

Review of Environmental Factors

Palm Beach Elevated Reservoir Renewal (November 2025)

1 Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of Palm Beach Elevated Reservoir Renewal. The REF was prepared under Division 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act), with Sydney Water both the proponent and determining authority.

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

Decision Statement

The main potential construction environmental impacts of the proposal include impacts to biodiversity and nearby sensitive receivers. During operation, impacts are not 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 REF considers how the proposal aligns with the principles of ecologically sustainable development (Appendix B). The information it contains is neither false nor misleading.

Prepared by:	Reviewed by:	Endorsed by:	Approved by:
Nik Kenny Environmental Scientist Sydney Water Date: 21/10/2025	Stuart Dawson Snr Environmental Scientist Representative Sydney Water Date: 21/10/2025	Mathilde Dupont Ep Simon Project Manager Sydney Water Date: 14/11/2025	Murray Johnson Senior Manager Environmental and Heritage Services Sydney Water Date: 8/12/2025

SW 142 12/25

2 Proposal summary

Table 1 Description of proposal

Aspect	Detailed description
Proposal need and objectives	<p>Palm Beach Elevated Reservoir WS0192 (WS0192) was constructed in 1963 as a 228 kL capacity mild steel elevated reservoir. It forms part of the Palm Beach Elevated Water Supply Zone (WSZ) and the Warringah Delivery System which includes Palm Beach water pumping station WP0110 (WP0110). The reservoir is critical in supplying water to the Palm Beach Elevated WSZ, which currently includes approximately 1,200 customers (634 properties) consisting of a large proportion of low-density residential.</p> <p>Internal and external inspections of the WS0192 reservoir were conducted on 1st May 2020. The inspections found:</p> <ul style="list-style-type: none">• the internal and external coating of the tank roof has extensively failed• rusted hatches• holes in the roof sheeting and widespread coating degradation and severe corrosion• ruptured coating with severe corrosion throughout the structure• the tower frame coating is degrading jeopardising the tower frame bracing connections. <p>Sydney Water is proposing repairs, remediation works and construction at WS0192 that will require the use of WP0110 for an alternative supply arrangement. Both sites are in Palm Beach, NSW.</p> <p>The objective of this project is to avoid roof failure, secure water quality, improve the performance of the reservoir, and optimise the service life of WS0192. In summary, the objectives of this proposal include:</p> <ul style="list-style-type: none">• meeting the objectives of the Reservoir Decision Framework and identifying and refurbishing assets that satisfy the selection criteria• avoiding unplanned outages due to failure of the roof• optimising service life by incorporating stakeholder needs coupled with improvements in design. <p>Key benefits of the project include:</p> <ul style="list-style-type: none">• maintaining the reliability of the reservoir by ensuring operational functionality of the tank and having no unplanned outages• maintaining the water quality by ensuring there is no reduction of water quality at this reservoir; and• improving safety by preventing risk of harm from roof disintegration and/or structural failure.

Consideration of alternatives/options

The following options were considered for the proposal:

- Option 1 – Full roof replacement only in 2 years
- Option 2 – Full roof replacement in 2 years and extensive tower coating patch repairs
- Option 3 – Full roof replacement in 10 years and complete coating replacement
- Option 4 – Reservoir replacement in 10 years
- Option 5 – Do nothing option.

Sydney Water is accountable for the water supply quality and the structural integrity of its assets, therefore the 'do nothing' option is not acceptable. At present there is no readily available alternate supply to enable this reservoir to be taken out of service for works. Any failure of WS0192 will increase servicing costs and negatively affect customers in the Palm Beach Elevated WSZ. A multi-criteria analysis placed Option 2 as preferred when considering technical uncertainties and potential impacts on operations and community.

Proposal description and methodology

The scope includes the removal of the existing roof and the installation of a new roof, the provision of alternate supply, and the undertaking of opportunistic improvements including a communications extension frame, ladder access system, and joint sealing.

Prior to works being undertaken within WS0192, an alternate supply arrangement is to be installed as part of this project. The proposed solution and least cost option are to upgrade the WP0110 pumps using a variable speed drive (VSD) to allow pumping directly in the WSZ, and size them to provide some resilience to the system in the event of failure near the reservoir.

The proposal will involve the following aspects:

WP0110 alternate supply arrangement:

- installation of site compounds and concrete foundation
- new VSDs installed inside the pumpstation
- new distribution board
- new permanent generator installed outside the pumpstation
- connection of the generator to the pumpstation via trenching and route cabling
- new meter panel
- new accumulator
- new ventilation system inside the pumpstation.

WS0192 elevated reservoir renewal:

- installation of site compounds
- vegetation clearance, including tree removal on/adjacent to 4 Boanbong Road, Palm Beach
- excavation and installation of permanent services
- foundation preparation of the Automatic Dosing System
- installation of reservoir perimeter path, if required
- works on the retaining wall and perimeter drain, if required
- drain water in reservoir via existing scour system
- removal and disposal of existing roof structure
- hazardous building material (HBM) removal and disposal by certified contractor
- internal abrasive blasting of existing bitumen wall and floor lining
- internal reservoir relining with epoxy
- replace cathodic protection system
- surface protection of internal pipework and external stairs
- installation of new roof structure
- vertical and horizontal lifts
- installation of new internal features
- installation and placement of the Automatic Dosing System
- installation of new security system
- landscape remediation works.

Location and land ownership

WS0192 is located off Boanbong Road, Palm Beach and WP0110 is located of McKay Road in Palm Beach. Both sites are owned and managed by Sydney Water.

- WP0110: DP397314 Lot 1
- WS0192: DP14630 Lot 67 and 68.

The works at WS0192 requires the removal of several trees within the local road corridor of Boanbong Road, which is a local road managed by the Northern Beaches Council.

Site establishment and access tracks

The laydown areas, compounds and construction amenities will be within the existing reservoir and pump station site boundaries, which comprise previously disturbed grassy areas and sealed access roads. Some vegetation clearing and excavation will be required for site establishment at WS0192. No vegetation clearing will be required at WP0110. The proposal area is shown in Figure 1.

Ancillary facilities (compounds)

Construction compounds will be required to house site sheds, construction amenities and material laydown. The exact location of these

within the proposal area will be chosen by the contractor and in consultation with Sydney Water's Project Manager.

Materials and equipment

Materials and equipment required for the proposal include, but are not limited to:

- confined spaces safety equipment (e.g. gantry/davit)
- skip bins
- ablution sediment tank
- concrete pumps
- mega blaster
- air compressors
- enclosed generators
- concrete saws
- jackhammers
- hand tools
- scaffold
- Elevated Work Platform
- site facilities and amenities
- 6x Storage containers
- 13t-18t excavators
- tip trucks
- concrete agitator trucks
- street sweeper
- handheld compactor
- light vehicles
- 100t cranes
- vac-truck
- enclosed fuel cells.

Commissioning

Commissioning involves testing and running the new equipment to ensure it works correctly and is integrated with existing plant operations. The exact commissioning steps depend on the type of the equipment, but typically include washing, inspecting and pressure testing the new assets.

Restoration

At the completion of works, the work site will be restored to the pre-existing condition following construction. All plant and equipment will be removed from the site. Replanting of removed vegetation will occur in line with Sydney Water's Biodiversity Offset Guide. More information on the offset requirements are provided in Section 5.

Work hours

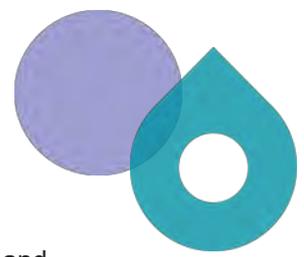
Work and deliveries will be scheduled during standard daytime hours:

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

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

Proposal timing

Construction is expected to start April 2027 and take about 14 months. Works at WP0110 are anticipated to take 6 months and works at WS0192 are anticipated to take 8 months.

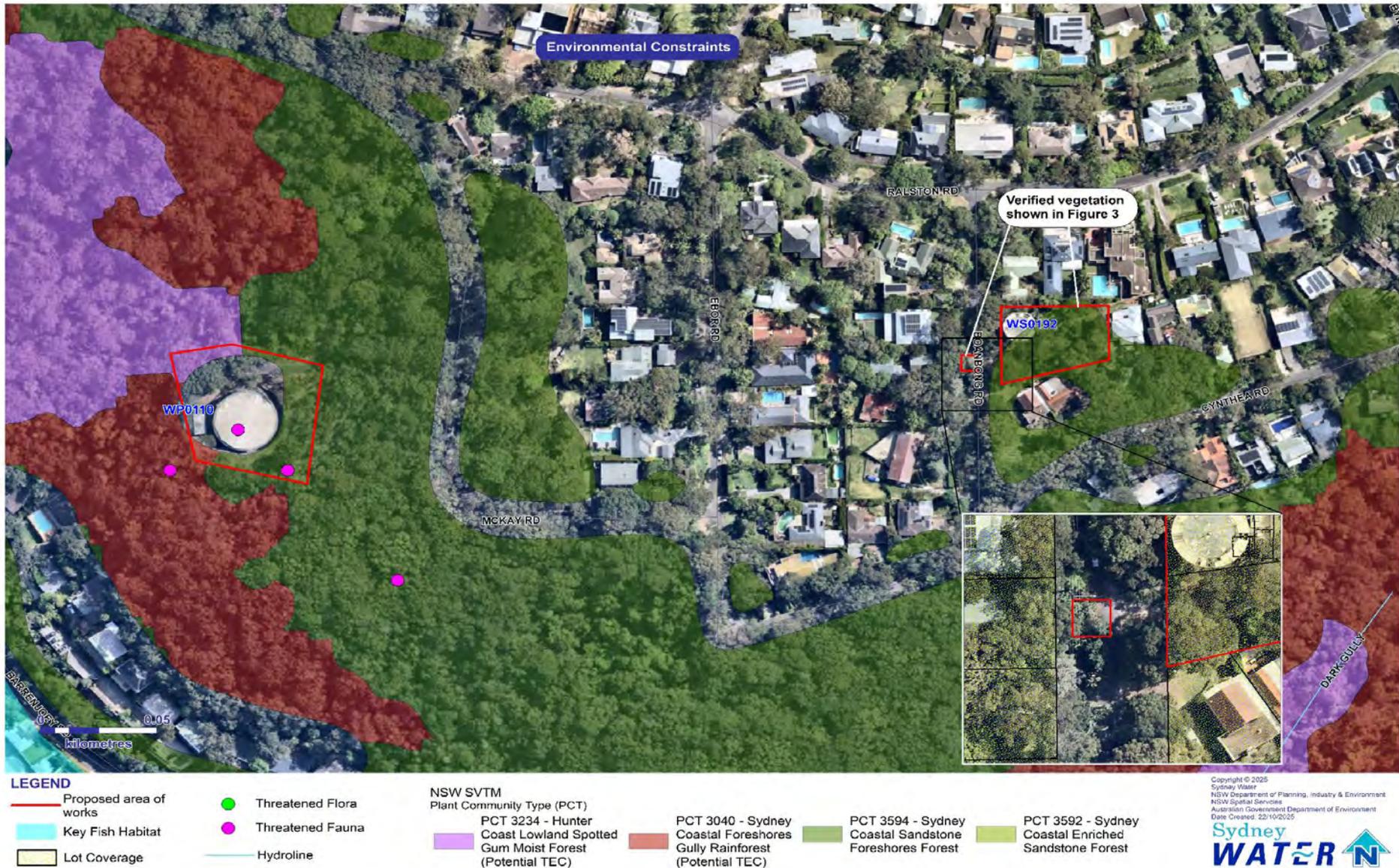


Operational requirements

Routine maintenance and inspections may occur at the reservoir and along the access track, which will include routine hazardous building material (HBM) surveys and grass mowing.



Figure 1 Location of proposal and environmental constraints



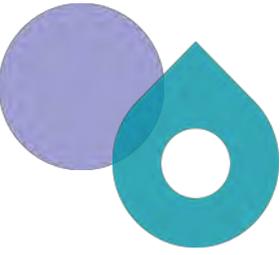
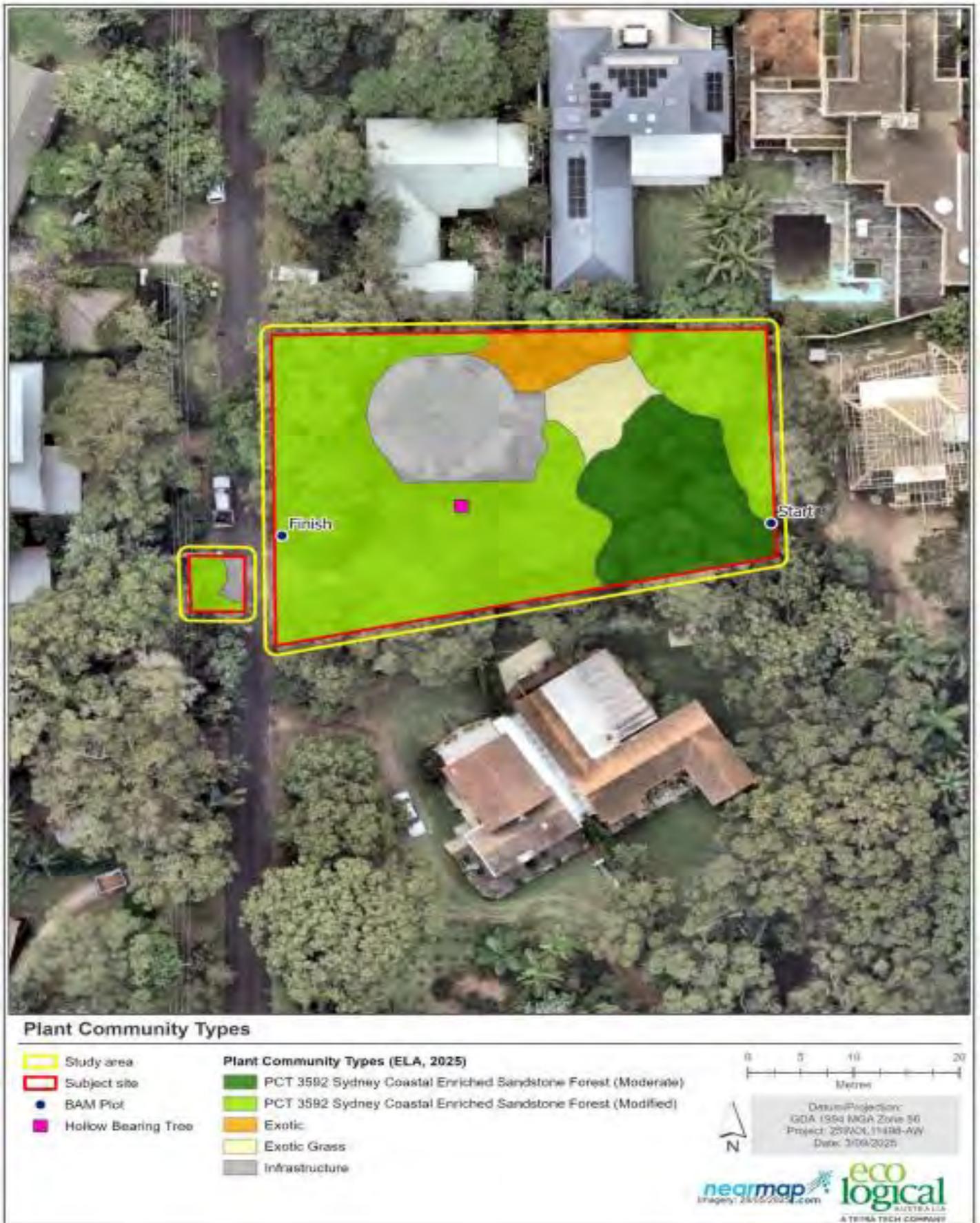
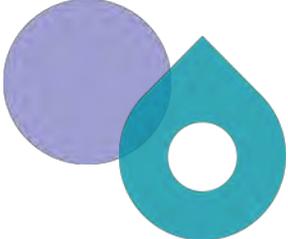


Figure 2 Location of the proposal and heritage constraints

This information has been redacted to protect sensitive Aboriginal heritage information

Figure 3 Ground-truthed vegetation (Eco Logical, 2025)





3 Consultation

Community and stakeholder consultation

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

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

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

The nature, scale and extent of the proposal's potential impact has been evaluated in this REF. 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. Northern Beaches Council will be consulted about matters identified in environmental planning instruments. This includes public safety issues, temporary works on council land, disturbance of any vegetation on council land, and full or partial road closures of council managed roads.

Consultation required under State Environmental Planning Policies and other legislation

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

No formal consultation was required under the TISEPP. Further detail is provided in Appendix C.

Local council (Northern Beaches Council) will be provided with reasonable notice before works commence and will be provided with regular project updates.

4 Legislative requirements

Table 1 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Pittwater Local Environmental Plan 2014 (Pittwater LEP)	<p>The proposal is located within the Northern Beaches Council LGA. Under the Pittwater LEP:</p> <ul style="list-style-type: none"> • WS0192 reservoir site is in land zoned SP2 – Infrastructure • WP0110 pump site is in land zoned SP2 – Infrastructure • immediately adjacent areas are zoned as C4 - Environmental Living.
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	<p>Section 2.159 of the TISEPP permits development by or on behalf of a public authority for water supply systems (which include water supply reservoirs) without consent on any land.</p> <p>Sydney Water constitutes a public authority for the purposes of the EP&A Act. As such, for the purpose of this scope, the proposal is permissible without consent and can be determined with an REF under Division 5.1 of the EP&A Act.</p>
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BCSEPP)	<p>Vegetation in non-rural areas (Chapter 2)</p> <p>The proposal is in an area or zone listed in subsection 2.3(1). However, subsection 2.4(1) states: ‘<i>This Policy does not affect the provisions of any other SEPP....</i>’, and as the works are permissible under the TISEPP, a council permit to clear vegetation under this SEPP is not required.</p> <p>Koala habitat protection (Chapter 3 and 4)</p> <p>These chapters aim to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline.</p> <p>Chapter 3 and 4 of the BCSEPP apply to development that requires consent. Sydney Water is the determining authority for the proposal and does not require development consent.</p> <p>Impacts to biodiversity are assessed in Section 5 and appropriate mitigation measures are outlined in Section 6.</p>

Table 2 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>Protection of the Environment Operations Act 1997 (POEO Act)</i>	<p>The POEO Act aims to, among other matters, protect, restore and enhance the quality of the environment in NSW. It includes offences for polluting the environment and establishes a regime of environment protection licences.</p> <p>Construction and operation of the proposal is not a scheduled activity under Schedule 1 of the POEO Act. An Environment Protection Licence (EPL) is not required for the proposal.</p> <p>Under Part 5.7 of the POEO Act, pollution incidents that cause or threaten material harm to the environment must be reported immediately to the relevant authority. The Act defines both “material harm” and the relevant authorities to be notified.</p> <p>The Contractor is responsible for immediately reporting any pollution incidents during construction in accordance with <i>SWEMS0009 Responding to incidents with an environmental impact</i>.</p>	N/A	N/A
<i>Biodiversity Conservation Act 2016 (BC Act)</i>	<p>The BC Act seeks to conserve biological diversity by providing a framework to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity.</p> <p>Under the BC Act, Sydney Water must consider the impact upon threatened species, populations, threatened ecological communities or areas of outstanding biodiversity value when undertaking construction and maintenance.</p> <p>If any of these may be impacted by the proposal, a ‘Test of Significance’ (ToS) must be completed. This addresses the requirements of section 7.3 of the BC Act by determining the significance of the impact.</p> <p>While the proposal will require the removal of around 0.065 ha of native vegetation, the implementation of mitigation measures provided in Section 6 will minimise the potential for impacts on threatened species, populations or ecological communities listed under the BC Act.</p> <p>Further information is provided in Section 5 and in the flora and fauna assessment attached as Appendix D.</p>	REF	Pre-construction, Sydney Water
<i>Environment Protection and</i>	The EPBC Act is the principal environmental law administered by the Commonwealth. It provides for	N/A	N/A

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>Biodiversity Conservation Act 1999 (EPBC Act)</i>	<p>the protection of matters of national environmental significance.</p> <p>Under the EPBC Act, an action that is likely to have a significant impact on a matter of national environmental significance must be referred to the Commonwealth Minister for the Environment and Water. If any listed species or habitats of national significance may be impacted by the proposal, an 'Assessment of Significance' (AoS) must be completed. This addresses the requirements of the EPBC Act to determine the significance of the impact.</p> <p>The proposal is not likely to have a significant impact on a matter of national environmental significance and has accordingly not been referred.</p>		
<i>National Parks and Wildlife Act 1974 (NPW Act)</i>	<p>The NPW Act provides for the establishment, preservation, and management of areas such as national parks, state conservation areas, nature reserves, and Aboriginal areas.</p> <p>The proposal is not within a national park, state conservation area or nature reserve.</p> <p>Under Section 86 of the NPW Act, it is an offence to desecrate an Aboriginal place or object unless authorised by an Aboriginal heritage impact permit (AHIP), or where it is reasonably determined that no Aboriginal object will be harmed.</p> <p>There are two registered AHIMS site in proximity to the proposal:</p>	N/A	N/A
<i>This information has been redacted to protect sensitive Aboriginal heritage information</i>			
<i>Heritage Act 1977</i>	<p>The <i>Heritage Act 1977</i> aims to promote conservation of heritage items in NSW. Part 3A establishes a state heritage register for the listing of heritage items including places, buildings, works, relics, moveable objects, precincts or land.</p>	N/A	N/A

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	<p>A permit under section 60 of the <i>Heritage Act 1977</i> is required for works that may impact a site listed on the state heritage register, except for works that comply with an exemption under section 57(2).</p> <p>As the proposal area is not located within or adjacent to listed heritage sites, the proposal will not require a permit under section 60 of the <i>Heritage Act 1977</i>.</p>		
<i>Fisheries Management Act 1994 (FM Act)</i>	<p>The FM Act protects threatened species, populations and communities of fish and marine vegetation, as well as commercial and recreational fishing areas, in NSW waters.</p> <p>Part 7 of the Act establishes certain activities for which notification, or a permit is required including dredging and reclamation work, temporary or permanent obstruction of fish passage, or harming marine vegetation.</p> <p>The proposal does not involve any dredging or reclamation, obstruction of fish passage or harm to marine vegetation and will not require notification under the FM Act.</p>	N/A	N/A
<i>Water Act 1912/ Water Management Act 2000 (WM Act)</i>	<p>Section 60A of the WM Act states that it is an offence to take water without a licence. However, under the <i>Water Management (General) Amendment (Exemption for Infrastructure) Regulation 2025</i> Sydney Water is exempt from the requirement to hold an access license for the taking of water in relation to construction of essential infrastructure. The maintenance and repair of water supply systems, and therefore the proposal, is covered by this exemption. The exemption is subject to the condition that Sydney Water record the water take, keep these records for 5 years and report water take to the Minister each water year. The proposal will adhere to these requirements. As such, a Water Access Licence (WAL) is not required under section 61 of the Act.</p> <p>Groundwater is unlikely to be encountered during the works given the proposed shallow depth of excavation and topography of the site. Geotechnical investigations were carried out in June 2025 and groundwater was not identified. If groundwater is encountered and requires dewatering, a water supply work approval (WSWA) under Section 90(2) of the Act would be obtained.</p>	WSWA (if required)	Pre-construction, Sydney Water

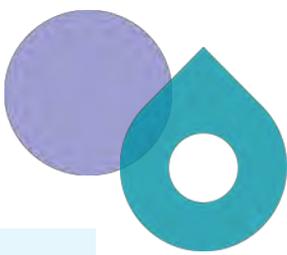
Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
<i>Roads Act 1993</i>	<p>Section 138 of the <i>Roads Act 1993</i> states a person must not carry out work in, on or over a public road without consent of the responsible roads authority, termed a road occupancy licence (ROL).</p> <p>The proposal may require temporary traffic control on local roads to allow access for large plant and equipment. As such an ROL would be obtained from council if required.</p>	ROL (if required).	Delivery Contractor

5 Environmental assessment

The environmental impacts checklist (SWEMS0019.01) was completed for the works which considers all environmental aspects. Table 3 includes only potentially impacted aspects.

Table 3 Key environmental aspects and potential impacts of construction and operation

Aspect	Potential impacts
<p>Topography, geology and soils</p>	<p>A geotechnical interpretive report and factual report were undertaken by Confluence Water in June 2025. Geotechnical investigations were completed on 13 May 2025 and comprised 4 shallow auger holes at the WS0192 and 1 shallow auger hole at the WP0110 site.</p> <p>The WS0192 site is underlain by Gynea erosional landscape which is characterised by undulating to rolling rises and low hills on Hawkesbury Sandstone. Hawkesbury Sandstone typically consists of medium to coarse grained quartz sandstone and soils comprise shallow to moderately deep sands. WP0110 is underlain by the Newport Formation consisting of interbedded laminite, shale and sandstone rock with quartz. Minor red clays, breccia and conglomerate can also be present. Soils comprise shallow to deep sands and yellow podzolic soils on sandstones.</p> <p>Neither site falls within any of the mapped Acid Sulfate Soil (ASS) risk categories and thus the risk of ASS being present is low. This is to be expected given the sites location and topographic elevation.</p> <p>A visual assessment of surface conditions was undertaken during the site investigation. The following observations were made:</p> <ul style="list-style-type: none"> • WP0110 is located on an edge of a slope. The proposed generator location is flat with around 5 m offset from the edge of the slope • WS0192 is located in a localised ridge and gently sloping downwards from east to west. <p>During construction, minor excavations and levelling will be required at WP0110 and WS0192 for site establishment, trenching and concrete foundations. The excavations will be up to 1.4 m deep.</p> <p>These activities will result in surface soil disturbance, stockpiled materials and spoil which could result in dust generation, contamination and sedimentation if not adequately managed. Spoil and other material will be temporarily stored in laydown areas, which will be located on a levelled hardstand and bunded. There is the potential for soil to become contaminated through accidental chemical or fuel spills and leaks from plant and equipment during construction. Stop works procedures and spill kits will be present on site to mitigate any significant impacts from contamination events.</p> <p>While some excavation and ground levelling will occur in the temporary laydown areas, this will not significantly change the surface topography and drainage patterns of the area.</p>



Potential impacts will be managed by implementing the mitigation measures listed in Section 6.

Water and drainage

The proposal area is not located within a drinking water catchment. The nearest watercourse to the proposal area is Dark Gully, about 175 metres south-east of WS0192. Dark Gully flows into Pittwater, a wide inlet to the south of Broken Bay, which is adjacent to the mouth of the Hawkesbury River.

Geotechnical studies (June 2025) did not encounter groundwater to depths of up to 1.4 m. It is noted that groundwater levels can vary seasonally and due to other factors, such as rainfall. It is not uncommon around Sydney that perched groundwater can temporarily flow at shallow depths atop the rock level following prolonged periods of rainfall.

The discharge of drinking water from WS0192 will be required. Water will be discharged through an existing scour line that leads to a stormwater chamber at the southern end of Boanbong Road. A stormwater pipe runs from this chamber along an easement between 27 and 29 Cynthea Road, and into McKay Reserve. The discharge will eventually flow into Pittwater via Dark Gully.

There is the potential for localised flooding should the stormwater infrastructure overflow due to the discharge rate exceeding the capacity of the downstream system, or due to blockages. This could impact nearby residents and properties. Additionally, if the discharge rate is too high there is the potential for erosion or scouring.

Poor site management during excavation activities may increase the risk of sediment-laden runoff from exposed areas. This has the potential to enter the surrounding environment and cause turbidity and enhanced sedimentation. This risk will be relatively minor and temporary and will be mitigated through standard erosion and sedimentation controls.

The proposal will require the use and temporary storage of fuels and/or chemicals for equipment and machinery operation during construction. Pollutants such as sediment, soil nutrients, construction waste, chemicals, fuels and gross pollutants may enter waterways, particularly during high rainfall events, which could result in a decline of water quality.

Potential impacts to water quality and drainage will be managed by implementing the mitigation measures listed in Section 6.

Flora and fauna

A specialist flora and fauna assessment (FFA) was undertaken by EcoLogical Pty Ltd in July 2025. The FFA included a survey of the proposal area, where vegetation clearing is proposed, and surrounding areas. The FFA is attached as Appendix D and the findings are summarised below.

Vegetation within the proposal area consists of remnant native vegetation, planted native vegetation and exotic landscaped areas. The vegetation throughout the majority of the surrounding area has been substantially modified by historical clearing and weed ingress, including horticultural plantings. One plant community type (PCT) was identified within the

proposal area in moderate condition, PCT 3592 (Sydney Coastal Enriched Sandstone Forest). PCT 3592 does not have any associated threatened ecological communities.

The study area does not contain any areas mapped on the Biodiversity Values map (BV map) under the BC Act. The proposal will remove up to 0.021 ha and modify up to 0.044 ha of native vegetation, equating to a total direct impact of 0.065 ha. Therefore, it does not trigger the area clearing threshold (0.25 ha or more for a minimum lot size of less than 1 ha) for entry into the Biodiversity Offset Scheme (BOS). No BC Act listed threatened flora or fauna were identified in the study area during field surveys. The following threatened fauna species were identified as having potential to use the study area as habitat and therefore Tests of Significance under the BC Act using the relevant guidelines were undertaken for the following entities:

Birds

- *Calyptorhynchus lathami lathami* (south-eastern glossy black cockatoo)
- *Glossopsitta pusilla* (little lorikeet).

Bats

- *Miniopterus australis* (little bent-winged bat)
- *Micronomus norfolkensis* (eastern coastal free-tail bat)
- *Miniopterus orianae oceanensis* (large bent-winged bat)
- *Myotis macropus* (southern myotis).

Mammals

- *Pteropus poliocephalus* (grey-headed flying-fox).

These Tests of Significance found that there would not be a significant impact on any threatened species, and therefore the BOS is not triggered by this threshold.

The following Matters of National Environmental Significance (MNES) listed under the EPBC Act were considered likely or have potential to occur in the proposed impact area:

- *Calyptorhynchus lathami lathami* (south-eastern glossy black cockatoo)
- *Pteropus poliocephalus* (grey-headed flying-fox).

The significant impact criteria were applied to these MNES and concluded that the proposal was unlikely to constitute a significant impact on any of these MNES.

The Sydney Water Biodiversity Offset Guide was applied to the proposal. Consistent with the Guide, the proposed works:

- are moderate in their nature (being over 100 m²)
- affect single trees

- require the replacement of 31 trees to offset the loss of trees
- require the installation of 2 nest boxes to offset the loss of one hollow.

The proposed offset package will be ideally located within the study area, however if that is not possible, locating the tree replacement and nest boxes on Sydney Water land close to the study area is second preference. If neither is possible, Sydney Water can consider other practical options including providing funds or plants to local bushcare.

The proposal is not expected to have an impact on aquatic ecology.

With the implementation of the mitigation measures in Section 6, only minor biodiversity impacts are anticipated.

Heritage

Non-Aboriginal heritage

The closest known non-Aboriginal heritage items are located 75 m south east of the proposal area. The items are two heritage listed houses 'Cohen House' and 'Treetops house' on the Pittwater LEP 2014. Impacts to these heritage items are not anticipated considering their distance from the proposal area.

Potential impacts to non-Aboriginal heritage will be managed by implementing the mitigation measures listed in Section 6.

Aboriginal Heritage

This information has been redacted to protect sensitive Aboriginal heritage information

Noise and vibration

Noise

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). The review indicated that the construction noise impact would be moderate to high risk and therefore a qualitative noise impact assessment was undertaken (see noise memo attached as Appendix E).

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.

The proposal area is in a low-density residential area. The existing noise environment is characterised by residential activities and bushland. The closest sensitive receiver is 14 Ralston Road which is about 5 metres from the proposal area and has a direct line of sight.

The works will generate noise and vibration during the works and general operation of machinery and equipment, in particular from abrasive blasting of the existing bitumen wall and floor lining of WS0192 which will occur for around 4-6 weeks.

Works are proposed across 5 shifts per week and construction will occur during standard construction hours for around 14 months.

Results from the assessment are summarised below:

- Residents within 40 m are predicted to experience noise levels of 75dB(A) or greater during works (highly affected).
- Noise impacts are also predicted for passive recreational users within 70 m of the proposal.
- The noisiest activity is the use of an abrasive blaster.
- Community consultation will be performed prior to construction to notify community members and discuss respite periods.
- The worst-case noise impacts (moderately intrusive noise up to 170 m for sensitive receivers).

These predicted noise impacts represent a conservative approach, as they assume abrasive blasting would be required every shift.

Feasible and reasonable mitigation measures

Figure 3 displays recommended mitigation measures at different distances. These are to be considered by the community team and offered where appropriate and include:

- N: Notification (e.g. letterbox drops)
- PC: Phone calls
- RO: Respite Offer (e.g. work blocks of 3 hours with one hour breaks in between).

Additional mitigation measures have been identified and are provided in Section 6 to avoid and mitigate noise impacts to nearby sensitive receivers.

Considering the implementation of mitigation measures significant impacts to sensitive receivers are not anticipated.

Operational noise

During operation the reservoir will comply with the Noise Policy for Industry (EPA, 2017). No additional noise or vibration impacts are anticipated.

Vibration

Works will involve the use of vibration intensive plant such as a jackhammer. During the use of such equipment, recommended minimum working distances should be maintained to avoid cosmetic damage to structures. Based on the TfNSW noise estimator tool minimum working distances of 1 m (nominal) are recommended for light-framed structures (i.e. residential buildings made with wooden framing) and 2 m for heritage and other sensitive structures. The human response distance is 3 m. The nearest residential receiver is about 5 m from the proposal area and there are no heritage structures within or adjacent. As such no vibratory impacts are anticipated.

Air and energy

The nearest residential receiver is 14 Ralston Road, Palm Beach, located directly adjacent to the WS0192 (about 5 metres). Dust and odour may be generated from excavations, spoil stockpiles and vehicle movements. This would be exacerbated during dry or windy conditions. Poorly maintained machinery may also cause air pollution and increase vehicle fumes.

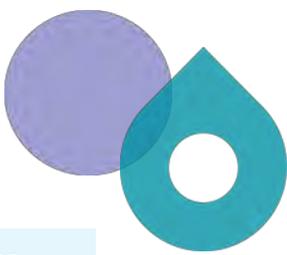
A dust collector will be in use during the mega blasting activities. These will occur during standard construction hours for a maximum of 6 weeks. There may be minor vehicle fume and dust impacts to residential receivers as vehicles travel along local roads. Potential impacts will be managed by implementing the mitigation measures listed in Section 6.

During operation, there will be no additional air, odour or energy impacts from the proposal.

Waste and hazardous materials

Hazardous Building Materials (HBMs) reports for WP0110 and WS0192 (February 2025) identified the following HBMs at each site:

- WS0192:
 - Synthetic Mineral Fibre (SMF) materials.
- WP0110:
 - Friable Asbestos Containing Materials (ACM)
 - Hazardous Paints (HP)
 - SMF
 - Polychlorinated Biphenyls (PCB) containing capacitors in electrical equipment.



The Environment Protection Authorities list of contaminated sites has been checked and there are none present in Palm Beach.

Wastes generated during construction include:

- excavated materials
- removal of redundant assets
- green waste from vegetation removal/trimming
- general construction waste
- contaminated material.

With the implementation of mitigation measures listed in Section 6, the potential health, safety and environmental impacts from HBMs and wastes can be appropriately managed.

Traffic and access

Access to WP0110 and WS0192 will be via the existing access road located off McKay Road and Boanbong Road respectively.

The proposal has the potential to affect vehicular traffic due to construction traffic on local roads. The anticipated construction traffic load will include cranes and excavators arriving at site, workers travelling to site daily (up to 18 at peak) and material deliveries. Traffic control will be used for material deliveries and for plant accessing the proposal area. Temporary traffic control may create minor delays and diversions for vehicular traffic. Traffic management measures are to be confirmed by the contractor, with any provisions and management / control plans to be prepared in consultation with council and other relevant authorities. The traffic generated for the proposal is expected to be minor and temporary. No full road closures are anticipated.

During construction and operation, there may be minor impacts to pedestrians or public access due to the proposal. As space in the proposal area is limited, work vehicles and possibly some plant may need to park on adjacent residential streets. As such, there would be a reduction in the availability of street parking spaces.

Mitigation measures listed in Section 6 will be implemented to manage potential impacts.

Social and visual

Nearby sensitive receivers to the proposal include residents (within 5 m north) and users of McKay reserve (adjacent). The proposal has the potential to cause social impacts associated with air quality, traffic, access and noise, which have been assessed above.

Visual impacts associated with construction include:

- vehicles on site
 - large equipment and materials
 - construction compound
 - the presence of up to 18 construction staff on site per day
- 

- excavations and disturbed ground
- vegetation removal.

Overall, these impacts will be temporary in nature, generally shielded by surrounding vegetation and impacted areas will be returned to pre-existing condition, where possible.

During operation, there will be no additional visual impacts compared to the existing reservoir. There will be positive impacts to the community by providing a reliable and safe, long-term water source.

Potential impacts will be managed by implementing the mitigation measures listed in Section 6.

Cumulative and future trends

Sydney Water is not aware of any planned or future work that will occur in the vicinity of the proposal while these works are being undertaken. Development applications currently (September 2025) active or determined in the last 6 months for the suburb of Palm Beach mostly relate to localised residential developments and changes to existing buildings. Any cumulative amenity impacts (e.g. noise, dust, traffic) would be minimal.

During the site visit in July 2025, residential works at 16 Cynthea Road were observed. These works are expected to be completed prior to commencement of the proposal.

Future trends such as climate change were considered as well as factors such as bushfires and flooding that could impact the proposal. The proposal is unlikely to further exacerbate future trends, such as those associated with bushfires and flooding.

Figure 4 Residential receivers within affected distance from the proposal



LEGEND

- ▬ Proposed area of works
- ▬ 70 m - Highly Intrusive (>30 db(A)) - N
- ▬ 170 m - Moderately Intrusive (20 - 30 db(A)) - N
- ▬ Hydroline
- ▬ 40 m - Highly affected (>75 db(A)) - N, PC, RO

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 NSW Spatial Services
 Australian Government Department of Environment
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6 Environmental mitigation measures

Table 4 Mitigation measures

Mitigation measures

General

Sydney Water's Project Manager (after consultation with the environmental and community representatives and affected landowners) can approve temporary ancillary construction facilities (such as compounds and access tracks), without additional environmental assessment or approval if the facilities 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 environmental impact assessment (EIA)
- 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.

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

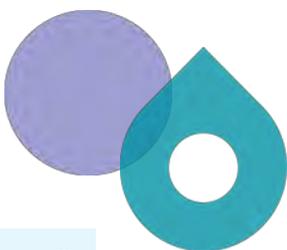
Should the proposal change from the REF, no further environmental assessment is required provided the change:

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

The 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.

The REF will be reviewed if there are changes to the surrounding land use that may change the assessment outcome.

Prepare a Construction Environmental Management Plan (CEMP) addressing the requirements of this environmental assessment. The CEMP should identify 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 and boundaries of the work area including locations of lay-down and storage areas for materials and equipment
- location of environmental controls (including erosion and sediment controls, any fences or other measures to protect vegetation or fauna, spill kits)
- location and full extent of any vegetation disturbance.

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

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

All site personnel should be inducted into the IMP.

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

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

Promptly notify the Project Manager, Community Relations Representative (Program Delivery) and Environmental Representative (Program Delivery) of any complaints.

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

Topography, geology and soils

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

- develop a Soil and Water Management Plan (SWMP) as part of the CEMP
- 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.

Include a Stockpile Management Plan (SMP) as part of the SWMP if any stockpiles remain on site for longer than a month, to adequately manage any proposed temporary and permanent stockpiles. This will include detail on:

- exact location of stockpiles
- minimising stockpile size
- height, slopes and batters
- preventing mixing and cross contamination
- consideration of future maintenance
- capping
- erosion and sediment control
- restoration.

The Stockpile Management Plan will be approved by the Sydney Water Project Manager in consultation with the Environmental Representative and Contamination and Hazardous Materials team.

A construction Contamination Management Plan must be prepared by a suitably qualified person as part of the CEMP and reviewed by Sydney Water's Environmental Representative in consultation with Contamination and Hazardous Materials team. The plan must identify the type and location of known/potential contamination, land-owner notification, management requirements (waste minimisation, waste segregation and classification) and reuse, offsite recycling and/or disposal measures.

A post-construction Contaminated Land Management Plan (CLMP) must be prepared by a suitably qualified person prior to completion of the project. The plan must be reviewed by Contamination and Hazardous Materials team. The plan must identify the type and location of contamination, risk mitigation measures such as location, type and extent of capping layers (if applicable) and the required ongoing management measures.

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

Minimise ground disturbance and stabilise disturbed areas progressively.

Contractor to ensure imported material is Virgin Excavated Natural Materials (VENM) or meets a relevant NSW EPA Resource Recovery Order and Resource Recovery Exemption or is a commercially supplied material that is not waste. If using materials that are subject to a NSW EPA Resource Recovery Order/Exemption the Delivery Contractor must ensure the conditions in that Order/Exemption are strictly adhered to.

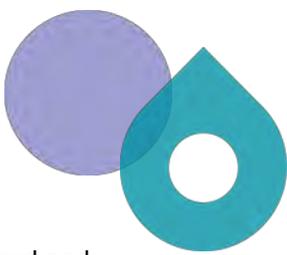
Stop work during heavy rainfall or in waterlogged conditions when there is a risk of sediment loss off site.

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.

Water and drainage

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



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

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.

Inspect downstream infrastructure for any debris, rubbish or blockages prior to discharge, namely, the stormwater chamber at the corner of Boanbong Road and Cynthea Road. Clear out any debris, rubbish or blockages if necessary.

Control discharge rate to avoid exceeding stormwater capacity. Monitor downstream infrastructure and sensitive environments. If indicators of system stress (e.g., ponding, surcharge, erosion) are observed, temporarily halt discharge to allow recovery and resume at a reduced rate.

If required, install energy dissipation structures (e.g., riprap aprons, stilling basins, or level spreaders) at discharge point to reduce velocity and prevent gully erosion.

Implement staged discharge protocols during high rainfall periods to avoid overwhelming downstream systems.

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

Store all chemicals and fuels in accordance with relevant Australian Standards and Safety Data Sheets. Record stored chemicals on site register. Bunded areas to have 110% capacity of stored liquid volume. Chemicals and fuels in vehicles must be tightly secured. All chemicals to be clearly labelled.

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

Conduct any equipment wash down within a designated washout area within an established compound with adequate stormwater drains.

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

Flora and fauna

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

- any minor:
 - vegetation trimming or
 - removal of exotic vegetation or
 - removal of planted native vegetation where the vegetation is not a threatened species (including a characteristic species of a threatened community or population), heritage listed, in declared critical habitat or in a declared area of outstanding biodiversity value.

- any removal of remnant vegetation where there is no net change to environmental impact (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).

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

The Sydney Water Biodiversity Offset Guide was applied to the proposal. Consistent with the Guide, the proposed works:

- are moderate in their nature (being over 100 m²)
- affect single trees
- require the replacement of 31 trees to offset the loss of trees
- require the installation of 2 nest boxes to offset the loss of one hollow.

The proposed offset would be ideally located within the study area, however if that is not possible, locating the tree replacement and nest boxes on Sydney Water land close to the study area is the second recommendation. If neither is possible, Sydney Water can consider other practical options including providing funds or plants to local bushcare.

Map and report native vegetation clearing greater than 0.01 ha in extent (and any associated rehabilitation) to the Sydney Water Environmental Representative. Track vegetation clearing as per SWEMS0015.26 Contractor Native Vegetation Clearing and Rehabilitation template.

Physically delineate vegetation to be cleared and/or protected on site and install appropriate signage prior to works commencing. Use orange safety barrier or similar low-impact (such as bunting or flagging) fencing prior to and during vegetation removal to ensure that work related impacts are contained within the impact area.

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

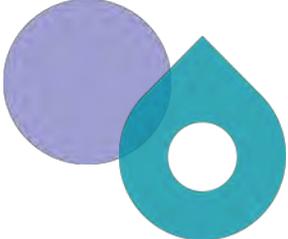
Notify potentially affected residents of any tree removal.

Limit vegetation removal to the minimum extent required to deliver the proposal. One tree has been assessed for removal opposite WS0192, in front of 1 Boanbong Road, due to manoeuvrability constraints for larger vehicles. The Delivery Contractor will re-assess the need for the removal of this tree and if required, notify the resident and consult them about replanting.

Retain dead tree trunks, bush rock or logs in-situ unless they are obstructing construction and/or operation of the proposal. Reposition material elsewhere on the site or approved adjacent sites. If native fauna is likely to be present, a licenced ecologist should conduct a pre-clearance inspection and undertake fauna relocation.

Inspect vegetation for potential fauna prior to clearing or trimming (within 1 week). If fauna is present, or ecological assessment has determined high likelihood of native fauna presence (including hollow bearing trees), engage WIRES or a licenced ecologist to inspect and relocate fauna before works.

Removal of trees should proceed slowly and carefully to allow any resident fauna disturbed by the works to escape.



Ensure instructions are made available for the people who are undertaking the removal of vegetation and dealing with orphaned or injured native animals. These instructions should include the contact details for the NSW Wildlife Information, Rescue and Education Service Inc. (WIRES).

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

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

Manage biosecurity in accordance with:

- *Biosecurity Act 2015* (see NSW Weedwise), including reporting new weed infestations or invasive pests
- contemporary bush regeneration practices, including disposal of sealed bagged weeds to a licenced waste disposal facility.

Record Pesticides and Herbicides use in accordance with SWEMS0017.

Bag all plant parts and excavated topsoil that may be infested with weed propagules and dispose at a licensed waste disposal facility.

In TOBAN period:

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

Ensure fertilisers, turf, mulch, weeds and imported soils are not unintentionally introduced into the native vegetation areas (i.e. through natural drainage pathways or general proximity).

Heritage

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

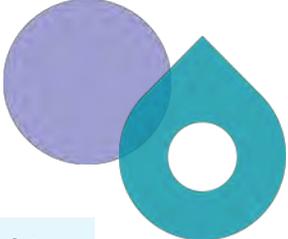
Repeat the basic AHIMS search if it is older than 12 months. Conduct additional assessment if new sites are registered and could be impacted by the works.

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

This information has been redacted to protect sensitive Aboriginal heritage information

Noise and vibration

Works must comply with the Draft Construction Noise Guideline (EPA, 2020), 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).

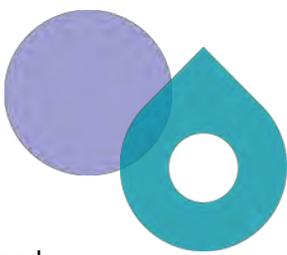
All reasonable and feasible noise mitigation measures should be justified, documented and implemented on-site to mitigate noise impacts.

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

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

If works **beyond standard daytime hours** are needed, 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.



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

Carry out attended monitoring to evaluate construction noise (and vibration if relevant) where receivers are within the recommended minimum working distances. Recordings will be measured to evaluate whether mitigation measures are adequate or require revision, and to address complaints.

If feasible and reasonable, install noise barriers around the work site and noisy equipment (eg. generators).

Engagement with the wider community is to be conducted before work starts. Ongoing engagement will continue on an ad-hoc basis. Engagement during construction will include proactive management of issues to minimise complaints. Where complaints and enquiries arise, action will be taken to address these with appropriate mitigation adopted.

Residents and businesses are to be notified at least seven days before work starts. This will include letterbox drops, and door knocks to nearby residents (if required).

If out of hours works are required, residents are to be notified of night work at least seven days in advance of work starting. An Out of Hours Work Plan (OHWP) will be completed in advance of work starting.

The following mitigation measures are to be considered by the community team and offered where appropriate:

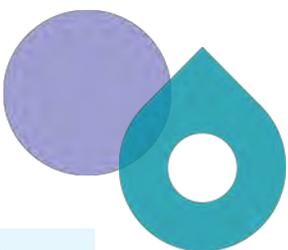
- notification (letterbox drop or equivalent) - Advance warning of works and potential disruptions can assist in reducing the impact on the community. The notification may consist of using variable message signs, letterbox drop (or equivalent), web site / social media or a combination to distribute information detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification should be a minimum of five working days prior to the start of works. The approval conditions for projects may also specify requirements for notification to the community about works that may impact on them.
- phone calls - Phone calls detailing relevant information made to identified/affected stakeholders, who have provided their contact details, within seven calendar days of construction start. Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposal and specific needs. Where the resident cannot be telephoned then an alternative form of engagement should be used.
- respite offer - Respite Offers should be considered where there are high noise and vibration generating activities near receivers. As a guide work should be carried out in continuous blocks that do not exceed 3 hours each, with a minimum respite period of one hour between each block. The actual duration of each block of work and respite should be flexible to accommodate the usage of and amenity at nearby receivers. The purpose of such an offer is to provide residents with respite from an ongoing impact. This measure is evaluated on a project-by-project basis, and may not be applicable to all projects.

Air and energy

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

A dust collector will be in use during the mega blasting activities.

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



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

Switch off vehicles/machinery when not in use.

Implement measures to prevent offsite dust impacts, for example:

- water exposed areas (using non-potable water source where possible such as water from excavation pits)
- cover exposed areas with tarpaulins or geotextile fabric
- modify or cease work in windy conditions
- modify site layout (place stockpiles away from sensitive receivers)
- vegetate exposed areas using appropriate seeding.

Cover all transported waste.

Waste and hazardous materials

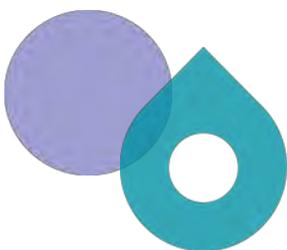
Prepare a Waste and Resource Recovery Plan (WRRP) to appropriately manage and classify any materials including soils, construction/demolition wastes and associated stockpiles.

The plan will be prepared by the Delivery Contractor (or nominated environmental consultant) and approved by the Sydney Water Project Manager in consultation with the Environmental Representative and Property Portfolio Environmental team.

The WRRP should include:

- expected waste types and their location
- delineation of waste /resource types including identification of likely vertical and lateral extents (where warranted)
- visual monitoring of materials during excavation and measures to be undertaken to prevent comingling / cross-contamination of waste / resource types
- ex-situ waste and resource recovery classification program, including timing relative to project / excavation phases as well as proposed hold points
- waste minimisation and resource recovery methodologies (including consideration of onsite reuse or management if contaminated)
- roles and responsibilities in relation to stockpile and material management and monitoring program
- proposed onsite reuse locations and reuse methodology (if applicable)
- proposed offsite reuse, offsite recycling and / or offsite disposal locations / facilities
- legislative compliance requirements
- consideration of future maintenance
- restoration.

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



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

Minimise stockpile size and ensure delineation between different stockpiled materials.

Minimise the generation of waste and sort waste streams to maximise reuse/recycling in accordance with the *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 where appropriate. Recycle soils at a licensed soil recycling facility or dispose at an appropriately licenced landfill facility.

Prevent pollutants from escaping including by covering skip bins.

Dispose excess vegetation (non-weed) that cannot be used for site stabilisation at an appropriate green waste disposal facility.

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

Manage lead paint in accordance with the WHS Regulation (2017) Part 7.2 and the Australian Standard Lead Paint Management Guidelines. Consult with the Contamination and Hazardous Materials team where works involve removal of lead-based paint. Develop a Lead Management Plan if required.

Review existing hazardous building materials (HBM) report and implement relevant safeguards. Conduct hazardous materials survey prior to commencement where works could impact hazardous materials not surveyed in previous HBM assessments.

Traffic and access

Prepare a Traffic Management Plan (TMP) in consultation with the relevant traffic authority. The Delivery Contractor will obtain a Road Occupancy Licence (ROL) from council, if required.

Develop management measures to minimise traffic impacts near residential properties, schools and businesses by consulting with them (e.g. no major materials deliveries at school drop off or pick up times etc).

Erect signs to inform road users of the proposed works and any temporary road closures.

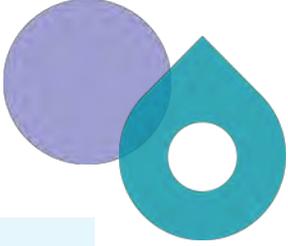
Manage sites to allow people to move safely past the works, including alternative pedestrian, bicycle, pram and wheelchair access.

All vehicles to park within the established laydown areas where available.

Ensure work vehicles do not obstruct vehicular or pedestrian traffic, or private driveway, public facility or business access unless necessary and only if appropriate notification has been provided.

Social and visual

Undertake works in accordance with Sydney Water Communications policies and requirements including:

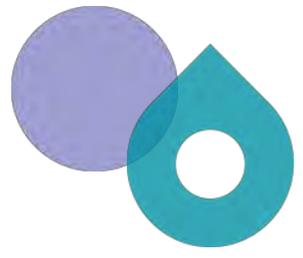
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- notify impacted residents and businesses
 - erect signs to inform the public on nature of work
 - treat community enquiries appropriately.

Restore work sites to pre-existing condition or better.

Maintain work areas in a clean and tidy condition.

Cumulative and future trends

Prior to and during construction the contractor will review council planning portals to identify any ongoing or new developments within 200 m of the proposal area. If adjacent works are identified, the contractor will consult with council, residents and contractors to coordinate schedules and update noise and traffic mitigation measures as required to mitigate any potential cumulative impacts.



7 Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of the Palm Beach Elevated Reservoir Renewal. The proposal is required to enhance the reliability of WS0192 and WP0110, secure water quality, improve the performance of the reservoir and optimise the service life of the assets.

The main potential construction environmental impacts of the proposal include impacts to biodiversity and nearby residential receivers. During operation, impacts are not 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.

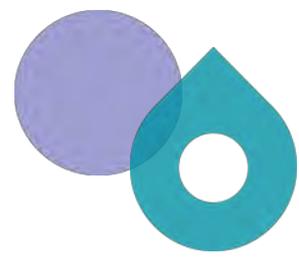
The REF considers how the proposal aligns with the principles of ecologically sustainable development (ESD) (Appendix B). The proposal will result in positive long-term environmental improvements. The proposal will not result in the degradation of the quality of the environment and will not pose a risk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

SW 142 12/25



Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may be temporary mid-term impacts on the community from vegetation removal, construction noise, construction traffic and use of public space. Overall, there will be environmental improvements by providing a reliable water service to the local community. Removed vegetation will be offset in accordance with the Sydney Water Biodiversity Offsets Guideline and as outlined in Section 5.
Any transformation of a locality	The proposal will not result in the transformation of a locality.
Any environmental impact on the ecosystems of the locality	The proposal will result in minor environmental impacts to ecosystems of the locality, from activities such as vegetation removal and noisy works.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposal will cause a temporary minor reduction in local aesthetic and environmental quality due to vegetation removal and construction noise.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal will not have any effect upon these factors.
Any impact on the habitat of any protected animals (within the meaning of the <i>Biodiversity Conservation Act 2016</i>)	The proposal will not have any significant impact on the habitat of protected animals. No threatened species or critical habitat have been recorded within the proposal area. Up to 0.065 ha of native vegetation will be impacted including 1 hollow, which may provide potential foraging habitat for native species. Removed vegetation and habitat features will be offset in accordance with the Sydney Water Biodiversity Offsets Guideline and as outlined in Section 5.
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	The proposal will not endanger any species.
Any long-term effects on the environment	The proposal will not have any long-term impacts on the environment but will have a long-term benefit by providing a reliable and modern water service for the area.
Any degradation of the quality of the environment	The proposal will maintain the quality of the environment.
Any risk to the safety of the environment	The proposal will ensure the safety of the environment by providing a reliable and modern water service for the area.
Any reduction in the range of beneficial uses of the environment	The proposal will maintain the range of beneficial uses of the environment.
Any pollution of the environment	Environmental mitigation measures will mitigate the potential for the proposal to pollute the environment. Construction noise pollution is anticipated, however with the implementation of mitigation measures, impacts from this pollution is not anticipated to be significant. No operational pollution of the environment above current levels is expected.
Any environmental problems associated with the disposal of waste	Waste disposal will be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.



Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not affect demand on resources.
Any cumulative environmental effect with other existing or likely future activities	The proposal will not have any cumulative environmental effect with other existing or likely future activities.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	The proposal will not have any impact on these factors.
Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act, Division 3.1	There are no applicable strategic planning statements or plans, as the proposal forms part of a Reservoir Renewals Program.
Any other relevant environmental factors.	The proposal has been assessed against the factors listed above, and there are no other relevant environmental factors to consider.

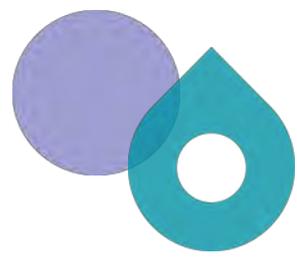


Appendix B – Consideration of TISEPP consultation

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 <i>the 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 (ie non-certified land)? <i>If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).</i>		X

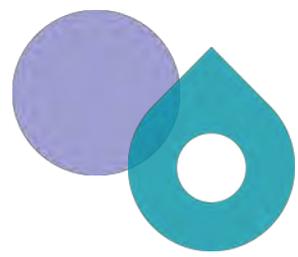
Appendix C - Consideration of principles of ecologically sustainable development (ESD)

Principle	Proposal alignment
<p>Precautionary principle - <i>if there are threats of serious or irreversible environmental damage, lack of scientific uncertainty should not be a reason for postponing measures to prevent environmental degradation. Public and private decisions should be guided by careful evaluation to avoid serious or irreversible damage to the environment where practicable, and an assessment of the risk-weighted consequences of various options.</i></p>	<p>The proposal will not result in serious or irreversible environmental damage. Mitigation measures have been designed to reduce scientific uncertainty relating to the proposal. The environmental impacts of the construction and operation of the proposal will be minor, localised and temporary.</p>
<p>Inter-generational equity - <i>the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.</i></p>	<p>The proposal will help to meet the needs of future generations by providing a reliable drinking water service.</p>
<p>Conservation of biological diversity and ecological integrity - <i>conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.</i></p>	<p>The proposal will not significantly impact on biological diversity or impact ecological integrity.</p> <p>Vegetation removal will occur within the proposal area.</p> <p>Impacts to biodiversity are summarised in Section 5 and mitigation measures are outlined in Section 6</p>
<p>Improved valuation, pricing and incentive mechanisms - <i>environmental factors should be included in the valuation of assets and services, such as 'polluter pays', the users of goods and services should pay prices based on the full life cycle costs (including use of natural resources and ultimate disposal of waste) and environmental goals</i></p>	<p>The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment. The proposal will improve operational efficiency in the drinking water system through ensuring the roof and reservoir is structurally adequate and by improving redundancy in the system. This option may require more initial capital expenditure compared to a 'Do nothing' option however, it has better life cycle costs and long-term benefits.</p>



Appendix D – Flora and Fauna Assessment





Appendix E – Noise Memo

