Review of Environmental Factors

Sydenham to Bankstown Wastewater Upsizing – Marrickville and Belmore (March, 2024)

Sydney WATER

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Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of the Sydenham to Bankstown Wastewater Upsizing – Marrickville and Belmore proposal. The REF was prepared under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Sydney Water both the proponent and determining authority.

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

Decision Statement

The main potential construction environmental impacts of the proposal include dust emissions, noise, potential non-Aboriginal heritage impacts and traffic impacts. No operational impacts are anticipated. The proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. Therefore, a Species Impact Statement (SIS) and/or Biodiversity Development Assessment Report (BDAR) is not required.

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

Certification

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

Prepared by:	Reviewed by:	Endorsed by:	Approved by:
[redacted]	[redacted]	[redacted]	[redacted]
Prinya Khamphounvong REF author Sydney Water Date: 23/11/2023	Deana Filipas Senior Environmental Scientist Sydney Water Date: 24/11/2023	Mihir Vardiwale Project Manager Sydney Water Date: 16/01/2024	Murray Johnson Environment and Heritage Manager Sydney Water Date: 22/03/2024

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 Sydenham to Bankstown Wastewater Upsizing - Marrickville and Belmore proposal 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 proposal has been undertaken in response to the Department of Planning and Environment's (DPE) '*Sydenham to Bankstown Urban Renewal Corridor Strategy*' (2017). The strategy targets growth opportunities for urban renewal around the train stations between Sydenham and Bankstown over the next 20 years. The purpose of these works is to improve network functionality by increasing the capacity of the wastewater network to service increased demand, thereby reducing the risk of wastewater main breaks in the future. Due to the Sydenham to Bankstown Metro Upgrade Project being undertaken by TfNSW, Sydney Water has an opportunity to access the railway corridor and upgrade wastewater infrastructure in these areas. This would be undertaken with ongoing consultation with TfNSW/Sydney Trains.
Proposal objectives	The objectives of the proposal include: • servicing development in stages to meet population and job growth forecasts • providing flexibility to be adaptable for a rapidly developing area.
Consideration of alternatives/options	To accommodate projected growth in the area wastewater pipe amplification or rezoning of wastewater areas were considered. Rezoning would involve connecting some wastewater assets to different or adjoining wastewater zones thus reducing large lengths of amplification. However, the options

Aspect	Relevance to proposal
	analysis indicated only a limited number of pipes were required to be amplified. As the sites are in a densely populated area, pipe amplification was proposed at existing pipe locations. The proposed works were selected as the preferred options as they were the least cost option to achieve the proposal needs and objectives while having an acceptable level of risk The decision framework considered the strategic outcomes from the regional and subregional plans. Option selection was made in consultation with internal and external stakeholders.

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 - *if there are threats of serious or irreversible environmental damage, lack of scientific uncertainty should not be a reason for postponing measures to prevent environmental degradation. Public and private decisions should be guided by careful evaluation to avoid serious or irreversible damage to the environment where practicable, and an assessment of the risk-weighted consequences of various options.*	The proposal will not result in serious or irreversible environmental damage and there is no scientific uncertainty relating to the proposal. The environmental impacts of construction would be minor, localised and short-term. The proposal will improve environmental conditions and customer experience in the area.
Inter-generational equity - *the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*	The proposal will help to meet the needs of future generations by providing a reliable wastewater service.
Conservation of biological diversity and ecological integrity - *conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.*	The proposal will not significantly impact on biological diversity or impact ecological integrity.
Improved valuation, pricing and incentive mechanisms - *environmental factors should be included in the valuation of assets and services, such as 'polluter pays', the users of goods and*	The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment.

Principle	Proposal alignment
services should pay prices based on the full life cycle costs (including use of natural resources and ultimate disposal of waste) and environmental goals	

2 Proposal description

2.1 Proposal details

Table 2-1 describes the proposal and Figure 1 and 2 shows the location and key environmental constraints.

Table 2-1 Description of proposal

Aspect	Detailed description
Proposal description	The scope of work is shown in Figure 1 and Figure 2 and described below: **Marrickville** The proposal involves construction of about 111 metres of a DN375 wastewater main via open trench along Victoria Street and into the railway property access driveway. Excavation depths will range from 3 to 4 metres. The proposal would also involve the construction of 4 new maintenance holes, and grouting and decommissioning the existing wastewater pipe. **Belmore** The proposal involves construction of about 45 metres of a DN450 wastewater main, with about 23 metres via open trench and about 22 metres via an underbore section of pipe under the railway corridor. The underbore would involve excavation to create launch and receiving pits of about 6 metres long, 4 metres wide and 2.7 metres deep. The proposal would involve construction of 3 new maintenance holes. This pipe would duplicate an existing pipe, to provide additional capacity.
Location and land ownership	**Marrickville** The proposal is located in the road and verge of Victoria Street and under the railway overpass Lot 1 DP1042838 in Marrickville. **Belmore** The proposal is located in the road and verge of Redman Parade and in Lot 12 DP 802657. All proposal locations are on land owned and managed by Inner West Council, the City of Canterbury Bankstown Council or land owned by Sydney Trains. The location of the proposal, including environmental constraints, is shown in Figure 1 and Figure 2.
Site establishment and access tracks	The proposal will be confined to previously disturbed areas, where possible, such as roads and road reserves, or council managed land. The proposal locations are accessible from the existing road network, and the proposal will not need to create new or temporary access tracks.

Aspect	Detailed description
Ancillary facilities (compounds)	Construction compound(s) will likely be required to house site sheds, construction amenities and materials laydown. During the design phase, the location of compounds and access tracks could not be confirmed. The exact location of these will be chosen by the contractor in consultation with landowner(s), and approved by Sydney Water's Project Manager as described by the mitigation measures in Section 5.2.11.
Methodology	The scope of work is outlined below: **Pre-Construction** • further site investigations may be required e.g. potholing, boreholes, geotechnical and contamination testing etc **Establishing site** • install erosion and sediment control measures • install fencing and traffic control measures **Wastewater upsizing works:** • open trench excavation in the verge, roadway, and public land for the new wastewater main, up to about 3 to 4 metres deep and 1.0 metre wide • minor excavation to create new maintenance holes • minor excavation to create launch and receiving pits, up to about 2.7 metres depth, 6.0 metres long and 4.0 metres wide (Belmore only) • microtunnelling from the launch to receiving pit, including a new section of the DN450 main (Belmore only) • install bends, tapers, tees, hydrants, thrust blocks and other fittings for new wastewater mains • connect the new wastewater main to existing network • traffic and pedestrian management during work and shutdown periods.
Commissioning	The proposal will be commissioned immediately following construction. This involves a series of checks, including testing, to ensure the proposal has been correctly constructed and integrated with existing infrastructure.
Restoration	The work site will be restored to the pre-existing condition following construction, in consultation with landowners.
Materials/ equipment	Plant and equipment required for the proposal include: • 13 tonne excavator with hammer attachment and buckets • standard road saw cutting • bogie trucks for spoil removal

Aspect	Detailed description
	• vacuum trucks for slurry removal • crane truck for delivery of road plates/shoring boxes/barriers • street sweeper • minimum of three trucks from micro tunnelling contractors to deliver the bore • shoring box • ATF fence and water filled barriers • skip bin • sediment tanks • concrete pumps • air compressors • generators • backhoes • jackhammers • hand tools • site facilities and amenities • storage containers • tip trucks • concrete agitator trucks • light vehicles • compactor • vibrator • auger drill.
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 final connection to the wastewater network This has been assessed and mitigation measures are provided in Section 6.
Proposal timing	Construction is expected to start in August 2024 and take about 8 to 10 months.

Figure 1 Location of proposal and key environmental constraints - Marrickville

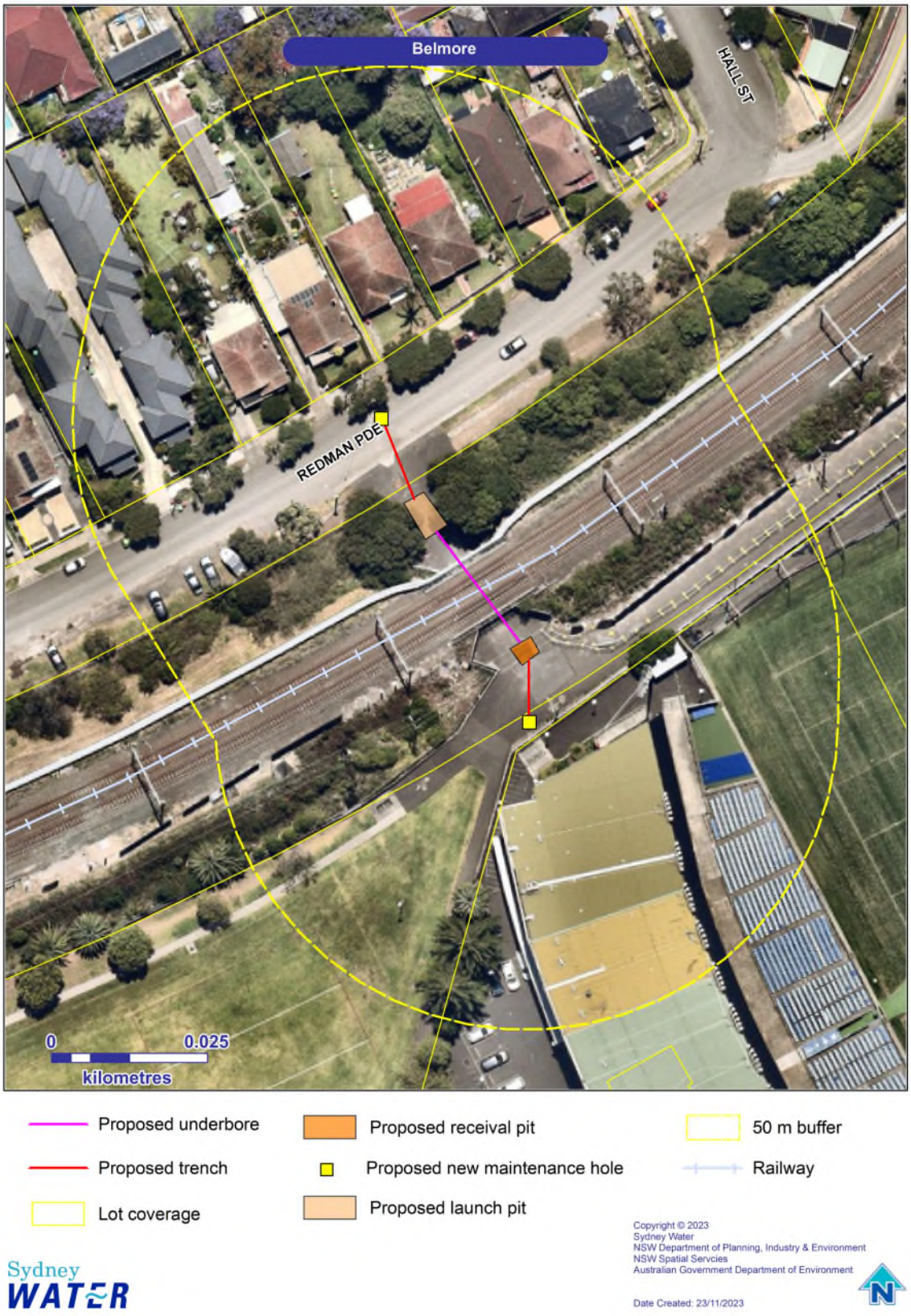

Figure 2 Location of proposal and key environmental constraints - Belmore

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 design and 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.

3 Consultation

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

As the wastewater upsizing works involve underboring below the railway corridor at Belmore, Sydney Water has been and will continue to consult with Sydney Trains about the proposal, including to prepare the Rail Access and Works Application Form for External Parties if needed. Sydney Water will give due consideration to any feedback raised by Sydney Trains.

3.2 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).

Both sites trigger the requirement to consult with Council in accordance with subsection 2.10 (1)(f) as they involve excavation of the surface of a road for which Council is the roads authority under the *Roads Act 1993*. An approval under section 138 of the *Roads Act 1993* would also be needed from Council. The delivery contractor has started consultation with Inner West Council and the City of Canterbury Bankstown Council.

3.3 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 3-1) and legislation (Table 3-2) are relevant to the proposal. Table 3-2 also documents any licences and permits required, and timing and responsibility for obtaining them.

Table 3-1 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Inner West Local Environmental Plan 2023 (Inner West LEP)	The proposal located at Marrickville is on land zoned SP2 - Infrastructure
Canterbury Bankstown Local Environmental Plan 2023 (Canterbury Bankstown LEP)	The proposal located at Belmore is on laned zoned: • SP2 – Infrastructure • RE1 – Public Recreation • R3 – Medium Residential.
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.126(6) of the TISEPP permits development for sewerage reticulation systems without consent on any land in the prescribed circumstances. A prescribed circumstance is if the development is carried out by or on behalf of a public authority, As Sydney Water is a public authority, and the development involves installing wastewater pipes and associated infrastructure (sewage reticulation system), the proposal is permissible without consent. Construction works connected with a sewerage system are identified in s.2.126(10) as being included in the development. This includes temporary construction yards and lay down areas for materials or equipment (s.2.3(3)).

Table 3-2 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Protection of the Environment Operations Act 1997 (POEO Act)	The proposal will be within the existing wastewater system environmental protection licence for the Malabar system (EPL 372) and has been designed to meet	N/A	Pre-construction, Sydney Water

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	the EPL compliance requirements. Construction of the proposal would not need a variation of the EPL for construction and operation of the proposal. Refer to Section 4 of this REF for details.		
Water Act 1912 / Water Management Act 2000	The proposal will encounter groundwater during construction. A Water Supply Works Approval (WSWA) under Section 90 of the WM Act, is required.	WSWA	Pre-construction, Sydney Water
Roads Act 1993	The *Roads Act 1993* declares Transport for NSW and other authorities (usually local councils) to be roads authorities. Section 138 of the Act states a person must not carry out work in, on or over a public road without consultation and consent of the appropriate roads authority. Approval will be required from the Council for works on Council managed roads.	Road Occupancy Licence	Pre-construction, contractor

4 Environmental assessment

Section 4 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.

4.1 Existing environment

The proposal is within the suburbs of Marrickville and Belmore on public land and land owned by Council. The existing environment around the sites can be generally characterised as previously disturbed areas by urban development. The land is primarily zoned for residential development, public recreation and infrastructure. The land surrounding all sites is characterised by low to medium density residential and areas for public recreation (eg public parks). The proposal will cross the railway corridor at both Marrickville and Belmore.

4.2 Environmental aspects, impacts and mitigation measures

4.2.1 Topography, geology and soils

Existing environment and potential impacts

Acid sulfate soils (ASS) and disturbed terrain have been identified within the Marrickville site. No ASS or disturbed terrain have been identified within the Belmore site. There are no EPA registered contaminated sites at both sites or adjacent to the sites. Inappropriate management of soils has the potential to impact surrounding land and watercourses from off-site leaching.

Excavation causing ground disturbance will be required for the following types of activities:

- open trenching for the exhuming of existing pipe and laying of new wastewater pipes
- construction of the launch and receiving pits
- minor levelling of compound areas if required to ensure a flat surface for plant and equipment laydown.

Where excavation is required for replacement of existing pipe sections, the extent of excavation would be restricted to the width of the existing trench where practicable. New excavations would occur in already disturbed land. Spoil stockpiling would occur for a minimal duration and used during backfilling where practicable. There is potential for soil erosion and generation of sediment-laden runoff from rainfall during open trenching and levelling activities.

The works would not permanently change the surface topography of the area. The area would be returned to its original condition following construction and no impacts during operation are expected. Potential impacts can be adequately mitigated by implementing the erosion and sediment control mitigation measures identified in this REF.

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 low.

Table 4-1 Environmental mitigation measures — topography, geology and soils

Mitigation measures
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
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 contractor must ensure the conditions in that Order/Exemption are strictly adhered to.
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 Property Environmental Services) to agree on proposed management approach.
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).
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.

4.2.2 Water and drainage

Existing environment and potential impacts

The proposal located at Marrickville is located 900 metres north of Cooks River which is listed as a Key Fish Habitat. *Marrickville Valley Floodplain Risk Management Study and Plan* (2017) indicates the proposal at Marrickville is located within 1 % Annual Exceedance Probability (AEP) for a flood event. Flooding has the potential to impact construction and increase movement of spoil/sediment or other contaminants offsite. Flooding impacts will be mitigated throughout construction activities.

The proposal located at Belmore 1.5 kilometres south of Cooks River is not on land mapped as flood prone.

A groundwater assessment was prepared by Delivering 4 Customers (D4C) in November 2023. The assessment notes that all excavations are likely to encounter groundwater, and it was estimated that a combined 1.31 megalitres may need to be dewatered across both sites. However, dewatering induced impacts to groundwater are not anticipated as:

- groundwater interception depths are shallow
- excavation areas are small
- the construction dewatering period is short
- there are no nearby existing registered bores or potential Groundwater Dependent Ecosystems.

Sydney Water will obtain a groundwater Water Supply Work Approval prior to any dewatering taking place. A Water Access Licence will not be required, as dewatering will not exceed 3 megalitres at both sites. Dewatering would be managed with appropriate mitigation measures, and in accordance with the approvals and licenses from the Natural Resources Access Regulator.

In addition, stockpiles will be managed carefully for proposal sites in flood-risk areas. Bunding potential contaminants, including contaminated wastes, will mitigate impacts from waste runoff and spills. Frac-outs and potential bypass system leaks can be actively managed by pressure monitoring and visual monitoring respectively and other mitigation measures provided below.

Mitigation measures

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

Table 4-2 Environmental mitigation measures — water and drainage

Mitigation measures
Bund open maintenance holes to reduce risk of wastewater spills.
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.
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.
Keep stockpiles outside of the 1 in 100 ARI flood extent
Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.
Conduct any equipment wash down within a designated washout area.

Mitigation measures
Sydney Water will obtain a groundwater Water Supply Works Approval and where dewatering is >3ML per water year (from 1 July) a Water Access Licence from NSW Department of Natural Resources will also be obtained. The Delivery Contractor is responsible for: • providing expert hydrogeological technical information to obtain the approvals preparing a Dewatering Management Plan • complying with the approval conditions (such as protecting water quality; minimising aquifer extraction volumes, monitoring extraction with flow meters and recording volumes).
Prepare Drilling Fluid Management Plan, including measures to: • contain and monitor drilling fluids at entry/exit points • identify and manage frac-outs • re-use and/or dispose of drilling fluids (checking waste classification).

4.2.3 Flora and fauna

Existing environment and potential impacts

A search of the NSW biodiversity databases and EPBC Act protected matters database was undertaken and found that threatened fauna species may occur in the broader Marrickville and Belmore areas. The vegetation within both sites includes only non-native vegetation. The vegetation is not a listed ecological communities or flora species under the EPBC or BC Act, and are not identified as important habitat for listed fauna species.

It is not anticipated that vegetation removal would be required for the proposal. No fauna species were identified within the proposal area due to the disturbed nature of both sites (e.g. rail infrastructure and residential houses).

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 low.

Table 4-3 Environmental mitigation measures — flora and fauna

Mitigation measures
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.

Mitigation measures
• Any removal of remnant vegetation where there is no net change to environmental impact (eg a different area of vegetation is removed but the total area is the same or less than assessed in the EIA). Written explanation of the application of this clause (including justification of the need for trimming or removal and any proposed revegetation) should be provided when seeking Project Manager approval. Any impacts to native vegetation and trees must be offset in accordance with the Biodiversity Offset Guideline (SWEMS0019.13).
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 provided.

4.2.4 Heritage

Existing environment and potential impacts

Aboriginal heritage

[redacted]

Non-Aboriginal heritage

There is one non-Aboriginal heritage item adjacent to the proposal at Marrickville, listed under the Inner West Local Environmental Plan '*Stone House, Including Interiors' (*I1270). The proposal is located 20 metres west of the heritage item curtilage. Potential vibration impacts may be experienced at the heritage structure during the use of the excavator with hammer. Vibration impacts to the listed heritage item have been discussed in Section 4.2.5.

There are no non-Aboriginal heritage items located near the proposal at Belmore.

Mitigation measures

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

Table 4-4 Environmental mitigation measures — heritage

Mitigation measures
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.
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.
All site personnel must be inducted on the nearby heritage item and potential heritage finds before starting work on site. The induction should include clear explanation of heritage constraints, go and no-go areas, measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed.

4.2.5 Noise and vibration

Existing environment and potential impacts

The proposal is located within multiple settings ranging from residential to industrial. The existing noise environment around the proposed works is influenced by road and rail traffic (trucks, cars, buses and trains). The works will generate noise and/or vibration during construction from the ground-breaking activities and the operation of machinery and equipment. Works are proposed to be carried out over five shifts per week (i.e. Monday through Friday 7am - 6pm. Construction is expected to take about 10 months to complete.

Based on the risk profile of the works from Table 2 of the *Draft Construction Noise Guideline* (EPA, 2020), a quantitative noise assessment was performed for the proposal. The purpose of the noise assessment was to assess the predicted worst-case noise impacts. This identified recommended additional mitigation measures for impacted receivers at different distances from the works, which guided community engagement for the sites. The noise assessment was performed using the RMS Construction and Maintenance Noise Estimator. The modelled scenario comprised of the following inputs:

- Representative noise environment – R4
- Distance based noisiest plant – 13-tonne excavator with hammer
- Line of sight to the receiver – Yes.

The worst-case noise impacts have been displayed in Figure 3 and Figure 4 below. Consultation will be undertaken with residents where works were considered ‘moderately intrusive’ and ‘highly intrusive’, and as a result recommended mitigation measures have been listed below:

- N: Notification (for residents affected by moderately and highly intrusive works)
- PC: Phone calls (for residents affected by highly intrusive works only)
- RO: Respite Offer (eg work blocks of three hours and one hour breaks in between) (for residents affected by highly intrusive works only).

One night of night works would be required to connect the new pipes to the existing wastewater network. The use of heavy machinery would not be required for final connections. Due to the short

nature of night works, noise impacts during this time would be managed with the mitigation measures listed below.

As discussed in Section 4.2.4, potential vibration impacts may be experienced at the heritage structure during the use of the excavator with hammer. The RMS Construction and Maintenance Noise Estimator was used to determine ground vibration – minimum working distances in relation to sensitive structure. The use of a 13-tonne excavator with hammer was used for the calculation as the most vibration intensive equipment to determine the minimum working distance to protect the heritage structure from vibration related impacts. It was determined that a minimum of 7 metres of separation would be required. As the proposal at Marrickville is located 20 metres north west of the heritage item curtilage, no impacts are anticipated.

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 4-5 Environmental mitigation measures — noise and vibration

Mitigation measures
Works must comply with the *Construction Noise Guideline* (Draft, EPA, 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) All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts.
As works **beyond standard daytime hours are needed**, the 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; 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.
A minimum of 7 metres minimum working distance will be required when working near 'Stone House, Including Interiors' (I1270).
Conduct a dilapidation survey / asset condition assessment prior to works which have potential to damage existing structures (heritage house and railway facilities).
Monitor compliance with the recommended vibration levels in DIN 4150-3 1999: Structural Vibration – Part 3; Effects of vibration on structures.

Figure 3 Predicted worst case noise impact - Marrickville

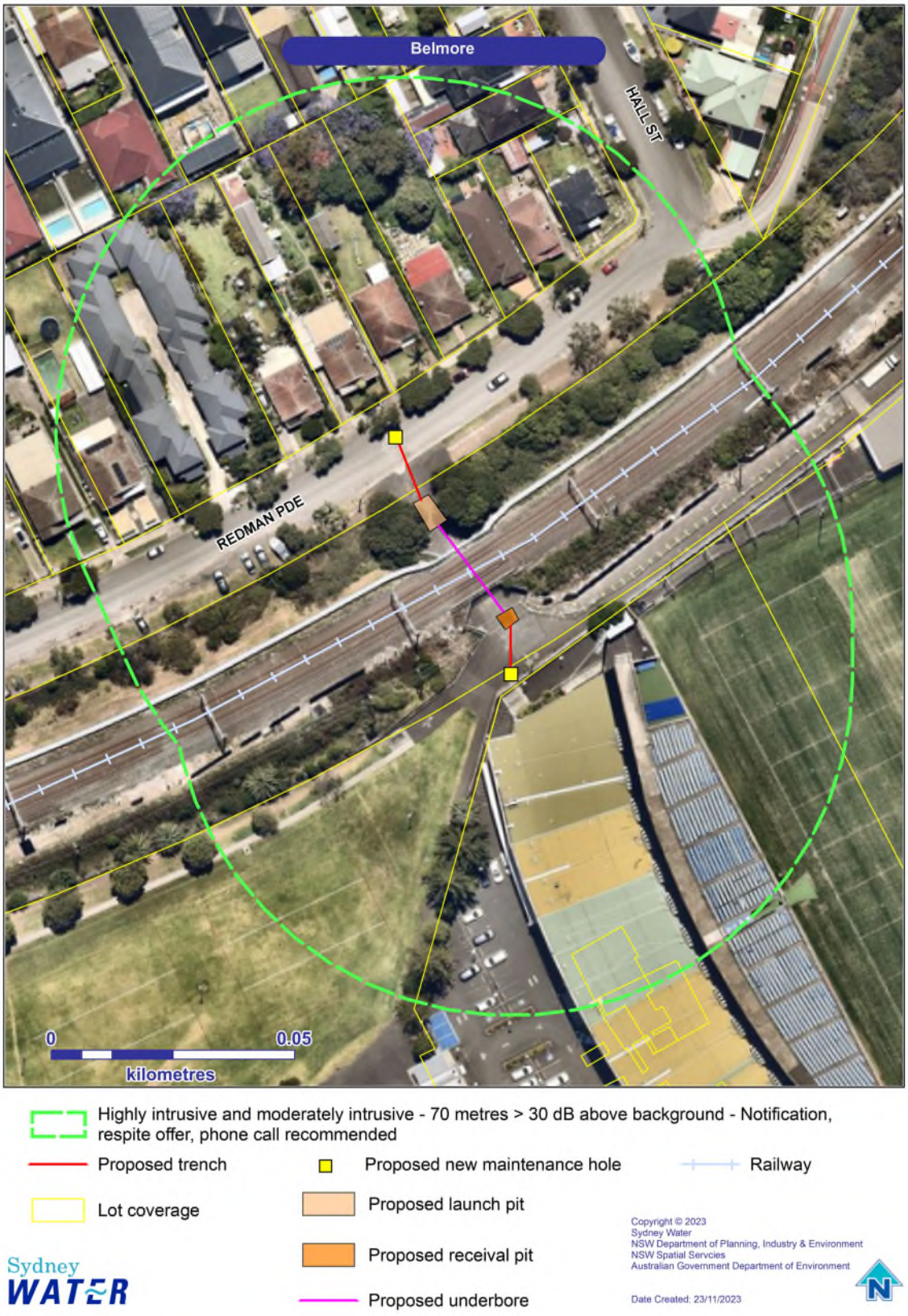

Figure 4 Predicted worst case noise impact - Belmore

4.2.6 Air and energy

Existing environment and potential impacts

The proposal is in residential, infrastructure and public recreation areas. The following activities have the potential to cause adverse impacts on air quality:

- emissions from works equipment and vehicles
- release of gases from the wastewater system when access chambers are opened
- odour emissions from opening up the wastewater system and during the cleaning process
- generation of dust during excavation.

It is not expected that the proposal will generate large quantities of dust, significant vehicle emissions or significant odours.

Construction activities at the sites will have the potential to generate dust from excavations and minor levelling compound sites and/or exhaust emissions from equipment and machinery. As the works will be in connection to the existing wastewater main, and include the opening of wastewater infrastructure, there will also be potential for odour to be generated during construction. Due to the short term and minor scale of the works, emissions to air are not expected. Any impacts on air quality from the proposal will not persist after works completion.

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 low.

Table 4-6 Environmental mitigation measures — air and energy

Mitigation measures
Use alternatives to fossil fuels where practical and cost-effective.
Ensure odour control measures 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.
Cover all transported waste.

4.2.7 Waste and hazardous materials

Existing environment and potential environmental impacts

There are no EPA registered contaminated sites at both sites or adjacent to the sites.

The proposal would generate waste during construction, however, the nature and volume of waste would generally be non-hazardous and minor. The following non-liquid wastes resulting from excavation and installation of pipes and maintenance holes would likely be generated:

- redundant pipes, pipe fittings and pipe off-cuts
- excess concrete and steel
- green waste
- excess spoil
- general site waste.

Liquid waste generated by the pipe cleaning process will be retained within the system. If any water from trench de-watering (if required) shows sign of contamination, the water would be disposed at an appropriately licenced facility in accordance with the mitigation measures in this REF.

The proposal will not generate significant quantities of waste material or spoil. There is the potential, however, for some of the waste materials generated to be contaminated. Any root material, sediment and redundant pipes removed from the wastewater system, for example, would be contaminated with a range of organic and inorganic pollutants. Provided adequate construction site management processes are followed, in conjunction with the mitigation measures identified below, the generation of waste by the works will not result in any significant adverse impacts on human health or the environment.

Mitigation measures

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

Table 4-7 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.
Minimise stockpile size and ensure delineation between different stockpiled materials.
Minimise the generation of waste, sort waste streams to maximise reuse/recycling in accordance with the *Waste Avoidance and Resource Recovery Act 2001*.
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 soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility.
Prevent pollutants from escaping including covering skip bins.

Mitigation measures
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 Property Environmental Services propertyenvironmental@sydneywater.com.au).

4.2.8 Traffic and access

Existing environment and potential impacts

The works at Marrickville and Belmore would be undertaken along Victoria Street and Redman Parade, respectively. Both roads are predominantly one lane in both directions, with kerbside parking.

Complete road closures would be required along Redman Parade in Belmore and partial closure of Victoria Street in Marrickville. Both roads are not within 100 m of a signalised road intersection or a State road. The work would be undertaken according to an approved Traffic Management Plan, in consultation with the Councils.

Road closures and work vehicles may reduce local street parking availability. However, work vehicles will be parked to avoid significantly impacting surrounding land uses, wherever possible.

During operation, there would be no impact to traffic or an increase in traffic volumes from the proposal. The proposal would form part of the existing Sydney Water network and be included in typical, infrequent operational maintenance activities.

Mitigation measures

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

Table 4-8 Environmental mitigation measures — traffic and access

Mitigation measures
Prepare a Traffic Management Plan (TMP) in consultation with the relevant traffic authority. Meet NSW Roads and Maritime Service's Traffic Control at Worksites Manual v5 requirements for TfNSW roads. The Delivery Contractor will obtain a Road Occupancy Licence (ROL) from TfNSW, including if works are within 100m of traffic signals when construction commences.
Develop management measure to minimise traffic impacts near residential properties, schools and businesses by consulting with them (eg no major materials deliveries at school drop off or pick up times etc).
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, bicycle, pram and wheelchair access.

Mitigation measures
Erect signs to inform road users of the proposed works and any temporary road closures.
Ensure work vehicles do not obstruct vehicular or pedestrian traffic, or private driveway, public facility or business access unless necessary and only if appropriate notification has been provided

4.2.9 Social and visual

Existing environment and potential impacts

The main social impact will be from cumulative construction impacts to sensitive receivers near the proposal. Individually the potential traffic, noise and visual amenity impacts have the potential to be a nuisance, and the cumulative impacts over the duration of works may compound if poorly managed.

Visual impacts would be associated with the temporary presence of plant, machinery, construction compounds. The construction activities at the sites would involve the temporary disruption of existing social infrastructure. This would include works on roads.

During operation the proposal is not expected to result in any visual impacts to the surrounding community, as the proposed infrastructure would be below ground.

As mentioned in Section 1, the proposal provides an increase wastewater capacity to service an increase in growth and job forecasts, therefore it is considered to be a positive social impact to the community.

Mitigation measures

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

Table 4-9 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.
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.

4.2.10 Cumulative and future trends

Potential environmental impacts

As identified in Section 1, the proposal would occur during the shutdown of the rail corridor as part of the Sydney Metro – Sydenham to Bankstown project. The main potential cumulative impacts from the proposal would be the simultaneous construction of the Sydenham to Bankstown Metro Upgrade.

Potential cumulative impacts would include additional noise and vibration, air quality, traffic and access impacts in the surrounding area. The mitigation measures identified below are considered appropriate to address any potential cumulative impacts.

The works would result in an improvement in the operation of the wastewater system, improving the health and amenity of the environment in the long-term, and reduce the risk of asset failure.

Mitigation measures

With the implementation of the mitigation measures below, cumulative impacts and future trends can be adequately managed, and residual impacts are expected to be low.

Table 4-10 Environmental mitigation measures — cumulative and future trends

Mitigation measures
If construction of the proposal coincides with any adjacent construction works, the Contractor will consult with local council and the proponent/owner of the property where works are being undertaken and any other relevant stakeholder to minimise potential cumulative impacts.

4.2.11 General environmental management

Table 4-11 Environmental mitigation measures — general environmental management

Mitigation measures
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 meet the following principles: • limit proximity to sensitive receivers • no disruption to property access • no impact to known items of non-Aboriginal and Aboriginal heritage • outside high risk areas for Aboriginal heritage • use existing cleared areas and existing access tracks • no impacts to remnant native vegetation or key habitat features • no disturbance to waterways • potential environmental impacts can be managed using the safeguards in the REF • no disturbance of contaminated land or acid sulfate soils • will be rehabilitated at the end of construction. The 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.

Mitigation measures

The agreed location of these facilities must be shown on the CEMP site plan and appropriate environmental controls installed.

To ensure compliance with legislative requirements for incident management (eg *Protection of the Environment Operations Act 1997)*, Sydney Water's employees and contractors will follow SWEMS0009. Attach SWEMS0009 to the CEMP.

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 (AHIP zones professionally surveyed. Mark the boundary with highly visible non-ground-disturbing and 'environmental protection zone' signs.) and boundaries of the work area/disturbance corridor 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)

The CEMP will identify appropriate delineation with the approved construction footprint before construction.

Should the proposal change from the REF, no further environmental assessment is required provided the change:

- remains within the assessment/study area for the REF has no net additional environmental impact; or
- is outside the assessment/study area for the REF but:
  - reduces impacts to biodiversity, heritage or human amenity; or
  - avoids engineering (for example, geological, topographical) constraints; and
  - after consultation with any potentially affected landowners and relevant agencies.

The 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 an Incident Management Plan (IMP) outlining actions and responsibilities during:

- 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.

5 Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of the Sydenham to Bankstown Wastewater Upsizing – Marrickville and Belmore proposal. The proposal is required to meet the wastewater needs for the anticipated growth of the Sydenham to Bankstown Urban Renewal Corridor.

The main potential construction environmental impacts of the proposal include dust emissions, noise, potential non-Aboriginal heritage impacts and traffic impacts. No operational impacts are anticipated. 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.

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Appendices

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, such as dust emissions, noise, potential non-Aboriginal heritage impacts and traffic impacts. There will be environmental improvements by providing reliable wastewater services 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 proposed work will not result in environmental impacts to ecosystems of the locality. There will be environmental improvements by ensuring a reliable wastewater service will collect and treat wastewater, minimising any impacts on ecosystems.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposed work will not have any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations.
Any 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 works are generally in previously disturbed areas and are not expected to have a direct or indirect impact on the heritage significance of the listed heritage items. The proposed work will not have any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposal will not have any impact on the habitat of protected animals.
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not be endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.
Any long-term effects on the environment	The proposal will not have any long-term impacts on the environment but will have a long-term benefit by providing a reliable and modern wastewater service for the area
Any degradation of the quality of the environment	The proposal will not degrade the quality of the environment
Any risk to the safety of the environment	The proposal will not increase risk to the safety of the environment

Section 171 checklist	REF finding
Any reduction in the range of beneficial uses of the environment	The proposal will not reduce 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. The infrastructure will be designed to operate in accordance with EPL 372.
Any environmental problems associated with the disposal of waste	Waste disposal will be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not increase demand on resources, that are, or are likely to become, in short supply.
Any cumulative environmental effect with other existing or likely future activities	The proposal will not have any cumulative environmental effect with other existing or likely future activities.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposal will not have any impact on coastal processes or hazards, and coastal processes and coastal hazards will not have any impact on the proposal.
Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act, Division 3.1	The proposal is to service growth and the applicable strategic planning statements or plans have been considered in the system planning and options selection process. Sydenham to Bankstown Urban Renewal Corridor Strategy identifies that the predicted growth within the metro railway corridor will generate further demand on infrastructure. Maintenance, renewal, and upgrades of infrastructure is important to accommodate that predicted growth. The proposal would directly contribute to the renewal of wastewater infrastructure to provide a more reliable service for customers now and into the future.
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?		✓
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		✓
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		✓
Connect to, and use a substantial volume of water from a council owned water supply system?		✓
Require temporary structures on, or enclose, a public space under council's control that will disrupt pedestrian or vehicular traffic that is not minor or inconsequential?	✓	
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?	✓	
Section 2.11, local heritage – consultation with council		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		✓
Section 2.12, flood liable land – consultation with council		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and will works alter flood patterns other than to a minor extent?		✓
Section 2.13, flood liable land – consultation with State Emergency Services		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? * (e) Div.14 (Public admin buildings), (g) Div.16 (Research/ monitoring stations), (i) Div.20 (Stormwater systems)?		✓
Section 2.14, development with impacts on certain land within the coastal zone– council consultation		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		✓
Section 2.15, consultation with public authorities other than councils		
Will the proposal be on land adjacent to land reserved under the *National Parks and Wildlife Act 1974* or land acquired under Part 11 of that Act? *If so, consult with DPE (NPWS).*		✓
Will the proposal be on land in Zone C1 National Parks and Nature Reserves or on a land use zone that is equivalent to that zone? *If so, consult with DPE (NPWS).*		✓
Will the proposal include a fixed or floating structure in or over navigable waters? *If so, consult TfNSW.*		✓
Will the proposal be on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*? *If so, consult with Subsidence Advisory NSW.*		✓
Will the proposal be on land in a Western City operational area specified in *the Western Parkland City Authority Act 2018,* Schedule 2 and have a capital investment value of $30 million or more? *If so, consult the Western Parkland City Authority*.		✓
Will the proposal clear native vegetation on land that is not subject land (ie non-certified land)? *If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney*		✓

Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).		