Review of Environmental Factors

Upper Cascades Reliability Improvement Program – Catalina Reservoir (June, 2024)

Sydney WATER

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Determination

This Review of Environmental Factors (REF) assesses potential environmental impacts of the Upper Cascades Reliability Improvement Project, in particular the construction of a new reservoir (Catalina Reservoir) off Valley Road, Katoomba. 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 vegetation removal, heritage impacts, erosion and sedimentation, dust, noise, and traffic impacts. During operation, the main impacts are associated with visual amenity and dewatering to the surrounding environment. The proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. Therefore, a Species Impact Statement (SIS) and/or Biodiversity Development Assessment Report (BDAR) is not required.

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

Certification

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

Prepared by:	Reviewed by:	Endorsed by:	Approved by:
[redacted] Ellen Curtis Environmental Scientist Sydney Water Date: 25 June 2024	[redacted] Deana Filipas Senior Environmental Scientist Sydney Water Date: 26 June 2024	[redacted] Maaran Mutharasa Project Manager Sydney Water Date: 26 June 2024	[redacted] Murray Johnson Manager, Environment & Heritage Sydney Water Date: 26 June 2024

1 Executive summary

The Catalina water supply zone serves a population of about 9,500 in the Blue Mountains, receiving its water from the Cascade water delivery system. There are two storage reservoirs at the Catalina site, one of which is decommissioned. The remaining reservoir does not meet current and future requirements for water demand within the Catalina water supply zone.

The proposal involves demolition of the decommissioned reservoir (WS0395) and constructing a new 5.8 megalitre (ML) capacity reservoir at the same location, to provide additional network storage and system reliability and resilience.

The study area is located adjacent to the eastern side of Valley Road, Katoomba, NSW. The construction corridor is within multiple Sydney Water owned lots and is situated within proximity to several sensitive receivers, including residential properties, small business, emergency services, and public transport routes. The proposal is also partly located within a declared Aboriginal Place (Upper Kedumba River Valley, or “The Gully”).

The main potential environmental impacts associated with the proposal’s construction are heritage impacts, vegetation removal, erosion and sedimentation, noise, and traffic. During operation, impacts are associated with visual amenity and very occasional discharges to the environment for planned maintenance activities.

A Construction Environmental Management Plan (CEMP) will be prepared by the delivery contractor to mitigate potential environmental impacts during construction. During operation, the proposal will operate under Sydney Water’s standard operating procedures.

Due to the sensitive nature of the surrounding environment, extensive stakeholder consultation has been undertaken during proposal development. This includes ongoing consultation with Aboriginal stakeholders in line with Heritage NSW requirements and as part of the Aboriginal Cultural Heritage Assessment (ACHA), Blue Mountains City Council and Water NSW. Sydney Water will apply to NSW Environment and Heritage for an Aboriginal Heritage Impact Permit (AHIP) for the works (decommissioning, construction and commissioning of the reservoir) within The Gully Aboriginal Place.

The proposal will result in positive long-term benefits by improving the reliability and resilience of the water supply network for the Blue Mountains community.

2 Introduction

2.1 Context

Sydney Water provides water, wastewater, recycled water and some stormwater services to over five million people. We operate under the *Sydney Water Act 1994* and have three equal objectives to protect public health, protect the environment and be a successful business.

We are a statutory State-owned corporation and are classified as a public authority, and a determining authority for the proposal under Division 5.1 of the EP&A Act. This REF assesses the potential environmental impacts associated with the Upper Cascades Reliability Improvement Project (Catalina Reservoir) and identifies mitigation measures that avoid or minimise potential impacts.

2.2 Proposal background and need

Table 2-1 summarises the proposal need, objectives and consideration of alternatives.

Table 2-1 Proposal need, objectives and consideration of alternatives

Aspect	Relevance to proposal
Proposal need	The proposal is part of the Upper Cascades Reliability Improvement Project (Catalina Reservoir) (the Project). The Cascade water delivery system is exposed to several risks that may result in a failure, in terms of continuity of supply or water quality. The Project aims to deliver an optimised solution for ensuring a flexible, more resilient and reliable water supply in the Blue Mountains. The Catalina water supply zone is within the Cascade water delivery system in Katoomba and supplies drinking water to over 6,000 properties and a population of around 9,500. There are two storage reservoirs located on Valley Road, Katoomba. One of these is decommissioned and Sydney Water has determined that the remaining reservoir does not meet current and future water security requirements. This proposal includes demolition and removal of the existing decommissioned reservoir, and construction of a new 5.8 ML capacity reservoir in the location of the existing decommissioned reservoir, and associated pipe connection infrastructure. An overflow discharge structure will be constructed, extending east from the new reservoir and towards what is known as 'The Gully' (Aboriginal Place).
Proposal objectives	The core objective of this proposal is to deliver a suitably sized water supply storage reservoir for the Catalina water supply zone, increasing water security for customers.

Aspect	Relevance to proposal
	The proposal aims to provide positive long-term benefits by improving the reliability and resilience of the water supply network for the Blue Mountains community.
Consideration of alternatives/options	The proposal forms part of a larger program of upgrades and new assets to improve the reliability and resilience of the water supply system. An options assessment was carried out by Sydney Water (in 2020) to identify the key issues and opportunities of the system. The options assessment identified that a range of issues are reducing the system's operational capacity. This includes: • storage capacity in Catalina Reservoir • lack of alternative supply when Catalina Reservoir needs to be taken off-line. The options assessment process identified a long list of potential solutions which were then refined through workshops to a short-list of options. One of these shortlisted options was the provision of a new reservoir at Catalina to support the existing operational reservoir. The preferred size of the new reservoir was determined through an optimisation process. The preferred option involves positioning a new 5.8 ML reservoir, with a 30 m internal diameter, adjacent to the existing roadway (Valley Road). The position of the proposed reservoir will make use of the level ground at the site, where possible, before it slopes down toward the east of the site. This requires the demolition of the existing decommissioned reservoir (WS0395).

2.3 Consideration of Ecologically Sustainable Development

Table 2-2 considers how the proposal aligns with the principles of ecologically sustainable development (ESD).

Table 2-2 Consideration of principles of ecologically sustainable development (ESD)

Principle	Proposal alignment
Precautionary principle - *if there are threats of serious or irreversible environmental damage, lack of scientific uncertainty should not be a reason for postponing measures to prevent environmental degradation. Public and private decisions should be guided by careful evaluation to avoid serious or irreversible damage to the environment where practicable, and an assessment of the risk-weighted consequences of various options.*	The proposal will not result in serious or irreversible environmental damage and there is no scientific uncertainty relating to the proposal. The proposal is designed to minimise environmental impacts. The proposal will result in positive community outcomes by providing increased resilience and reliability to the water supply network.

Principle	Proposal alignment
Inter-generational equity - *the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*	The proposal will help to meet the needs of future generations by providing a reliable and resilient water service.
Conservation of biological diversity and ecological integrity - *conservation of the biological diversity and ecological integrity should be a fundamental consideration in environmental planning and decision-making processes.*	The proposal will not significantly impact on biological diversity or impact ecological integrity. The proposal has been designed to avoid vegetation where possible and will not impact threatened ecological communities. Impacts to non-threatened native vegetation will be offset in accordance with Sydney Water's Biodiversity Offset Guideline.
Improved valuation, pricing and incentive mechanisms - *environmental factors should be included in the valuation of assets and services, such as 'polluter pays', the users of goods and services should pay prices based on the full life cycle costs (including use of natural resources and ultimate disposal of waste) and environmental goals*	The proposal will provide cost efficient use of resources and provide optimum outcomes for the community and environment. The proposal will recommend cost-efficient use of resources. Construction methodologies have been selected to minimise environmental impacts, including locating the new reservoir at the site of the decommissioned reservoir. The proposal includes a commitment to voluntary biodiversity offsets. The proposal would provide long-term sustainable water infrastructure to theCascade water delivery system to meet future population demands and provide optimum outcomes for the community and environment.

3 Proposal description

3.1 Proposal details

Table 3-1 describes the proposal and Figure 3-1 shows the location and key environmental constraints.

Table 3-1 Description of proposal

Aspect	Detailed description
Proposal description	The proposal involves demolition and removal of the existing decommissioned reservoir, and construction of a new 5.8 ML capacity reservoir (**Figure 3-1**). The reservoir requires a new DN375 cross connection to Catalina rising main in Valley Road, a DN375 inlet pipe and DN300 outlet pipe (to service customers), which will connect back to the new reservoir, and associated pipe infrastructure. An overflow discharge structure will be constructed, extending east from the new reservoir and towards what is known as 'The Gully'. **Figure 3-2** shows an isometric render of the proposed reservoir, providing an indication of the general form and layout. Works are predominantly within Sydney Water land; however, some works are needed within the road.
Location and land ownership	The proposal is located at 11-21 Valley Road within the suburb of Katoomba in the Local Government Area (LGA) of Blue Mountains City Council. The following land parcels are owned by Sydney Water: • Lot 1 DP34359; Lot 2 DP34359; Lot 2 DP881800; Lot 1 DP935066; Lot 1 DP180589; Lot 1 DP34360; Lot 2 DP34360; Lot 17 DP232969; Lot 18 DP232969. The Blue Mountains Incident Control Centre (housing both the NSW Rural Fire Service and NSW State Emergency Service) is adjacent (north) to Sydney Water's property and the reservoir. These agencies also use some of the area within the Sydney Water site for storage and vehicle movements. The proposal may reduce this available area; however, Sydney Water would continue to allow these agencies to use available space.
Site establishment and access tracks	Site establishment would include delineating the construction sites, storage and laydown areas, erosion and sediment controls, traffic management, any vegetation removal and leveling of the Sydney Water site. The site can be accessed via the existing road network. Some road work would be required to provide new pavement along the verge of Valley Road, enabling maintenance or other operational vehicles to access the site without the need to park on the road.

Aspect	Detailed description
	Vehicles would be parked within Sydney Water property, where practicable, and on the road verge where necessary. Valley Road is a Regional road, managed by Blue Mountains City Council.
Ancillary facilities (compounds)	A construction compound will be required for site sheds, construction amenities, plant and equipment, and materials laydown. An indicative location for the compound is shown on **Figure 3-1**. The exact location and footprint of the compound will be chosen by the Contractor within the boundary of Sydney Water land and approved by Sydney Water's Project Manager, as described in the safeguards in Section 6. The compound will require earthworks to provide a level surface for heavy machinery to access the reservoir during construction.
Methodology	General The scope of work includes the construction and operation of water infrastructure at a Sydney Water-owned site with some minor works in Council owned land and roads. Activities would include demolition of the existing decommissioned reservoir and some associated pipework infrastructure, vegetation clearing for new infrastructure and access, earthworks, open trenching, and construction and commissioning of the new reservoir. Indicative activities associated with the construction works are described below. Dewatering of the existing reservoir would not be necessary as it is not operational and does not store any water. Investigations and site establishment Site establishment and investigative works will include geotechnical, contamination and survey work and/or potholing for existing services. Site preparation works will include: • vegetation removal • earthworks to provide a level surface for machinery access and reservoir construction • establishing temporary compounds and access roads • installing erosion and sediment controls • traffic management measures • removal of pavement, footpath and/or road surfaces. Demolition of existing reservoir Demolition of the existing reservoir would involve: • demolition of existing pipework and fittings on reservoir (internal and external) • demolition of reservoir structure

Aspect	Detailed description
	• demolition of any foundations. Earthworks Construction activities would involve earthworks to provide a flat area for the new reservoir. Due to the sloping topography of the site, it is anticipated that the volume of cut (removed) material would be greater than the volume of fill (placed) material. Construction activities include: • install pile foundations to bedrock to support the reservoir • earthworks and soil management • removal of topsoil and cutting into the bedrock of the site to prepare for reservoir construction • dewatering of excavations as/if necessary • establishment of retaining walls around fill. The new Catalina Reservoir is 30 m diameter with a 10 m high steel wall with coned aluminium roof structure. A 2 m wide access corridor is proposed around the perimeter of the reservoir to allow for operation and maintenance needs. Construction of new reservoir Construction of the new reservoir would involve: • construction of retaining wall • construction of reservoir base slab • delivery of prefabricated components of the reservoir • assembly of the reservoir using a crane • installing wall cladding, roof and roof access arrangements • construction of overflow relief and scour pipeline and associated structures • construction of valve chambers • construction of perimeter walkway, paved access shoulder off Valley Road and external stair tower • construction of stormwater drainage works • installation of electrical and telemetry works including kiosk, conduits and instrumentation • installation of mechanical equipment such as mixer • pipework fittings and connections made to reservoir • commissioning and site restoration.

Aspect	Detailed description
	Open trenching New pipelines to connect to the existing water network would be installed by open trenching methods. Construction activities include: • excavation of trenches, including stockpiling of spoil material on the upslope side of trenches, or at temporary site compounds • shore and dewater trenches if needed, depending on trench depth and groundwater levels • lay pipe bedding material (granular material such as sand or gravel) along the bottom of the trench • install the water pipeline • backfill the trench with bedding material and excavated soil • compact trench fill material and restore areas disturbed by the works • test and commission the pipe. Excavations for the new infrastructure will be approximately: • trenches for new pipes: 2m wide by 2m deep • outlet pit: 13m long by 5m wide by 5m deep • inlet pit: 7m long by 13m wide by 3m deep • overflow discharge and scour structure: 5m wide by 4m deep.
Commissioning	Commissioning involves testing and running the new equipment to ensure the equipment is working correctly and integrated with existing operations. The exact commissioning process depend on the type of equipment, but typically include: • disinfection of reservoir tank • filling of reservoir for pressure testing • checking for leaks • pressure and acceptance testing of pipework • disinfection of pipework.
Restoration	The work site will be restored to pre-existing conditions following construction. Site restoration would include: • dismantling compounds, removal and disposal of waste material and removing construction signage and hoardings • restoring ground cover and vegetation, including all offset requirements

Aspect	Detailed description
	• restoring road surfaces and drainage where pipework is trenched • removing erosion and sediment controls, temporary fencing and any traffic control measures.
Materials/ equipment	The materials required for the construction of the proposal would largely be prefabricated/pre-cast and include sections of pipe, building materials and the reservoir. It is anticipated that a construction workforce of around six to 18 people would be required, depending on the activity. Construction of the proposal would also involve the use of a range of vehicles, plant, and equipment, which would include: • confined spaces safety equipment (eg gantry/davit) • skip bins • sediment tank • concrete pumps • generators • backhoes • jackhammers • hand tools • site facilities and amenities • storage containers • excavators • tip trucks • concrete agitator trucks • street sweepers • light vehicles • compactor • cranes • vacuum trucks
Work hours	Work and deliveries will be scheduled to occur during standard daytime hours of: • 7 am to 6 pm, Monday to Friday • 8 am to 1 pm, Saturdays. The proposal is expected to require work outside these hours (eg for work in roads, delivery of oversize equipment or asset isolation). This has been assessed and mitigation measures are provided in Section 6. The community would be informed of works outside of these standard hours.
Proposal timing	Construction is expected start early 2026 and to take approximately 20 months, with completion anticipated late 2027.
Operational requirements	During operation, the new infrastructure will be connected to the water supply system and will enhance storage and supply to the Blue Mountains region. Once operational the project will be subject to periodic routine maintenance activities such as inspections, testing and repairs as necessary. An operational requirement of the new reservoir is an overflow relief mechanism. An overflow relief allows the reservoir to release water in a semi-controlled manner, if there is some type of valve or instrumentation failure, to avoid

Aspect	Detailed description
	damaging the reservoir or releasing large volumes of water uncontrolled into the surrounding environment. Typically, this would consist of a pipe connecting the reservoir to a nearby stormwater system. However, at this location, there is no nearby stormwater infrastructure to connect to. For this site, an overflow pipe would be directed to nearby bushland for overflow discharges. Two energy dissipation structures would be installed to reduce the velocity of any discharges and protect the receiving environment from potential erosion and sedimentation impacts. Refer to Section 6 for further details of potential impacts. The overflow relief mechanism would be used only occasionally and only as needed.

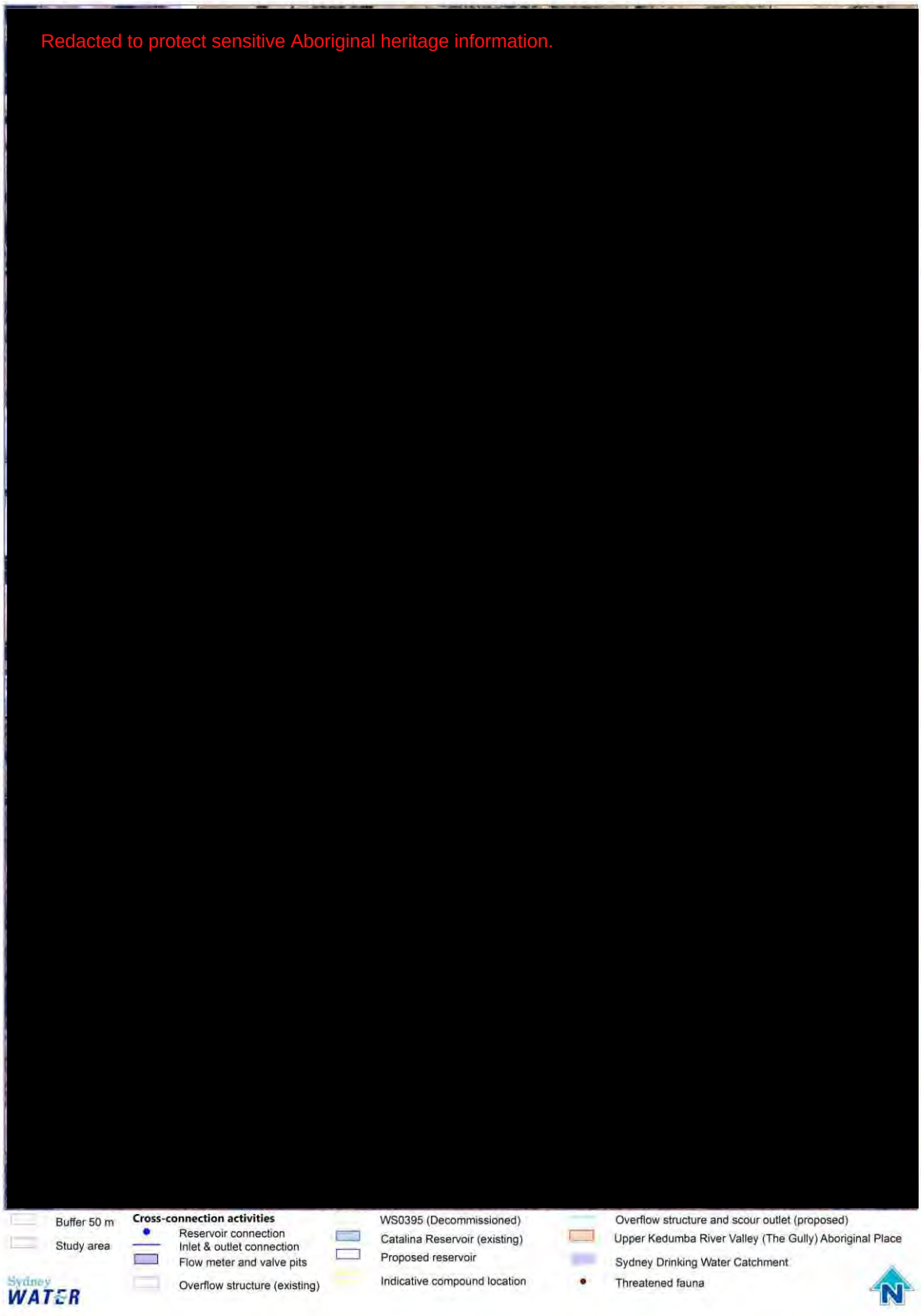

Figure 3-1 Location of proposal and key environmental constraints

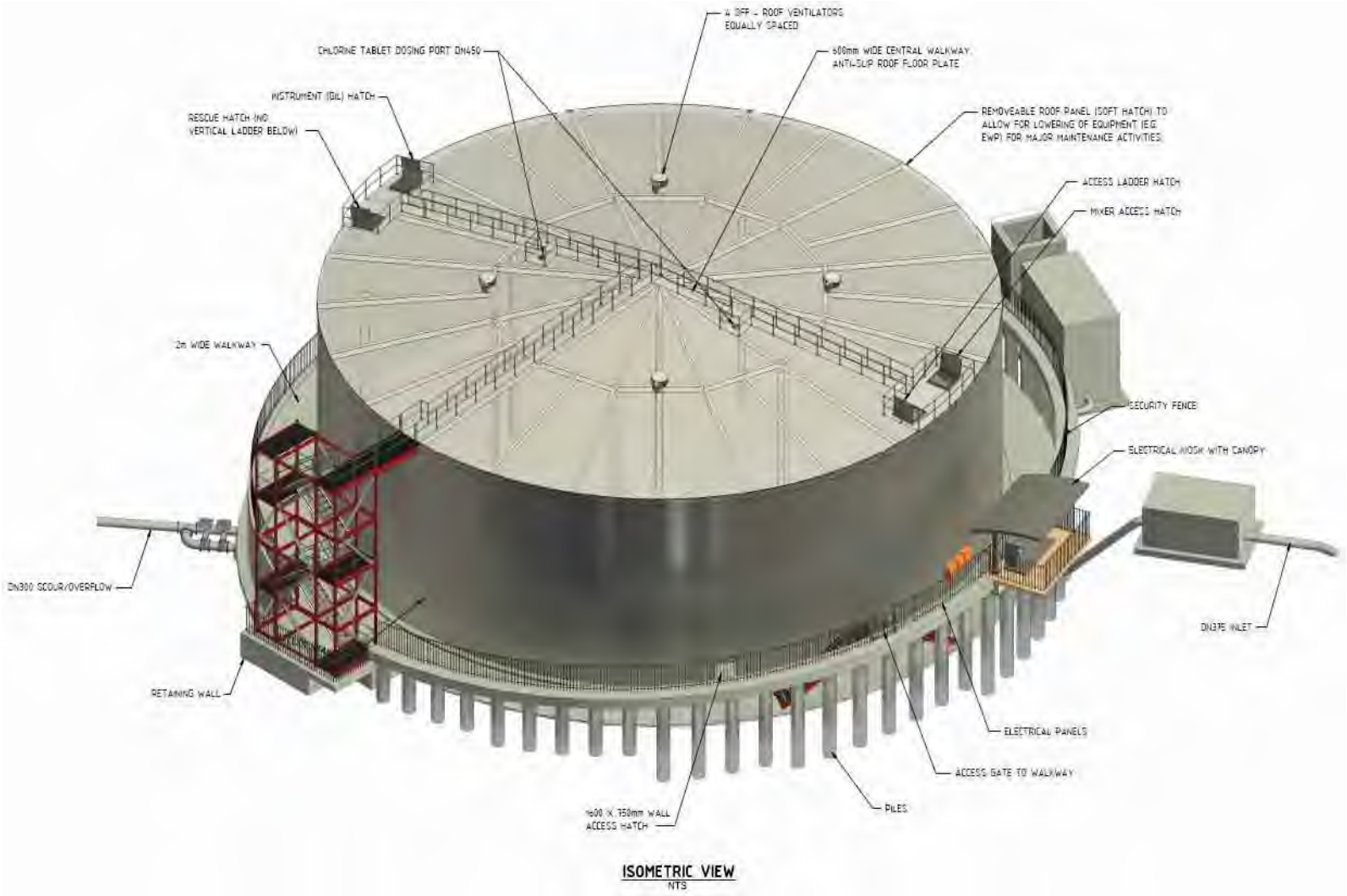

Figure 3-2 Isometric render of the proposed reservoir

3.2 Field assessment area and changes to the scope of work

The proposal shown in this REF is indicative and based on the latest concept design at the time of REF preparation. The final proposal may change based on detailed design and/or construction planning. The general mitigation measures outline when changes to the proposal trigger supplementary environmental impact assessment. If required, further assessment must be prepared in accordance with SWEMS0019.

An addendum is not required provided the change:

- remains within the study area of the REF and has no net additional environmental impact; or,
- is outside the study area of the REF, but reduces the overall environmental impact of the proposal (subsection 5.4(a) of the Act).

Changes to the proposal outside the study area can only occur:

- to reduce impacts to biodiversity, heritage or human amenity; or
- to avoid engineering (for example, geological, topographical) constraints; and
- after consultation with any potentially affected landowners and relevant agencies.

The Contractor will 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.

4 Consultation

4.1 Community and stakeholder consultation

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

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

- enables us to explain strategy, policy, proposals 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 Blue Mountains City Council with reasonable notice when we would like to commence works. Council will be consulted about matters identified in environmental planning instruments (refer Section 4.2 below). This includes public safety issues, and full or partial road closures of council managed roads.

A Communications and Stakeholder Action Plan (CSAP) was prepared to document key stakeholders consulted during the planning and design phases of the proposal. These stakeholders include:

- Blue Mountains City Council – including discussions regarding the possibility of Sydney Water and Council co-funding a public toilet facility near Lake Catalina, to protect the waters that run through The Gully and support cultural activities. This acknowledges a request from Traditional Owners (see below) but is outside the scope of this REF.
- The Gully (Upper Kedumba River Valley Aboriginal Place) Traditional Owners
- Indigenous Land User Agreement (ILUA) representatives
- NSW Rural Fire Service
- Local residents and businesses
- Bus companies – CDC NSW
- Services companies, including Telstra and Oxicom
- Water NSW.

Ongoing consultation with key stakeholders will be maintained throughout construction of the proposal.

4.2 Consultation required under State Environmental Planning Policies and other legislation

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

Consultation is required under s2.10(1f) of the TISEPP as the proposal involves excavation of a council managed road and/or footpath. However, subsection 2.17(1)(a) provides that sections 2.10-2.15 do not apply to development that would require an approval (other than development consent) under any other law from council, for the development to be carried out lawfully. As council approval under section 138 of the *Roads Act 1993* is required, and as Sydney Water has held several discussions with Blue Mountains City Council regarding the proposal, formal consultation under the TISEPP is not necessary.

The proposal is within a Sydney Drinking Water Catchment. WaterNSW were consulted regarding the proposal and have reviewed the REF and are satisfied that the activity will not impact on water quality in the Sydney Drinking Water Catchment, if all mitigation measures are implemented in full. Mitigation measures are captured in Section 6 of this REF.

5 Legislative requirements

5.1 Environmental legislation

Sydney Water is the proponent and determining authority under the EP&A Act. The proposal does not require development consent and is not classified as State significant infrastructure. We have assessed this proposal under Division 5.1 of the EP&A Act. This REF has concluded that the proposal is unlikely to have a significant impact on the environment.

The following environmental planning instruments (Table 5-1) and legislation (Table 5-2) are relevant to the proposal. Table 5-2 also documents any licences and permits required, and timing and responsibility for obtaining them.

Table 5-1 Environmental planning instruments relevant to the proposal

Environmental Planning Instrument	Relevance to proposal
Blue Mountains Local Environmental Plan 2015	The proposal is located on land zoned Infrastructure (SP2). Land adjacent to Sydney Water property includes Environmental Living (C4) and Environmental Conservation (C2). Areas of the site overlap the Aboriginal Place of Upper Kedumba River Valley (also referred to as "The Gully").
State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP)	Section 2.159(2) of the TISEPP permits development by or on behalf of a public authority for water storage facilities (including reservoirs) without consent on land in certain land use zones, including SP2 Infrastructure. As the proposal involves development of a water storage facility, is in land zoned SP2 Infrastructure, and Sydney Water is a public authority, the proposal is permissible without consent.
SEPP (Biodiversity and Conservation) 2021	**Vegetation in non-rural areas (Chapter 2)** Chapter 2 of this SEPP applies as it is in a zone listed in subsection 2.3(1). However, subsection 2.4(1) states: '*This Policy does not affect the provisions of any other SEPP….*', and as the works are permissible under the TISEPP a Council permit to clear vegetation under this SEPP is not required. **Koala habitat protection Chapter 4** Chapter 4 of this SEPP aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas. The LGA of Blue Mountains City

Environmental Planning Instrument	Relevance to proposal
	Council, in which the proposal is located, is listed under Schedule 2 as an LGA to which Chapter 4 applies. Chapter 4 applies to development for which consent is required. No approved koala plan of management is currently in force within the Blue Mountains LGA. Section 4.9 provides the applicable development controls for development on land with no koala plan of management. Section 4.9(1) establishes the application of the development controls as land which (a) has an area of at least 1 hectare (including adjoining land within the same ownership), and (b) does not have an approved koala plan of management applying to the land. The total area of adjoining land owned by Sydney Water is less than 1 hectare, totalling about 0.48 hectares. Therefore, the development controls are not applicable to the proposal. Potential impacts to koala habitat were considered and are discussed in section 6.2.3. **Water catchments (Chapter 6)** Chapter 6 consolidates former chapters 8 to 11 related to water catchments for the Georges River catchment, Hawkesbury-Nepean catchment, Sydney Harbour catchment and Sydney drinking water catchment. The study area is located within the Sydney drinking water catchment as declared by Chapter 6, section 6.60 of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021*. Activities by determining authorities assessed under Part 5 of the EP&A Act that are within a drinking water catchment, are required to consider whether the activity would have a neutral or beneficial effect on water quality, as specified in Section 171A of *Environmental Planning and Assessment Regulation 2021*. Accordingly, a neutral or beneficial effect on water quality (NorBE) assessment was carried out (following the *NorBE on Water Quality Assessment Guideline* (Water NSW, 2022)) and concluded the proposal would have a neutral effect on water quality. The NorBE assessment is provided at Appendix C.

Table 5-2 Consideration of key environmental legislation

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
Protection of the Environment Operations Act 1997 (POEO Act)	Construction and operation of the proposal is not a scheduled activity and therefore an Environment Protection Licence (EPL) is not required. The works have the potential to pollute the environment during construction from accidental spills and movement of sediment off-site. Provided the safeguards outlined in section 5 of this REF are applied during construction, no pollution is expected. Chapter 5 of the POEO Act deals with pollution of, and harm to the environment. There is a requirement under Part 5.7 of the POEO Act to immediately report any pollution incidents to the relevant authority, where material harm to the environment is caused or threatened. The definition of material harm and the relevant authorities are identified in Part 5.7 of the POEO Act. The Contractor will notify the EPA and all relevant authorities as soon as they become aware of any pollution incidents that have caused, or threatened, material harm to the environment, in accordance with SWEMS0009.	NA	NA
Biodiversity Conservation Act 2016 (BC Act)	Protection of native species and ecological communities in NSW is under the BC Act. Threatened species and communities are listed in the Schedules of the Act. A flora and fauna assessment was undertaken by Biosis in 2022, and a desktop assessment by Sydney Water in June 2024. The Biosis study involved a desktop review, which included database searches for flora and fauna previously recorded, a flora and fauna survey, likelihood of occurrence assessment for the identified flora and fauna, and assessment of significance for those species and communities that were found to be likely to occur. The complete flora and fauna assessment is provided as Appendix D. Clearing of native, non-threatened vegetation is required for construction of the proposal. However, the proposal would not have any direct impact on threatened species, communities, or their habitats. No	NA	NA

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	significant impact is expected; therefore, the Biodiversity Offsets Scheme does not apply to the proposal. Vegetation removed will be offset in accordance with Sydney Water's Biodiversity Offset Guidelines. Potential impacts to biodiversity are described in Section 6.2.3.		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	A check of the protected matters search tool was made in June 2024 and no impacts to matters of national environmental significance listed under the EPBC Act are expected as a result of the proposal.	NA	NA
National Parks and Wildlife Act 1974 (NPW Act)	Under section 86 of this Act, it is an offence to harm or 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. The proposal is within an Aboriginal Place and an AHIP under section 90 of the Act will be required. The proposal does not require work within or adjacent to a National Park.	AHIP	Post REF, pre-construction, Sydney Water (for AHIP)
Water Act 1912/ Water Management Act 2000	Section 60A of the *Water Management Act* states that it is an offence to take water without a licence. A Water Access Licence is required under section 61 where groundwater extraction will be greater than 3 ML. A Water Supply Work Approval (WSWA) is required under Section 90(2) for all activities that involve dewatering groundwater (eg dewatering an excavation such as a trench, or HDD), irrespective of volume.	WSWA (for <3ML) and WAL (for >3ML)	Pre-construction, Contractor.
Roads Act 1993	This act regulates works in, on or over a public road. Approval under Section 138(1) of this Act is required for carrying out works in, digging up, or disturbing a public road. Traffic control or partial closures may be required for work on these roads. Valley Road is a Regional road managed by Blue Mountains City Council. A road occupancy licence will be required.	Road Occupancy Licence	Pre-construction, Contractor

Legislation	Relevance to proposal	Permit or approval	Timing and responsibility
	Potential impacts of the proposal on traffic and access are described in Section 6.2.8.		
Native Title Act 1993 (Commonwealth)	The proposal is located within the application area of an Indigenous Land Use Agreement (ILUA) under the *Native Title Act 1993*. The Gundungurra Area Agreement (NI2014/001) covers a large area, of about 6,942 km^2. Around 8 km south of Lithgow to about 18 km north of Goulburn. Sydney Water has consulted with representatives of the Gundungurra Area Agreement about the proposal. Sydney Water received a letter of support from the chairperson of the Gundungurra Area Agreement for the proposal, dated 19 November 2019, including the temporary use of Sydney Water-owned land within the Aboriginal Place adjacent to the reservoir. After additional consultation was carried out with The Gully Traditional Owners in November and December 2022, concerns were raised regarding the updated proposal. An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared for the proposal (ELA 2024). Based on the outcomes and recommendations of the ACHAR, Sydney Water will obtain an Aboriginal Heritage Impact Permit (AHIP) for the works affecting the Aboriginal Place.	AHIP	Pre-construction, Sydney Water
Environmental Planning and Assessment Regulation 2021 (EP&A Regulation)	The study area is located within the Sydney drinking water catchment as declared by Chapter 6, section 6.60 of the EP&A Regulation. Activities by determining authorities assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* that are within a drinking water catchment, are required to consider whether the activity would have a neutral or beneficial effect on water quality, as specified in Section 171A of EP&A Regulation. Accordingly, a neutral or beneficial effect on water quality (NorBE) assessment was carried out (following the *NorBE on Water Quality Assessment Guideline* (Water NSW, 2022)) and is provided at Appendix C.	NorBE	During REF, Sydney Water

6 Environmental assessment

Section 6 describes the existing environment and assesses direct and indirect impacts of the proposal during construction and operation**.** It also identifies mitigation measures to minimise impacts. These will be incorporated into contract documents and a Construction Environmental Management Plan (or similar) prior to starting work.

6.1 Existing environment

The proposal is situated on the eastern side of Valley Road in the suburb of Katoomba within the Blue Mountains City Council LGA. The proposal would be carried out primarily within land owned by Sydney Water. The proposal is located on land zoned Infrastructure (SP2). Surrounding land uses consist of a mix of lower density residential properties and environmental conservation. The Blue Mountains Incident Control Centre is located adjacent to the proposal. This facility co-locates the Rural Fire Service (RFS) with the Emergency Operations Centre and SES Unit Control Centre. Sydney Water currently allows the RFS to use some of the available space on Sydney Water-owned land for storage and other activities.

An existing steel tank reservoir built, pre-1950, is located at the site and has not been operational for decades. A bus stop is located at the northern extent of the site. A telecommunications tower, owned by Telstra, is also located at the site and is fenced off.

The surrounding area is characterised by a gently sloping topography with the site located about 1050 m Australian Height Datum (AHD). There is native remnant vegetation located at the site, however groundcover is generally poor. Environmentally sensitive areas include adjacent bushland and a declared Aboriginal Place in the vicinity of the proposal. Figure 6-1 shows the site, looking east from Valley Road.

Figure 6-1 Existing site including decommissioned reservoir. Source: Google Maps

6.2 Environmental aspects, impacts and mitigation measures

6.2.1 Topography, geology and soils

Existing environment

The topography of the study area is generally sloping east towards bushland. The slope flattens to a lower bench which is partly occupied by the RFS and is used for storage and vehicle parking. The elevation of the study area is about 1053 m AHD, sloping east to about 1045 m AHD.

The geology of the study area is characterised by Banks Wall Sandstone of the Grose Subgroup and the broader Narrabeen Group of sandstones. The Banks Wall Sandstone is described as a quartzose sandstone with two sub-units comprising:

- Docker Head Claystone Member – kaolinitic claystone; includes paleosols
- Wentworth Falls Claystone Member – red-brown claystone, partly mottled.

Soil landscapes are identified as “Wollangambe” and “Medlow Bath” in the vicinity of the proposal. These soil landscapes are described as being erosional and residual in nature. Localised fill material may also be present, originating from earthworks associated with the existing decommissioned reservoir.

A search of the NSW Environment Protection Authority public register of licences and notices in the LGA of Blue Mountains did not return any areas of known contamination within the vicinity of the proposal.

A geotechnical investigation was also carried out (SWPP, 2022a; 2022b) for the proposal to identify the characteristics of underlying soils and geology, and inform the design of the proposal. Figure 6-2 shows the interpreted geology with the proposed reservoir overlain.

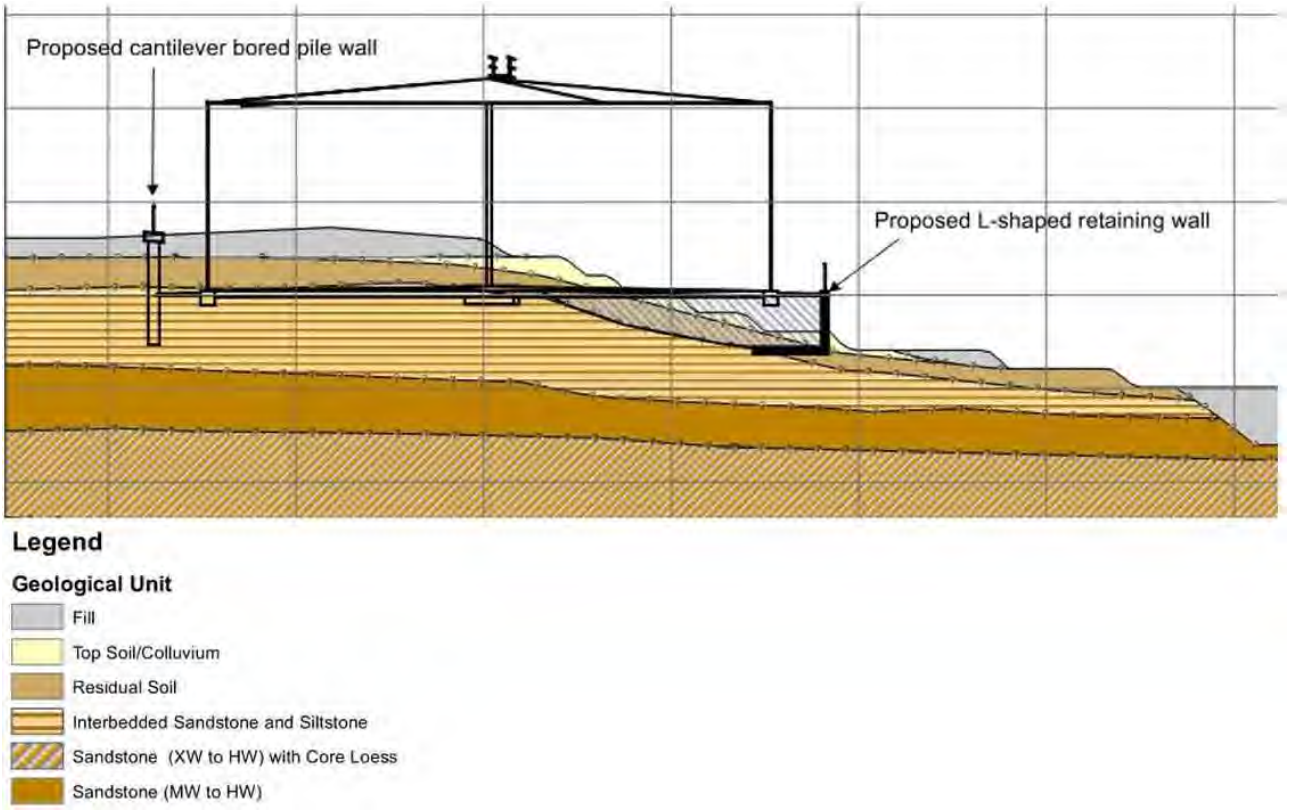

Figure 6-2 Geological cross section

Potential impacts

The main potential impact to topography, geology and soils during construction is erosion and sedimentation. Construction activities would involve excavation for placement of the new reservoir, trenching for connections, and stockpiling of excavated material. In the event of rainfall, stockpiled material has the potential to erode and lead to sedimentation of surrounding land and waterways.

Soils, erosion and sedimentation

The proposed reservoir would be founded at 1050 mAHD, while the existing ground level at the proposed reservoir location slopes from about 1053 mAHD to 1047 mAHD. The reservoir would be constructed at this elevation to match the existing reservoir level on the western side of Valley Road. Excavation up to approximately 5 m deep would be required. Placement of fill across the proposed reservoir and access corridor footprint would also be necessary to provide a level surface and a stable base for the reservoir. The estimated volume of cut (excavated material) and fill (placed material) required is summarised in **Table 6-1.** While there will be more cut material than the required fill, it is likely that engineered fill material would be necessary in addition to the balance presented, to meet Sydney Water specifications and provide a safe and stable foundation.

Table 6-1 Earthworks balance for reservoir excavation

Cut	Fill	Net total
- 1617.37 m^3	+ 253.36 m^3	- 1364.01 m^3

Cross-connections between the proposed reservoir and the existing water network within the road corridor of Valley Road would be open trenched. A maximum excavation depth of about 2 m below surface levels would be necessary to provide the connections, and up to 5 m for associated flow meter and valve pits. A trench of approximately 5 m wide and 4 m deep, for the length of the alignment is required for the overflow discharge and scour structure. For trenches greater than 1.5 m deep, appropriate trench stabilisation would be provided.

Minor grading of the surface within the proposed construction compound may also be required to provide a level surface for workers, vehicles, plant, materials, spoil and equipment to be stored.

Stockpiling of excavated material would be situated outside of flood prone areas and as far as practicable on level surfaces. The stockpiles would be established for a relatively short duration before being used in backfilling and restoration where practicable or transported off-site. Erosion and sediment controls would be installed to prevent sediment moving off-site. As such, the potential for substantial erosion and sedimentation to occur would be limited.

Acid sulfate soils and soil contamination

A preliminary site investigation and contamination assessment report was carried out (SWPP, 2022c) as part of the concept design development of the proposal to identify any potential areas of environmental concern.

As the study area is not mapped as containing acid sulfate soils and geotechnical investigations did not identify any potential acid sulfate containing materials, interaction with acid sulfate soils is not considered likely.

The preliminary site investigation of contamination indicated that there is potential for some contamination to be present due to historic land uses. A total of eight soil samples and a groundwater sample were collected from the study area and analysed for the presence of asbestos and contaminants of potential concern (CoPC). These CoPC included total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides and organophosphorus pesticides (OCP/OPP), and heavy metals. Analysis was also conducted for the presence of per- and polyfluoroalkyl substances (PFAS).

The analysis of samples taken in the study area indicate that CoPC concentrations in soil were either below the limit of reporting or below the relevant human health and ecological screening levels. Trace concentrations of perfluorooctanoic acid (PFOS), a PFAS substance, were detected in two soil samples of fill material at concentrations of 0.0005 milligrams per kilogram (mg/kg) and 0.0016 mg/kg. This is assumed to be associated with the adjacent Rural Fire Service property. No PFAS was detected in groundwater and no asbestos was detected in samples.

The PFAS National Environmental Management Plan version 2.0 (HEPA, 2020) provides human health and ecological guideline values for soil concentrations of PFOS in various land uses (ie different potential levels of exposure). Table 6-2 summarises the relevant guideline values.

Table 6-2 Guideline PFOS values for soil

Receptor	PFOS concentration	Land use
Human health	1 mg/kg	Public open space[1]
Ecological direct exposure	1 mg/kg	All land uses

Note 1: It is not expected that the study area would be open to the public, however public open space land use was adopted as a conservative level of potential exposure.

The trace concentrations of PFOS are well below the guideline values for human health and ecological direct exposure. Based on the analysis of collected samples, soils and groundwater in the study area do not pose a risk to human health or the environment (SWPP, 2022c).

Topography

Construction and operation of the proposal would change the surface topography to a minor extent, also affecting localised drainage patterns. The topography of the reservoir site has also previously been modified due to the construction of the existing reservoir. Appropriate fill and reinforcing structures, such as retaining walls, would be constructed to ensure a stable landform and reduce the risk of settlement, or movement, of the reservoir once constructed.

Summary

Overall, construction and operation of the proposal would have limited potential impacts on topography, geology and soils, with the key potential impact being erosion and sedimentation during construction. With the implementation of the safeguards provided below, the proposal is expected to have only a minor impact.

Mitigation measures

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

Table 6-3 Environmental mitigation measures — topography, geology and soils

Mitigation measures
Prevent sediment moving offsite in accordance with *Managing Urban Stormwater, Soils and Construction, Volume 1 and 2A* (Landcom 2004 and DECC 2008), including: • develop a Soil and Water Management Plan (SWMP) as part of the CEMP • divert surface runoff away from disturbed soil and stockpiles

Mitigation measures
• install sediment and erosion controls before construction starts • reuse topsoil where possible and stockpile separately • inspect controls at least weekly and immediately after rainfall • rectify damaged controls immediately • remove controls once surfaces have been stabilised, including removing trapped sediment in drainage lines.
Minimise ground disturbance and stabilise disturbed areas progressively.
Contractor to ensure imported material is certified for intended use and is free from contamination including asbestos.
Stop work in the immediate vicinity of suspected contamination. Indicators of contamination include discoloured soil, anthropogenic fill material, asbestos, strong 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. Sydney Water Project Manager to contact Property Environmental Services for advice regarding management options.
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.

6.2.2 Water and drainage

Existing environment

The proposal is not located in the vicinity of any natural waterways and no stormwater infrastructure is in the vicinity of the reservoir. Valley Road is not connected to a stormwater network, and it is assumed that stormwater or other water discharges from properties along Valley Road are not managed. The nearest natural waterway from the study area is around 150 m west and is an ephemeral tributary of Megalong Creek, further west. To the east, the nearest watercourse is about 500 m away, separated by bushland within Frank Walford Park, also known as ‘The Gully’ to the Traditional Owners of the land.

A review of *Blue Mountains Local Environmental Plan 2015*, and Blue Mountains City Council interactive mapping and flood studies indicates that the proposal is not located within a flood prone area.

Potential impacts

As no stormwater drainage infrastructure is present in the vicinity of the proposal, potential discharges and overflows from the reservoir would be managed through an overflow relief structure. The overflow relief is proposed to discharge to the adjacent environment, directed towards bushland east of the proposal. The overflow relief structure should be designed and implemented such that it moderates the volume and velocity of potential discharges, with the aim to prevent erosion and sedimentation. The design would include energy dissipating measures and an engineered surface for water to release onto (such as riprap or gabion). An indicative design of the overflow relief outlet structure is shown in Figure 6-3.

Site drainage arrangements, such as reservoir roof guttering, would be directed to the overflow relief structure to control site runoff. It is unlikely that stormwater releases through the overflow relief would have any material impact to the receiving environment as it would pass through the energy dissipating measures onto the riprap or similar.

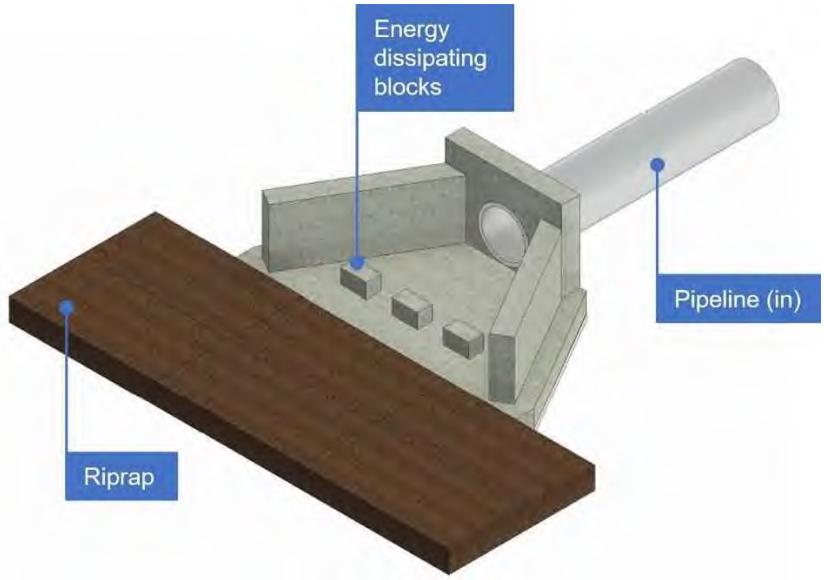

Figure 6-3 Indicative design of overflow relief discharge structure

During commissioning, the reservoir would be filled to check for leaks and that the system is operating correctly. Discharge of this water through the overflow structure would be necessary to empty the reservoir. The rate of discharge would be monitored and controlled to minimise the potential for flooding or environmental damage of the receiving environment caused by the discharge. The overflow arrangement includes two energy dissipating structures to reduce the velocity of discharged water with the aim to prevent erosion.

Once operational, planned maintenance activities would be necessary from time-to-time, however activities that requires the emptying of the reservoir would be very infrequent. Typically, the first maintenance activity requiring the reservoir to be empty (such as roof renewals or relining) would be around 25 to 30 years from commissioning. Planned emptying would occur about every 30 years. These planned activities would also not require the discharge of the entire capacity of the

reservoir as it would be reduced as low as possible through normal supply operation before discharging the remaining water through the overflow structure.

As with any operational asset, there may be unplanned or unforeseen events that necessitate the emptying of the reservoir, such as a valve or control failure, or water quality incident. However, Sydney Water continuously monitors the water network and assets, and it is considered highly unlikely that an unplanned incident would occur necessitating emptying of the reservoir.

The study area is located within the Sydney drinking water catchment as declared by Chapter 6, section 6.60 of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021*. Activities by determining authorities assessed under Part 5 of the EP&A Act 1979 are required to consider whether the activity would have a neutral or beneficial effect on water quality, as specified in Section 171A of *Environmental Planning and Assessment Regulation 2021*. Accordingly, a neutral or beneficial effect on water quality (NorBE) assessment was carried out and is provided at Appendix C. Following assessment of the proposal against the matters considered in the NorBE assessment, it was determined that with the implementation of safeguards presented in this REF, the proposal would have a neutral effect on water quality.

Mitigation measures

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

Table 6-4 Environmental mitigation measures — water and drainage

Mitigation measures
Bund potential contaminants and store on robust waterproof membrane, away from drainage lines.
Keep functioning spill kit on site for clean-up of accidental chemical/fuel spills. Keep the spill kits stocked and located for easy access.
Locate portable site amenities away from watercourses or drainage lines.
If the potential for intercepting groundwater is identified after the REF is determined, Sydney Water will obtain a groundwater Water Supply Approval and where dewatering is >3ML per water year (from 1 July) a Water Access Licence from NRAR will also be obtained. The Delivery Contractor is responsible for: • providing expert hydrogeological technical information to obtain the approvals preparing a Dewatering Management Plan • complying with the approval conditions (such as protecting water quality; minimising aquifer extraction volumes, monitoring extraction with flow meters and recording volumes).
Discharge all water in accordance with Sydney Water's Discharge Protocols Standard Operating Procedure (WPIMS5021), including erosion controls, discharge rate, dechlorination where required, and monitoring. Maintain a slow rate of discharge, with the aim to prevent erosion. Re-use potable / groundwater water where possible.

Mitigation measures
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 and drainage lines with functioning spill kits close by.
Conduct any equipment wash down within a designated washout area.
Ensure equipment is leak free. Repair oil/fuel leaks immediately or remove from site and replace with a leak-free item.

6.2.3 Flora and fauna

A specialist flora and fauna assessment has been undertaken and is summarised here (Biosis 2022). The flora and fauna assessment included a desktop review including database searches for flora and fauna previously recorded, a flora and fauna survey, likelihood of occurrence assessment for the identified flora and fauna, and assessment of significance for those species and communities that were found to be likely to occur, as well as a field survey. The complete flora and fauna assessment is provided as Appendix D. An updated desktop assessment was also undertaken (June 2024) as part of the REF process.

Existing environment

The study area of the flora and fauna assessment encompasses the property owned by Sydney Water adjacent to the location of the proposed reservoir. The study area contains fringing native vegetation of the contiguous bushland to the east. Vegetation within the study area has previously been disturbed by various activities, including construction of the decommissioned reservoir. The study area is also within 100 m of Category 1 bushfire prone land (the highest risk category for bushfire) and is accordingly mapped as a bushfire prone land buffer zone.

A flora and fauna field survey of the study area was carried out to characterise the ecological values present. The survey identified the plant community types (PCTs) that are present within the study area along with their conservation status under the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). One PCT was identified in the study area, being:

- PCT 1248 *Sydney Peppermint – Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion*.

PCT 1248 is not associated with any threatened ecological communities listed under the BC Act or EPBC Act. Non-native vegetation and weeds are present within the study area. Figure 6-4 displays the existing vegetation within the study area.

A review of historic aerial imagery – dated 1943 and 1975, indicates that the remnant vegetation within the study area is likely to be regrowth following earlier disturbance. Figure 6-5 and Figure 6-6 show the study area with little to no tree coverage over much of the site, and quite extensive disturbance, particularly in the 1975 imagery.

Background searches identified a total of 47 threatened flora species and 26 threatened fauna species recorded or predicted to occur within 5 km of the study area. Species with at least a moderate likelihood of occurrence within the study area were determined based on the presence of suitable habitat and consisted of seven threatened flora species and 16 threatened fauna species.

During field investigations, the study area was surveyed for the presence of threatened species and habitat features that may support threatened species such as hollow-bearing trees. No threatened species or habitat features were observed within the study area. The proposal is not situated within a known Koala corridor and Koalas have not been recorded at the site. Impacts to unknown Koala populations are not expected. Appropriated mitigation measures will be applied, including stop work procedures.

Sydney Water also maintains a Property Environmental Management Plan for the Catalina Reservoir sites (on either side of Valley Road) which indicates that 14 weed species have been recorded (noting this includes the study area and the reservoir property on the western side of Valley Road). Weeds recorded include Weeds of National Significance, *Biosecurity Act 2015* listed, Priority Weeds (any weed identified in a local strategic plan), and High Threat Weed species (as defined by the Biodiversity Assessment Method (BAM) and listed on the high threat weeds list published in the BAM calculator). These weeds include:

- Sorrel, *Acetosella vulgaris*
- Kikuyu Grass, *Cenchrus clandestinus*
- Broom, *Cytisus scoparius*
- African Lovegrass, *Eragrostis curvula*
- English Ivy, *Hedera helix*
- St. John's Wort, *Hypericum perforatum*
- Small-leaved Privet, *Ligustrum sinense*
- Honeysuckle, *Lonicera japonica*
- Fishpole Bamboo, *Phyllostachys aurea*
- Creeping Buttercup, *Ranunculus repens*
- Onion Grass, *Romulea rosea*
- Blackberry, *Rubus fruticosus spp. aggregate*
- Willow, *Salix spp.*
- Greater Periwinkle, *Vinca Major.*

Figure 6-4 Existing vegetation within the study area assessed by Biosis 2022.

Figure 6-5 Historic aerial imagery dated 1945. Source: Spatial Services Historical Imagery Viewer

Figure 6-6 Historic aerial imagery dated 1975. Source: Spatial Services Historical Imagery Viewer

Potential impacts

The potential impacts on flora and fauna would primarily be due to clearing of vegetation and associated potential habitat for threatened flora and fauna species within the study area. A maximum of 0.22 hectares (ha) of native vegetation (PCT 1248) and a further 0.22 ha of non-native vegetation is proposed to be impacted (removed) for the construction of the proposed reservoir and associated compound and site establishment activities. No habitat features such as hollow-bearing trees would be impacted by the proposal.

For all species with a medium or greater likelihood of occurrence, Tests of Significance (ToS) for species listed under the BC Act and Significant Impact Criteria (SIC) assessments for species listed under the EPBC Act were prepared. In summary, the ToS and SIC assessments determined that the proposal is unlikely to result in a significant impact to any threatened species.

While this assessment assumes that the impact area would consist of all vegetation within the study area, opportunities to retain native vegetation within the study area would be explored further during detailed design and construction planning.

Under the *Biosecurity Act 2015*, "*All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable*". To prevent biosecurity risks from occurring as a result of the presence of weeds within the study area, all practical steps should be taken to control and eradicate the weeds from the study area, prior to or during vegetation removal.

Although formal offsets are not required under the BC Act, Sydney Water has an internal position to deliver a 'maintained or enhanced' biodiversity outcome if projects have residual biodiversity impacts. Vegetation removed will be offset in accordance with Sydney Water's non-statutory *Biodiversity Offset Guideline*. Re-vegetation would be carried out in accordance with Sydney Water's *Guideline for managing native re-vegetation for construction projects*.

During construction, there is potential for bushfire ignition as a result of hot works (eg welding) and use of machinery in vegetated environments. The potential for bushfire as a result of the proposal would be minimised through the implementation of the below safeguards.

During operation, infrequent, planned water discharges to bushland will be required. Water discharges will be controlled from the outlet structure, which has been designed to reduce and dissipate flow, to minimise potential impacts to the sensitive receiving environment. Planned water discharges would occur about once every 30 years. Before the outlet is used, the level of water in the reservoir would be reduced as low as possible through normal supply operation.

There is potential for water to be released for stormwater management reasons following rain events, mitigating the risk of the reservoir overflowing, or due to an unplanned incident/reservoir overflow. Unplanned incidents, requiring the complete emptying of the reservoir are considered highly unlikely to occur due to preventative measures built into the design of the reservoir, eg level control instruments.

Impacts to flora or fauna are expected to be low during operation of the proposal.

Mitigation measures

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

Table 6-5 Environmental mitigation measures — flora and fauna

Mitigation measures
Offset residual impacts to native vegetation and trees in accordance with the Biodiversity Offset Guideline (SWEMS0019.13). For Catalina Reservoir, the impact of residual loss of biodiversity values resulting from works is moderate as per the Guideline. The recommended offset ratio for moderate impacts to non-threatened native vegetation is 2:1 (eg. Where 100 m^2 of non-threatened native vegetation is removed, 200 m^2 of vegetation will need to be restored).
Undertake re-vegetation in accordance with the Guideline for managing native re-vegetation for construction projects (SWEMS0025.11).
Minimise vegetation clearance and disturbance, including impacts to standing dead trees where practicable. Where possible, limit clearing to trimming rather than the removal of whole plants.
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.
Retain dead tree trunks, bush rock or logs in-situ unless they are in the impact area and moving is unavoidable. Reposition material elsewhere on the site or approved adjacent sites. If native fauna is likely to be present, a licenced ecologist should inspect the removal and undertake fauna relocation.
If native fauna is encountered on site, stop work and allow the fauna to move away unharassed. Engage a licenced ecologist if assistance is required to move fauna.
If any threatened species (flora or fauna) is discovered during the works, stop work immediately and notify the Sydney Water Project Manager. Work will only recommence once the impact on the species has been assessed and appropriate control measures provided.
If any damage occurs to vegetation outside of the impact area (as to be 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.

Mitigation measures
Record Pesticides and Herbicides use in accordance with SWEMS00017 where applicable.
To prevent spread of weeds: • clean all equipment including PPE prior to entering or leaving the work sites. • wrap straw bales in geofabric to prevent seed spread.
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: 1. Check specific TOBAN notice to confirm whether the work can be carried out under standard exemptions (Govt Gazette No16 Feb 2018) 2. If not, apply to RFS for specific exemption 3. No hot works to occur.
A fire prevention plan is to be prepared prior to the commencement of construction which includes: • immediate reporting procedures for any accidental ignition events • carrying basic firefighting equipment (e.g. rake hoes, water and small fire extinguishers evacuation plan.

6.2.4 Heritage

Existing environment

Aboriginal heritage

A basic Aboriginal Heritage Information Management System (AHIMS) search undertaken on 20 February 2024 identified no Aboriginal sites and one Aboriginal Place within 200 m of the proposal. The identified Aboriginal Place is the 'Upper Kedumba River Valley, referred to as 'The Gully', declared under section 84 of the *National Parks and Wildlife Act 1974* (NPW Act).

The Gully covers an area of about 81 ha, mostly consisting of council and Crown land, but also includes three parcels of land within the study area owned by Sydney Water. The Gully is managed through a Plan of Management, prepared and implemented by Blue Mountains City Council, in cooperation with The Gully Traditional Owners, through The Gully Cooperative Management Committee (Blue Mountains City Council, 2021). It is noted that The Gully Plan of Management does not apply to the Sydney Water-owned parcels of land (Blue Mountains City Council, 2021) (refer to Table 1 of The Gully Plan of Management).

The Gully is a former Aboriginal fringe camp/settlement. Before 1788, prior to European arrival, The Gully was an important meeting and camping place for Aboriginal people. The Gundungurra people had established a permanent residential settlement in The Gully from at least 1894, having built their own huts and formed a strong community. However, in 1957 the residents of The Gully were forcibly evicted to make way for construction of a car racing circuit (Heritage NSW, 2015).

The circuit saw its peak during the 1960s, with its use gradually decreasing until it was effectively disused by the 1980s. In 2001, Gundungurra Elder Aunty [redacted] nominated The Gully for declaration as an Aboriginal Place. Just a year later, in May 2002, The Gully was declared as an Aboriginal Place under the NPW Act (Blue Mountains City Council, 2021).

Today, The Gully is a public reserve used for recreation and sporting activities. Walking tracks developed by the former Aboriginal occupants of The Gully are still used by residents and visitors.

The proposal is also located within an area subject to an Indigenous Land Use Agreement (ILUA), established under the Commonwealth *Native Title Act 1993*. The Gundungurra Area Agreement (ILUA NI2014/001) covers a large area in NSW (about 6,942 km^2), around 8 km south of Lithgow to about 18 km north of Goulburn which encompasses the study area.

Non-Aboriginal heritage

There are no non-Aboriginal heritage items in the vicinity of the proposal. The nearest non-Aboriginal heritage item is about 120 m west of the study area. This item is 'Bonnie Doon Reserves', a landscape conservation area listed under the *Blue Mountains Local Environmental Plan 2015*.

Potential impacts

Aboriginal heritage

A section of the footing of the new reservoir will need to be constructed within The Gully Aboriginal Place (Figure 3-1). Sydney Water has consulted with The Gully Traditional Owners regarding the proposal and the potential impacts to Aboriginal cultural heritage values associated with The Gully Aboriginal Place. A letter of support was provided to Sydney Water from the chair of The Gully Traditional Owners, dated 19 November 2019. The letter acknowledges that the proposal would involve the use (including construction activities, future repairs, maintenance and upgrades) of Sydney Water-owned land declared as part of the Aboriginal Place. At the time, the letter confirmed that the use of Lot 1 DP34360, Lot 2 DP34360 and Lot 17 DP232969 (those lots owned by Sydney Water and that form part of the Aboriginal Place declaration) will not harm the Aboriginal cultural heritage values for which the Upper Kedumba River Valley (The Gully) Aboriginal Place has been declared under section 84 of the NPW Act. Subsequent consultation in November 2022 was undertaken with The Gully Traditional Owners to provide updates with regards to the proposal and the potential impacts to the land of the Aboriginal Place. During the 2022 consultation process, The Gully Traditional Owners raised concerns that potential discharges from the reservoir could cause harm to the Aboriginal Place to the east of the study area. To address these concerns, Sydney Water added extra design features and in 2024 Sydney Water engaged specialist consultants, Eco Logical, to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR). The ACHAR is summarised below and is available in full (with redactions of sensitive information) at Appendix E.

Summary of assessment findings:

- The proposed works are located within the Upper Kedumba River Valley – The Gully, Aboriginal Place ID 9.

- No Aboriginal objects or potential archaeological deposits were identified within the study area during the survey and no specific cultural values were identified that contribute to the significance of the Aboriginal Place.
- The impacts proposed will not damage, diminish or remove any Aboriginal cultural values that contribute to the significance of the Upper Kedumba River Valley – The Gully Aboriginal Place.
- There are no AHIMS sites within the study area and there will be no harm to any known Aboriginal objects. The closest recorded AHIMS site is located approximately 450 m to the south-east of the study area.
- The Gully Traditional Owners have no objection to the proposed upgrades to the Catalina Reservoir if appropriate erosion and sedimentation management was in place to ensure no impacts to the Aboriginal Place (included in the revised design).
- Three recommendations were proposed based on the findings on the 2024 ACHAR
    - **Aboriginal Heritage Impact Permit (AHIP) is required:** prior to construction, Sydney Water will apply for an AHIP for activities proposed within the The Gully Aboriginal Place, in accordance with section 90A of the NPW Act. Activities include demolition of the decommissioned reservoir and constructing and commissioning new infrastructure. No works would occur that are within, or likely to affect, the Aboriginal Place prior to obtaining the AHIP.
    - **Erosion and sedimentation management:** controls must be applied prior to any construction groundwork, and erosion controls installed for the overflow outlet for future sedimentation management.
    - **Unexpected finds procedure:** stop works procedure as outlined in Table 6-4 Mitigation measures are required to be followed.

As The Gully Plan of Management does not apply to the Sydney Water-owned parcels of land within the Aboriginal Place, the proposal would not affect the implementation and ongoing or future management actions of the Plan of Management.

While the footprint of the proposed reservoir would be marginally located within the Aboriginal Place, Sydney Water will not place any other permanent structure within the declared Aboriginal Place. In accordance with the ACHAR and engagement undertaken, Sydney Water will seek an AHIP from NSW Environment and Heritage for the construction and commissioning of the reservoir within The Gully Aboriginal Place.

Following construction, planting of native species to restore this area would be carried out in accordance with Sydney Water's *Biodiversity Offset Guidelines* and *Guideline for managing native re-vegetation for construction projects*. Sydney Water would also contribute to bushland restoration activities within The Gully, as agreed with Blue Mountains City Council and The Gully Traditional Owners. Sydney Water is also working with council and The Gully Traditional Owners to provide a new toilet block in The Gully, to improve amenities, however this is not within the scope of this proposal.

Non-Aboriginal heritage

Due to the distance to the nearest non-Aboriginal heritage item and the localised nature of works, the proposal will not impact any listed heritage item.

Mitigation measures

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

Table 6-6 Environmental mitigation measures — heritage

Mitigation measures
If any Aboriginal object or non-Aboriginal relic is found, cease all excavation or disturbance in the area and notify Sydney Water Project Manager in accordance with SWEMS0009.
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.
Harm to any Aboriginal objects and declared Aboriginal places is only permitted once an Aboriginal Heritage Impact Permit (AHIP) has been granted. Include Aboriginal Heritage Management Plan (AHMP) in CEMP to address AHIP conditions.
All work personnel are to undergo an Aboriginal cultural heritage awareness toolbox talk prior to starting work on site. The induction should include clear explanation of heritage constraints specific to The Gully Aboriginal Place, go and no-go areas, measures to avoid impacts, stop work procedures, and contact details to obtain further heritage guidance if needed.
As per ACHAR recommendations (ELA 2024), erosion and sedimentation management controls to be installed: • prior to any groundworks / preconstruction • for the overflow outlet for future sedimentation management.
Construction area should be clearly defined, with go and no-go areas clearly identified.

6.2.5 Noise and vibration

Existing environment

The proposal is in the vicinity of a small number of residential properties, commercial premises, and bushland. The nearest open space or public recreation area is about 650 m southeast. Works would occur about 30 m from the nearest residential receiver and about 15 m from the nearest commercial premises, an Indian restaurant directly across Valley Road and adjacent to the operational reservoir.

Existing sources of noise in the area would predominantly consist of road and traffic noise, and typical domestic activities such as grass mowing. There may also be occasional noise emissions from the BMICC, such as emergency vehicle sirens. There are no nearby industrial land uses or developments in the vicinity.

Potential impacts

The proposal would generate noise and vibration during demolition and excavation, vegetation removal and other general construction activities. The majority of works would occur during standard daytime hours, with some works within Valley Road being carried out during the night to minimise disruption to traffic.

The likelihood of noise impacts from the proposal was reviewed against risk factors presented in Table 2 of the EPA's 2020 Draft Construction Noise Guideline (refer to **Table 6-7**). The review indicated that the likelihood of noise impact will be low to medium risk and a qualitative noise impact assessment was undertaken.

Table 6-7 Noise risk profile of the proposal

Work attribute	Description	Noise impact risk
Time of construction	The majority of works would occur during the recommended standard construction hours.	Low
Duration of works	Up to 18 months, however the majority of this time would be during standard construction hours.	High
Noise-making equipment and process	Use of medium-sized equipment. Light and medium-sized vehicles would be required during construction, with occasional deliveries and removals by large vehicles.	Medium
Proximity to sensitive receivers	The proposed works would occur in the vicinity of some residential properties and commercial premises.	Medium
Containment of noise	Works would be outdoors with limited isolation/containment from some sensitive receivers. However, there are opportunities to implement reasonable and feasible mitigation measures to control noise.	Medium

Work attribute	Description	Noise impact risk
Number of people affected and community views	The proposal has the potential to impact on a low number of sensitive receivers.	Low

Construction works would occur for about 18 months. During this time, works would have the potential to impact on sensitive receivers. However, it is important to note that over the duration of construction, the noisiest activities (such as earthworks and vegetation clearing) would not occur for the complete duration and there would be periods of relatively minimal noise where less noisy works would occur. Additionally, all equipment and machinery used during construction would not always be operating simultaneously nor in the one location, which would minimise potential noise impacts.

While most works would be carried out during standard daytime hours, works may sometimes need to be scheduled at other times in certain situations such as works within the roadway or deliveries of large equipment or structures. Where works outside of standard hours are necessary, the following hierarchy would be implemented (from most to least preferable):

- Saturday afternoons (1pm to 5pm)
- Sunday daytime (8am to 6pm)
- weekday evening periods (6pm to 10pm)
- weekday nights (10pm to 7am)
- all other times.

Vibration intensive works during construction may include the use of the following items of equipment:

- jackhammers
- vibrating rollers and vibrating pad compactors.

The minimum working distances of these items of equipment from off-site receivers are shown in Table 6-8 which is based on recommendations of the Transport for NSW *Construction Noise and Vibration Strategy*.

Table 6-8 Recommended minimum working distances from vibration intensive plant

Plant	Description	Cosmetic damage	Human response
Vibratory roller	1-2 tonne	5 m	15 – 20 m
	2-4 tonne	6 m	20 m
	4-6 tonne	12 m	40 m
	7-13 tonne	15 m	100 m

Plant	Description	Cosmetic damage	Human response
	13-18 tonne	20 m	100 m
	>18 tonne	25 m	100 m
Jackhammer	Hand held	Avoid contact with structure	1 m (nominal)

The use of handheld jackhammers is not expected to cause any vibration-related damage to structures or discomfort to any nearby receptor. Jackhammers would not be used on any structure other than the decommissioned reservoir proposed for demolition where necessary, and the only person within the human response distance would be the operator of the jackhammer. The use of a vibratory roller would involve compacting fill to an appropriate standard for the proposed reservoir. A dilapidation survey and/or asset condition report would be conducted prior to vibratory works that have the potential to impact a building or structure.

All reasonable and feasible mitigation measures would be implemented to reduce noise and vibration impacts during construction.

During operation, there would be negligible impacts to the existing background noise of the area as the proposal generally would not emit audible noise. No vibration-generating activities would occur during operation.

Mitigation measures

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

Table 6-9 Environmental mitigation measures — noise and vibration

Mitigation measures
Works must comply with the EPA Construction Noise Guideline (Draft, 2021), including scheduling work and deliveries during standard daytime working hours of 7am to 6pm Monday to Friday and 8am to 1pm Saturday. No work to be scheduled on Sunday nights or public holidays. Any proposed work outside of these hours must be justified. The Proposal will also be carried out in accordance with: • Sydney Water's Noise Management Procedure SWEMS0056 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:

Mitigation measures

  - 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 (eg 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 (eg 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 (eg 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:

- 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.

Conduct a dilapidation survey / asset condition assessment prior to works which have the potential to damage existing structures.

6.2.6 Air and energy

Existing environment

The proposal is located in a low density residential area, with some residential properties and commercial premises in the vicinity as well as bushland immediately to the east of the proposal. Existing air quality in the surrounding area is expected to be good given the nature of surrounding land uses, including large areas of native vegetation and low density of development.

The National Pollutant Inventory shows that there are two facilities within about 2 km of the proposal, which are:

- Elgas Katoomba at 35 Megalong Street, Katoomba
- Cascades Water Filtration Plant (owned and operated by Sydney Water) located off Mort Street, Katoomba.

Potential impacts

Emissions monitored and reported from the Elgas facility consist of volatile organic compounds (VOCs) which are carbon-based chemicals that easily evaporate at room temperature. Chlorine is monitored as an emission at Cascades which is used in the water purification process. The proposal would not materially contribute to these emissions, nor would these emissions affect the proposal.

Minor and temporary air quality impacts may result from construction of the proposal and compound activities due to emissions from machinery, equipment and vehicles used during construction. Air quality around the study area may be additionally impacted by dust generated during earthworks. Potentially dust generating activities such as earthworks would not occur for the entire duration of construction. Where there is a risk of substantial dust emissions, dust suppression measures would be implemented such as covering stockpiles and wetting exposed soils.

Energy use during construction of the proposal would primarily involve the use of fuels to power plant and equipment and is not expected to be substantially dissimilar than would be typical for similar scale construction projects. Sydney Water aims to minimises energy use in the water network. Energy would be used to pump water to the reservoir, generally at nighttime when there is lower demand on the electricity network, with water released from the reservoir primarily by gravity. During operation, the proposal is not expected to use energy greater than would be typical for a reservoir of its size.

During operation, there will not be changes to background odour at nearby receivers.

Mitigation measures

Table 6-10 Environmental mitigation measures — air and energy

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

Mitigation measures
• 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.

6.2.7 Waste and hazardous materials

Existing environment

Historic and current land uses such as water supply and activities conducted by emergency services on adjacent land, as well as uncontrolled dumping and filling, suggest that there is potential to encounter waste and hazardous materials in the study area. A preliminary site investigation was carried out within the study area to determine the potential presence of contaminants and hazardous materials. The investigation identified several potential contaminants, however these were found at very low concentrations and do not pose a risk to human or ecological health, as described in section 6.2.1. Nonetheless, there remains a risk that contaminated and/or hazardous materials are present within the study area.

Potential impacts

Construction of the proposal would generate the following waste streams:

- wastes associated with the demolition of the decommissioned reservoir
- green waste, including potential weed waste, from vegetation clearing
- excess spoil from excavations and earthworks
- general waste from the workforce such as food packaging waste
- wastewater from temporary, portable amenities.

All waste streams would be classified in accordance with the *Waste Classification Guidelines* (EPA, 2014) during construction. Further discussion of wastes is provided below.

Demolition of the existing decommissioned reservoir would generate waste requiring disposal. A review of HazCentral indicates that the existing decommissioned reservoir contains lead paints on some surfaces, while some locations were recorded as inaccessible. Risks relating to lead exposure would be managed in accordance with Part 7.2 of the *Work Health and Safety Regulation 2017* and the relevant Australian Standard Lead Paint Management Guidelines. Inaccessible locations are regarded as potentially containing asbestos. The contamination assessment report prepared for the proposal recommended that a suitably qualified person (eg occupational hygienist) should undertake a hazardous materials survey at the site to provide

specialist advice on the presence and location of hazardous materials, including but not limited to asbestos and lead-based paint.

Green waste would be generated during vegetation clearing. It is expected that some of this waste would be reused or mulched for restoration and rehabilitation activities. Some of the waste would likely classify as weed waste and would need to be appropriately managed to avoid propagation of weed species.

The proposal would require disposal of about 1500 m^3 of spoil from earthworks associated with the construction of the reservoir. Geotechnical and contamination investigations suggest that this material would most likely meet the classification of General Solid Waste (non-putrescible) as defined by the waste classification guidelines. This material would be temporarily stockpiled on site before being transported off site for disposal or reuse were practicable. The stockpiles would be managed in accordance with the safeguards listed in Section 6.11. There would also be small amounts of general construction waste.

Addendum to Part 1 of the Waste Classification Guidelines (EPA, 2016) includes specific contaminant concentration values for PFOS and other PFAS-related chemicals. The trace concentrations of PFOS detected in soil samples discussed in section 6.2.1 are well below the maximum allowed value for classification as general solid waste.

General workforce waste including food packaging and other domestic refuse would be generated in minor quantities and would be classified as putrescible or non-putrescible general solid waste. Wastewater would classify as liquid waste and be contained to temporary amenities.

Our corporate objectives include to be a resource recovery business with an increasing portfolio of circular economy products and services. This includes reducing waste through recycling and re-use, and encouraging our suppliers to minimise waste. Opportunities to reduce, recycle and reuse on this proposal would be sought with the Contractor and documented in the Waste Management Plan or CEMP.

Mitigation measures

With the implementation of the mitigation measures below, impacts to the environment from waste and hazardous materials can be adequately managed, and residual impacts are expected to be minor.

Table 6-11 Environmental mitigation measures — waste and hazardous materials

Mitigation measures
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

Mitigation measures
• 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 co-mingling / 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.
Implement a Waste Management Plan as part of the CEMP.
Provide adequate bins for general waste, hazardous waste and recyclable materials.
Minimise the generation of waste, sort waste streams to maximise reuse/recycling in accordance with the *Waste Avoidance and Resource Recovery Act 2001*.
Manage waste and excess spoil in accordance with the NSW EPA Waste Classification Guidelines. Dispose wastes at an appropriately licenced facility.
Prevent pollutants from escaping including 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. Contact Sydney Water Project Manager (who will consult with Property Environmental Services 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. Contact Property Environmental Services for advice. Develop a Lead Management plan if required.

Mitigation measures
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 the HBM.

6.2.8 Traffic and access

Existing environment and potential impacts

Existing environment

The proposal is located on Valley Road, Katoomba and does not currently have a formal access road or driveway. Valley Road is managed by Blue Mountains City Council. The existing traffic volumes on Valley Road are expected to be low. Valley Road ends about 150 m north of the study area where it intersects with Bathurst Road. The Great Western Highway is located about 100 m further north and can be accessed via Bathurst Road. To the south of the study area, Valley Road continues until it intersects and becomes Narrow Neck Road.

In the vicinity of the study area, and along Valley Road, there are no formal pedestrian paths or bicycle lanes. The verges of Valley Road are grassed or show signs of erosion, with no kerbs (with the exception of the frontage of the BMICC property) or stormwater drainage infrastructure present.

A bus stop (stop ID 2780273) is located on Valley Road at the northern extent of the study area. CDC NSW is the bus service operator for the Blue Mountains area, including Katoomba and surrounding towns. This bus stop is currently serviced by two routes: route 698, a Katoomba to Blackheath loop service and route 8715, a school bus service.

Potential impacts

During construction, some temporary partial road closures may be required for:

- Oversize vehicle access such as a crane or excavator
- Delivery of large items (such as prefabricated reservoir components), plant and equipment
- Construction of the connection pipeline from the proposed reservoir to the existing assets on Valley Road.

The number of construction vehicle movements have been estimated to be up to five light and three heavy vehicles per day during construction works. Vehicles would access the site from Valley Road into the proposed construction compound within Sydney Water-owned land. Some vehicles may be parked along Valley Road where space is not available within the site. Vehicle movements during construction would generally be at the start and end of each shift, with occasional deliveries occurring throughout the duration of works. There would also be heavy vehicle movements to transport spoil and other materials off site for reuse or disposal.

A traffic management plan would be prepared by the Contractor, in consultation with Blue Mountains City Council to manage potential traffic impacts.

The bus stop is proposed to be temporarily relocated about 20 m towards the entrance to the Blue Mountains Incident Control Centre during construction of the proposal. There is a possibility that the bus stop may be permanently relocated, depending on the outcomes of detailed design. However, whether it is a temporary or permanent relocation, the proposal is not expected to impact operation of the bus stop or services as the relocated stop would remain on Valley Road in the vicinity of its current position. Sydney Water would undertake the relocation in consultation with the bus operator, council and the Blue Mountains Incident Control Centre to determine the most suitable location.

Operation of the proposal would have a negligible impact on existing traffic conditions as vehicle movements associated with the proposal would be limited to intermittent maintenance and inspections. The proposal would also not impact existing access to any adjacent properties. Pavement surface at the front of the proposed reservoir would be provided to allow operational maintenance vehicles to park and access the site off Valley Road. Additionally, the design would provide for vehicular access to the existing Telstra asset on the north side of the site. Site fencing for security and safety purposes may also be installed around the site.

Mitigation measures

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

Table 6-12 Environmental mitigation measures — traffic and access

Mitigation measures
Prepare a Traffic Management Plan (TMP) in consultation with the relevant traffic authority.
Minimise traffic impacts near residential properties, schools and businesses by consulting with them (eg no major materials deliveries at school drop off or pick up times etc.).
Manage sites to allow people to move safely past the works, including alternative pedestrian, cyclist etc. access.
Consult with the relevant traffic authority about managing impacts to pedestrian traffic, signposting, meters, parking, line-marking or if traffic control or pavement restoration is required.
Erect signs to inform road users of the proposed works and any temporary road closures.
Ensure work vehicles do not obstruct vehicular or pedestrian traffic, or private driveway, public facility or business access unless necessary and only if appropriate notification has been provided.

6.2.9 Social and visual

A visual impact assessment was carried out for the proposal and is summarised below, and included at Appendix F.

The proposal is about 1.2 km northwest from the Katoomba town centre. The study area consists of Sydney Water-owned property which includes the existing decommissioned reservoir and two telecommunications towers. The study area also contains native vegetation including trees, as well

as non-native vegetation and weeds. On the western side of Valley Road, directly opposite the study area, an operational reservoir and pumping station are co-located on property also owned by Sydney Water.

The remaining land use surrounding the study area is predominantly low density, environmental living residential development, some commercial and environmental conservation bushland. Other government and agency property in the vicinity includes the Blue Mountains Incident Control Centre adjoining the study area to the north and an Airservices Australia aviation navigation facility on the western side of Valley Road, to the south of the study area.

The existing social values and infrastructure in the vicinity of the proposal are limited. The nearest recreational space is around 650 m southeast, consisting of Catalina Park and the Katoomba Sports and Aquatic Centre. There are limited businesses in the vicinity, including an Indian restaurant on the opposite side of Valley Road adjacent to the existing operational reservoir. An automotive servicing and repair business, and a motor inn are located about 160 m north of the proposal.

The study area and immediate surrounds feature prominent infrastructure elements including the existing reservoirs and tall communications towers. Existing views of the study area are relatively limited, generally only visible to nearby properties and passing motorists due to the surrounding topography and trees, bushland and other vegetation screening the area from more distant viewpoints. Figure 6-7 demonstrates the limited visibility of the study area looking south from 6 Valley Road. The entrance to the Blue Mountains Incident Control Centre is visible in the foreground on the lefthand side of Valley Road, while the Telstra communications tower within the study area is visible behind the building. On the opposite side of Valley Road, the top of the existing operational reservoir can be seen above vegetation.

Figure 6-7 View from 6 Valley Road, looking north towards the study area. Source: Google Maps

Potential impacts

Construction of the proposal would introduce equipment and machinery, in contrast to the existing setting however this would be temporary and removed following construction. Construction would also involve removal of trees and vegetation within the study area. During operation, the existing visual setting of a reservoir would continue, albeit with a larger footprint. During early operation the trees and vegetation adjacent to the existing reservoir would no longer be present, however restoration and replanting would restore this setting as plants mature.

A total of four viewpoints were selected as representative views of the study area from potentially affected receptors (such as local residents). These include:

- VP1 – front of 2 Valley Road
- VP2 – front of 12 Valley Road
- VP3 – front of 20-22 Valley Road
- VP4 – front of 42 Valley Road.

Each viewpoint was assessed according to the sensitivity of the receptor and magnitude of the change during construction, and operation at day one and at year 10 (representing the study area with vegetation removed and mature planted vegetation). These factors were combined to provide a visual impact rating at each stage of the proposal. A summary of the viewpoint assessments is provided in Table 6-13.

Table 6-13 Viewpoint assessment summary

Viewpoint	Receptor type	Receptor sensitivity	Magnitude of change			Visual impact rating		
			Construction	Operation (day one)	Operation (year 10)	Construction	Operation (day one)	Operation (year 10)
VP1	Temporary accommodation residents	Moderate	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
VP2	Residents	High	Moderate	Moderate	Low	High-moderate	High-moderate	Low
VP3	Residents	High	Moderate	Moderate	Low	High-moderate	High-moderate	Low
VP4	Road users	Low	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

VP1 represents the view from 2 Valley Road, around 118 m northwest of the study area. This property is a motor inn and views from occupants are generally restricted to the property itself due to the motor inn's layout and surrounding vegetation. The study area is however partially visible from the streetscape at this property. Due to the limited visibility of the study area from this viewpoint, the potential visual impact is rated as negligible for all stages.

VP2 represents the view from 12 Valley Road, opposite the study area and adjacent to the existing operational reservoir. This viewpoint is representative of the worst-case scenario, being the nearest residential property to the study area. Existing views towards the study area are relatively open, with some vegetation present in the front of the property. During construction, works would be clearly visible from this viewpoint including demolition of the existing reservoir, tree and vegetation removal, and machinery and equipment use. Once operational, the new reservoir would be similar to the existing view, replacing the old, decommissioned reservoir with a view of a new, larger reservoir in an environmental green colour. However, due to the removal of surrounding vegetation, the reservoir would be more prominent. At around year 10 of operation, maturation of planted trees within the study area would partially reinstate the pre-construction bushland setting of the property surrounding the reservoir. The visual impact rating during construction is high, day one operation is considered high-moderate, and year 10 of operation this impact reduces to low.

VP3 represents the view from the Airservices Australia site, 20-22 Valley Road, south of the study area. From this viewpoint, 23 Valley Road is directly opposite, which is a residential property adjoining the study area. This property is on a sloping lot, with the house set lower than Valley Road. From the viewpoint, the foreground view comprises Valley Road, overhead powerlines and a mix of native and exotic vegetation. The existing decommissioned reservoir and communications towers are partially obscured by vegetation, however the towers remain prominent due to their height. During construction, the extent of vegetation removal within the study area would extend to the property boundary of 23 Valley Road. This would expose this property to the construction works. At day one of operation, the new, larger reservoir would be a prominent built element with the absence of surrounding vegetation. Around 10 years into operation, the maturation of planted trees would restore the existing view from this viewpoint.

VP4 represents the view from 42 Valley Road, a residential property about 190 m southwest of the study area. The view is representative of motorists travelling north towards the study area. The existing reservoir within the study area is not visible from this viewpoint and demonstrates the limited distance at which the proposal would be seen. During all three phases of the proposal (ie construction, operation (day one) and operation (year 10)) the visual impact rating is negligible.

While avoiding all visual impacts of construction and operation is not possible, mitigation through design has sought to reduce potential impacts. Physical location, materials and finishes can assist in minimising visual impacts during design. The following aspects of design and positioning would help to mitigate potential visual impacts of the proposal:

- within Sydney Water-owned property and on a site already containing a reservoir
- views of the site are limited to a small number of properties and passing motorists
- positioning of the new reservoir is proposed in a similar position to the existing reservoir

- colour of the reservoir is proposed to be environmental green, a darker green which aims to reduce the contrast between the infrastructure and the surrounding natural environment.

In addition to mitigation through design, landscaping and planting of native species, particularly in a bushland setting, can reduce the visual prominence of the proposed reservoir. During construction and early periods of operation, the proposed reservoir would be prominent. However, planting and landscaping the surrounding area within Sydney Water property would return the site to a similar setting to the existing condition as the vegetation matures.

Figure 6-8 shows the existing study area from VP2 as well as indicative views of the proposed reservoir at day one and year 10 of operation.

Figure 6-8 View looking south towards reservoir.

Mitigation measures

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

Table 6-14 Environmental mitigation measures — social and visual

Mitigation measures
Undertake works in accordance with Sydney Water Communications policies and requirements including: • notify impacted residents and businesses • erect signs to inform the public on nature of work • personnel treat community enquiries appropriately.
Direct artificial light away from sensitive receivers where possible (ie residents, fauna or roadways).
Maintain work areas in a clean and tidy condition.
The reservoir outer surface and colour should be sympathetic to the natural landscape character and colour palette, thereby reducing the contrast, reflectivity and visual prominence of the new reservoir.
Retain existing trees and shrubs where possible.
To further minimise visual impacts, restoration and replanting should be undertaken within Sydney Water's property, to retain the existing bushland character of the site.

6.2.10 Cumulative and future trends

Existing environment

A review of the NSW Government Major Projects portal on 20 February 2024 did not identify any major projects in the vicinity of the proposal. The Blue Mountains City Council Development Application Tracker was reviewed 25 June 2024 and did not identify any local project in the vicinity of the proposal. Sydney Water is not aware of any other works (future Sydney Water or other projects) occurring in the area.

Potential impacts

The main potential cumulative impacts of the proposal include air quality, noise and traffic impacts during construction. These potential cumulative impacts would be localised and temporary during construction of the proposal. There is the potential for local development to be occurring in the area, however potential cumulative impacts with such development would be minor and short term. The Contractor would work with council and local developments to minimise cumulative impacts as required.

Future trends such as climate change were considered. Factors such as bushfires, flooding, extreme heat, and increasing frequency and intensity storm events that could impact the proposal, were considered. The proposal is unlikely to further exacerbate future trends and would increase water security for customers in the area by providing greater storage capacity for the supply zone. The proposal would also provide an increased independent water supply if Cascades Water Filtration Plant could not be accessed or operated, for example, due to bushfire.

The proposal is unlikely to be impacted by future trends. While the proposal is in the vicinity of bushland, the reservoir would be constructed of non-combustible materials and connection points would include a fire hydrant for firefighting services. The proposal is not located in a flood prone area and is unlikely to be affected by increasing frequency and intensity storm events or extreme heat events.

Mitigation measures

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

Table 6-15 Environmental mitigation measures — cumulative and future trends

Mitigation measures
If construction of the proposal coincides with other construction works in the vicinity, the Contractor will consult with Blue Mountains City Council and the developer to minimise potential cumulative impacts of concurrent construction works.

6.2.11 General environmental management

Table 6-16 Environmental mitigation measures — general environmental management

Mitigation measures
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 • location of environmental controls (including erosion and sediment controls, any fences or other measures to protect vegetation or fauna, spill kits, stockpile areas) • location and full extent of any vegetation disturbance.

Sydney Water's Project Manager (after consultation with the Project's environment 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 or Aboriginal places
- 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

Mitigation measures

- no disturbance to waterways
- potential environmental impacts can be managed using the safeguards in this REF
- no disturbance of contaminated land or acid sulfate soils
- will be rehabilitated at the end of construction.

The Contractor must demonstrate in writing how the proposed ancillary facilities meet these principles. Any facilities that do not meet these principles will require additional environmental impact assessment.

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

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

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

To ensure compliance with legislative requirements for incident notification (eg. *Protection of the Environment Operations Act 1997*), Sydney Water's employees and contractors will follow SWEMS0009 Responding to incidents with an environmental impact procedure.

All site personnel should be inducted into the IMP.

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

7 Conclusion

Sydney Water has prepared this REF to assess the potential environmental impacts of the Upper Cascades Reliability Improvement Project, in particular the construction of a new reservoir (Catalina Reservoir) off Valley Road, Katoomba. The proposal is required to improve the reliability and resilience of the water supply network.

During construction, the main potential environmental impacts of the proposal are typical construction impacts such as vegetation removal, heritage impacts, erosion and sedimentation, dust, noise, and traffic impacts. During operation, the impacts are associated with visual amenity and dewatering to the surrounding environment. 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. An AHIP will be sought from NSW Environment and Heritage for the construction and commissioning of the reservoir within The Gully Aboriginal Place.

The REF considers how the proposal aligns with the principles of ESD. The proposal will result in positive long-term environmental improvements. The proposal will not result in the degradation of the quality of the environment and will not pose a risk to the safety of the environment. The proposal will result in positive long-term benefits by improving the reliability and resilience of the water supply network for the Blue Mountains community.

References

Sydney Water (2020), *Upper Cascades Reliability Improvement Options Planning – Options Assessment Report*.

Sydney Water Planning Partnership (SWPP) (2022a), *Upper Cascades Reliability Improvement – Catalina Reservoir: Geotechnical Factual Report*.

Sydney Water Planning Partnership (SWPP) (2022b), *Upper Cascades Reliability Improvement – Catalina Reservoir: Geotechnical Interpretative Report*.

Sydney Water Planning Partnership (SWPP) (2022c), *Upper Cascades Reliability Improvement – Catalina Reservoir: Desktop Contamination Assessment Report*.

Biosis 2022. *Upper Cascades and Catalina Reservoir: Flora and fauna assessment*. Sydney Water. Goold. Z, Nicholson. J. Biosis Pty Ltd. Sydney, NSW. Project no. 35829.

Blue Mountains City Council (2021), *The Gully Aboriginal Place Plan of Management*.

Eco Logical Australia (ELA), 2024. *Catalina Reservoir Upgrades, Katoomba NSW - Aboriginal Cultural Heritage Assessment*. Prepared for Sydney Water.

EPA (2014), *Waste Classification Guidelines – Part : Classifying waste*, NSW Environment Protection Authority, https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines

EPA (2016), *Addendum to the Waste Classification Guidelines (2014) – Part 1: classifying waste*, NSW Environment Protection Authority, https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines

HEPA (2020), *PFAS National Environmental Management Plan Version 2.0*, Heads of EPAs Australia and New Zealand, https://www.dcceew.gov.au/environment/protection/publications/pfas-nemp-2

Heritage NSW (2015), *State Heritage Inventory: Upper Kedumba River Valley – The Gully*, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5062893

Appendices

Appendix A – Section 171 checklist

Section 171 checklist	REF finding
Any environmental impact on a community	There may be short-term impacts on the community due to emissions of noise and dust. There will also be longer term changes to visual amenity in the immediate surrounds. There will be environmental improvements by providing a reliable and more resilient water service to the local community.
Any transformation of a locality	The proposed work will not result in the transformation of a locality. The proposal would be situated at a locality that is historically associated with water supply infrastructure.
Any environmental impact on the ecosystems of the locality	The proposal will not result in significant environmental impacts to ecosystems of the locality as discussed in Section 6.2.3; however, there will be some impacts to non-threatened native vegetation. Offsets commensurate with the impacts would be provided in accordance with Sydney Water's Biodiversity Offsets Guideline. The proposed work may have minor localised and temporary impacts to air quality and soils through erosion during construction. Safeguards have been designed to mitigate these potential impacts.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The proposed work will result in a minor reduction of the aesthetic value of the immediate locality as the new reservoir would be larger than the existing decommissioned reservoir. Safeguards have been provided to minimise potential visual amenity impacts, including replanting vegetation required to be removed for construction.
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 is located adjacent to and partially within a place having cultural significance (The Gully). An Aboriginal Cultural Heritage Assessment Report, completed in 2024, notes any proposed impacts from construction work would not damage, dimmish or remove any Aboriginal cultural values contributing to the significance of this Aboriginal Place. The proposal will only proceed after an Aboriginal Heritage Impact Permit is obtained. No other effects will occur upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations.
Any impact on the habitat of any protected animals (within the meaning of the *Biodiversity Conservation Act 2016*)	The proposed work will result in impacts to non-threatened native vegetation and potential habitat for protected animals. However, as discussed in section 6.2.3, the proposal will not have a significant impact on any species, community or habitat.

Section 171 checklist	REF finding
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 proposed work will not be endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.
Any long-term effects on the environment	The proposed work would alter the visual character of the environment over the long-term due to the construction of a larger reservoir. However, visual impacts are expected to be experienced by a low number of residents, and replanted vegetation will reduce the visual impacts over time. Visual and environmental impacts from vegetation removal during construction would be temporary, with impacting vegetation being offset 2:1 in accordance with Sydney Water's Biodiversity Offsets Guideline. The proposal will have a long-term benefit by providing a more resilient water supply service for the area.
Any degradation of the quality of the environment	The proposed work will include infrequent discharges of water through the overflow relief structure. However this is not expected to degrade the quality of the environment. The overflow relief structure would be designed to reduce the velocity of discharges and displace the water over an engineered surface, to reduce the likelihood of scouring or erosion.
Any risk to the safety of the environment	The proposed work will not increase risk to the safety of the environment. The new reservoir has been designed in line with industry standards and regulations. The new reservoir would also provide a direct fire hydrant connection point for firefighting activities.
Any reduction in the range of beneficial uses of the environment	The proposed work will not have any reduction in the range of beneficial uses of the environment. The new reservoir would be located on property already owned by Sydney Water and on a site where an existing (decommissioned) reservoir is positioned.
Any pollution of the environment	Environmental safeguards will mitigate the potential for the proposed work to pollute the environment. No pollution of the environment is expected.
Any environmental problems associated with the disposal of waste	The disposal of wastes will be conducted in accordance with the environmental safeguards, and no environmental problems associated with the disposal of waste are expected.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	The proposal will not increase demand on resources, that are, or are likely to become, in short supply.

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 coastal processes or hazards, and coastal processes and coastal hazards will not have any impact on the proposal.
Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act, Division 3.1	The Blue Mountains form part of the Western City District under the Greater Sydney Region Plan – A Metropolis of Three Cities. The Western City District Plan recognises the importance of water infrastructure as one of the key infrastructure components for supporting current and future populations. The proposal aligns with the Plan as it would provide greater resilience to the water supply system for current and future populations.
Any other relevant environmental factors.	The proposed work has been assessed against the factors listed above, and there are no other relevant environmental factors to consider.

Appendix B – Consideration of TISEPP consultation

TISEPP section	Yes	No
Section 2.10, council related infrastructure or services – consultation with council		
Will the work:		
Potentially have a substantial impact on stormwater management services provided by council?		✓
Be likely to generate traffic that will strain the capacity of the road system in the LGA?		✓
Connect to, and have a substantial impact on, the capacity of a council owned sewerage system?		✓
Connect to, and use a substantial volume of water from a council owned water supply system?		✓
Require temporary structures on, or enclose, a public space under council's control that will disrupt pedestrian or vehicular traffic that is not minor or inconsequential?		✓
Excavate a road, or a footpath adjacent to a road, for which the council is the roads authority, that is not minor or inconsequential?	✓	
Section 2.11, local heritage – consultation with council		
Is the work likely to affect the heritage significance of a local heritage item, or of a heritage conservation area (not also a State heritage item) more than a minor or inconsequential amount?		✓
Section 2.12, flood liable land – consultation with council		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and will works alter flood patterns other than to a minor extent?		✓
Section 2.13, flood liable land – consultation with State Emergency Services		
Will the work be on flood liable land (land that is susceptible to flooding by the probable maximum flood event) and undertaken under a relevant provision*, but not the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance? * (e) Div.14 (Public admin buildings), (g) Div.16 (Research/ monitoring stations), (i) Div.20 (Stormwater systems)?		✓
Section 2.14, development with impacts on certain land within the coastal zone– council consultation		
Is the work on land mapped as coastal vulnerability area and inconsistent with a certified coastal management program?		✓
Section 2.15, consultation with public authorities other than councils		
Will the proposal be on land adjacent to land reserved under the *National Parks and Wildlife Act 1974* or land acquired under Part 11 of that Act*? If so, consult with DPE (NPWS).*		✓
Will the proposal be on land in Zone C1 National Parks and Nature Reserves or on a land use zone that is equivalent to that zone? *If so, consult with DPE (NPWS).*		✓
Will the proposal include a fixed or floating structure in or over navigable waters? *If so, consult TfNSW.*		✓
Will the proposal be on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*? *If so, consult with Subsidence Advisory NSW.*		✓
Will the proposal be on land in a Western City operational area specified in *the Western Parkland City Authority Act 2018,* Schedule 2 and have a capital investment value of $30 million or more? *If so, consult the Western Parkland City Authority*.		✓
Will the proposal clear native vegetation on land that is not subject land (ie non-certified land)? *If so, notify DPE at least 21 days prior to work commencing. (Requirement under s3.24 Chapter 3 Sydney Region Growth Centres - of the SEPP (Precincts – Central River City) 2021).*		✓

Appendix C – Neutral or beneficial effect on water quality (NorBE Assessment)

NorBE assessment – is there likely to be a neutral or beneficial effect on water quality?	
Are there any identifiable potential impacts on water quality? What pollutants are likely? *Major potential pollutants are sediments (fine & coarse), nitrogen, phosphorus, pathogens and hazardous chemicals and contaminants such as oil/fuel.* At what stage do the impacts occur? *ie during construction and/or post construction?*	**Construction requirements** The proposal includes excavation and vegetation removal to enable the removal of existing infrastructure and construction of the proposed new reservoir. The construction method will include ground disturbance in the form of cut and fill, and removal of trees. The proposed works are located within an area previously modified for water infrastructure and/or within the roadway and verge in disturbed land. The nearest natural waterway from the study area is around 150 m west and is an ephemeral tributary of Megalong Creek further west. To the east, the nearest watercourse is at a distance of about 500 m separated by bushland within Frank Walford Park, also known as 'The Gully' to the Traditional Owners of the land. Potential pollutants are sediment from the excavation and/or stockpiling of soil. Hazardous construction waste, including existing infrastructure comprised of cement, fabricated metals and/or any debris that arises during proposed activities. There is a small potential for fuel spills from the vehicles to impact water quality, and possible hazardous materials (eg lead paint) but this can be managed by the mitigation measures. Construction activities have the potential to cause soil erosion and/or soil contamination, mainly from the excavation and stockpiling of soils. Additionally, incorrect stockpiling of soils could result in sediment run-off entering the surrounding ecosystem. Potential pollutants are not anticipated post-construction. **Operational requirements** Once operational, planned maintenance activities would be necessary periodically. However, activities that requires the emptying of the reservoir would be very infrequent. Typically, the first maintenance activity requiring the reservoir to be empty (such as roof renewals or relining) would be around 25 to 30 years from commissioning. Planned emptying would occur about every 30 years. These planned activities would also not require the discharge of the entire capacity of the reservoir as it would be reduced as low as possible

NorBE assessment – is there likely to be a neutral or beneficial effect on water quality?	
	through normal supply operation before discharging the remaining water through the overflow structure. As with any operational asset, there may be unplanned or unforeseen events that necessitate the emptying of the reservoir, such as a valve or control failure, or water quality incident. However, Sydney Water continuously monitors the water network and assets, and it is considered highly unlikely that an unplanned incident would occur necessitating emptying of the reservoir. An overflow pipe directed to nearby bushland would be provided for overflow discharges and would include two energy dissipation structures to reduce the velocity of any discharges, protecting the receiving environment from potential erosion and sedimentation impacts. The mitigation measures to manage the potential impacts from construction and operational requirements are discussed in section 6.
For each pollutant list the safeguards needed to prevent or mitigate potential impacts on water quality? *These may be WaterNSW endorsed current recommended practices (CRPs) and/or equally effective other practices*	The mitigation measures used to manage identifiable potential impacts on water quality are described in section 6.2.2.
Will the safeguards be adequate for the time required? How will they need to be maintained?	Yes, the mitigation measures would be managed by the contractor through the implementation of the CEMP. Further safeguards are not required.
Will all impacts on water quality be effectively contained on the site by the identified safeguards (above) and not reach any watercourse, waterbody or drainage depression? Or will impacts on water quality be transferred outside the site for treatment? How? Why?	The mitigation measures outlined in this REF (Section 6) are considered effective to contain any potential impacts to water quality on site. No transfer of water is required for offsite treatment.
Is it likely that a neutral or beneficial effect on water quality will occur? Justify	The proposal is likely to have a neutral effect on water quality. Mitigation measures would be implemented with the aim to prevent any potential impacts.

NorBE assessment – is there likely to be a neutral or beneficial effect on water quality?	
	When the proposal has been completed, the level of pollutants will be the same as they were before the proposal commenced (ie neutral effect).

Appendix D – Flora and Fauna Assessment

Appendix E – Aboriginal Cultural Heritage Assessment Report

Redacted to protect sensitive Aboriginal heritage information. For information regarding project ACHAR, please contact Sydney Water representative.

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

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

Appendix F – Visual Impact Assessment

SWXXX XX/XX Insert a publication number. (*required if publicly displayed/published)*