

Review of Environmental Factors

Multi-program - Category B



Critical Watermain Renewal T44 – N02 Boundary Road, Oakville

1 Determination

This Review of Environmental Factors Multiprogram - Category B (Category B REF) is to be read in conjunction with the Review of Environmental Factors Multi-program pipeline and related infrastructure replacement, repair and upgrades (Multi-program REF) (August 2025). Together both documents assess the potential environmental impacts of the Critical Watermain (CWM) Renewal T44 – N02 Boundary Road, Oakville (the proposal). These documents were 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 Category B REF and Multi-program REF. Additional environmental impact assessment may be required if the scope of work or work methods described in either the Multi-program REF or this Category B REF change significantly following determination.

Decision Statement

The main potential construction environmental impacts of the proposal include to waterways, traffic and noise. 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 Category B REF and the Multi-program 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:
Ellen Curtis Environmental Scientist Sydney Water Date: 26/03/2026	John Eames Snr. Environmental Scientist Sydney Water Date: 30/03/2026	Johnny Kim Project Manager Sydney Water Date: 31/03/2026	Elissa Howie A/Senior Manager, Environment and Heritage Services Sydney Water Date: 1 April 2026



2 Proposal Summary

Table 1 Description of proposal

Aspect	Detailed description
<p>Location</p>	<p>The proposal is located along Boundary Road, which borders the boundary of Oakville (west) and Box Hill (east) in NSW and is within the North West Growth Area. Boundary Road is a regional roadway, which also borders two local government areas (LGAs):</p> <ul style="list-style-type: none"> • Hawkesbury City Council (west of Boundary Road centreline) • The Hills Shire Council (east of Boundary Road centreline). <p>The proposal is in both LGAs. Predominantly, the pipeline works would occur in the roadway and footpath/grassed verge of Boundary Road. Some sections of the proposed alignment cross and run parallel to adjacent intersecting roads within Box Hill, including:</p> <ul style="list-style-type: none"> • Flemington Parkway • Brahman Road • Manso Crescent • Pridham Avenue • Gelt Street • Hannaford Avenue. <p>The Oakville Depot, an existing compound site at Sydney Water’s Oakville Elevated Reservoir (WS0297), located at 154 Boundary Road, Oakville, will be used as a compound/laydown area for this proposal. Its long-term use and operation as required by projects is assessed under an existing approval (see discussion below and Appendix C).</p> <p>The proposal is within areas zoned:</p> <ul style="list-style-type: none"> • low density residential (R2) • medium density residential (R3) • public recreation (RE1) • infrastructure (SP2) • mixed use (B4). <p>The proposal location and environmental constraints are shown in Figure 1.</p>

Approved REF

Existing relevant approvals for the proposal are:

- Review of Environmental Factors Multi-program pipeline and related infrastructure replacement, repair and upgrades (Multi-program REF) (August 2025).
- Review of Environmental Factors Oakville Depot – Establishment and ongoing use (March 2022).

Aspect

Detailed description

- Compound/laydown activities.

Proposal description

The proposal is part of Sydney Water's renewal program. The scope of works consists of the following main aspects:

- geotechnical survey/soil sampling, including groundwater monitoring (if required)
- potholing and services location
- site establishment, including compound/laydown setup within the Oakville Depot (activities assessed under an existing approval)
- minor vegetation trimming/cutting (existing certified land)
- excavation for pipelaying
- auger boring for trenchless pipelaying
- rehabilitation and reinstatement.

Other works include recommissioning the new watermain (such as pressure testing and chlorination) and connecting the main to the existing system. An indicative volume of 200,000 L is anticipated to be used during pressure testing and will be directed to the existing local stormwater system.

Road surfaces and concrete footpaths would be restored to similar or better than preexisting conditions.

The new alignment will address operational requirements for growth, improve reliability of the water system and reduce the risk of watermain breaks in the future.

Watermain construction

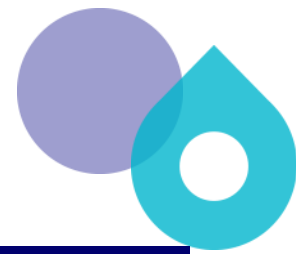
Work will include replacing existing assets (DN250) with new, larger DN300 – DN450 watermains within the existing roadway, and/or future proposed roadways (pending finalisation of council plans).

Open trenching along most of the 800 m alignment is proposed, with trenchless methods (i.e. auger boring) proposed to avoid existing stormwater features/drainage channels. Excavation for open trenched sections of the alignment will range between 1 m to 4.5 m deep and up to 1.2 m wide. Auger boring dimensions, including launch and retrieval pits, will range between about 4 m to 4.5 m deep and up to 4m wide.

Small patches of vegetation trimming and/or clearing may be required where the proposed alignment deviates from Boundary Road, crossing onto local side streets. Wherever possible, the project is committed to limiting vegetation impacts to trimming and will remain within Existing Certified Land (NWGA biodiversity certification).

Proposed compound/laydown (Oakville Depot)

The Oakville Depot is an established compound/laydown facility for use by projects in the NWGA. This site was established as a regional hub



Aspect	Detailed description
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maintenance depot site for use by Sydney Water contractors including Confluence Water. Use of the depot falls under an existing approval (Appendix A: Sydney Water (2022), *Oakville Depot – Establishment and ongoing use*), and is proposed to be used by the current proposal.

The Oakville Depot is located within an existing Sydney Water property, adjacent to Oakville Elevated Reservoir WS297. Typical compound and laydown activities, including temporary storage of spoil, machinery and equipment/material laydown, and provision of facilities and parking for workers, are assessed under this existing approval. For construction of the proposed T44 – N02 Boundary Road CWM, the compound and laydown area would be used for activities consistent with the existing approval including:

- storage of backfill materials, excavated materials, pipes and fittings
- office space and other amenities
- plant and equipment laydown
- the compound may also be used to pre-weld short strings of pipe.

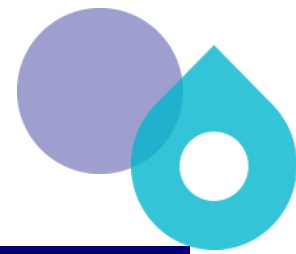
To cover the complete scope of work, this Category B REF, as well as the existing Category A REF and Oakville Depot REF must be read in conjunction, to ensure all relevant mitigation measures are captured in the project’s CEMP. Any additional environmental constraints and/or potential impacts identified from use of the Oakville Depot by present proposal, will be included below in in Section 5.

Machinery/equipment

Machinery and equipment for the proposal is expected to require the following:

- | | |
|---|--|
| • confined spaces safety equipment (e.g. gantry/davit) | • shoring boxes (4,200 mm x 1,500 mm x 2,000 mm) |
| • sediment tank | • concrete saws |
| • jackhammers | • storage containers |
| • hand tools | • road plates (3,000 mm x 1,800,mm x 30,mm) |
| • backhoes | • drill rigs |
| • 35 T excavators (launch/receival) | • noise blankets |
| • excavators (various sizes: 14 T/23 T/5 T, pipe laying/compound operation) | • cranes |
| • 13.5 T excavator with hammer | • concrete agitator trucks |
| • tipper trucks | • submersible pumps |
| • light vehicles – work utes & cars | • site amenities & storage containers |
| • compactor – hand operated | • jetting machine/grinder |





Aspect	Detailed description
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|--|---|
| <ul style="list-style-type: none"> • pipe saw (demo saw) | <ul style="list-style-type: none"> • street sweepers |
| <ul style="list-style-type: none"> • light tower/day makers | <ul style="list-style-type: none"> • pole holder |
| <ul style="list-style-type: none"> • generators | <ul style="list-style-type: none"> • skip bins. |
| <ul style="list-style-type: none"> • vacuum trucks | |

Noisiest equipment/activities

Noisier equipment is expected to include concrete saws, jackhammers and medium sized excavator with hammer attachment for rock breaking, excavation and pipe laying activities. It is anticipated that wherever possible work would occur during standard daytime hours and would progress along the alignment. Use of noiser equipment would be limited and temporary, not occurring every shift of the whole project.

See Section 5 and Appendix D for further discussion of noise impacts.

Proposal timing

The proposal is expected to take about 4 months from mid to late 2026.

Most work would occur during standard daytime construction hours. Up to five weeks of nightworks will be required, including for road crossings (e.g. Boundary Road, about two weeks or 8 shifts) and connections (about three weeks). Back-to-back day and night shifts are expected during road crossings. The work fronts for each (day versus night) back-to-back shift will be separated by a distance of at least 500 m. Additional night work may be required, due to servicing commitments, safety and/or to reduce impacts (e.g. traffic) at different times (e.g. for work in roads or delivery of oversize equipment) and pending road occupancy licences (ROLs)/council requirements, and flow isolation flow management (FIFM) requirements.

The proposed construction schedule will continue to be refined. However indicatively, out of hours work may include (from most preferred to least preferred):

- extended weekend shifts:
 - Saturday 7am to 8am and 1pm to 6pm
 - Sunday and public holidays 8am to 6pm.
- evening shifts: 6pm to 10pm
- night: all other times.

Noisy activities, such as rock breaking, will not occur later than 12am.

Per the existing approved REF (Sydney Water 2022), the Oakville Depot is available for use on a 24-hour basis to account for potential emergency work and for deliveries of spoil and equipment/materials during out of hours works. However, depot operation, work and deliveries are generally expected to occur during standard daytime hours.





3 Consultation

Community and stakeholder consultation

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

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.

Consultation between Sydney Water's project team and Hawkesbury City Council (west of Boundary Road) and The Hills Shire Council (east of Boundary Road) has occurred to ensure compatibility of the proposal with proposed future Boundary Road upgrades. The project team will continue to liaise with both councils throughout detail design, including for the development of a traffic management plan (TMP).

Community consultation is planned, including all consultation and notification requirements outlined in Appendix D.

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 requirement is specified in the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP).

Consultation was required under sections 2.10(1)(e), and 2.10(1)(f), as the proposal involves excavation of, and installing structures on, a council owned footpath and council managed land. Both Hawkesbury City Council and The Hills Shire Council were notified with a formal TISEPP notification letter on 23 December 2025.

As of 26 March 2026 no response was received from Hawkesbury City Council. The Hills Shire Council responded on 15 January 2026, requesting a copy of the latest design plans for their records. Sydney Water responded and fulfilled this request on 3 February 2026. No further comments or requests have been received.

The proposal is located within the North Growth Centre in 'certified land' as referred in Section 3.12 of the SEPP (Precincts – Central River City) 2021. Clause 5 of the Biodiversity Conservation Order (BCO) indicates that no further threatened species assessment would be required on 'certified land'. As only minor vegetation impacts (trim/remove) are proposed on certified land no further assessment or notification would be required under this SEPP. The project will apply mitigation measures to minimise vegetation impacts where possible.

4 Legislative requirements

There are additional legislative requirements beyond those already assessed in the Multi-program REF.

Table 2 Consideration of additional environmental legislation relevant to the proposal

Legislation	Additional considerations
<p><i>State Environmental Planning Policy (Koala Habitat Protections) 2021</i></p>	<p>Koala habitat protection 2021 (Chapter 4)</p> <p>Chapter 4 of <i>State Environmental Planning Policy (Koala Habitat Protections) 2021</i> applies to all zones in the Hawkesbury LGA. However, subsection 4.4(3) provides that the Chapter does not apply to land on which biodiversity certification is in force. As the proposal within Hawkesbury City Council is on land to which a biodiversity certification is in force, this Chapter does not apply.</p>
<p><i>Roads Act 1993</i></p>	<p>The works would be accessed using local roads under the control and management of the Hawkesbury City Council (west of Boundary Road) and The Hills Shire Council (east of Boundary Road).</p> <p>Section 138 of the <i>Roads Act 1993</i> states a person must not carry out work in, on or over a public road without consent of the responsible roads authority. The proposal requires temporary structures to be erected along or within, and excavation within public roads. Therefore consent from these local councils, before the start of works, is required.</p> <p>Consultation with the Hawkesbury City Council (west of Boundary Road) and The Hills Shire Council (east of Boundary Road) has occurred and will be ongoing throughout the design development.</p>
<p><i>State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BCSEPP)</i></p>	<p>Water catchments (Chapter 6)</p> <p>Chapter 6 of this SEPP applies as the proposal is within the Hawkesbury-Nepean Catchment, a regulated catchment. Section 5 of this REF assessed potential environmental impacts on water quality and quantity, aquatic ecology, flooding, access, cultural heritage, flora and fauna, and scenic quality. The assessment confirmed that potential impacts are negligible and meet the requirements of part 6.2 of the SEPP.</p> <p>Section 171A of the EP&A Regulation requires a determining authority to take into account the likely environmental impact from the proposal for work in a regulated catchment. As the proposal is in the Hawkesbury-Nepean Catchment, sections 6.6 to 6.9 of this SEPP need to be considered. Impacts to water quality and quantity, aquatic ecology, flooding, and recreation and public access would be negligible or minor. The proposal is not on flood-prone land, and no impact on public recreation areas (e.g. parks) has been proposed. Minor and temporary impacts on public access are anticipated. Section 5 details these potential impacts.</p> <p>Strategic conservation planning (Chapter 13)</p> <p>The proposed compound/laydown location (i.e. Oakville Depot) is in the Cumberland Plain Conservation Plan (CPCP) area, but not within a nominated growth area.</p> <p>The CPCP establishes several land categories, and planning controls apply to land identified as:</p> <ul style="list-style-type: none"> • avoided land • certified-urban capable land, or

Legislation**Additional considerations**

- land in a strategic conservation area.

As the proposal is not within a CPCP land category, there is no further consideration of the CPCP required.

Biodiversity Conservation Act 2016 (BC Act)

Biodiversity certification

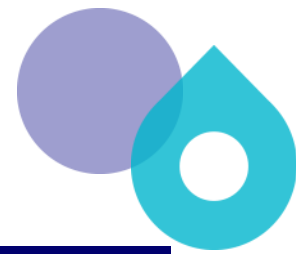
The certification of land is governed by Part 8 of this Act. Section 8.4(5) states that a determining authority under Part 5 of the EP&A Act is not required to consider the effect on biodiversity of an activity, to the extent that it is carried out on biodiversity certified land. The proposal is partly located within land certified under the NWGA.

5 Additional environmental impacts and mitigation measures

The tables below list the additional environmental impacts that could result from the proposal and the additional mitigation measures. All other environmental impacts and mitigation measures identified in the Multi-program REF and Oakville Depot REF remain the same and will be incorporated into the Contractor's Construction Environmental Management Plan (CEMP).

Table 3 Environmental impacts table

Aspect	Additional impacts	Additional mitigation measures
Water and drainage	<p>The proposal requires ground disturbance including from excavation and general movement of personnel and vehicles across the sites.</p> <p>The proposal is not on flood-prone land. The nearest waterway to the proposal is located approximately 500 m south of the works and includes the Killarney Chain of Ponds (KCoP). KCoP is mapped Key Fish Habitat (KFH), including part of a tributary of KCoP which dissects the proposed alignment. Although within 40 m of the proposal, KFH will not be directly impacted by the proposal.</p> <p>As trenches would be progressively excavated and backfilled, work is unlikely to have a significant impact on topography and by extension, surface water movement and drainage patterns. Similarly, no substantial ground disturbance would occur at the compound site and impacts to water and drainage are unlikely.</p> <p>The main potential environmental impacts from the works include:</p> <ul style="list-style-type: none"> • sediment migration offsite that can impact the receiving waterway 	<p>Apply mitigation measures in the existing approvals:</p> <ul style="list-style-type: none"> • Cat A Multi-program REF • Oakville Depot REF. <p>Apply the following additional mitigation measures:</p> <p>Discharge all water in accordance with Sydney Water's Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable/groundwater water where possible.</p> <p>Discharge flow rate should be reduced, as far as is practicable, and all potable</p>



Aspect	Additional impacts	Additional mitigation measures
	<ul style="list-style-type: none"> improperly compacted and restored sites may experience settlement and sediment loss. <p>Surface water runoff/dewatering</p> <p>Surface water runoff that enters the excavation trenches may require dewatering. This would be managed in accordance with SW Guidance Standard 9.1 Excavation Dewatering.</p> <p>Groundwater dewatering</p> <p>There is potential for groundwater to be encountered. However, at the time of writing, confirmation of dewatering requirements could not be determined. If groundwater dewatering is required, a Water Supply Works Approval (WSWA) informed by a groundwater dewatering management plan, must be obtained first, and should include an estimate of groundwater volumes.</p> <p>Discharge of drinking water</p> <p>The adjacent study area includes mapped KFH, including the manmade stormwater management feature flowing east of Manso Crescent.</p> <p>Pressure testing of the new assets would require discharging about 200,000 L of potable water into the existing local stormwater system, with several indicative discharge points proposed along the alignment (Figure 4). There is potential for discharged potable water to impact aquatic ecology in downstream environments. Water will be discharged as per the SW dewatering guidelines. However, given the presence of KFH in the surrounding area and to minimise potential impacts to aquatic species, a reduced discharge flow rate and dechlorination will be applied.</p> <p>Potential impacts would be appropriately mitigated through mitigation measures outlined in this REF and the existing approvals.</p>	<p>water discharges should be dechlorinated.</p> <p>If the potential for intercepting groundwater is identified after the REF is determined, Sydney Water will obtain a groundwater Water Supply Works Approval (WSWA). The contractor is responsible for:</p> <ul style="list-style-type: none"> providing expert hydrogeological technical information to obtain the approvals preparing a Dewatering Management Plan complying with the approval conditions.

Flora and fauna

One threatened fauna species was identified within 200 m of the proposed alignment. The grey-headed flying fox is listed vulnerable under the BC Act and the EPBC Act. Roosting colonies have not been identified or recorded within the proposal area. This species is highly mobile and, if disturbed during potential nightworks, can move to adjacent habitat.

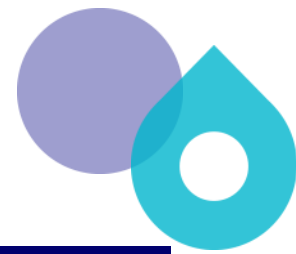
One threatened flora species, which was not captured in the existing Oakville Depot approval, is within 200 m of

Apply mitigation measures in the existing approvals:

- Cat A Multi-program REF
- Oakville Depot REF.

Apply the following additional mitigation measures:





Aspect	Additional impacts	Additional mitigation measures
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the proposed compound location. *Acacia pubescens* (Downy Wattle) is listed as as a vulnerable species under both the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *Biodiversity Conservation Act 2016* (BC Act). The Downy Wattle is often found in endangered communities like the Cumberland Shale Plains Woodland. Direct impacts to this species are not proposed.

The proposal will intercept a small area of Cumberland Shale Plains Woodland, a threatened ecological community (TEC). Small patches of this community will require trimming and/or clearing. However, impacts will be limited to within the proposed 10 m construction corridor. As the vegetation is on Existing Certified Land within the NWGA, no further biodiversity impact assessment is required. Vegetation outside the construction corridor or biodiversity certification area, including the Oakville Depot, will not be impacted (i.e. trimming or removal).

Potential impacts to flora and fauna would be appropriately mitigated through mitigation measures outlined in this REF and existing approvals.

Restrict vegetation impacts (trimming/removal) to within the assessed 10 m construction corridor.

Heritage

The proposal will require the construction of new watermains to replace existing assets and use of an existing compound area (i.e. Oakville Depot). Proposed pipeline construction activities will be restricted to previously disturbed areas within or adjacent to an existing roadway. Similarly, Oakville Depot is a significantly disturbed site, with ongoing use as a regional hub maintenance depot.

A desktop review, including relevant heritage databases, was undertaken and there is no non-Aboriginal heritage within the study area. Similarly, an Aboriginal heritage due diligence (AHDD) was completed and summarised below (refer to Appendix E - AHDD).

The proposal is in a high risk landscape for Aboriginal heritage (< 200 m from waters). A search of the Aboriginal Heritage Information Management System (AHIMS) database was conducted on 17 December 2025 and 23 December 2025 for the proposed pipeline and compound site, respectively. These searches identified several registered Aboriginal sites within 200 m of the proposed watermain alignment (AHIMS client service no. 1005641). There were no registered Aboriginal sites within 200 m of the Oakville Depot/compound area (AHIMS client service

Apply mitigation measures in the existing approvals:

- Cat A Multi-program REF
- Oakville Depot REF.

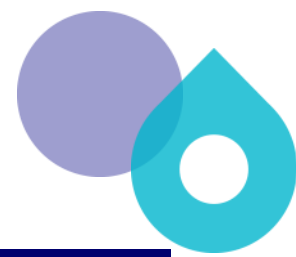
Apply the following additional mitigation measures:

Implement an unexpected finds protocol.

[Redacted text]

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Aspect	Additional impacts	Additional mitigation measures
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no. 1078892). The latter is consistent with the previous assessment for the depot site (see Appendix C).

Site cards within 200 m of the proposed watermain alignment were reviewed [REDACTED]
 [REDACTED] Review of the site cards clearly place known objects on disturbed land outside of the proposed construction corridor. [REDACTED]

[REDACTED]
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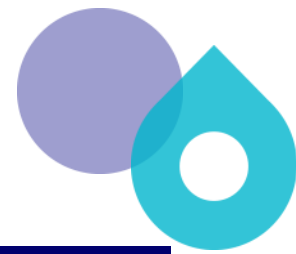
Several existing or expired AHIPS are located within the study area. Works falling within an existing AHIP would require approval by the AHIP holder. As Sydney Water is not proposing to work within an existing AHIP, no further steps are required.

The proposal area constitutes 'disturbed land' as defined under the *Due Diligence Code of Practice* (see the definition of 'disturbed land' on page 18 of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*). Former land uses have heavily disturbed the proposal area through activities such as agricultural use, vegetation clearing, establishment of existing infrastructure and major earthmoving and landscaping activities for urban growth. Historic aerials were examined, further confirming land disturbance throughout the study area (refer to Appendix C - AHDD). The proposal is unlikely to impact any Aboriginal objects.

An unexpected finds procedure and no-go areas will be implemented to ensure appropriate management should any relics or Aboriginal objects be encountered. This approach acknowledges that isolated Aboriginal objects can occur even in highly disturbed landscapes.

Works can proceed with caution. Potential impacts would be appropriately managed through mitigation measures outlined in this REF and existing assessments, including implementing an unexpected finds procedure as outlined above.





Aspect	Additional impacts	Additional mitigation measures
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Noise and vibration

The likelihood of noise impact from the proposal was reviewed against risk factors (based on Table 2 of the EPA’s 2020 Draft Construction Noise Guideline). Based on a worst-case scenario, the review indicated that the construction noise impact would be medium-high risk and therefore a quantitative noise impact assessment was undertaken (see Appendix C for the detailed construction noise and vibration assessment memo). The Transport for NSW (TfNSW) Construction and Maintenance noise estimator tool (TfNSW, 2022) was used for the assessment.

The purpose of the noise assessment is to assess the predicted worst-case noise impacts to surrounding receivers. Quantifying these impacts will assist in identifying how many receivers may be impacted at different times and during different activities. Where receivers are predicted to experience noise impacts, recommended mitigation measures at different noise impact levels have been identified, which will guide the community engagement for the sites.

Existing environment

The proposal is located within suburban environment, predominantly consisting of low density residential (R2) and medium density residential (R3) housing. The closest buildings are occupied housing along side streets, which are immediately adjacent to the proposal. Being part of the NWGA, the area is undergoing rapid and ongoing development associated with residential housing, which would contribute to the existing background noise levels.

Other nearby sensitive receivers include local home-based business and other potential work from home roles. Box Hill Public School (about 750 m northeast) and The Vineyard Hotel (about 750 m southwest) are also located within the surrounding area.

Construction noise impacts

Construction noise impacts associated with the proposed construction of T44 – N02 Boundary Road include:

- Noisy/annoying work (per Section 4.5 of the Guideline (DECC, 2009)) is expected to occur each shift and will be completed by midnight.
- Some rock breaking is anticipated. The exact amount is unknown, as it is dependent on ground conditions found during construction. However,

Apply mitigation measures in the existing approvals:

- Cat A Multi-program REF
- Oakville Depot REF.

Apply the following additional mitigation measures:

The contractor is to consider the relevant mitigation measures from Transport for NSW noise estimator tool and offer where appropriate as detailed in Appendix C.

This includes:

- notifications
- phone calls
- respite offers
- duration respite
- alternative accommodation
- specific notification.

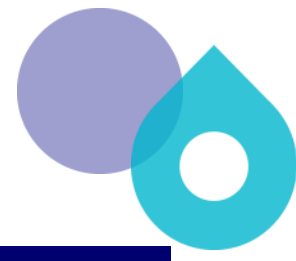
If non-standard and/or night work hours are required, all noisy/annoying works would be completed before 12 am. Refer to section 4.5 of the Interim Construction Noise Guideline (ICNG) (DECC, 2009)) for examples of noisy/annoying activities.

If work is to extend beyond two nights per week, community consultation in advance of work starting will determine an acceptable number of nights.

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



Aspect	Additional impacts	Additional mitigation measures
	<p>current expectations are that it will be limited and intermittent.</p> <ul style="list-style-type: none"> • Most work would be moving linearly; any one receiver is not expected to be impacted by noise every shift. • Some works fronts are expected to be static, including road crossings and connections. <p>As indicated above and in Appendix C, most construction will be during standard daytime hours. Some OOHW will be required, including up to five weeks of night work (road crossings and connections) and extended Saturday shifts pending weather, council requirements, community engagement outcomes, and any other unforeseen events. Up to two weeks (8 shifts) of back-to-back day/night shifts is required for road crossings (e.g. Boundary Road). In these instances, the work fronts for each (day versus night) back-to-back shift will be separated by a distance of at least 500 m minimising noise impacts to any one receiver.</p> <p>The above proposed OOHW is necessary to minimise disruption to traffic and potential safety risks to construction personnel and road users, and address FIFM requirements, for road crossings and connections.</p> <p>Results from the assessment are summarised below:</p> <ul style="list-style-type: none"> • Residents within 70 m are predicted to experience noise levels of 75 dB(A) or greater during both day and night work (highly affected) (Figure 5 and Figure 6). • Noise impacts are predicted to be clearly audible (10 to 20 dB(A)) within 390 m of the proposal during night work (Figure 6). • Works will advance along the alignment at an average rate of about three pipe lengths per shift, with noise levels increasing as the work approaches a receiver and then decreasing as they move past. • The noisiest activity is use of a 13.5 T excavator with hammer attachment, during non-standard work hours (night work), which may be required for rock breaking. • Noisy/annoying equipment (per Section 4.5 of the Guideline (DECC, 2009) will be used intermittently between the start of the shift and midnight, where night works are required. • Community consultation will be conducted prior to construction to inform the project of the preferred 	<p>Conduct a dilapidation survey/condition assessment prior to works which have potential to damage existing structures.</p> <p>Back-to-back day/night shifts must not occur at the same work site location to minimise noise impacts on any one receiver.</p>



Aspect	Additional impacts	Additional mitigation measures
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construction schedule. Agreement from the community will be required for more than two nights a week of night work.

- These predicted noise impacts represent a conservative approach, as they assume use of the excavator with hammer attachment every shift.
- The predicted worst-case noise impacts are summarised in Figures 5 and 6 and detailed in Appendix C. Additional mitigation measures are recommended at different distances from sensitive receivers, as identified by the noise estimator tool. This includes a reasonable and feasible assessment to discuss appropriate application of additional mitigation measures (see Tables 5 to 7 in Appendix C). These are to be considered by the community team and offered where appropriate.

Construction vibration impacts

There may be vibratory impacts from use of an excavator with hammer attachment and jackhammers. Excavators without hammer attachments are not considered to be vibrationally intensive equipment. The Transport for NSW noise estimator tool provides a guide for the minimum working distance for vibratory equipment (see Table 4 in Appendix C).

Vibrationally intensive equipment in the current proposal have minimum working distances that range between 1 m to 3 m (jackhammer) and 7 m to 23 m (excavator with medium hammer attachment). If minimum working distances are complied with, then no adverse impacts from vibrationally intensive works are likely in terms of human response or cosmetic damage.

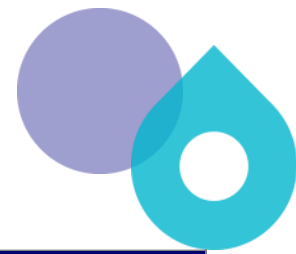
Generally, the proposed construction corridor would ensure that these minimum working distances will be complied with. However, small sections of the alignment pass by residential housing at or under the recommended minimum working distances. Per recommendations outlined in the TfNSW tool, smaller gauge equipment is to be considered and applied where working distances cannot be maintained. Additionally, a dilapidation survey/condition assessment would be completed prior to works which have potential to damage existing structures. Potential construction noise and vibration impacts would be appropriately mitigated through mitigation measures outlined in this REF and existing assessments. Operational impacts are not anticipated.



Aspect	Additional impacts	Additional mitigation measures
<p>Traffic and access</p>	<p>The road network around the proposal includes small local roads, with Boundary Road functioning as a main egress for residents and thoroughfare to Windsor Road, south of the proposal. The proposal would utilise this existing road network to access the study area, including regular movements between the Oakville Depot and construction corridor.</p> <p>During construction, there will likely be minor and temporary impacts to traffic along local roads, including partial road closures. Local transport, including bus routes that operate along Boundary Road, may experience some minor impacts due to these changed traffic conditions. While partial road closures are expected for Boundary Road crossings and connections, no long-term lane closures are expected.</p> <p>Predominantly, local roads consist of two lanes, with residents utilising local side streets for parking. Street parking would be used for the project, in addition to parking within the Oakville Depot. Construction vehicles and plant using street parking would predominantly be restricted to the proposed construction corridor and may cause some residents and visitors to park further away during construction hours. However, affected residents would be notified prior to the start of work, and impacts would be temporary, moving along the alignment, with access reinstated at the completion of the project.</p> <p>A traffic management plan will be required, and subject to council consultation. Some night work is proposed to minimise impacts on local road networks. Potential impacts would be managed by mitigation measures in the existing assessments.</p>	<p>Apply mitigation measures in the existing approvals:</p> <ul style="list-style-type: none"> • Cat A Multi-program REF • Oakville Depot REF.

Table 4 Environmental mitigation measures

General	
1.1	<p>Should the methodology change from the EIA, no further environmental assessment is required provided the change:</p> <ul style="list-style-type: none"> • remains within the proposal area for the REF and has no net additional environmental impact or • is outside the proposal area for the REF but: <ul style="list-style-type: none"> - 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.



General	
	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.
1.2	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 Environmental Works Method Statement and/or CEMP.
Water and drainage	
2.1	Discharge all water in accordance with Sydney Water's Water Quality Management During Operational Activities Policy (D0001667) including erosion controls, discharge rate, dechlorination, monitoring. Re-use potable/groundwater water where possible.
2.2	If the potential for intercepting groundwater is identified after the REF is determined, Sydney Water will obtain a groundwater Water Supply Works Approval (WSWA). The contractor is responsible for: <ul style="list-style-type: none"> • providing expert hydrogeological technical information to obtain the approvals • preparing a Dewatering Management Plan • complying with the approval conditions.
Heritage	
3.1	[REDACTED]
3.2	Implement an unexpected finds protocol.
Flora and fauna	
4.1	Restrict vegetation impacts (trimming/removal) to within the assessed 10m construction corridor.
Noise and vibration	
5.1	The contractor is to consider the relevant mitigation measures from Transport for NSW noise estimator tool and offer where appropriate as detailed in Appendix C and Table 3 of this REF.
5.2	If non-standard and/or night work hours are required, all noisy/annoying work would be completed before 12 am. Refer to section 4.5 of the Interim Construction Noise Guideline (ICNG) (DECC, 2009)) for examples of noisy/annoying activities.
5.3	If work is to extend beyond two nights per week, community consultation in advance of work starting will determine an acceptable number of nights.
5.4	Consider less vibration intensive methodologies where practicable and use only the necessary sized and powered equipment.
5.5	Conduct a dilapidation survey/condition assessment prior to works which have potential to damage existing structures.
5.6	Back-to-back day/night shifts must not occur at the same work site location to minimise noise impacts on any one receiver.





Figure 2 Proposed compound/laydown within the existing Oakville Depot - environmental constraints (to be reviewed with this and the existing Oakville Depot REF).

This information has been redacted to protect sensitive Aboriginal heritage information

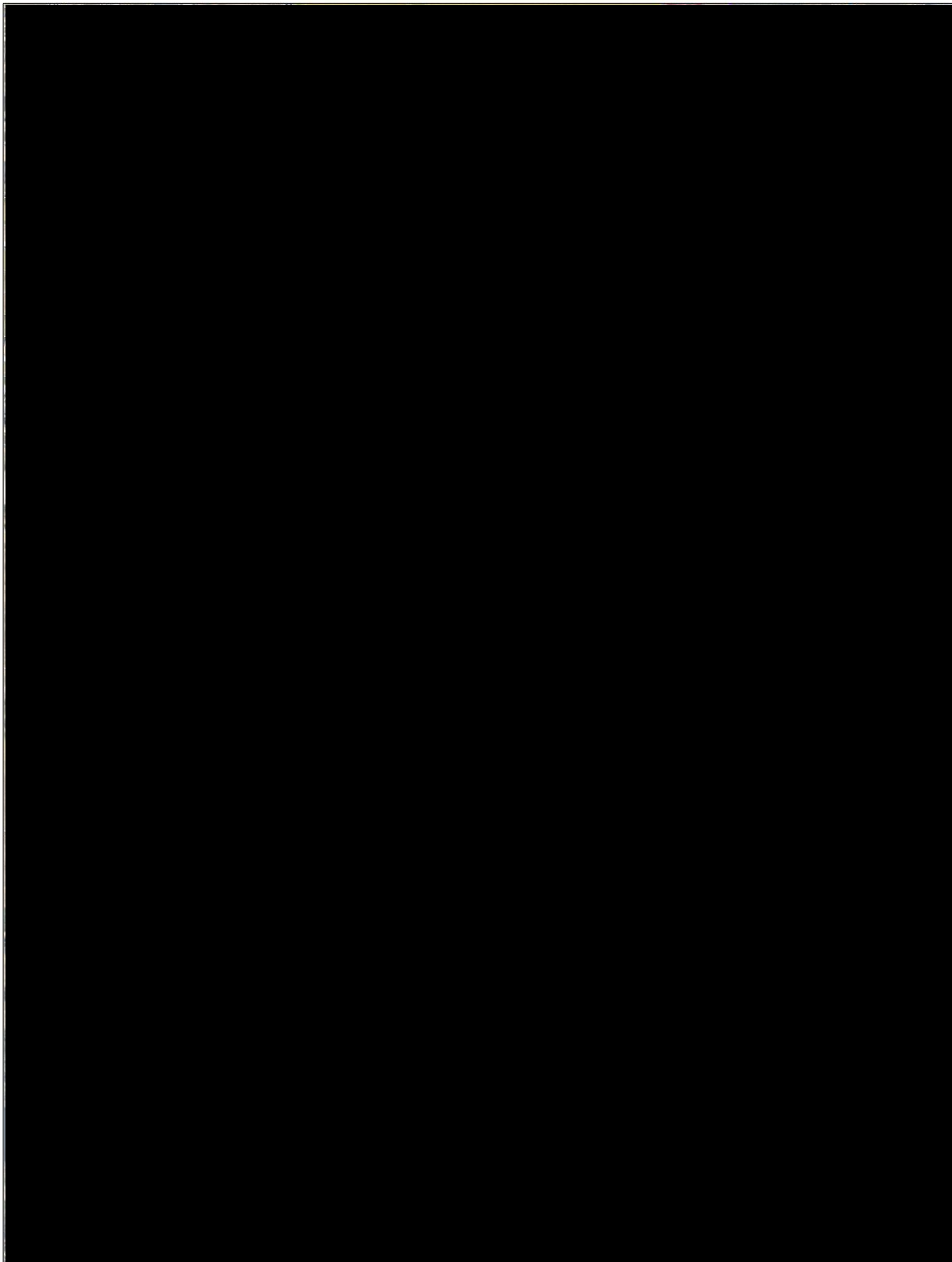


Figure 3 Proposed critical watermain construction – heritage constraints.

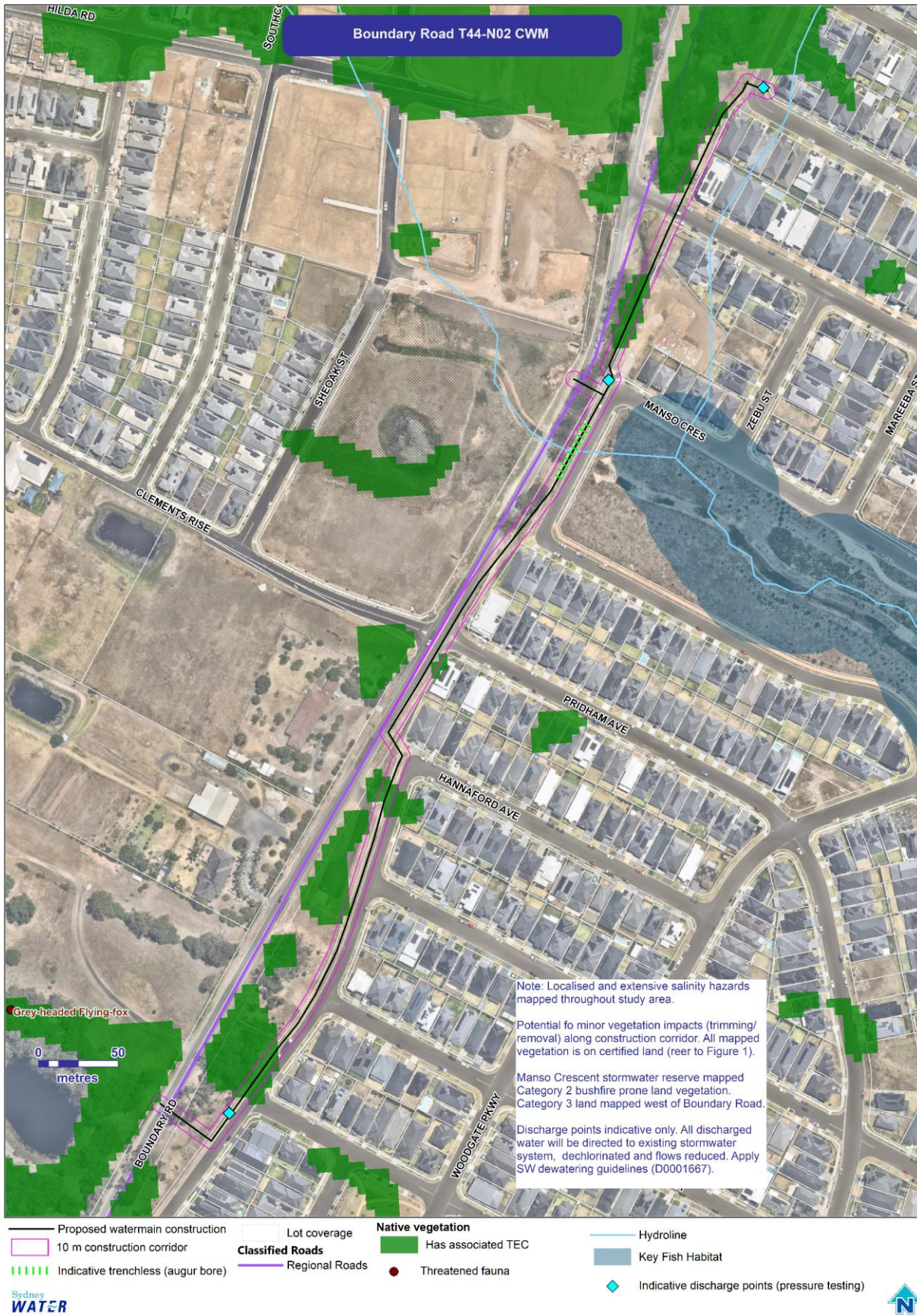


Figure 4 Proposed critical watermain construction – biodiversity constraints. Minor vegetation impacts will be restricted to within the 10 m construction corridor.

Worst case noise impact - Noisy equipment - Day



N: notification (eg letterbox drop); RO: respite offer; PC: phone call.
 dB(A): frequency based adjustment made to sound-level measurement to approximate the response of the human ear.

- Proposed watermain construction
- Hydroline
- Classified Roads**
 - Regional Roads
- Sydney WATER Lot coverage
- Noise impact estimate (day)**
 - No line of sight (receivers)
 - 70 m - moderately intrusive - 20 to 30 dB(A): N
 - 25 m - highly intrusive - > 30 dB(A): N, RO, PC
- Line of sight (receivers)**
 - 70 m - highly affected - 75dB or greater: N, RO, PC

Figure 5 Residential receivers within affected distance during Out of Hours: Day (13.5 T excavator with hammer attachment)

Worst case noise impact - Noisy equipment - Night



Figure 6 Residential receivers within affected distance during Out of Hours: Night (13.5 T excavator with hammer attachment)



6 Conclusion

This Category B REF outlines potential environmental impacts associated with waterways, traffic and noise as part of CWM Renewal T44 – N02 Boundary Road, Oakville. Any additional environmental impacts are considered minor and potential impacts can be mitigated through implementation of the measures outlined in this Category B REF and existing approvals (i.e. Multi-program REF and Oakville Depot REF). The proposal is not likely to significantly impact the environment.



Appendix A – Section 171 checklist

There are no requirements in addition to those considered in the Multi-program REF.

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?		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
Section 2.15, consultation with public authorities other than councils		
Will the proposal be on land adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i> or land acquired under Part 11 of that Act? <i>If so, consult with DPE (NPWS).</i>		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? <i>If so, consult with DPE (NPWS).</i>		X
Will the proposal include a fixed or floating structure in or over navigable waters? <i>If so, consult TfNSW.</i>		X
Will the proposal be on land in a mine subsidence district within the meaning of the <i>Coal Mine Subsidence Compensation Act 2017</i> ? <i>If so, consult with Subsidence Advisory NSW.</i>		X
Will the proposal be on land in a Western City operational area specified in the <i>Western Parkland City Authority Act 2018</i> , Schedule 2 and have a capital investment value of \$30 million or more? <i>If so, consult the Western Parkland City Authority.</i>		X
Will the proposal clear native vegetation on land that is not subject land (i.e. non-certified land)? <i>If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).</i>		X



Appendix C – Oakville Depot REF

Appendix D – Noise and construction noise memo

Appendix E – Aboriginal Heritage Due Diligence (AHDD)