that a heritage assessment has been prepared for the works. This s170 HAF assesses the proposal from a heritage perspective only. This s170 HAF does not constitute a statutory heritage approval. Additional environmental assessment may be required, including statutory planning approval.

Should the proposed physical scope of works change from the scope as assessed herein, a new or modified s170 HAF may be required.

This s170 HAF has been prepared by the following qualified Sydney Water heritage advisor:



Kylie Seretis
Principal Heritage Advisor

13/08/2026

Related Documents

Parent document number	Parent document title
SWEMS0031	Heritage Compliance Procedure

Appendix E – Contaminated Land Management Plan (CLMP) - Corner Hale Street and Foreshore Road, Botany

Appendix F – Aboriginal Heritage Due Diligence

Aboriginal heritage information must not be made publicly available or be published in any form or by any means by Sydney Water or our contractors / joint ventures, unless written approval has been provided to Sydney Water from DPE's AHIMS Registrar .

For publicly displayed REFs, all Aboriginal heritage information that identifies individual sites must be removed.

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