Review of Environmental Factors Addendum

Elanora Heights Reservoir WS0214 Reline and Roof Renewal, August 2025

Determination

This Review of Environmental Factors Addendum (REFA) assesses additional potential environmental impacts of Elanora Heights Reservoir WS0214 Reline and Roof Renewal Project. This REFA 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:

- Elanora Heights Reservoir WS0214 Reline and Roof Renewal (February 2024) (approved REF)
- this REFA.

Additional environmental impact assessment may be required if the scope of work or work methods described in this REFA change significantly following determination.

Certification

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

Prepared by:	Reviewed and endorsed by:	Endorsed by:
[redacted]	[redacted]	[redacted]
S.May REF author Confluence Water Date: 11/07/2025	Yameng Lai A/Senior Environmental Scientist Sydney Water Date: 12/08/2025	Sherif Elias Senior Project Manager Sydney Water Date: 13/08/2025

Decision Statement

The main additional construction environmental impacts of the proposal change are those from noise, vibration and vegetation removal. Impacts during operation would be related to the maintenance of the Asset Protection Zone (APZ) around the reservoir. 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. Accordingly, a Species Impact Statement (SIS) and Biodiversity Development Assessment Report (BDAR) are not required.

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

Determined by:	[redacted]	Murray Johnson Senior Manager Environment and Heritage, Water and Environment Services Sydney Water Date: 14/08/2025

1. Proposal description

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

Aspect	Description
Approved REF	Review of Environmental Factors | Elanora Heights Reservoir WS0214 Reline and Roof Renewal, February 2024.
Proposal need	The Elanora Heights Reservoir (WS0214) was constructed in 1966 as part of the Ryde Water System. The circular reservoir has a diameter of 22.6 metre (m), a depth of 6.2 m and a capacity of about 2.5 Megalitres (ML). A condition assessment was carried out in November 2017 and a follow-up assessment was conducted in January 2020. The internal and external inspections found: • minor to significant levels of corrosion throughout the internal structure • the handrail was in poor condition due to corrosion of the bottom of the rails • there were access issues associated with the external ladder • numerous leaks with the worst leaks around the hatches near the end of the roof sheeting • holes in the sheeting caused by impact damage and galvanic corrosion were significant sources of water ingress. The proposal aims to address strength and serviceability risks largely caused by corrosion damage to the roof structure and walkway.
Proposal objectives	The proposal is part of Sydney Water's renewal program. The proposal objectives are to: • meet the objectives of the Reservoir Decision Framework and refurbish assets that satisfy the selection criteria • avoid unplanned outages due to failure of the roof or walls • optimise service life by incorporating stakeholder needs coupled with improvements in design • support Sydney Water's commitment to its customers under its Operating Licence • meet the National Water Quality Management Strategy Australian Drinking Water Guidelines 6, 2011 • ensure Sydney Water manages its drinking water quality to the satisfaction of NSW Health. Specifically, this proposal addresses the internal wall coating, preventing rainwater or vermin entry.

Aspect	Description
Proposal change description	The following changes are the subject of this addendum: • A Bushfire Assessment identified the need for further vegetation removal around the site for the creation of Asset Protection Zones (APZ) during construction and later for operation (Appendix F). • In accordance with Sydney Water electrical specifications, electrical cables would be installed underground. Additional rock breaking would occur. • Allowance has also been made for traditional rock breaking activities, where previously chemical rock breaking had been considered. The proposal changes, and how they fit into the various stages of construction, are outlined below: **Site establishment** Site establishment as detailed within the approved REF incorporates the installation of laydown areas, compounds and construction amenities. Vegetation will be cleared to accommodate both this and the temporary tank. Changes to the site establishment scope include: • additional clearing of 0.41 hectares (ha) of native vegetation (Plant Community Type (PCT) 3593) around the temporary tank and existing reservoir • removal of 3 additional trees along the access road (*Eucalyptus haemastoma x 2* and *Acacia melanoxylin x 1).* **Construction** Construction as detailed in the approved REF includes all earthworks and the construction of the temporary tank. Changes to the construction scope include: • additional rock breaking along the site access road (trench 400 m long, 850 millimetre (mm) deep and 800 mm wide) for the installation of underground electrical cables to permanently supply the reservoir and a Telstra communications line • rock breaking within the existing reservoir site around the proposed chemical dosing kiosk (CDK) where chemical rock breaking was to occur (5 m x 5 m x 2 m) and for minor electrical trenching work. **Reservoir refurbishment** No proposal changes. **Testing and commissioning / defects liability period (DLP)** This was not included in the approved REF. No construction will occur during this 12-month period.

<table>
<tr><th>Aspect</th><th>Description</th></tr>
<tr><td></td><td>Site restoration
Site restoration work as detailed in the approved REF includes removal of the temporary tank and site revegetation. Changes to the site restoration scope include:
a 5 m clearance around the existing reservoir will remain in place, forming a permanent APZ
offsetting and revegetating the additional (0.41 ha) of vegetation removed, in line with Sydney Water’s Biodiversity Offset Guide.
Figure 1-1 provides an overview of the proposed scope changes.</td></tr>
<tr><td>Justification for proposal change</td><td>The justification for the proposal changes is outlined below.<table><tr><th>Change</th><th>Justification</th></tr><tr><td>Additional clearing of 0.41 ha of native vegetation</td><td>Jacobs prepared a Bushfire Assessment (Appendix F) which recommended the removal of additional vegetation around the temporary tank and associated construction infrastructure to form an APZ. This will manage risks associated with a bushfire event.</td></tr><tr><td>Additional rock breaking along site access road</td><td>Electricity to the site is currently via overhead electrical cables along the site access road. In accordance with Sydney Water electrical specifications, all above ground cables are to be installed underground. This also includes placing a Telstra communications cable within the same trench.

A rock outcrop extends across the site therefore rock breaking is required to construct the electrical trenches. This would take about 3 months. Alternative construction techniques such as saws would not be suitable for this excavation.</td></tr><tr><td>Removal of 3 native trees along access road</td><td>Three trees are in the area where the electricity trenches will be constructed therefore their removal is required.</td></tr><tr><td>Area of rock breaking where chemical rock breaking was previously to occur</td><td>The approved REF outlined chemical rock breaking on-site for site establishment and the CDK. While this is the preferred method of construction, rock hammering would be used as a worst-case scenario.</td></tr><tr><td>Defects Liability Period</td><td>The temporary tank will remain on-site until it can be confirmed that no defects exist in the newly refurbished existing reservoir. This is a</td></tr></table></td></tr>
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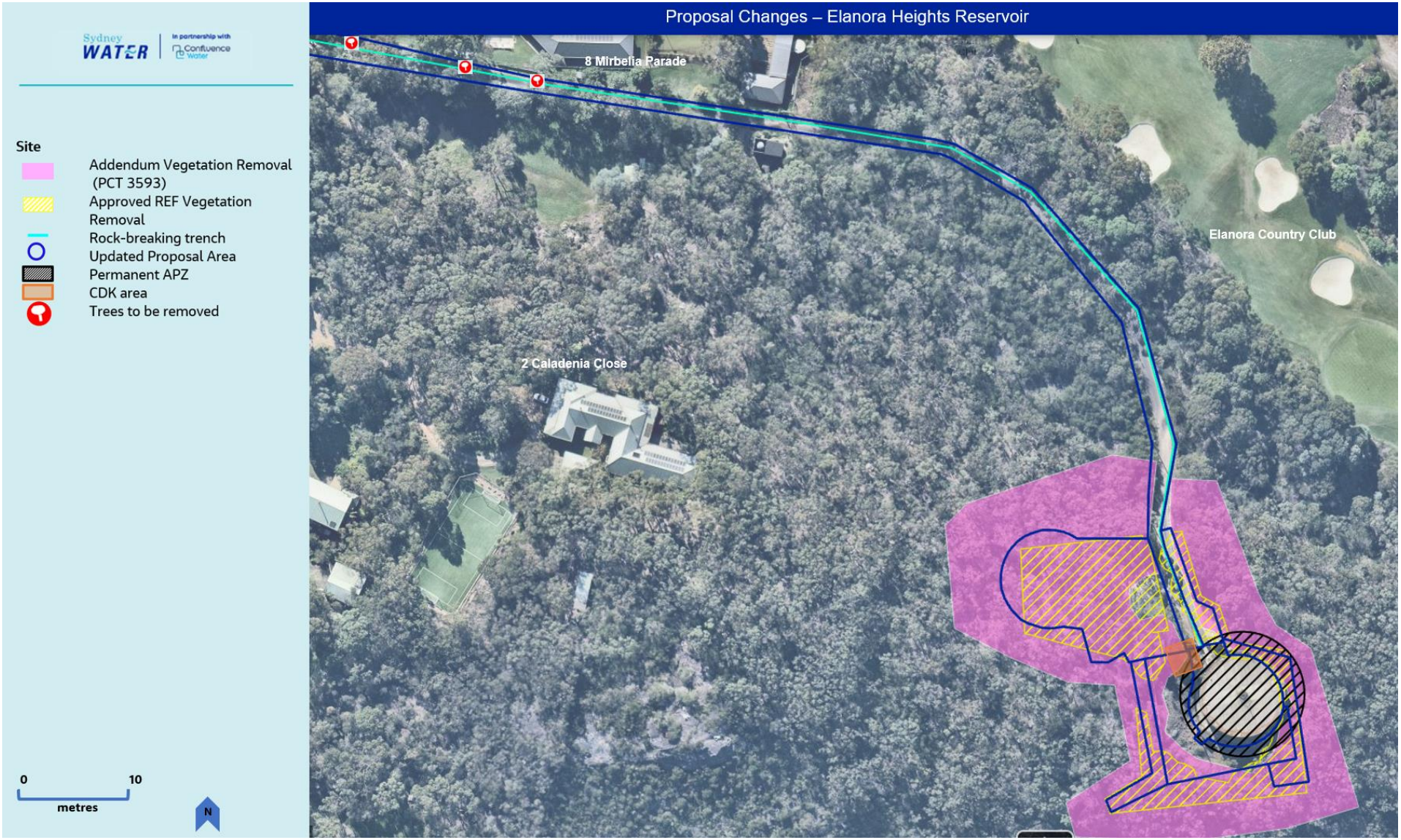
Aspect	Description	
		standard Sydney Water requirement, and no construction will occur during this time. It is included in this REFA to help understand proposal timeframes.
	5 m APZ around existing reservoir	The reservoir is an important potable water source that needs to be maintained. As the existing reservoir is within BPL, it may provide water important to firefighting operations via the reticulated water network. This is in line with the aims of *NSW Rural Fire Service's Planning for Bush Fire Protection (2019)*.
Location and land ownership	The reservoir is located at 158A Elanora Road, Elanora Heights on Lot 1 DP 538508 and is owned and managed by Sydney Water. The reservoir site is surrounded by land owned and managed by the Elanora Country Club, which manages the adjacent golf course. The land owned by Elanora Country Club includes the land for the temporary tank and the reservoir access road from the pump station. The access road between the road and the pump station is owned by 2 Caladenia Close and Sydney Water has an easement along this road. The reservoir is within the Northern Beaches Local Government Area (LGA). The reservoir falls under the jurisdiction of the *Pittwater Local Environmental Plan (LEP) 2014,* on land zoned as Infrastructure (SP2). The land for the temporary tank and access road is located on land zoned as Private Recreation (RE2) and Large Lot Residential (R5).	
Proposal timing	The proposal changes have increased the overall proposal timeframe. Site work is currently expected to start late 2025 and is summarised below (dates are indicative only). **Site establishment** Site establishment will involve vegetation removal and establishing site sheds, a compound and fencing. This is expected to take place from September to December 2025. **Construction (including testing/commissioning of temporary tank)** The bulk of the work is civil work (earthworks, undergrounding of electrical cables, construction of temporary tank). Construction will occur from about December 2025 to July 2026 and commissioning of the temporary tank will run until September 2026. **Reservoir refurbishment** Roof renewal and refurbishment will occur from October 2026 to July 2027, with further electrical works taking place from August 2027 to September 2027. **Testing and commissioning / DLP** Once the existing reservoir has been refurbished it will be tested and commissioned. Following this, the temporary tank will remain on-site for 12 months during a DLP to make sure that there are no further issues with the refurbished reservoir during this time. No construction work will occur during this period. The DLP is likely to end around September 2028.	

Aspect	Description
	Site restoration Once the DLP has ended, the temporary tank will be dismantled and any remaining site sheds will be removed. Revegetation will occur in line with Sydney Water's Managing Native Re-vegetation for Construction Projects (2020). Site restoration is expected to take place from October 2028 to June 2029. **Total duration** The proposal is expected to take 3.5 years to complete (this includes the one-year DLP where no work will occur). This timeline is conservative and accounts for potential productivity delays and adverse weather conditions.

Figure 1-1 Location of proposal change and key environmental constraints



2. Consultation

A Community and Stakeholder Action Plan (CSAP) has been developed for the project and includes consultation requirements with both nearby residents and golf courses. As there are residents and golf courses near the site, effective consultation is integral in delivering a successful project.

Construction activities will be carried out on land owned by the Elanora Country Club (the Club) and therefore direct consultation with the Club started in August 2023, including a meeting to discuss initial use of the access track, placement of the temporary tank and vegetation clearing. The Club will be similarly consulted about the proposal changes and this will continue throughout proposal delivery. It is understood that the Club is particularly sensitive to potential noise impacts associated with the proposal. Therefore, as the proposal changes result in further noise impacts, potential methods of mitigation will be discussed in more detail with the Club. Additionally, the issues of vegetation removal and potential rehabilitation locations will also be discussed.

Direct consultation will also occur with the closest residents affected by the proposal changes. This includes owners of 2 Caladenia Close as the owners of part of the access road, and residents at 8 Mirbelia Parade.

Additional community consultation has been considered as part of the mitigation of impacts associated with the proposal changes and this is outlined further in Chapter 4.

3. Legislative considerations

The land on which the proposal will take place has been classified by Northern Beaches Council as bushfire prone, vegetation category 1. This proposal is assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* and therefore does not require council consent.

Legislation	Additional legislative considerations in this REFA
Biodiversity Conservation Act 2016 (BC Act)	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. Under the BC Act, Sydney Water must consider the impact on threatened species, threatened ecological communities or areas of outstanding biodiversity value when undertaking construction and maintenance. The BC Act protects listed species, populations and ecological communities in NSW to be considered in deciding likelihood of significant impacts on threatened biota or habitats. If any species could be potentially impacted by the proposal, a 'Test of Significance' (ToS) must be completed. This addresses the requirements of section 7.3 of the BC Act to determine the significance of the impact. The proposal changes require removing an additional 0.41 ha of native vegetation and 3 native trees. However, implementing the mitigation measures in Table 4-3 would minimise the potential for impacts on threatened species, populations or ecological communities listed under the BC Act. The works would not have a significant impact on threatened species under this Act (Appendix E).
Environmental Planning and Biodiversity Conservation Act 1999	The EPBC Act is the principal environmental law administered by the Commonwealth. It provides for the protection of matters of national environmental significance. 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 could be potentially 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. The removal of additional vegetation is unlikely to have a significant impact on a matter of national environmental significance and has not been referred (Appendix E).

4. Environmental assessment

The tables below assess the additional environmental impacts from the proposal change and identify additional mitigation measures. All other environmental impacts and mitigation measures identified in the approved REF (February 2024) remain the same and will be incorporated into the Contractors Construction Environmental Management Plan (CEMP).

Table 4-1 review of environmental aspects

Aspect	Potential additional impacts
Topography, geology and soils	Additional excavation (400 m long, 850 mm deep and 800 mm wide) is required to place the electrical infrastructure beneath the ground. Additionally rock breaking activities may also take place near the CDU (5 m x 5 m x 2 m) and for minor electrical trenching work. However, impacts associated with this (such as soil displacement, sediment runoff and dust generation) are consistent with the approved REF and can be effectively managed with the mitigation measures in the approved REF.
Flora and fauna	**Existing environment** Appendix E includes information on ecological features of the site and assesses the impacts of the additional vegetation clearance (Confluence Water, July 2025). This assessment involved a new field survey on 6 December 2024. The survey was conducted during the flowering window of the threatened Leafless Tongue Orchid (*Cryptostlis hunteriana)* which had previously been identified as having potential to exist at the site and is listed as vulnerable under the BC Act and EPBC Act. New targeted surveys for the threatened Leafless Tongue Orchid were conducted as well as a general random meander survey. The survey confirmed that the additional area to be cleared was within the Sydney Coastal Sandstone Bloodwood Shrub Forest (PCT 3593), consistent with that approved for removal in the approved REF. PCT 3593 is not consistent with a threatened ecological community. No threatened flora or fauna were detected during the survey. No hollow-bearing trees or stick nests were observed at the site. **Proposal changes** The proposal changes include increased vegetation clearance for both temporary (for site establishment and construction) and permanent (establishment of APZ around existing reservoir) works. Table 4-2 outlines the additional vegetation removal required. Most vegetation clearing will occur during site establishment and could take up to 2 months to occur. Three native trees along the access road would be removed during the construction phase and will only take 1 or 2 days. Clearance around the construction site will be maintained over the 3.5-year proposal period.

Aspect	Potential additional impacts

Table 4-2 Additional vegetation impacts

Reason for Removal	Additional Clearance (ha)	Type of Vegetation	Offsetting
Site establishment Bushfire buffer zones around site and temporary tank (temporary)	0.39	PCT 3593 Sydney Coastal Sandstone Bloodwood Shrub Forest	2:1
Site establishment Bushfire buffer zone around existing reservoir (permanent APZ)	0.0183	PCT 3593 Sydney Coastal Sandstone Bloodwood Shrub Forest	2:1
Construction Machinery and vehicle access (temporary)	3 trees removed	*Eucalyptus haemastoma x 2* and *Acacia melanoxylin x 1*	3:1

Temporary clearance

Vegetation clearing will remove suitable habitat for native species using the site. A termite nest that had previously been identified in the approved REF containing nesting Laughing Kookaburra is now within the area of additional impact. While not a threatened species, mitigation measures have been developed to reduce any potential impact.

AoS were completed for threatened species identified in the approved REF as likely to occur at the site (Appendix E). This assessment identified that direct impacts are unlikely to have a significant impact on threatened species, populations and their habitat.

Minor noise impacts on fauna are possible during rock breaking activities, as well as disturbance from creating trenches along the access road. However, as these activities are temporary, these impacts are considered minor and able to be managed effectively by the measures outlined in Table 4-3.

Of the additional 0.41 ha of PCT 3593 to be removed during construction, a 5 m buffer around the existing reservoir will remain as an APZ. Therefore a total of 0.39 ha of PCT 3593 and 3 trees will be temporarily removed and revegetated at the end of the work. Given the temporary nature of this clearance and the connectivity of the site to a large intact patch of dense native vegetation, the loss is unlikely to have a significant impact on biodiversity values.

Once the temporary tank is removed, the area cleared for the tank will be rehabilitated and revegetated. In accordance with Sydney Water's Biodiversity Offset Guide (Table 4-2), offsetting will occur on-site where possible, in areas identified by the Elanora Country Club, or at an alternative suitable facility.

Aspect	Potential additional impacts
	Permanent clearance During operation, a 5 m buffer around the existing reservoir will remain as an APZ (i.e. 0.0183 ha of PCT 3593 will remain cleared). This APZ will be subject to ongoing foot traffic disturbance and minor weed encroachment and as such will not result in fragmentation of the surrounding high-quality vegetation. Based on this, it is unlikely to result in a significant impact on threatened species.
Noise and vibration	Additional vegetation removal and rock breaking activities will result in greater noise generated for the proposal than was assessed in the approved REF. A noise and vibration assessment memo (Confluence Water, July 2025) (Appendix D) provides: • a noise impact assessment of additional proposed scope in this REFA for vegetation clearing and rock breaking • a vibration impact assessment of the proposed additional rock breaking activities along the access road and around the CDK. The memo identified a total of 29 nearby residential receivers, one commercial, one place of workshop and 2 areas of active recreation (2 golf clubs). The adopted noise management levels (NMLs) for receivers are: • Residential: 50 dB(A) • Commercial: 70 dB(A) • Places of worship: 55 dB(A) • Active recreation: 65 dB(A). 'Highly affected' receivers are defined as residential receivers experiencing noise levels of 75 dB(A) or higher. **Noise impacts** Vegetation removal and rock breaking will be the noisiest and most far-reaching activities. Vegetation clearing and rock breaking would occur during standard daytime hours. No works would occur on Sundays or public holidays. During vegetation removal, 22 receivers would experience noise levels above the NML. Of those, 8 Mirbelia Parade would be 'highly noise affected' and some users of both the Elanora Golf Club and Monash Country Club will also experience levels over 75 dB(A). Vegetation removal would occur in discrete stages over a 2-month period before any civil works occur. Rock breaking activities for trenching works would also impact 22 receivers above the NML when using a large 30 tonne excavator with mounted rock breaker. Of those, 8 Mirbelia Parade would be 'highly noise affected' and small sections of the greens for both golf clubs will also experience levels 75 dB(A) or over. Alternative rock breaking methods will be explored, such as using a smaller rock breaker (12-18 tonne) which will reduce the NML by 5 dB(A). Neither golf course would remain over 75 dB(A) however 8 Mirbelia Parade would still be 'highly noise affected'. Trenching works along the access road will occur for a period of about 3 months. Being transient, the highest noise

Aspect	Potential additional impacts
	impacts will occur when immediately adjacent to sensitive receivers, therefore noise levels will not be consistent for one receiver over that entire 3-month period. Rock breaking activities within the reservoir site around the CDK would impact 12 receivers above the NML but no receivers would be 'highly noise affected' or over 75 dB(A). Rock breaking here is expected to take just under one month, with miscellaneous trenching for cabling occurring for short durations over the 7-month construction period. Implementing reasonable and feasible measures and direct consultation as outlined in Table 4-3 will manage both impacts and expectations in relation to noise. **Vibration impacts** A 30-tonne excavator with a mounted rock breaker would be used for rock breaking along the access road. The minimum safe working distance of a 30 tonne excavator for potential building damage is 22 m and for human comfort is 73 m. Receivers within the human comfort impact range would experience minor vibrations during rock breaking activities. The receiver at 8 Mirbelia Parade would be within the 22 m vibration safe working distance for buildings. Alternative rock breaking methods will be explored, such as using a smaller rock breaker (12-18 tonne) which will reduce the safe working distance to 7 m. Buildings at 8 Mirbelia Parade would be beyond this distances and cosmetic impacts will be avoided. Additionally, the rock breaking within the CDK area will be within 3-6 m of the reservoir. Here, alternative methods of rock breaking that generate less vibration will be used where possible, such as chemical rock breaking and using a rock saw. Table 4-3 outlines mitigation measures for potential vibration impacts. No noise and vibration impacts will be experienced during the 12-month DLP. During operation, there would be some minor noise impacts when APZ maintenance works occur in accordance with regular maintenance schedules. Works would likely involve grass and tree trimming. Noise impacts would be minor and temporary. Overall, impacts from noise and vibration during construction are expected to be moderate for the surrounding sensitive receivers. Consultation with surrounding receivers and implementation of mitigation measures would occur to minimise impacts.
Traffic and access	The road to the site is a private access road that leads to the reservoir. It is used by Sydney Water to access the reservoir and the Elanora Country Club for maintenance. Trenching within the access road would temporarily disturb users of this road. As the road is the sole access out of the reservoir in the event of an emergency, access will still be maintained throughout the duration of the works. Additional vehicle movements throughout the construction period would increase local traffic movements. These impacts have already been identified

Aspect	Potential additional impacts
	as part of the approved REF and impacts from the proposal changes are consistent with those already assessed. During operation, there would be some traffic impacts when APZ vegetation maintenance works occur in accordance with regular maintenance schedules. Works would generate some light vehicle movements to and from the site. Potential traffic impacts would be minimal and temporary. With the implementation of mitigation measures, any additional impacts on traffic and access because of the proposal change are expected to be minimal.
Social and visual	Removing additional vegetation to provide a temporary APZ around the temporary tank is not expected to have any significant impact on visual amenity. Vegetation removal will occur on the northern side of the reservoir, an area well shielded by vegetation and with few visual receptors. The existing reservoir sits atop the hill and is clearly visible from the Elanora Country Club. However, the reservoir and surrounding vegetation provide adequate screening of the temporary tank area. Contiguous views of vegetation across the wider landscape would be maintained. Following construction and refurbishment works, the site will be rehabilitated. Most of the removed vegetation will be offset on-site where space allows and in consultation with the Elanora Country Club. This will assist in restoring the visual amenity of the reservoir site and minimise long-term visual impacts. During site establishment and construction, there would be social amenity impacts to users of both golf clubs due to noise. Consultation would occur before the works start and implementation of noise mitigation measures, would minimise social amenity impacts. While an area of vegetation will not be replanted due to the creation of a permanent 5 m APZ around the existing reservoir, this is in a highly disturbed area where vegetation cover is already sparse. As such the creation of this APZ is unlikely to have any long-term significant visual impacts. Additionally, the APZ would provide long-term protection to the reservoir and water supply to customers. The risk of bushfire will also be reduced by the undergrounding of electrical cables to the site, reducing a potential fire ignition source. The proposal would therefore provide a beneficial impact to the community.
Aboriginal Heritage	Given that over 12 months have passed since the approved REF was completed, a new desktop search was conducted for items of Aboriginal heritage. No further items were identified and no additional impacts are expected.
Cumulative impacts	The removal of additional vegetation and rock breaking activities is unlikely to add to any additional cumulative impacts beyond that already identified within the approved REF. Conversely, undergrounding of the electrical cables along the access road will reduce the need for the Sydney Water maintenance team to undertake trimming of vegetation along this power line easement, as is normally undertaken by the request of electricity suppliers. As such, potential cumulative impacts of maintenance work has been slightly reduced.

Table 4-3 Additional mitigation measures

Additional mitigation measures
Flora and Fauna
Before vegetation clearing or trimming, an ecologist or arborist will visually examine the vegetation for fauna, nests or dreys (i.e. a small round nest made from a thicket of sticks). If mobile fauna is present, allow it to move away without harassment. If any nests or dreys are present these should be carefully removed and placed within proximity to, but away from the works.
The laughing kookaburra nest identified in the approved REF to be checked and if it is in use, it is to be removed by a licensed professional (i.e. WIRES) before works occur. The nesting period is from August to January and removal of the nest outside of this period is preferred.
Trenches are to be covered each night to prevent fauna from entering. Should snakes be encountered in trenches, do not handle and contact an Environmental Representative to arrange removal.
Engage a bush regeneration specialist to complete rehabilitation following completion of works and demobilisation from site. Plants and seeds used for replanting works should be locally sourced and species consistent with PCT 3593.
Given the high condition of vegetation across the site and surrounds, site rehabilitation plans at the site of the temporary tank are to include 12 months of post-revegetation monitoring, including weed monitoring and removal measures at 3 and 6 months.
The timing and location of offsite revegetation offsets would occur in consultation with Elanora Country Club.
Noise and Vibration
Use a smaller excavator mounted rock-breaker for areas around 8 Mirbelia Parade e.g. a medium sized rock-breaker (12-18 tonne excavator with 900 kilograms hammer) to minimise potential vibration impacts, where reasonably possible.
Avoid simultaneous operation of 2 or more noisy plant close to receivers. In particular, avoid use of the excavator mounted rock-breaker concurrently with jackhammer use to minimise noise generated.
Conduct live vibration monitoring when vibratory activities are going to occur within the recommended set back distances for cosmetic damage to structures.
Before starting rock breaking activities, in consultation with owners, a pre-construction dilapidation survey would be carried out to document the existing condition of nearby structures (particularly 8 Mirbelia Parade and the existing reservoir). In consultation with owners, a follow-up post-construction dilapidation survey would occur to identify any changes or potential damage resulting from the works.
Notify the residents at 8 Mirbelia Parade, 2 Caladenia Close and 6 Caladenia Close, as well as the Elanora Country Club and Monash Golf Club, and provide ongoing updates when rock breaking and tree removal works are scheduled. This includes how long and when the works will be completed.

Additional mitigation measures
Consult with the residents at 8 Mirbelia Parade, 2 Caladenia Close and 6 Caladenia Close to discuss any reasonable mitigation and/or respite options before rock breaking and tree removal activities.
Conduct attended noise monitoring as required during vegetation removal and rock hammering works to verify modelled noise impacts at nearby sensitive receivers.
Before construction, prepare a noise and vibration management plan, or similar, within the Construction Environmental Management Plan which considers reasonable and feasible noise mitigation measures including respite periods.
Install temporary construction noise barriers for concentrated, noise-intensive activities (such as vegetation clearing and rock breaking) where practical.
Use alternative rock breaking methods, such as chemical rock breaking, rock saws or concrete pulverizer around the CDK where feasible and necessary to reduce vibration impacts.
Traffic and Access
Consult with the Elanora Country Club and 2 Caladenia Close on any access limitations along the access route before the start of construction.
The access road is to remain usable at all times.

5. Conclusion

Sydney Water has prepared this REFA to assess the potential additional environmental impacts of vegetation clearing and rock breaking for the Elanora Heights Reservoir WS0214 Reline and Roof Renewal Project. The proposal change and scope of works are required to meet bushfire planning recommendations and Sydney Water requirements.

The main potential additional construction environmental impacts of the proposal change include impacts from noise, vibration and vegetation removal. The removal of vegetation and rock breaking activities will create temporary, moderate noise impacts for the closest receivers. This would be appropriately managed by community notification and the implementation of a noise and vibration plan so that impacts are anticipated and reduced. The removal of vegetation is expected to have a minimal impact on biodiversity values at the site, with the majority of on-site vegetation restored after the conclusion of works. Additionally, by creating a permanent APZ, the reservoir (and water supply) will have increased protection in the long-term.

Given the nature, scale and extent of impacts and implementation of the mitigation measures in this REFA and the approved 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. Implementing measures for greater bushfire protection will in turn reduce the risk to the safety of the surrounding residents and assist in maintaining water supply during bushfire events.

Appendix A – Section 171 checklist

Requirements in addition to the approved REF are considered below.

Section 171 checklist	REF finding
Any environmental impact on a community	There will be additional noise impacts on the community from the noise associated with removal of additional vegetation and rock breaking activities. While this will be moderate, it will only occur during the construction period and therefore would not be a permanent, long-term impact. The implementation of mitigation measures outlined in this REF will minimise the overall impacts of noise. The undergrounding of electrical cables to the site will improve both the site and surrounding community safety during bushfire seasons by removing a potential ignition source. Maintaining a long-term APZ around the existing reservoir will assist in providing a reliable long-term water service to the local community in the event of bushfire.
Any transformation of a locality	The proposal changes will not result in the significant transformation of a locality. Additional vegetation will be removed, with all vegetation removal offset in accordance with Sydney Water's Biodiversity Offset Guide. A small area of 5 m will remain cleared around the existing reservoir, but this area is already disturbed and therefore the APZ will be consistent with the amenity of a working facility.
Any environmental impact on the ecosystems of the locality	The proposal will not result in environmental impacts to ecosystems of the locality. The bushland adjoining the proposal area is of high-quality vegetation. The removal of vegetation for the proposal will not result in loss of connectivity within this greater ecosystem.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposal will not reduce these factors.
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The proposal will not have any effect on these factors.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	All vegetation to be cleared will be offset (at a rate of 3:1 for the native trees and 2:1 for the vegetation community). As such any impact on habitat for any protected animals is considered temporary.

Section 171 checklist	REF finding
	No threatened flora or fauna were detected at the site during the ecology survey undertaken. However, the site is likely to provide opportunistic foraging habitat for several threatened species and protected native fauna, but the ecology assessment determined that this habitat is not considered to be important habitat. The proposal changes involve 0.41 ha of additional vegetation removal. Tests of significance identified that this removal will have a negligible impact on threatened species and their habitat. The area that will remain as part of the permanent APZ is already disturbed and therefore unlikely to provide preferable habitat. The proposal is immediately adjacent to a large intact patch of dense native vegetation.
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. The development of the APZ around the reservoir and temporary tank will help to manage a consistent water supply during potential bushfires. The undergrounding of electrical powerlines will remove a bushfire hazard.
Any reduction in the range of beneficial uses of the environment	The proposal will not reduce the range of beneficial uses of the environment.
Any pollution of the environment	Environmental mitigation measures will mitigate the potential for the proposal to pollute the environment. No pollution of the environment is expected.
Any environmental problems associated with the disposal of waste	Waste disposal will be in accordance with the environmental mitigation measures, and no environmental problems associated with the disposal of waste are expected.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not affect demand on resources.

Section 171 checklist	REF finding
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 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 Ecologically Sustainable Development

There are no ESD consideration in addition to those covered in the approved REF.

Appendix C – Consideration of TISEPP consultation

TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		✓
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		✓
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		✓
Connect to, and use a substantial volume of water from a council owned water supply system?		✓
Require temporary structures on, or enclose, a public space under council's control that will disrupt pedestrian or vehicular traffic that is not minor or inconsequential?		✓
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?		✓
Section 2.11, local heritage – consultation with council		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		✓
Section 2.12, flood liable land – consultation with council		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and will works alter flood patterns other than to a minor extent?		✓
Section 2.13, flood liable land – consultation with State Emergency Services		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? * (e) Div.14 (Public admin buildings), (g) Div.16 (Research/ monitoring stations), (i) Div.20 (Stormwater systems)?		✓
Section 2.14, development with impacts on certain land within the coastal zone– council consultation		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		✓
Section 2.15, consultation with public authorities other than councils		

TISEPP section	Yes	No
Will the proposal be on land adjacent to land reserved under the *National Parks and Wildlife Act 1974* or land acquired under Part 11 of that Act*? If so, consult with DPE (NPWS).*		✓
Will the proposal be on land in Zone C1 National Parks and Nature Reserves or on a land use zone that is equivalent to that zone? *If so, consult with DPE (NPWS).*		✓
Will the proposal include a fixed or floating structure in or over navigable waters? *If so, consult TfNSW.*		✓
Will the proposal be on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*? *If so, consult with Subsidence Advisory NSW.*		✓
Will the proposal be on land in a Western City operational area specified in *the Western Parkland City Authority Act 2018,* Schedule 2 and have a capital investment value of $30 million or more? *If so, consult the Western Parkland City Authority*.		✓
Will the proposal clear native vegetation on land that is not subject land (i.e. non-certified land)? *If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).*		✓

Appendix D – Noise Assessment

Appendix E - Ecology Assessment

Appendix F - Bushfire Assessment

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